

University of Gloucestershire

**THE HEALTH STATUS AND LIFESTYLE BEHAVIOURS OF HIGHER
EDUCATION STUDENTS IN LIBYA**

Khalid Khalil

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**A thesis submitted in partial fulfillment of the requirements of Gloucestershire
University for the degree of Doctor of Philosophy**

Author's declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text.

No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas.

Any views expressed in the thesis are those of the author and in no way represent those of the University.

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Abstract

Aims. This research investigated the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviours (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan higher education students (HES). The objectives were to compare their health status and lifestyle behaviours in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition to this, the study aimed to determine if any association existed between demographic and academic variables and health and lifestyle variables. **Purpose.** The purpose of the study was to provide baseline data required by university health programmes in Libya for planning related to the health needs of students. **Methods.** The sample consisted of 1300 higher education students from different higher education institutes and different disciplines. The self-administered health questionnaire used included questions on health and health-related behaviours and their associated social and economic factors. It was conducted during lecture time. Data were analysed with SPSS. Binary logistic regression analysis was used to identify socio-demographic variables associated with health and lifestyle variables. **Results.** In this sample of students, the prevalence of overweight was higher than the prevalence of underweight and obesity (14.5%, 18.2%, and 4.2% respectively), and 40% of students were trying to lose weight. High rates (45%) of depressive symptoms were found, however; overall 8.8% of respondents reported being diagnosed with anxiety, and 4.3% with depression. The findings of this study also indicated that students reported high levels of subjective health complaints. The majority of students reported that their physical activity levels were insufficient; only 5% of students met the international recommended levels of physical activity. Only one in ten students was found to be consuming an adequate amount of fruit and vegetables (at least five times a day). About 6% of the students self-identified themselves as current smokers, and the results revealed that smoking was a male phenomenon in Libya. Alcohol consumption is not very common among Libyan students, and only 3.5% reported drinking alcohol; overall, 1.6% reported using drugs, and all students who reported using drugs reported cannabis use. A gender difference was noticeable and consistent across types of complaints; depressive symptoms, dietary behaviour, physical activity, smoking and alcohol and drug consumption. Females reported significantly worse health status than males in terms of health complaints, and depressive symptoms. Males reported higher levels of physical activity and higher levels of smoking and alcohol and drug consumption than females. Students in North Libya showed the highest levels of physical activity, and also the highest levels of smoking, alcohol and drug consumption, whereas students in East Libya had the highest levels of fruit and vegetable consumption. Logistic regression analysis revealed substantial associations between females and depressive symptoms, dietary behaviour and higher levels of complaints, and also between social support and anxiety and depression. The comparisons with other survey data showed that the Libyan rates of overweight and obesity were similar to rates reported amongst students at Alexandria University in Egypt, and much higher than those reported in other countries such as Poland, Japan and Korea. Depressive symptom rates were similar to the rates reported among university students in Bulgaria and higher than those reported in Germany, Denmark and Poland with respect to male students, and Libyan HES reported lower rates of health complaints than students in certain other European countries. In addition, the levels of fruit and vegetable consumption amongst Libyan HES were lower than those reported amongst Australian students. The prevalence of physical activity levels was lower than that reported amongst university students in the United Arab Emirates. The results of this study clearly indicate that the prevalence of smoking and alcohol and drug consumption among students in Libya was lower than among those from other Arabic

countries such as the United Arab Emirates and Saudi Arabia. *Conclusion.* Efforts to promote a healthy lifestyle among students are needed and should place greater emphasis on physical activity and increased fruit and vegetable consumption, and on discouraging smoking and body dissatisfaction. There is a need for future research on student health, which should be carried out with a larger sample group to develop a national standardized instrument. Future research will be helpful for accurately identifying perceived barriers to, and recommending changes to enhance, physical activity among HES.

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List of Abbreviation

Name	Abbreviation
Higher Education Students	HES
Eastern Mediterranean Region	EMR
World Health Organization	WHO
International Monetary Fund	IMF
Food and Agriculture Organization	FAO
United States Department of Health and Human Services	USDHHS
National Heart, Lung, and Blood Institute	NHLBI
House of Commons Health Committee	HCHC
National Health Service Centre for Reviews and Dissemination	NHSCRD
Libyan Secretariat of Health and Environment Survey	LSHES
National Centre for Chronic Disease Prevention and Health- USA	NCCDPH
American College Health Association	ACHA
Gross Domestic Product	GDP
Body Mass Index	BMI
Higher Education Institute	HEI
University/ College	U/C
Beck Depression Inventory	BDI

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List of Publications

Khalil, K. (2009). Rates of anxiety and depression among higher education students in Libya. *Al-Satil Journal*. Accepted 20 April 2010.

Khalil, K., El-Ansari, W & Crone, D. (2010). *Correlates of Clinically Dianosed Anxiety and Depression Among Higher Education Students In Libya*. Under review. Germany. University of Chemnitz Press.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The purpose of this chapter is threefold, namely to introduce the research, to clarify the structure of the thesis and to explain how each of the individual chapters contributes to answering the research questions. The chapter starts by describing the background to the determinants of health (Section 1.2). The next section focuses on the significance of the study population (Section 1.3). In the following section the background of the study is discussed (Section 1.4). The following section provides a fuller explanation of the rationale of the study (Section 1.5). This is followed by an overview of the research aim (Section 1.6). Then, the focus shifts to explaining the thesis structure and manner in which each of the individual chapters contributes to answering the research questions (Section 1.7). Finally, the chapter concludes with a summary (Section 1.8).

1.2 Determinants of health

There are many factors which combine to influence the health of individuals and communities including: the social and economic environment, the physical environment, the person's individual characteristics and behaviours, and many others, and it is important to understand these main factors of determinants of health and how they come to influence health and cause disease (Marmot & Wilkinson, 2006). Good health is essential to a person's quality of life and according to Dahlgren and Whitehead (1991), "*Health is shaped by multiple factors including personal lifestyle and the social, cultural and physical*

environments within which a person exists” (Dugdill et al., 2009, p.7). Dahlgren and Whitehead (1991) contextualized these influences in a diagram (see Figure 1.1).

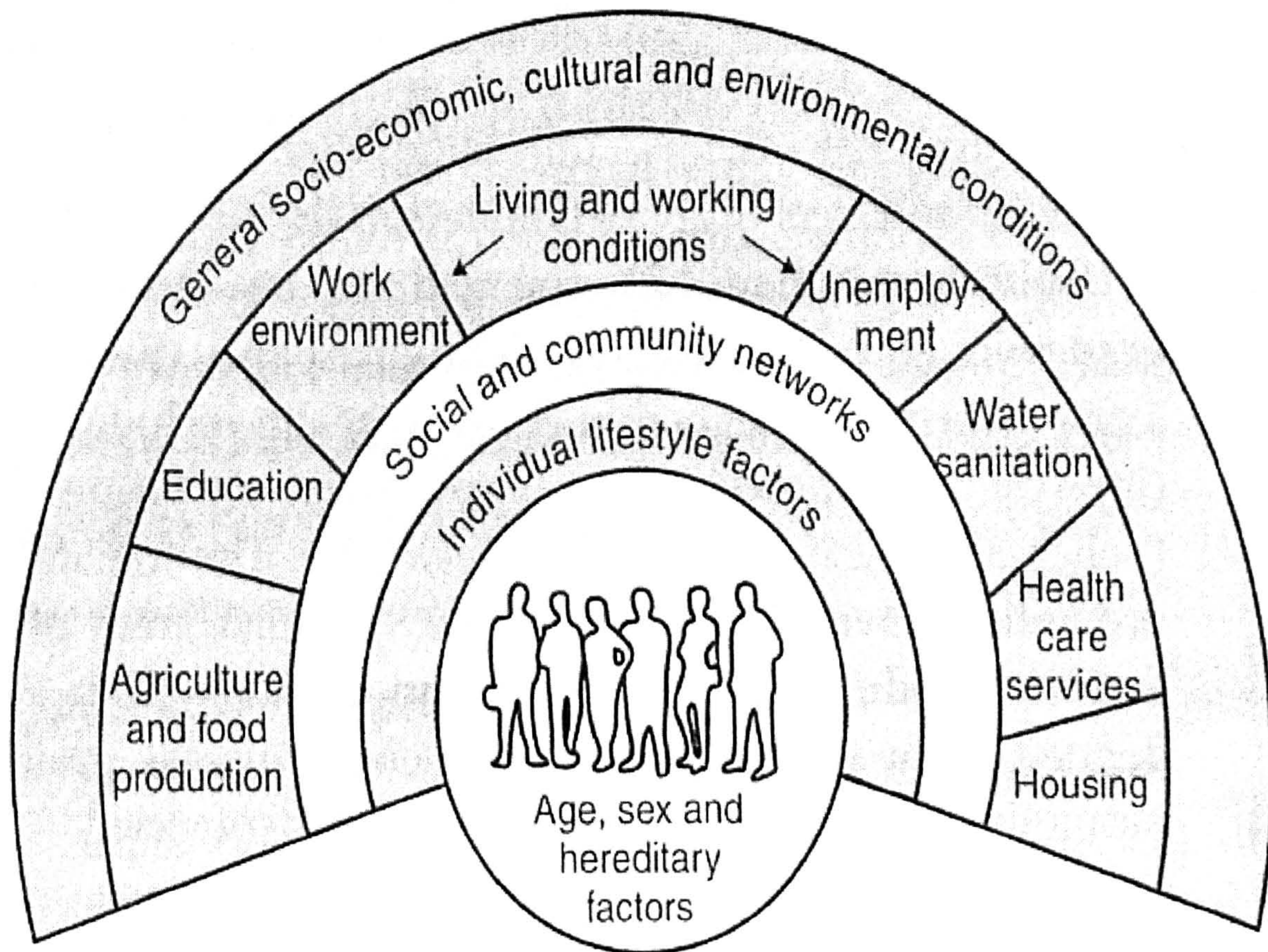


Figure 1.1: The main determinants of health: as illustrated by Dahlgren and Whitehead (1991, p.20)

Figure 1.1 shows the main factors which can affect the health of individuals and communities; therefore, by examining these important factors in the population, researchers can clarify the nature of their relation to health, make substantial progress in understanding the health of a population and summarize their findings to be used as a guide for policymakers and the public. The present study investigated some health aspects and lifestyle

behaviours (e.g. weight perceptions and BMI, mental health condition, general health complaints, fruit and vegetable consumption, physical activity, smoking, and alcohol and drug consumption) which cover individual lifestyle factors, and some social and academic factors (e.g. year of study, subject, residence during semester). Finally, it consider gender, age, the number of people who provide social and emotional support, satisfaction with social support, all of which cover the general socio-economic, cultural and environment factors, which are part of Figure 1.1. Housing, healthcare services, water sanitation, work environment and agriculture and food production factors are not, however, included in this study. Several studies using self-reported health indicators among student populations have been carried out in many different countries (Mikolajczyk et al., 2008; Arslan et al., 2009; Nazary et al., 2010; Mao et al., 2009; El Anasri et al., 2010). A point to note is that this current research covers a multitude of variables as mentioned above, whereas many previous studies only investigated one or two variables. Further information on the justification for the variables explored in this study is provided in Chapter five (Section 5.6.1.6).

Measuring the health status of students is important to ascertaining health intervention effectiveness, monitoring progress, and as a critical step in measuring the health of general populations. Moreover, students are a significant population in terms of numbers; they are young adults, and the attitude and lifestyle behaviours of students are not only important for them, but are also relevant to policies concerning health. Higher education students not only have to deal with academic stressors, they must also contend with various other life stressors such as developing their independence, including separation from their parents (Oxington, 2005). Higher education students' concerns, burdens and worries are different from those of other population groups (Mikolajczyk et al., 2008). For example, these students face the dual

stress of addressing academic challenges and achievements, often with financial limitations (Mikolajczyk et al., 2008). Therefore, attention to the health of university students has increased in recent years (Cheung, 2007; Stock et al., 2007; Oliveira et al., 2008; Mikolajczyk et al., 2008; El Anasri and Stock, 2010). As a result, it is vital to acquire and compile knowledge about these population groups to underpin the development of health promotion activities that meet the health needs of university students. It is necessary to understand a range of factors associated with student health to gain knowledge about the lifestyle behaviours of this group, which will help in designing appropriate interventions for these groups (Mikolajczyk et al., 2008; El Anasri, 2010).

1.3 The significance of the study population

Health patterns in students and student behaviours which may lead to major health problems in later life (mortality and morbidity), show worrying trends in national priority areas such as mental health and obesity (WHO, 2006). This emphasizes the importance of an increased focus on the health of students and young people in general, in policy terms, and will be beneficial to the population as a whole (Viner & Booyl, 2005). Furthermore, there are many features which make students an important group to study. Firstly, students' health is a very important issue because they make up a substantial proportion of young adults, and because late adolescence and early adult (e.g. college/university) life may be a critical period of transition, so it is important to monitor trends in lifestyle behaviours at this age, and to understand factors such as attitudes and knowledge of health benefits that may be associated with student activity levels (Haase et al., 2004). Secondly, the attitudes and lifestyle habits (e.g. smoking and alcohol consumption) adopted during or prior to university are likely to affect lifelong behaviours, family life and also general public health (Steptoe et al., 2002).

Zahran et al. (2007) showed that internationally students at each academic level engage in different risky behaviours; e.g. smoking and the absence of leisure time physical activity were more prevalent among students in secondary education; smoking and binge drinking were more prevalent among students in technical schools or colleges; and binge drinking was more prevalent among younger graduate students. The association between risky behaviours and mental health could have serious consequences in terms of impaired physical health as these students get older. Thirdly, according to the recent Health Promoting University Project (WHO Regional Office of Europe, 1998), more research is needed on effective health education and health promotion programmes in HEIs. In addition, Musaiger (2004) indicated that there is a lack of studies on student health, and recommended effective action to study factors contributing to the occurrence of obesity in the Eastern Mediterranean Region (EMR). Fourthly, to understand the problem in context, it is necessary to undertake an international comparison of the commonest health problems and lifestyle behaviours between students from different countries; for example, levels of body weight, mental health problems, smoking and physical activity. Such knowledge can help to inform practice which could be shared internationally. Therefore, investment in research related to the health of students is undoubtedly a key priority in all countries, because of the impact this can have on public health in the long term.

According to a WHO round-table discussion in Bahrain (2005) about promoting young people's health and development in the EMR, progress in the planning and development of health strategies is not happening as quickly as student health requires. Insufficient evidence about young people's health is being collected, with the result that health planning is being overtaken by the rapid changes taking place in the region. These changes demand an urgent

response, and a more integrated approach is required to tackle the needs arising from such changes (WHO, 2005).

The current situation regarding the health of young people in the EMR is described, employing the main components of young people's health and development identified by the Regional Office as main areas of concern, within the cultural and religious norms prevailing in the region. These are: sexual and reproductive health; mental health; nutrition and eating habits; lifestyle; and personal hygiene. Thus, according to research activities undertaken in countries of the region, the lives of many young people are being challenged by a rapidly changing socioeconomic and cultural environment (WHO, 2006). Although young people in these countries share many of the needs of young people around the world, they live in a region that is characterized by distinct cultural norms and social and economic problems which are mainly the result of economic embargoes, intergenerational educational gaps, and conflicts and disasters (WHO, 2006). Therefore, the health and development of young people should be addressed both separately and comprehensively within the prevailing religious and socio-cultural values of the region.

Moreover, in 2006 Dr Nada Abbas Haffadh, the then Minister of Health in Bahrain, asserted that raising awareness about healthy lifestyles does not change the behaviour of young people (WHO, 2006). Instead, improving knowledge levels about important issues related to students should always be accompanied by improving the basic skills of the students themselves in order to improve their behaviours. Also, Ministries of Health and concerned governmental and non-governmental sectors face major challenges in directing the attention of the public to

the hazards of risky practices such as smoking and drug addiction. Nowadays, there is a special need for raising the awareness of the student in particular about following a healthy lifestyle, such as physical exercise and healthy eating habits. Student health, however, is determined not only by students themselves but also by the adults who shape their social, economic, political, cultural and physical environment. These adults include parents, relatives, friends, family, teachers, sports coaches, health workers, religious leaders, musicians, film stars, sports figures, politicians and journalists (WHO, 2006).

1.4 Background of the study

The Eastern Mediterranean Region (EMR) is comprises of 23 countries extending from Morocco in the west to Pakistan in the east (Figure 1.2). About 450 million people live in the region (Mohit, 2001). The EMR countries have diverse historical and cultural backgrounds and climatic, environmental, and economic conditions but there are certain common factors which justify the grouping of these countries together as a region. One is religion. The region is the cradle of many religions, such as Islam, Christianity, Judaism and Zoroastrianism and many members of these faiths live in the region. Islam is the religion of about 90% of the people. Language is the second factor. Arabic is spoken by about 50% of the people living in 80% of the countries of the region, and most of the rest speak either Farsi or Urdu. Climatic similarities are another factor. Most countries of the region have scarce water resources and an abundance of deserts. Demographically, the greatest shared characteristic of the countries of the region is the existence of a very young population; roughly, 40% of the population is under fifteen years of age (Mohit, 2001).

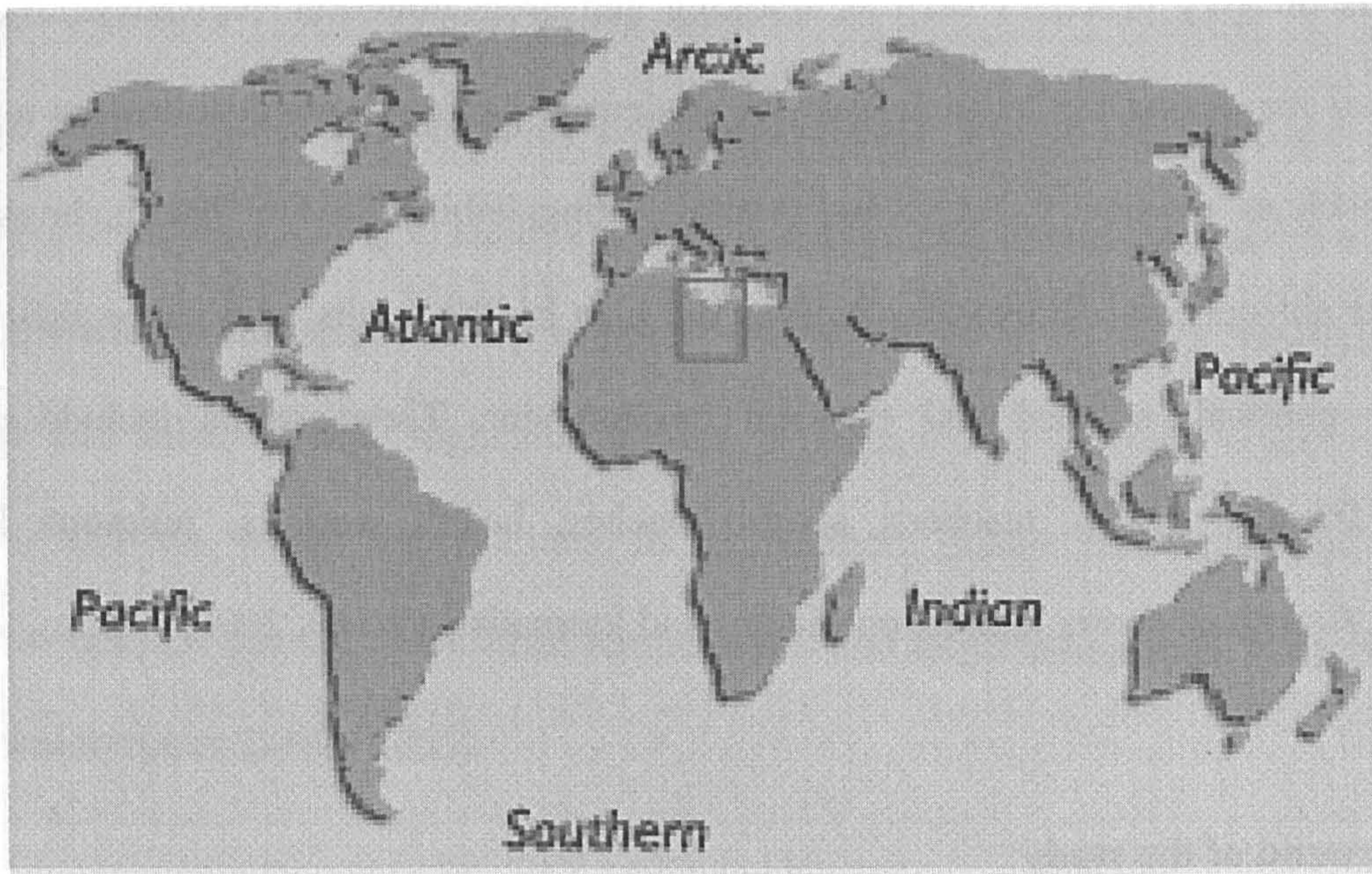


Figure 1.2: Geographical location of Libya.

Libya is one of the EMR countries, and it is situated in North Africa. It is a mostly desert country facing strong constraints in terms of availability of water resources and of food self-sufficiency. The population is relatively young, mostly urban and concentrated in the coastal area. Agriculture is not sufficiently productive to meet the food needs of the population. The country's economy, largely state-controlled, is heavily dependent on oil production and exports (Food and Agriculture Organization [FAO] 2005).

Libya has a total area of about 1.76 million km², bordered to the north by the Mediterranean Sea, to the east by Egypt and Sudan, to the south by Chad and Niger, and to the west by Algeria and Tunisia. There are four types of terrain: the coastal plains, that run along the Mediterranean sea and vary in width; the northern mountains, that run close to the coastal plains and include the Jabal Nafusah in the West and Jabal al Akhdar in the East; the internal depressions, that cover the centre of Libya and include several oases; and the southern and

western mountains (FAO, 2005). About 95% of the country is covered by desert. The climatic conditions are influenced by the Mediterranean Sea to the north and the Sahara desert to the south, resulting in an abrupt transition from one kind of weather to another. The Mediterranean coastal strip has dry summers and relatively wet winters, whereas the Jabal Natusah and Jabal Akhdar highlands present a plateau climate with higher rainfall and humidity and low winter temperatures. In the southern inland part, pre-desert and desert climate conditions prevail, with torrid temperatures and large variation in temperature. Rain is rare and irregular (FAO, 2005).

1.5 Rationale of the study

The importance of the present study arises from the need for the Libyan government, especially health sector, to pay more attention to the health of the student population in Libya. The initial idea for conducting this research project came from the researcher's personal experience of student health promotion programmes targeted at higher education institutes in Libya. Almost all universities in Libya lack any kind of health provision infrastructure. Students with health problems either see their personal doctor or are referred directly to the nearest hospital. While this means that the treatment of health problems is generally fast and efficient, the prevention of health problems and advice on healthy lifestyle is almost entirely lacking. This absence of health promotion/educational programmes available to students results in a lack of awareness among students of the health challenges potentially facing them, as well as a service based on reaction/treatment rather than prevention. Policymakers need to consider the range of health problems more prevalent amongst students than the general population, for example anxiety and depression, and design

programmes that can prevent or treat these conditions closer to the students, preferably on-campus.

In addition, it has become clear that there is a significant lack of information in Libya related to student health and lifestyle behaviours and their health impacts in relation to what appears to be well-known in other countries. Current literature searches have not revealed any similar research which has been conducted in Libya examining this important issue of health status and lifestyle behaviours in HES, with the sole exception of two studies investigating smoking behaviour amongst medical students in Libya (Buni, 2006 & Singh et al., 2006), and that no other study previously carried out has included the comparison of higher education institutions in Libya with regard to lifestyle behaviours. According to the WHO (2005), the resources available for students' health-related programmes are still inadequate in most countries in the EMR. It is both important and beneficial to target young adults, (defined as 18 -30 years old), for the promotion of healthy lifestyles such as physical activities. Therefore, the work of this PhD aims to bridge a clear gap in this knowledge and contribute to efforts to improve the health of the Libyan student populations. In view of these factors the research poses the following questions:

1. What is the health status among Libyan HES, for example, body perceptions and BMI, mental health conditions and general health complaints?
2. What are the lifestyle behaviours among Libyan HES, for example, smoking behaviour, physical activity and drug and alcohol consumption?
3. Are there differences in health status and lifestyle between Libyan HES by region?

4. Are there associations between demographic and academic variables and the most prevalent health and lifestyle behaviour variables?
5. Are there differences in health status and lifestyle behaviours of Libyan HES and HES from other countries?

Therefore, the main motivations for the researcher undertaking this study was to provide policy makers and decision takers with the information necessary to develop health programmes directly targeted at students. The evidence collected by this study is intended to enable universities and colleges to make plans and implement policies to improve the performance and ensure the long term health of students, enabling them to perform better at university and be productive members of society.

To date, the present study is the first of its kind in Libya, and therefore it is expected that it will provide useful insights, implications for practice and research as well as recommendations for policymakers, university committee, health educators committees and educational administrators and bodies.

1.6 Research aim

The overall aim of the present study was to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviors (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan higher education students (HES); to compare health status and lifestyle behaviours of HES in the different regions of Libya; and to compare Libyan HES with those from other countries.

In addition to this, the study aimed to determine if any associations existed between demographic and academic variables and the most prevalent health and lifestyle variables.

To meet these aims the specific research objectives included:

1. To survey the health status of HES in Libya.
2. To investigate the prevalence of healthy and unhealthy lifestyles and risk factors of HES in Libya.
3. To investigate how health status and lifestyle behaviour in HES of Libya vary by different regions.
4. To assess the associations between demographic (e.g. gender, age) and academic (e.g. year of study, residential place during semester) variables and the most prevalent health and lifestyle variables that emerged from the survey.
5. To critically compare health status and lifestyle behaviors of Libyan HES with HES from other countries.
6. In the light of findings from objectives 1 to 5, to conclude with recommendations to improve and develop health promotion programmers for Libyan HES.

1.7 Thesis layout

The thesis consists of eight chapters. The current chapter has provided an overview of the research settings and will subsequently summarize the remaining chapters. The remainder of the thesis is divided as follows (Figure 1.3): Chapter two deals with information and background regarding the study setting, Libya. It considers the relevance of elements which are known to have significant and substantial effects on health status and lifestyle behaviors

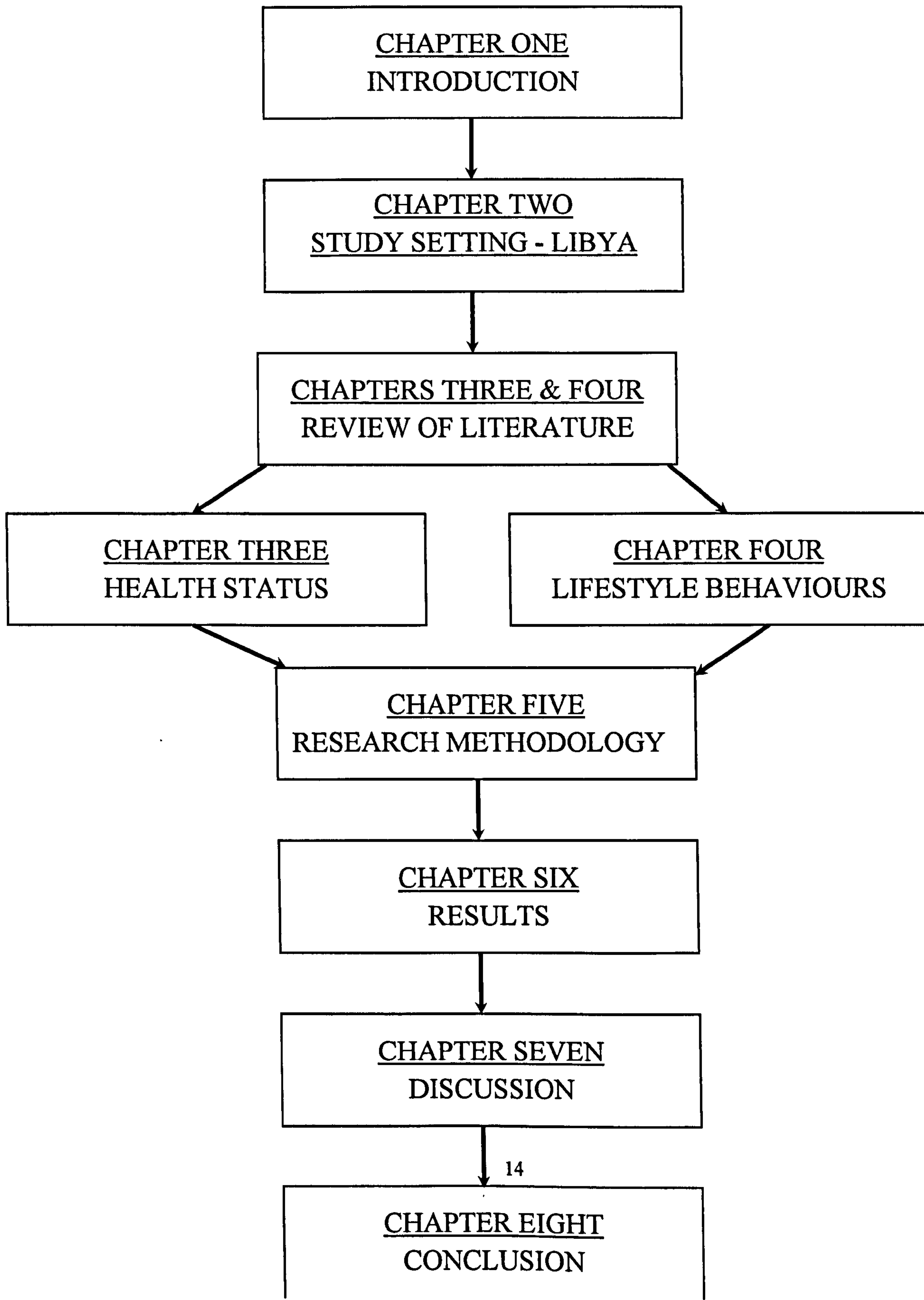
in general, including population indicators, education systems and attendance, agriculture, the economy, the health sector and food consumption. Chapter three focuses on literature relating to the health status aspects (e.g. weight perceptions and BMI, mental health conditions, and health complaints). Chapter four reviews previous studies on lifestyle behaviours (e.g. body image perceptions and dietary behavior, physical activity, fruit and vegetable consumption, smoking, alcohol and drug consumption) among students from different countries.

Chapter five presents the methods used in the present study which explore health status and lifestyle behaviors, and also tests whether there are differences in health status and lifestyle between Libyan HES institutions. Finally it tests whether there are differences in health status and lifestyle behaviors between Libyan HES and HES from other countries. This chapter includes a presentation of the research questions and the research objectives, data collection methods, the questionnaire survey population, sample and design, the pilot study, administration of the survey and response rates. Finally, the statistical tests applied to the data are explained.

Chapter six presents the results of the survey and descriptive analysis of the main findings regarding the student population in Libya. Gender differences and differences between Libyan HES institutions are detailed. Chapter seven discusses the findings of this study, provides a comparison between Libyan HES and those from other countries. Finally, Chapter eight presents a summary and discussion of the overall study, and highlights its pertinent findings. It also outlines a number of suggestions for future research, whilst acknowledging the

limitations of the current study. Contributions of knowledge and a number of recommendations are also provided at the end of the chapter.

Figure 1.3: Thesis Layout



1.8 Summary

This introductory chapter presented the background to the research problem, providing a brief outline of the determinants of health, the significance of the study population and the study's rationale. This chapter has also highlighted the research questions and research objectives used in this study. Finally, the layout of the thesis has been detailed. The following chapter provides essential background concerning the country of Libya where the research was undertaken. It focuses particularly on the following areas: population indicators, education, agriculture, economy, health sector and food consumption. These factors have a significant impact on health in general.

CHAPTER TWO

STUDY SETTING: LIBYA

2.1 Introduction

The previous chapter outlined the overall structure of this research study on health status and lifestyle behaviours of HES in Libya. The main purpose of this chapter is to provide a background to the study, in particular contextual data concerning Libya. It provides relevant and pertinent information including population indicators, education systems and attendance, agriculture, the economy, the health sector and food consumption. These elements have significant and substantial effects on health status and lifestyle behaviours in general (Marmot & Wilkinson, 2006; Raphael, 2008; Dugdill et al., 2009). The second section provides an overview of the population indicators of the country.

2.2 Population indicators

The population of Libya is approximately 6,3 million, which includes around 160,000 non-nationals, and has a relatively youthful profile with 33% of the population under fourteen years of age (male 1,06 million/female 1,09 million), 62.7% aged 15-64 (male 2,03 million/female 1,92 million), and 4.3% aged 65 and over (male 133,000 million/ female 138,000 million) (The Central Intelligence Agency, 2009). The population of Libya has steadily increased during the last thirty years. The rate of this increase has been around 2-3% per year, and as a result the working population has also grown at a similar rate since the 1990s (FAO, 2005). Nevertheless, this population growth has not been even. The rural population has undergone a small decrease whereas the corresponding urban population has increased. The density of population in Libya varies greatly. In the northern regions there are 150 inhabitants per km² whereas in the rest of the country this rate is as low as one inhabitant per km². The

coastal areas are by far the most densely populated. In fact, about 75% of the total population is concentrated in 1.5% of the land area of the country (FAO, 2005). The next section focuses on education in Libya and particularly the higher education system.

2.3 Education

In Libya there are 1.7 million pupils of school age which ranges from 6 to 18 years of age (Clark, 2004). Education up to university level is free in Libya. There are four levels of education: primary, preparatory, secondary and tertiary. All teaching is conducted in Arabic. The academic year of both schools and universities starts in September and lasts until June, it is 35 weeks long, and students study for six days each week (Clark, 2004). Education is a major priority for the Libyan government as it is deemed to be vital for developing society and ensuring progress. Starting at the age of six, education is compulsory for the first nine years, until the age of fifteen. Attendance rates at all levels of education are high, at about 92%. The adult literacy rate is 91% for men and 68% for women (Clark, 2004). Primary education in the first six years covers the Arabic language, science, mathematics, Koran studies, art, history, music and physical education. The English language was added to the curriculum in 2005 and starts when children are aged five and six. Primary education is followed by three years of preparatory school, where the curriculum is extended to cover other sciences like physics, chemistry and biology, the principles of technology, English and Libyan society.

2.3.1 Higher education in Libya

Higher education in Libya is provided by universities (both general and specialist) and higher technical and vocational institutes. A degree of university education requires four to five

years (five years for medicine) of full-time study leading to a Bachelor's Degree. There is a common curriculum for all first-year students. Undergraduate medical programmes closely follow the British model. Degrees are conferred after five years of study, which is often preceded by a preparatory year and includes a one-year residency. Examinations are often conducted by the British Royal Colleges of Medicine and conferred by the Libyan Board of Medicine (Clark, 2004). The number of university students increased from 13,418 students in 1975-76 to 269,302 during the 1999-2000 academic years. There appeared to be an imbalance at that time between enrolment in humanities and arts, and basic sciences and technology, with the heaviest concentration in the liberal arts, humanities, social sciences and law (Al-Qazzat, 1997). Approximately 35.4% of the population aged 18 to 24 was enrolled in universities and higher vocational institutes. As a result of the growing number of higher education students, Libya's higher education policy allowed the local public administration and the private sector to establish university colleges and higher education institutes. The educational system, however, was not able to provide an adequately skilled workforce to match the needs of the employment market (IMF, 2003). Therefore, the Libyan government also grants scholarships to postgraduate students to study abroad. Furthermore, there are many foreign students studying in Libya; roughly 16% of Libyan university students are non-Libyans from other African and Arab nations. Many foreign students are on scholarships offered to them by Libya as a means of spreading its influence, as well as sharing its wealth (El-Hawat, 2003).

Female enrolments rose dramatically in the last decade, mainly concentrated in the humanities whilst males dominated in science, engineering, and business faculties. Government encouragement has led to increased participation of females in the sciences,

especially in medicine. The growth in female student enrolment in higher education is a positive aspect of the Libyan education policy because women constitute half of the population, and therefore their education and contribution are essential for the construction and development of a new society (Al-Qazzat, 1997). According to the General People's Committee for Education (2009), Libya currently has fourteen universities (Al-Fateh University, Al-Fateh for Medical Science, Al-Arab Medical, Bright Star, Garyounis, Sebha, Tahaddi, Seven of April, Seven of October, Omar El-Mukhtar, Nasser, Al-Mrgab, Al-Jabal Al-Gharbi, and Darnah). In addition there are many different higher technical institutes. The next section provides a brief summary of agriculture in Libya since it plays an important role in the food supply system.

2.4 Agriculture

About 9% of the Gross Domestic Product (GDP) of Libya is produced by agriculture and the agricultural industries employ about 5% of the economically active population. Agriculture production is naturally affected by the hot and dry desert climate and a scarcity of water. The surface area of Libya suitable for agricultural production is only 10%. Irrigated land produces nearly half of the cereal production and 90% of the production of fruit and vegetables. The main five food commodities in 2002 were cow's milk, wheat, watermelon, maize, and fresh vegetables. Human consumption was the destination for nearly all of these goods, with the exception of maize, which was used to feed animals. In total, 30% of agricultural production is animal-based; this provides meat, dairy products, eggs, and milk. The principal livestock are camels, sheep, and goats. The national demand is not met by the supply of animal products. This is DUE, in part, to climatic conditions, shortages of water, and a lack of government support (FAO, 2005). There is a very small number of inland fisheries and

agriculture, so fisheries are mainly on the coast. Fish products are aimed at human consumption, on a local level. The per capita supply of fish products was about 7 kg per year in 2001 (FAO, 2005). The next section describes the economic situation in Libya.

2.5 Economy

Although remaining to a large extent state-controlled and dependent on oil, the economy of Libya grew steadily in 2003/04, partly as a consequence of world oil markets (IMF, 2005). Almost all export earnings come from oil and about a quarter of the GDP. Sectors which have seen increasing development are the non-oil manufacturing and construction sectors. These sectors have moved from the processing of mainly agricultural products towards the production of petrochemicals, iron, steel, and aluminium (FAO, 2005). A complicated regime of regulation and ubiquitous government intervention has continually hindered the private sector. The public sector accounts for 73% of all imports; these include machinery, transport equipment, food consumption, and consumer products (IMF, 2003). The next section provides a brief summary of the health sector in Libya since it plays an important role in providing extensive health care and medical services.

2.6 Health sector

Over the last twenty years, the health status of Libya has continually improved. For example, the average life span of individuals was 46 years in the 1960s, however in 2003 it was reported to be 74.4 years. All Libyan citizens now have a guaranteed right to free health care and access to hospitals and health establishments (WHO, 2003). In 2003 there were 102 public hospitals and specialist centers, 1177 primary healthcare facilities, and fourteen physicians and 39 beds per 10,000 people (El-Taguri et al., 2005). The two most significant cities in Libya contain its two main hospitals; Tripoli (the capital, in the West) and Benghazi

(in the East). These hospitals are closely affiliated with medical schools and also other specialist institutions which train nurses and medical technicians. They provide extensive healthcare and medical services (WHO, 2003).

Similar to other countries, health care in Libya operates at different levels. At the primary level there are the basic healthcare units, where curative and preventative care for population densities 5,000 to 10,000 citizens is available (WHO, 2001). Secondary care includes healthcare centres, provided for between 10,000 and 26,000 citizens (WHO, 2001). The third level is the general hospitals, which play an important role and are based in cities. General hospitals provide most health services and serve between 50,000 and 60,000 citizens (WHO, 2001), and are staffed by highly specialized physicians. They also include laboratory and radiological services and a pharmacy. The fourth level consists of two specialist hospitals in Tripoli and Benghazi. Patients requiring specialist care are transferred to these hospitals (WHO, 2001).

Since the discovery of oil during the past four decades, Arabs have developed a more Western lifestyle, and this has meant an increased consumption of fat, refined diets and a sedentary and urbanized lifestyle (WHO, 2006). Research has shown that modern lifestyle can result in health concerns and in Libya in particular, it has led to an increase in diseases such as diabetes mellitus, hypertension, cardiovascular disease and cancer. For example, Kadiki and Roaeid (2001) have warned that diabetes in Libya is becoming a significant health challenge with approximately 22.6% of Libyans under 20 years of age diagnosed as glucose intolerant. Similarly to other modern societies, after cardiovascular disorders, cancer is the

second highest cause of death and high rates of cancer morbidity and mortality levels have been reported amongst Libyan men (Singh & Al-Sudani., 2001). The next section reviews food consumption in Libya.

2.7 Food consumption

Bread, couscous and pasta form the staple food in Libya, all based on wheat. Couscous is by far the most popular and traditional food, although pasta is becoming more and more popular and is also easy and quick to prepare (FAO, 2005). The most important food product which is imported to Libya is rice. Chickpeas, dried beans, fava beans and lentils are the most popular pulses. Lamb and mutton are the most widespread and popular meat products eaten by Libyans. This is followed by beef, camel and poultry. The month of Ramadan sees a steep increase in the consumption of milk, which is usually taken at breakfast. The warm and arid climate of Libya allows for an abundance of many fruits and vegetables, especially citrus fruits and dates. In spite of the local availability of olive oil there has been a recent increase in the use of subsidized corn oil, which is used for cooking, frying and baking. The use of animal fat is not popular. Three meals a day are generally eaten in Libya, with lunch around 3.00 p.m. being the main meal (FAO, 2005).

2.8 Summary

This chapter has provided relevant information about Libya where this study is based, including population indicators, education systems and attendance, agriculture, the economy, the health sector and food consumption. This is intended to provide the reader with a raft of background information. The contextual information in this chapter is complemented by the following two chapters that provide a detailed overview and critique of previous research investigating the health status and lifestyle behaviours of higher education students

worldwide. Chapter 3 includes the areas of weight perception and BMI, mental health disorders and health complaints. Chapter 4 critiques research into body image and dietary behaviour, fruit and vegetable consumption, physical activity patterns, smoking behaviour, alcohol and drug consumption and the areas that are considered to have the most significant impact on student health. The next chapter reviews the literature on student health status in different countries including both developed and developing countries.

CHAPTER THREE

LITERATURE REVIEW- HEALTH STATUS

3.1 Introduction

The previous chapter provided background details on Libya. Since one of the objectives of this thesis is to examine health status of HES in Libya, an in-depth understanding of health status is deemed crucial. Thus, the main purpose of this chapter is to present a review of the literature on students' health which looks at health concerns regarding higher education students. The remainder of this chapter is as follows: Section one present a general introduction to the chapter; the second section discusses the terms used in the literature search; the third section presents a review of the literature on weight perception and body mass index; the fourth section discusses the literature on students' mental health conditions; the fifth section reviews the literature regarding to general health complaints amongst student populations. Section six discusses the relationship between socio-economic characteristics and health status, and the last section provides a summary of the literature.

3.2 Search of literature and terms

An investigation into health status and lifestyle behaviors of HES requires an understanding of a number of areas related to health such as health problems and lifestyle factors, their implications to health and their prevalence. To provide this understanding a thorough review of literature was undertaken. The review was based on an extensive search of various sources for research evidence, including library, reference and citation lists from previous and reviews articles, bibliographic databases and the internet (www.emro.who.int), in addition to reports and conference proceeding. The list of relevant electronic bibliographic databases included: PubMed; JMA; Science Direct; Psych Articles; and Psychology and Behavioral

Sciences. The databases covered a wide range of relevant subject areas including health status and lifestyle behaviours. Different key search terms were used to complete this search, for example: university; college; students; body mass index; health complaints; anxiety and depression; diet; physical activity; smoking behavior; alcohol consumption and various combinations thereof. The search process that was carried out was based on two stages, the first stage of the research was to look at the articles included in the most recent reviews undertaken on this subject area, this process indicated how many articles had previously been published, and also helped to identify new articles during the research process. The second stage of the search process searched all relevant electronic bibliographic databases by using all the search terms listed above. Moreover, I was able to find many of these sources in the university Library or online, and did not need to purchase any or order them from other libraries. I requested some copies of articles from the British Library, and many resources were also provided by my supervisors, Professor Wlaid El Ansari and Dr Diane Crone.

The literature review was therefore divided into two chapters, one considered health status and the other considered lifestyle behaviours. The focus of this study is on health status and lifestyle behaviours in the student population with specific reference to HES. This is due to the great importance of this population and the implications that the health of this group has upon public health. For inclusion, studies were required to meet the following criteria:

- Focused on higher education students, including both university and college.
- Published in peer-reviewed journals.
- Included at least one variable related to those used in the current study.
- Published in the English language or Arabic.

- International spread of studies.
- Covered the study subject in any country.

All journal articles used were peer-reviewed, this means that the articles were assessed by a credible panel of experts before being published, and this therefore ensured an accurate and critical assessment of the included review articles (NHSCRD, 2001).

Exclusion Criteria.

- Studies including further education were not applicable.
- Non peer reviewed journals.
- Participants not at the educational level of the group targeted by this study.
- Other populations not meeting the required study population (No university or college population).
- Studies which had none of the variables appropriate to the study.

3.3. Weight perceptions and body mass index

This section focuses on body mass index and weight perception and reviews previous studies which have been conducted among student. The section will first describe weight perception and the three main levels of classification of body weight (obesity, overweight and underweight), and then explore the public health issues for overweight and obesity amongst student populations. Finally, the section will briefly outline the factors affecting body weight.

3.3.1 Weight perceptions

In recent decades many socio-cultural factors such as, for example, pressure from family, peers and especially the media, have affected perceptions of what constitutes an attractive body, and social pressures to lose weight have intensified (Oxington, 2005; El Ansari et al., 2010). There are many negative deprecatory references to people who are overweight. People who are overweight are often, or at least they feel, stigmatised (Myers & Rosen, 1999). They also feel prejudice and discriminated against, not just in the workplace but also in their social relationships and perversely, even by health professionals. Body image is severely influenced by self-perception of body weight; it is affected by social norms and the standards of the dominant culture (Veggi, 2004). Mikolajczyk et al. (2010) examined the relationship between perceived body weight and body mass index based on self-reported height and weight among university students, using a cross-sectional study in seven European countries (Denmark, Poland, Bulgaria, Germany, Lithuania, Spain and Turkey). Their results revealed that despite low rates of obesity, many university students perceived themselves as overweight, especially women. The majority of students (65-83% of females, 72-84% of males) reported 'a normal' BMI, only 32% to 685 of students considered their weight 'just right'. About 20% of females with a BMI of 20 km/m² considered themselves 'a little too fat' or 'too fat', and the percentages increased to 60% for a BMI of 22.5 kg/m². Male students rarely felt 'a little too fat' or 'too fat' below a BMI of 22.5 kg/m², but most felt 'too thin' with a BMI of 20 kg/m². Finally, the survey results also suggested that universities are the ideal forums to correct misconceptions about body weight and also to influence attitudes about unhealthy behaviours among students.

3.3.2 Body Mass Index

Height, weight and Body Mass Index (BMI) have been used extensively as indicators of weight-related health-problems (Bjornelv et al., 2006; Mikolajczyk et al., 2010). BMI could also be an indicator of poor diet and too little exercise. A decrease in weight could also be an indicator of a poor diet (Bjornelv et al., 2006; Neumark-Sztainer, 2005). The importance of measuring body weight has increased during the last few decades due to the need to evaluate changes in nutritional status, which can affect body reserves differentially (Macias et al., 2006). BMI is a simple and important measure to assess exactly whether the body mass is normal weight, under weight, overweight or obese in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m) for example, an adult who weights 70 kg and whose height is 1.75m will have a BMI of 22.9. BMI classifies < 18.5 as underweight, 18.5 – 24.99 as normal weight, 25 – 29.99 as overweight and ≥ 30 as obese (WHO, 2004). BMI is widely used to study the close association between weight and health (e.g. Cheung et al., 2007; Bjorhelv et al., 2006; Macias et al., 2006; Wardle et al., 2005; Stock et al., 2004). BMI distribution can be used to assess health status and provide valuable guidance for the planning of long-term health development programmes, and agriculture planning as well (WHO, 2006). The World Health Organization (WHO) and the National Institute of Health (NIH) in the United States also use BMI in their weight guidelines (WHO, 2005).

An increase in BMI is closely linked with an increased risk of certain diseases and conditions, including heart disease, high blood pressure, osteoarthritis and certain cancers (WHO, 2006). High morbidity also can occur from a BMI as low as 23, which then steadily increases (Kim et al., 2003). However, it is important to bear in mind that BMI is not a perfect indicator of

health. BMI for instance does not distinguish between muscle and fat. Therefore, a person with a low BMI may still have a high fat ratio and be less healthy than a person with a higher BMI who has a good muscle ratio. Therefore BMI is less useful as a valid indicator of health in many people, for example, athletes and adolescent who are still growing (Che, 2002). So, in order to understand the distribution of BMI in populations, it is essential that data is only used from populations with no problems of nutrition (underfeeding and overfeeding), and individuals in the population who do not smoke and do not suffer from any chronic or acute disease, or, in other words, from healthy populations (WHO, 2006).

There are a number of definitions of obesity, overweight and underweight of which the following are representative.

- The definition of obesity based on body size has been challenged in regard to different populations, due to the different relationships of the percentage of body fat at the same BMI levels (Macias et al., 2006). Obesity refers to the segment of the population with a body mass index (BMI) of > 30 (WHO, 2006). Obesity is defined as an excessively high amount of body fat or adipose tissue in relation to lean body mass in adults (Shen, 2007). According to the House of Commons Health Committee in the UK (2004), obesity is an excess of body fat frequently resulting in a significant impairment of health and longevity. Madrigal et al. (2000) indicated that there are both genetic and nutritional factors associated with obesity, and the distribution of obesity is affected by socioeconomic levels and lifestyle behaviours like diet and physical activity.

- Overweight refers to the segment of the population with a body mass index (BMI) from 25.0 – 29.9 kg/m² (WHO, 2006). In most industrialized (and also some less developed) societies there is a prevalence of being overweight. This is a major health problem. Being overweight is the direct result of an energy imbalance, which is caused by an excessive intake of energy and an insufficient expenditure of energy. The problems of being overweight can have social, cultural, and behavioural causes; the prevalence of an overweight population is affected by the level of socioeconomic development (WHO, 2006). The [U.S.] National Cancer Institute (2004) reported that all overweight and obese adults (18 years of age or older) with a BMI of ≥ 25 are considered at risk of developing associated morbidities or diseases such as hypertension, high blood cholesterol, type 2 diabetes, coronary heart disease and other diseases. Similarly, Abolfotouh et al. (2007) found that body mass index is positively associated with an increased risk of diabetes and hypertension amongst people aged 18 and over in Egypt.
- Underweight refers to the segment of the population with a body mass index (BMI) less than 18.5 kg/m² (WHO, 2006, p. 6). Adults form the main economic support for society, so their nutrition and health are of prime importance. Environmental factors throughout childhood affect adult weight and height. Underweight is assessed by comparing low body weight relative to height, often expressed as a BMI. In a report in 2002, the WHO stated that the health risks of being slightly underweight are comparable to those of being overweight (WHO, 2002). However, Che (2002) indicated that there was a relationship between being underweight and poor general work performance, and also an increase in the likelihood of illness and early death.

WHO (2000) reported that some studies in Ethiopia and India have shown low levels of physical activity amongst male students who are underweight.

3.3.2.1 Public health issues for overweight and obesity among HES

The WHO (2006) stated that obesity is a socioeconomic problem; it is an epidemic which shortens, and reduces the quality of life. Moreover, a report of a WHO Consultation, Geneva (2000) showed that obesity was a complex problem which requires greater understanding. In the EMR, according to the WHO (2000) report, the prevalence of obesity is increasing, although the proportion varies from country to country and between geographical areas within a country. The main causes of chronic illness and early deaths in the EMR are Type II diabetes mellitus, high blood pressure, heart disease and cancer. All these are closely linked with obesity (WHO, 2000). In Libya, the Secretariat of Health & Environment survey-LSHES (2009) showed that 31% of men aged 25 – 34 years were classified as being overweight, and 16.8% were classified as obese. Also this survey of LSHES reported that 33% of both men and women in Libya aged between 25 – 64 years were classified as overweight, and the prevalence of obesity was 30.5% among men and women with the same age. Moreover, the rates of obesity in the EMR are increasing, especially among university students in Arab Gulf countries such as Kuwait and Saudi Arabia (Musaiger et al., 2004; Al Qauhiz, 2010). Al-Rethaiaa et al. (2010) suggested that several factors, such as changes in dietary habits, socioeconomic factors, and inactivity, determine obesity in this region.

Furthermore, the increasing problem of overweight and obesity has been reported among student populations from different countries. Abolfotouh et al. (2007) studied health-related lifestyle and their determinants amongst 600 Alexandria University students in Egypt, using a

self-reported questionnaire. They found that 25.3% of respondents were either overweight or at risk of becoming so, and more female students reported a lack of physical activity and were overweight. Likewise, Jackson et al. (2007) estimated and compared the prevalence of overweight and obesity among female student, comprising of 340 Egyptian, 245 Kuwaiti and 336 Lebanese. This study showed that Lebanese students had the lowest rates of obesity, and Kuwaiti students had the highest percentage of obesity. Egyptians students were intermediate, but were closer to the Kuwaitis in overall obesity prevalence. Overall, the prevalence of obesity at age 18 ranged between 0.1% and 4.0% and the prevalence of overweight ranged between 5% and 18%. Finally, Jackson et al. (2007) pointed to the need for further research employing large samples on the prevalence of overweight and obesity among students in the EMR to clarify the most appropriate reference to use to classify overweight and obesity.

In Saudi Arabia, Al-Qauhiz (2010) conducted a cross-sectional study aimed at surveying obesity, dietary habits and health behaviours among Saudi female university student and found that the rate of overweight and obesity reached 47.9% of a sample of 799 female university student aged 18-74 years old. The results also found a significant association between the factors presence of obesity among family members, marriage and frequency of drinking aerated beverages and obesity. The misperception of body weight among female students was reported by 17.4% and 54.2% of obese and overweight students respectively. The findings of this study (Al-Qauhiz, 2010) were in line with the results of an earlier survey of college students in Saudi Arabia. Al-Rethaiaa et al. (2010) studied obesity and eating habits among college student in Saudi Arabia. A total of 375 male student aged 18-24 years completed the self-reported questionnaires. Their results revealed that 22% of the sample was overweight and 16% were obese, and the survey also found that a high BMI was associated

with snack consumption rate, eating with family and frequency of eating the fruit dates. Their findings led them to conclude that strategies and coordinated efforts at all levels to reduce the tendency of obesity and overweight were required to promote healthy eating lifestyles in this population.

In the USA, Huang et al. (2003) stated that obesity is recognized as a serious public health epidemic among all ages, and is a significant underlying cause of morbidity and mortality in the United States. Likewise, in England the House of Commons Health Committee (2004) reported that around two-thirds of the population were overweight or obese, and obesity had grown by almost 40% in the previous 25 years. According to the World Health Organization Regional Office for Europe (2006), obesity is one of the greatest public health challenges of the 21st century. Its prevalence has tripled in many countries in the European Region since the 1980s, and the numbers of those affected continues to rise at a significant rate. Furthermore, obesity is already responsible for 2-8% of health expenditure and 10-13% of deaths in different parts of Europe. Also, many Asian countries such as Japan, India, Singapore, and mainland China are seeing an increasing trend towards obesity. For instance, in Hong Kong, Cheung et al. (2007) reported that two thousand students were referred to the Hong Kong Hospital Authority for obesity management in the 2004/2005 academic year. The following section will discuss the factors affecting body weight in detail.

3.3.2.2 Factors affecting body weight

The underlying causes of obesity fall into two categories: firstly, an environment in which it is increasingly easy to access food, and secondly a susceptible genotype (Wardle, 2005). Similarly, Kakeshita and Almeida (2006), indicate that the causes of obesity are complex and

exist in an environmental and soci-cultural context, for example, lifestyle changes and eating behaviours. The UK House of Commons Health Committee (2004) reported that the main two causes of obesity, genetic disposition and lifestyle, can both be seen within a context of family and society. The development of obesity is affected by many factors, for instance, nutrition habits (high fat food), genetic predisposition, lack of physical activity, family history, gender and income (Chuning, 2000; Livingstone, 2000).

Change in dietary habits

Studies have shown that societies which have changed their eating habits to a more western diet have experienced a higher incidence of diet-related diseases and health conditions (Belahsen & Rguibi, 2006). Western style food, characterised by high fat content, cholesterol, salt and low fibre, has caused an imbalance in energy intake and output in most countries in the Eastern Mediterranean Region. This calorie-laden food, together with a mainly sedentary lifestyle has contributed to the incidence of obesity in the population of this region (Musaiger, 2004). As a result of changes in eating habits and modernisation, obesity has been on the increase among people of the Arabian Gulf countries (Musaiger et al., 2003; Belahsen & Rguibi, 2006).

Socio-demographic factors affecting body weight

In the United Arab Emirates, a study in 2003 among male university students showed a higher incidence of obesity among those students who had a sedentary lifestyle, were smokers and who did not participate in sport. However, in the EMR obesity was more widespread amongst women, in urban areas, and among those of higher socioeconomic status (Musaiger et al., 2003). In Jordan, Musaiger et al. (2004) reported that the prevalence of obesity was 56% in urban areas compared with 44% in rural areas. Similar trends were found

in Egypt, the Islamic Republic of Iran, Morocco, Oman, Tunisia and Turkey. Lebanon was an exception, as obesity was more prevalent among rural than urban women (Musaiger, 2000)

Sedentary lifestyle

One of the main factors connected to obesity and so a major cardiovascular risk factor is sedentary behaviour (Musaiger et al., 2003; Belahsen & Rguibi, 2006). This is largely due to a rapid change in socioeconomic status in Arab countries (Al-Rethaiaa et al., 2010). This change has caused an increase in diabetes, hypertension and cardiovascular disease. This sedentary behaviour is largely caused by long hours watching television or using the internet. There is also a tendency to consume high energy snacks whilst watching television and it has been found that most advertisements during children's viewing times were about food (Musaiger et al., 2003; Al-Rethaiaa et al., 2010). General changes in lifestyle, due largely to the availability of cars, television, and home appliances have made life more sedentary and reduced physical exercise (Belahsen and Rouibi, 2006). In Egypt, Abolfotouh et al. (2007) found that 33.8% of the population were physically inactive and 25.3% were overweight or at risk of becoming overweight. In Saudi Arabia, Al-Rafae & Al-Hazaa (2001) showed that 53.5% of Saudi men aged 19 years and older were almost totally physically inactive, and another 27.5% were irregularly active. Only 19% were active on a regular basis. Al-Isa (1999) indicated that Kuwait; university students may face the risk of obesity because of the dynamic changes in their levels of physical activity and calorific intake.

Other factors known to affect body weight

There are many other factors, such as home environment, body image, school environment, beliefs and attitudes, lack of health awareness and cultural conditions, which may be linked with obesity but have not been sufficiently investigated (Musaiger, 2004).

There has been increased discussion in the literature on the problems of body weight. From the above discussion the researcher can conclude that inappropriate weight perceptions among university students, especially female students and young people in general, is of concern, because it can lead to unhealthy behaviours such as eating disorders. A review of studies showed significant gender differences with regard to perceived weight related to BMI, with male students being more likely to perceive themselves as 'too thin', while female students are more likely to perceive themselves as 'too fat', even those with a normal BMI. Furthermore, it seems that the prevalence of overweight and obesity is much higher than the prevalence of underweight, and that furthermore overweight and obesity are an escalating global issue. The WHO (2004) indicates an association between obesity and increased morbidity, such as heart disease, diabetes, gallbladder disease and musculoskeletal disorder; and early death, and indicated that obesity is associated with many different health issues including blood pressure, cholesterol, and heart diseases (WHO, 2004). Cancer Research in the UK has suggested that one in seven cancer deaths in men and one in five in women are associated with obesity (HCH, 2004). The British Heart Foundation estimated that 5% of coronary heart disease deaths in men and 6% in women are linked to obesity (HCH, 2004). The treatment of obesity should be long term and the presence of co-morbidities should be taken into account when deciding on treatment (Veggi et al., 2004 and Kim et al., 2003). Weight loss management should be long term with the aim of preventing further weight gain (NHLBI, 1998). Although treatment for overweight individuals is only recommended when patients have two or more risk factors, there should be an emphasis on improving dietary and physical activity patterns. There is also a need for follow up programmes for long term weight loss maintenance (WHO, 2006). Preventive and long term strategies should concentrate on educating people in the principles of good nutrition and sufficient physical exercise, and their own role in this. In addition, there appears to be many factors which play a

role in obesity and overweight among student populations, and during the last few decades many different countries have experienced rapid socio-cultural changes as a result of their accelerating economy. For example, Al-Rethaiaa et al. (2010) stated that the rapid socio-cultural changes in Saudi Arabia were associated with major changes in food choices and eating habits which, progressively, became more and more 'Westernized'. Such 'a nutritional transition' has been linked with the increase of overweight and obesity prevalence which has recently been observed among the Saudi population. Similar recommendations have been made (WHO, 2006; Jackson et al., 2007; Mikolajczyk et al., 2010) for the establishment of university health educational programmes to address misperceptions with regard to body weight, and to prevent unhealthy behaviours amongst students, such as eating disorders. The next section focuses on mental health conditions amongst student populations in different countries.

3.4 Mental health conditions

The previous section outlined the problems of body weight, and reviewed previous studies concerned with body weight in student populations. The purpose of this section is to provide an overview of mental health conditions and review previous studies which have been conducted among student populations. The section will first describe the three main common challenges to students' mental health (depressive symptoms, depression and anxiety), and then discusses the possible reasons for student anxiety and depression. The last section will discuss the public health issues of mental health disorders among student populations.

According to Mind out Mental Health Project (2007) a definition of mental health problems is "*Mental health problems range from the stresses and worries that all of us experience at*

some times in our lives, to life-changing conditions which affect our whole personality” (2007, p.2). The Oxford University Programme (2007) states that, “*Mental health problems range from the worries and grief we all experience as part of everyday life, to the most bleak, suicidal depression or complete loss of touch with everyday reality*” (2007, p.2). Mental health conditions are common among young people, and can range from fully developed psychiatric diseases to disabilities, behavioural problems, speech and language problems and psychosomatic complaints (Viner & Booy, 2005). Oliveira et al. (2008) surveyed 2,194 university students who sought help at a campus mental health service in Brazil, and reported that students often experience their first psychiatric episode during their time at university, and that epidemiological research reports that many mental problems usually have their onset in young adulthood. The mental health of university students has begun to be a matter of concern in developed countries, and it should be noted that many young adults may experience their first psychiatric episode during their time at university (Bayram & Bilgel, 2008; Oliveira et al., 2008)). The American College Health Association – National College Health Association [ACHA] (2006), which surveyed approximately 47,000 students at 74 colleges, found that mental health issues were increasing on college campuses today. The ACHA reported the following data: 10% “seriously” considered suicide, 14% reported a diagnosis of depression, 63% reported feeling hopeless, and 94% reported feeling overwhelmed. Depression (20%) and anxiety (13%) were the 4th and 9th of the top 10 issues mentioned by students in the spring 2005 survey from the American College Health Association for physical and mental problems.

There are a number of definitions of anxiety and depression of which the following are representative.

- Anxiety: among negative emotions, anxiety is the most widely experienced of all. Almost all human beings have recognized, and have experienced, states of anxiety (Abdel-Khalek & Al-Ansari, 2004). Donnellan (2005) stated that:

“Anxiety is an unpleasant feeling of fear and apprehension. Normally anxiety can be useful, helping us to avoid dangerous situations, making us alert and giving us the motivation to deal with problems. However, if the feeling become too strong or go on for too long, they can stop us from doing the things we want to, making our lives miserable” (Donnellan, 2005, p.21).

Anxiety is a normal human feeling, and everyone experiences it when faced with a situation which they find threatening or difficult, but it is normally short term and manageable. However, if the feelings become very strong or last for an unreasonable amount of time, they can impact severely on an individual’s life (Oxford University, 2007). The symptoms of anxiety are varied, and the anxious person may feel worried all the time, they may feel tired, have a feeling of being cut off from reality, poor memory, sleeping badly and unable to concentrate or irritable (Donnellan, 2005).

- Depression: there has been increased discussion in the literature on depression, yet the definitions available often have common themes of experience and an effect. For example, using the International Classification of Diseases, Version 10 (ICD-10) to help define depression, the WHO (2007) provided a useful definition:

“In typical mild, moderate, or severe depressive episodes, the patient suffers from lowering of mood, reduction of energy, and decrease in activity. Capacity for

enjoyment, interest and concentration is reduced and a marked tiredness after even minimum effort is common” (WHO, 2007).

In addition, the World Federation for Mental Health (2009) described depression as:

“Depression is a mental disorder that primarily affects mood. People with depression can feel an overwhelming sense of sadness and guilt, and may find it difficult to get any satisfaction from life. They may feel extremely tired, have no energy, find it difficult to concentrate, feel hopeless about the future and be preoccupied with thoughts about death and dying. Depression affects people in different ways. It can range from mild to severe, and can consist of one episode of depression or many episodes” (2009, Chapter One, p.3).

Depression can affect anyone at any age, and according to the Mental Health Foundation (2009), 1 in 6 people will have depression at some point in their life. It is most commonly found in people between the ages of 25 to 44 years, however these figures are not totally reliable, as they are based on people who actually seek help; many people will remain undiagnosed. Other symptoms that can become severe during bouts of depression are:

- Diminished appetite.
- Sleep disorders.
- Feelings of worthlessness or guilt.
- Reduced self-esteem and confidence.

The following section gives more details on the common challenges to student mental health.

3.4.1. Common challenges to student mental health

It has been suggested that in addition to coping with the problems of higher educational study and late adolescence, when students are concerned about their studies, they are more likely to suffer different types of health issues such as mental health problems (Oxington, 2005). University life has become more stressful for many students, and this stress can cause their symptoms to become worse (Nur et al., 2008; Arslan et al., 2009). Students spend six to eight months per year at university, so going away from home to university for the first time can be difficult, and these difficulties are compounded if a student suffers illness. For many students this might be the first experience that they have had of dealing with being unwell and away from home, and it can be a frightening prospect (Adewuya et al., 2006; Oliveira et al., 2008). Also, coping with the contrast between school and university work, working independently, exams, housing and money worries, all of these can cause anxiety (Oxington, 2005; Mikolajczyk et al., 2007). Anxiety and depression are the commonest challenges to a student's mental health, and it is more likely that students will suffer mental health problems if they are concerned about their studies (Wardle et al., 2004; Abdel-Khalek et al., 2004; Martins et al., 2004; WHO, 2005; Rubin, 2008). Kadison (2004) reported that among college campus students at the University of Harvard, the most common issues related to mental health were depression, anxiety, substance abuse, eating disorders, sleep disorders and relationship issues. Kadison also indicated that the increase in the prevalence of anxiety and depression are demonstrated to be an impairment to health. There are various mental health problems and this study will consider the three major mental health aspects (depressive symptoms, anxiety and depression), which have been shown to be very common among student populations (Rab et al., 2008; Aniebue and Onyema, 2008; Rong et al., 2009).

3.4.2 Reasons for student anxiety and depression

There are many reasons why students might show high levels of stress, for instance, the pressure of work and assessment, relationship problems, money worries, drinking and drug use. University life for many students is both an exciting time in their lives but also one which bring with it many factors which can lead to stress. The positive aspects are perhaps, leaving home, making new friends, entering a new environment and the challenges of their chosen area of study. However, students today need to deal with many other factors which are not so positive. Some of these are, for example, family dysfunction, pressure of studies, financial pressure, and the easy availability of alcohol and drugs (Kitzrow, 2003). Kadison and DeGeronimo (2004) suggested that there are additional problems for some international students, these include possible prejudice, cultural differences, financial worries, living arrangements and daily living problems. In addition, in the UK, Maughan et al. (2004) indicated that:

“By age 18, however, the proportion of young people showing mental health problems had risen still further, with especially marked increases in the level of mood disorders (predominantly depression) in girls, and alcohol and drug-related problems in boys. Other studies have confirmed this pattern, suggesting that the late teens and early twenties are periods of especially high risk for mental health problems, possibly the highest at any stage in the life course” (2004, p.5).

Mental health is clearly linked to poor academic performance (Andrews & Wilding, 2004; Nur et al., 2008; Oliveira et al., 2008). Some students today are not adequately prepared for the academic requirements of university education. It is seen to be a major stress in their lives to find that their work is inadequate at university level. They may have been accustomed to

high grades at school or college, but now find their work is not quite up to the required standard. Another element which can affect their mood, and so impact on mental health, is insufficient social support. Studies specifically targeting college students have shown that those students with good social support deal much better with the stress of university life than those without it, (The Faculty Advisory Council and the Student Advisory Committee, 2007). Maughan et al. (2004) indicated that by age 18 many young people exhibit depressive tendencies, which are expressed as depressive symptoms in females and by a tendency to alcohol and drug abuse among males. The following section will outline the influence of mental health symptoms in detail.

3.4.3 Public health issues of mental health among students

The WHO has been very active in the EMR during the past twenty years. Their aim is to integrate general and primary health care systems (Mohit, 2001). There has been increasing collaboration in the fields of planning, training and research. Due in large part to this collaboration, most countries in the Eastern Mediterranean Region now have national mental health programmes. These programmes promote the mental health, diagnosis and treatment of the mentally ill (Mohit, 2001). Although there are 22 Arab countries in the Arab League, the mental health services that are provided in those countries show several distinct variations. Economic, political, social and cultural factors seem to play a major role in determining the state of the psychiatric profession and the access of citizens to this service in any particular country (Okasha, 1999).

The prevalence of depressive symptoms varies across different countries and populations. In many developed and developing countries, the prevalence of depressive symptoms is frequent

and appears to be increasing among university and college student (Arslan et al., 2009). Previous studies (Bostanci et al., 2005; Mikolajczyk et al., 2007; Baldassin et al., 2008; El Ansari et al., 2010) have used the Beck Depression Inventory (BDI) to measure the degree of depressive symptoms. This section presents data from studies of university and college students in many different countries. The BDI consists of many different items which are presented in Chapter Five (Section 5.7.6). Below some studies conducted among HES populations are reviewed.

Mikolajczyk et al. (2007) studied depressive symptoms among 2,146 university students below 23 years of age, in four major European countries: Germany and Denmark in the West, and Poland and Bulgaria in the East. The Modified Beck Depression Inventory (M-BDI) was used, and the cut-off point for depression screening was a score of ≥ 35 . They found that depression was more common in the Eastern European countries (Germany 26.7% / 22.8%, in Denmark 24.9% / 12.1%, in Poland 45.5% / 27.3%, in Bulgaria 42.9% / 33.8% for female and male students, respectively). In addition, their study also found a gender differences: female students on average had higher depression scores and were twice as likely to have M-BDI scores ≥ 35 on average. Students who perceived income insufficiency were also more likely to have higher levels of depressive symptoms. The study concluded that the difference between western and eastern European countries with regards to the prevalence of depressive symptoms in university students persisted 15 years after political changes took place and cannot be explained by differences in perceived sufficiency of income. Similarly, Bunevicius et al. (2008) reported that depressive symptoms were more prevalent in humanities students (12%) and medical students (14%) at the University of Kaunas in Lithuania. Finally, the

study results pointed to the need for special attention to students who had high rates of depressive symptoms and low levels of emotional stability.

Chang, (2007) conducted a study amongst 1039 college students at the Nan Hua University in Taiwan. The study examined the manifestation of depressive symptoms and their relationship to help-seeking attitudes among Taiwanese college students, using the Chinese Beck Depression Inventory (BDI-II scores ≥ 16). It was found that depressed Taiwanese students (BDI-II scores ≥ 16) were significantly less likely to display certain somatic features than non-depressed students. In the meantime, depressed Taiwanese students were more likely to display some cognitive-effective symptoms than non-depressed students. The results also indicated that college students in Taiwan with raised levels of depression recognized the cognitive-affective symptoms of depression. One important finding was the gender difference with regard to help-seeking attitudes, with female students more likely to seek professional psychological help than males. The study concluded that further investigation is still needed on clinical assessments in order to further understand the symptoms of depression among ethnic-Chinese people. Rong et al. (2009) seemed to confirm this. A cross-sectional survey was distributed among 220 Chinese second and third year medical students at the University of Peking and 177 Australian second year medical students at the University of Sydney. This study compared the levels of awareness of depression between Chinese and Australian medical students. The findings strongly confirmed that Chinese students placed significantly less emphasis on somatic symptoms (e.g. sleep disorder) which are typical for people with depression, and placed greater emphasis on certain psychological symptoms, for example 'thinking life is not worth living'. Furthermore, the survey found that huge differences were uncovered in terms of the level of knowledge concerning the impact on health of depression

amongst medical students in China and Australia. Chinese students were more likely to admit to seeking help from mental health professionals whilst Australian students were more prone to look for help from general family doctors. More could be done; it was suggested, in the medical curriculum in China to raise the awareness of the ability of general doctors to deal with problems of this kind.

Aniebue & Onyems (2008) assessed the prevalence of depressive symptoms amongst 262 Nigerian undergraduate medical students, and they reported that 23.3% had experienced depression. Their results revealed that female students and those who had had a professional examination were more likely to have a higher depression scores, and students who smoked regularly had significantly higher rates of depression compared with students who did not smoke. The study suggested that the vulnerability of medical students to depression needed to be noted. In line with the findings of Aniebue & Onyems (2008), Adewuya et al. (2006) who examined the socio-demographic correlates of depressive disorder among university students in Nigeria, stated that depressive disorder is common amongst university students in Nigeria. In the study of Adewuya et al. (2006), depressive disorder was identified using the Mini International Neuro-psychiatric Interview (MINI), and the questionnaire was completed by 1,206 students. Their results showed that overall, 8.3% of students met the criteria for depressive disorders, with 2.7% having major depressive disorders and 5.6% having minor depressive disorders. It was also shown that the variables accommodation, female gender, very large family size, heavy cigarette smoking and high level of alcohol consumption were significantly associated with depressive disorder in the students. Further, the study recommended that:

“Depression is common among Nigerian university students and significantly associated with socio-demographic factors. An effective model for the prediction of the development of depression in university needs to be developed and evaluated and interventions aimed at reducing the incidence of depression among this population need further research” (2006, p.674).

There has been increased discussion in the literature on depressive symptoms and several studies have shown that university students are susceptible to high levels of depressive symptoms. The high levels of depressive symptoms were found to be associated with many different factors such as: living in university accommodation; low socioeconomic status; poor school performance; and smoking and alcohol consumption (Maria et al., 2008; Bostanci et al., 2008; Baldassin et al., 2008; Arslan et al., 2009). According to Baldassin et al. (2008) the high levels of co-morbidity during university years are associated with an increased risk of suicide, and therefore counselling and confidential mental health services are required in order to evaluate student depressive symptoms and also to help students to recognize their depression and seek for appropriate treatment.

Abdel-Khalek & Alansari, (2004) conducted a study which investigated gender differences with regard to anxiety among volunteer undergraduate students from ten Arab countries: Kuwait, Saudi Arabia, The United Arab Emirates, Oman, Egypt, Syria, Lebanon, Palestine, Jordan and Iraq. The Kuwait University Anxiety Scale (KUAS) was used in this study, and the questionnaire was administered to 3,064 undergraduate students. Their results showed that anxiety is one of the most fundamental of all constructs in psychology. In seven out of

the ten countries (Kuwait, Saudi Arabia, Emirates, Oman, Egypt, Syria and Lebanon) female students tended to worry more than males. On the other hand, there were no significant gender differences among participants from Palestine, Jordan and Iraq. Finally, the survey results pointed to the need for an extension of this research, to be conducted among younger and older age groups. Likewise, in Pakistan, Rab et al. (2008) revealed that there were more female medical students experiencing feelings of anxiety and depression than male. The Pakistani study also indicated that those students who had experienced negative life events reported more feelings of anxiety and depression. Students living in university accommodation were significantly more anxious and depressed compared to those living at home. The importance of further research considering the associated factors was emphasised by Rab et al who stated:

“Further studies are required into other factors such as loss of parents, past history of systemic and mental illness and family history or mental illness. Further studies are required to evaluate the potential risk factors, especially those affecting the students living in college dormitories. Since residing in dormitories was found to be an independent risk factor contributing to higher levels of stress, living conditions in dormitories should be reviewed. A student welfare system should be available to the new students entering the medical college and especially those leaving home for the first time” (2008, p. 132).

Similar patterns have been found in the United States, where depression, anxiety and other serious mental health problems are increasingly common among college and university students. The American College Health Association (2006) showed that out of over 94,000 students surveyed in the spring of 2006, 67% of women and 55% of men

reported feeling hopeless at some time over the previous school year, that 47% of women and 38% of men reported feeling depressed. This result is supported by a survey carried out in (2007) by the Anxiety Disorders Association of America, which investigated students seeking help for these problems. Students' use of campus mental health services had risen at almost all schools over the previous three years, with 13% of students using campus mental health services, but the survey indicated that they don't always get the help they need (Shute, 2007). Harper and Peterson (2005) confirmed that the number of students reporting depression and anxiety is increasing. However, Shute (2007) reported that students still needed to wait a number of weeks for their first session of counselling.

The literature does express serious concern over the effectiveness of treatment of mental health disorders and also shows that the average levels of reported symptoms are high amongst the student population and many students experience and suffer from serious mental health problems such as anxiety and depression. Research has suggested that mental health programmes for undergraduate students and research students should be enhanced to provide more advice and support to students. Danile et al. (2007) have suggested that campus mental health services can sometimes reduce the delay between the onset of psychiatric conditions and their proper treatment. Also they highlight an association between substance abuse, academic problems and other problems later in life. Moreover, Maria et al. (2008) stressed that campus mental health services ought to be a priority. Similarly, Martins et al. (2004) suggested that access to mental health programmes at an early stage can help to mitigate emotional disturbance and academic dysfunction. They go on to stress that it is important to improve mental health care systems. Oliveira et al. (2008) indicate that campus mental health services can reduce problems among students. According to the Office for National Statistics

in the UK (2004), there is a need for further research into these issues since the cost of mental health problems is rising. In the following section the literature with regard to general health complaints will be reviewed.

3.5 General health complaints

This section focuses on general health complaints within student populations and reviews the previous studies which have been conducted among students in different countries. The section will first describe the most frequently reported health complaints among students. Finally, public health issues of health complaints among students are highlighted.

Several studies using self-reported health indicators among student populations have been carried out in many different countries (Takakura et al., 2005; Zahran et al., 2006; Stock et al., 2007). The most frequently reported health complaints amongst students' populations were headache, backache, stomach-ache, depressive mood and sleep disorders (Sleskova et al., 2005 and Stock et al., 2007). Steptoe and Wardle (2001) found a link between poor health and an unhealthy lifestyle which included a low level of knowledge about health and behaviour, a belief in influence which is uncontrollable, and emotional problems. As a corollary of this, students' anxieties about their health can sometimes be somatic and psychosomatic, for example headache, neck and back pain, depression and insomnia. These were the most common health complaints among students from Spain, Germany, Lithuania and Sweden (Stock et al., 2007; Simonsson et al., 2008). A small proportion of students experience health problems which were severe enough to have an impact on their daily lives (Simonsson et al., 2008). Studies have shown an increase in students presenting with symptoms of a psychosomatic nature, and perceived health or indeed illness has many

contributing factors for instance, social, structural, and cultural influences. The following section details the public health issues of health complaints within student populations.

3.5.1 Public health issues of health complaints among students

Across different developed and developing countries, and also in different populations, the prevalence and risk factors of subjective health complaints have been studied. Some studies which have been conducted amongst HES populations will be reviewed in this section.

Stock et al. (2003) examined the differences in health complaints among students from three different European countries (Spain, Germany and Lithuania), and also studied the risk factors associated with health complaints. A total of 2343 students participated in this study and ten health complaints were measured by a symptoms checklist through a self-administered questionnaire. The study findings revealed that the highest number of complaints came from Spain, then Germany, followed by Lithuania. Spanish students reported the highest level of access to a doctor (81.8%), and were more likely to engage in risky behaviours, for example, smoking and alcohol drinking than other students. The study found that lack of social support, lower levels of health awareness, and physical inactivity were associated with higher levels of health complaints. They found also that students reporting insufficient income were more likely to suffer from neck/backache. Finally, the survey results pointed to the need for health counselling to increase healthy behaviours and intervention programmes to prevent the manifestation of symptomatic disease at a later time. Likewise, Simonsson et al. (2008) examined the prevalence of health complaints among students in Sweden. Their results indicated that headaches occurred in more than one third of students of both sexes in Sweden.

Stock et al. (2007) also conducted another study which looked at gender differences in student health complaints amongst university students from seven European countries (Germany, Poland, Bulgaria, Spain, Lithuania, Denmark and Turkey). A total of 5,317 university students completed a self-administered questionnaire during lecture time. Health complaints were measured by using a symptoms checklist which included stomach complaints, dizziness, diarrhoea, headache, nervousness, constipation, backache, neck/shoulder ache, depressive moods, and sleep disorders. Their results showed that most of the complaints were highly prevalent in the students, affecting as much as about 20-50% of students quite often or very often. Headaches and anxiety were highest on the list of health complaints, followed by back or neck aches. Students from Turkey and Spain had the highest numbers of complaints, while those from Denmark and Lithuania the lowest. Significantly more complaints were recorded by female students, with mean risks ranging from 1.2% to 4%. The gender difference was strongest in Bulgaria and Poland and on average the smallest in Turkey. One interesting finding from the study was that depressive disorder had the strongest impact on the quality of life amongst student populations. Finally, the study suggested that:

“Intervention to increase social support among students and to establish social network especially in the first year of studies would help to cope with psychosocial and study-related stress and to prevent depressive mood, all together resulting in a higher quality of life for the students” (2007, p. 360).

Research in Egypt (Abolfotouh et al., 2007) concentrated on a questionnaire on health-related lifestyle and risk behaviours among students living in Alexandria University hostels, which was administered to 600 university students. It was found that among students in Alexandria

University, almost a third reported having poor sleep or engaging in risky behaviours such as smoking and drinking alcohol. In total, 23% of students mentioned that they suffered from poor health and as many as 80.3% reported low to moderate social support, while 32.2% had sleep disorders. Those students reporting low social support were more likely to report health complaints. Significant gender differences were found, with female students more likely to report higher levels of health complaints than male students. The findings led the researchers to conclude that:

- Healthy lifestyles should be promoted to the student population by providing healthy food and improving recreational and sports facilities.
- Interviews with students should be carried out by focus groups to discover information about their health problems and to make suggestions for improvements.
- In Alexandria University, health education messages could be disseminated to hostels through informal programmes to elicit changes in student behaviour in areas such as: smoking, physical activity, dietary behaviour and sleep habits.
- Excursions such as weekend trips should be organised for students at hostels.
- Health educators or supervisors could instigate peer-education programmes. Students who show a keen interest in health or have an aptitude should be encouraged to become leaders in these programmes.
- It is highly recommended that an investigation take place to compare students living in hostels with those outside hostels with regards to different lifestyle and health-risk behaviour.

A review of the studies with regard to headaches revealed that few studies have been conducted on headache frequency in student populations, however previous research (Bicakci et al., 2007; Curry & Green, 2007; Simonsson et al., 2008) has shown that headaches are a very commonly reported complaint in the student population. Curry & Green (2007) studied the incidence of headaches in a sample of 104 university students in the USA, and reported that the majority of students studied reported experiencing headaches and 60% of student revealed that headaches interfered with their usual activities while 92.55% reported the use of non-prescription medicines for headache management. Their findings also showed that student knowledge about the prevention and treatment of headaches was lacking. It suggested that further studies are required to determine the incidence of headaches among students and also primary care should be provided to address patient education in student populations and to assist patients in diagnosing headache types. Similarly, Bicakci et al. (2007) concentrated on a questionnaire on headache characteristics in medical students in Turkey, which was administered to 141 students in the first instance. At the second stage, students answering 'yes' were invited to a face-to-face interview. It was found that headaches were a common symptom in the student population in Turkey and it affected quality of life due to the limitation of daily activities. A total of 50.7% of the sample reported tension-type headaches and 46.3% suffered from migraine. Curry and Green (2007) also indicated:

“Screening for headache is an important role of the primary care provide. It is recommended that headache screening tools be incorporated into new and ongoing patient visits whenever a headache history is noted. The primary care provider is in an optimal role to assist patients with recognition of headache types and appropriate clinical management” (2007, p. 282).

3.6 A review of the relationship between socio-economic characteristics and health status

The relationships between socio-economic characteristics and health variables have been discussed extensively in the literature. A review of studies showed significant gender differences with regard to perceived weight related to BMI, with male students being more likely to perceive themselves as 'too thin', while female students are more likely to perceive themselves as 'too fat', even those with a normal BMI (Cheung et al., 2007; Mikolajczk et al., 2010). Similarly, Chmara et al. (2007) examined the socio-economic factors and prevalence of underweight and overweight among female students in Poland, based on a survey of 718 female students aged 18-24 years. Their finding highlighted the higher incidence of underweight among female students in Poland rather than overweight and obesity (15.3% and 3.5%, respectively). They also found a positive association between higher socio-economic status and underweight, and that 70% of females students of normal weight (BMI=18.5-24.99 kg/m²) wanted to have a lower body weight. No significant correlation was found between the prevalence of very low body weight and lifestyle variables. Similarly, Ojala et al. (2007) indicted that overweight females are more likely to be trying to lose weight than male students amongst students in Europe, Israel and North American, and found that the majority of females in all countries were either trying to (or felt that they should be trying to) lose weight. On other hand, overweight males often thought that their weight acceptable or were trying to gain weight.

Che, (2002) indicated that different factors, like a very active lifestyle and concerns about weight, can affect the weight of students. The results also showed that people under 25 years of age, especially female single people and those not living with their family, were found to be more likely to be underweight. The study also revealed that low body weight amongst

young people can be affected by lifestyle, for instance smoking, exercising and dieting. Chmara et al. (2007) pointed out that underweight has a detrimental effect on health and can be particularly dangerous for young females, as it may lead to problems such as a lower fertility. Moreover, the WHO (2002) revealed that significantly higher risks of poor health, low physical performance, lethargy and even death are linked to a BMI of less than 16.

The previous analysis for a potential relationship between socio-demographic variables and mental health problems produced some significant results, for example, research in Turkey by Bayram & Bilgel (2008) concentrated on a questionnaire investigating the prevalence and socio-demographic correlations of depression, anxiety and stress amongst undergraduate university students using Depression Anxiety and Stress Scale (Dass-42). The questionnaire was administered to 1,617 students at the Uludag University in Bursa, Turkey. The surveys found that anxiety, depression and stress scores of moderate levels or above were reported by 47%, 27.1% and 27%, of respondents respectively. They also found that gender was correlated to anxiety and stress, but this correlation was weak. Females' mean anxiety and stress levels were significantly higher compared to male students. First and second year students had higher anxiety and depression scores than others. Political and social sciences students had higher anxiety, depression and stress levels than those studying engineering and medicine. Students from wealthier families had lower depression and stress scores than those from poor families. Also significant differences were found between a rural and urban background, with students from a rural background being significantly more likely to have elevated depression.

Recent research on the relationship between health and income in student populations has shown that the impact of income on health accumulates over time, and the financial aspect of a student's life appears to be one of the major mental health problems to a great number of students. Martins et al. (2004) surveyed Brazilian university students, and indicated that many students reported anxieties connected to their levels of income, and also reported that living in university residential facilities has also been found to be a factor in the presence of depressive symptoms. Finally, their study results highlighted that it is important that Brazilian public universities do not charge students registration or any other academic fees. Another problem that faces students is homesickness, which can be a problem in students forced to relocate because of the university/college which they are attending. Previous studies (Rab et al., 2008; Oliveria et al., 2008) showed important differences between resident and non-resident students, and resident students were significantly more anxious and depressed. Rab et al. (2008) revealed that there were more female medical students in Pakistan experiencing feelings of anxiety and depression than male. The Pakistan study also indicated that those students who had experienced negative life events reported more feelings of anxiety and depression. Students living in university accommodation were significantly more anxious and depressed compared with those living at home. Similarly, amongst Brazilian students, Oliveira et al. (2008) found that students whose main source of income was a scholarship and those who lived in the campus residence hall were also overrepresented amongst the campus mental health service clients.

Furthermore, there appear to be many factors which play a role in student health complaints. Gender seems to be significant, with female students reporting higher levels of health complaints than male students. In Slovakia, Sleskova et al. (2005) found that

young male students had better self-related health and less long-term illness, whilst female students reported significantly worse health problems and levels of vitality. Another factor which was found to be associated with health complaints was satisfaction with social support. Various studies (Stock et al., 2003; Takakura et al., 2005) have found that students experiencing low levels of social support had less satisfaction than those with high support, and they were at greater risk of health complaints. Takakura et al. (2005), in a study conducted amongst Japanese students, seemed to confirm the importance of high levels of social support in terms of subjective health complaints and they recommended that interventions which improve the psycho-social school environment were needed in order to promote school-related health. Furthermore, Simonsson et al. (2008) discovered that students who lived with a single parent were twice as likely to present psychosomatic complaints as those who lived with two parents. Also, Stock et al. (2003) found that headaches were less common amongst students who were studying health related courses. It is assumed that this was due to their having increased knowledge about health issues and being more likely to engage in preventive behaviours. Hadjistavropoulos et al. (2007) reported that those students who felt that other people had unrealistic expectations of them reported more pain related problems. Costa et al. (2000) found that lying down or isolating themselves from their environment was the most commonly used self-help technique. Simonsson (2008) stressed that students can be helped to prevent themselves from developing psychosomatic complaints by developing a strong sense of coherence. The following section summarises the chapter, highlighting the most important studies regarding the health status of student populations which have been reviewed in this chapter.

3.7 Summary of the literature with regard to students' health status

From the above sections it may be concluded that many developing and developed countries (e.g. Egypt, Lebanon, Turkey, Brazil, European countries, and the USA) have been paying increasing attention to the health of their student populations. This is clear from reviewing the literature of these countries. This chapter has provided many useful insights into the three health aspects, namely Weight perceptions and BMI; mental health conditions; and general health complaints. By reviewing the previous studies and other reports on the health of student populations. In summary, recently researchers (Tom et al., 2006; Jackson et al., 2007; Mikolajczyk et al., 2010) have been using height, weight and body mass (BMI) extensively as indicators of weight-related problems. BMI is a simple but important measurement to assess exact body mass, and whether a person is of normal weight, underweight, overweight or obese. It can also be used to assess the degree of nutritional, agricultural interventions and other socioeconomic deprivation in a population. An increase in BMI is closely linked with an increased risk of certain diseases, including heart disease, blood pressure, diabetes and cancer.

A review of the published literature on the health implications of body weight demonstrated that overweight and obesity have become a major health problem worldwide, and are associated with several chronic diseases in more developed countries. Sedentary behaviour caused by long hours watching television or using the internet, consuming high energy snacks whilst watching television as well as other factors such as inactivity and socioeconomic conditions are the reasons behind the rise of overweight and obesity (Musaiger, 2003). Also, evidence shows that there is link between being underweight and poor performance at work, and an increase in illness and mortality (Che, 2002). A variety of effective options exist for

the management of overweight and obese patients, including dietary therapy approaches such as low-calorie diets and lower-fat diets, altering physical activity patterns, pharmacotherapy and surgery. However, treatment of overweight is recommended by WHO (2006) only when patients have two or more risk factors. It should focus on altering dietary and physical activity patterns to prevent the development of obesity and aim to produce moderate weight loss. It is essential, therefore, to establish national programmes in all countries that show a high prevalence of these issues to prevent and control underweight, overweight and obesity, taking into consideration social, cultural, dietary and lifestyle factors that may increase the risk of obesity.

Regarding mental health, the literature revealed that mental health conditions include both stress and worries, and are mostly common among young people (Oliveria et al., 2008; Arslan et al., 2009). A great deal of stress is linked to academic performance. Students are concerned about their studies; as a result, they are more likely to suffer from different types of health issues such as mental health disorders. Anxiety and depression are the most common challenges to students' mental health and there are increasing rates of anxiety and depression among students, especially those living in university halls of residence around the world (e.g. some Arab countries, Pakistan, Turkey, Eastern and Western European countries, Brazil, the UK and the United State) (Abdel-Khalek & Alansari, 2004; Mikolajczyk et al.; 2007; Rab et al., 2008; Bayram & Bilgel, 2008; Arslan et al., 2009). Student mental health programmes can help students to develop positive mental health, and such programmes can also teach students life-skills (e.g. critical thinking, communication, problem-solving and methods to cope with emotions and crises). Furthermore, prevention, assessment and treatment can be included in student's mental health programmes. It is fundamental for

students with emotional disturbance and academic dysfunctions to be recognized at an early stage, and it is important for them to have access to programmes that provide mental health services. In addition, as the economic costs of service provision for people with mental health disorders are likely to be high, studies have indicated that further research should be conducted to address these issues (Martins et al., 2004; Daniel et al., 2007; Zahran et al., 2007).

Regarding general health complaints, the literature showed that the most common health complaints among students are: headaches; neck and back pain; depression; and insomnia. The incidence of headaches was found to be a widespread phenomenon among university students; for example, in Turkey, a total of 50.7% of medical students reported tension-type headaches and 46.3% suffered from migraine. Also students in Turkey reported that headaches affected their quality of life due to a resulting limitation of daily activities (Bicakci et al., 2007). These health complaints can be severe enough to have a serious impact on students' daily lives. More female students reported significantly worse health status than males. Moreover, Stock et al. (2007) reported high levels of headache, nervousness and backache amongst university students in seven European countries. Therefore, student health programmes are considered to be very important to prevent the development of psychosomatic complaints among students.

Although recurrent health complaints are a relatively frequent experience among university students, they are not well understood (Hadjistavropoulos et al., 2007). Furthermore, previous research indicated that a large and increasing number of students have presented with

subjective health complaints and health worries, specifically psychosocial health such as depression and anxiety among higher education students (Stock et al., 2003; Abdel-Khalek & Alansari, 2004; Rab et al., 2006; Mikolajczyk et al., 2007; Simonsson et al., 2008). The reason for studying health status and lifestyle behaviours in higher education students is that more research is needed in order to develop effective health education programmes and health promotion policies such as the Health Promotion Universities Project by the World Health Organization (1998). Self-related health is therefore an important area to investigate, along with the health status and lifestyle behaviours of student populations. Musaiger (2004) has indicated that there is a lack of research on students' health problems, such as obesity, in the EMR. In addition, Abolfotouh (2007) suggested that there is a need to promote lifestyle change and to reduce obesity to prevent the incidence of diabetes and hypertension among Egyptians. Therefore, there is an urgent need for national programmes to prevent and control obesity in the countries of the EMR.

The aim of the present study was to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviors (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan higher education students (HES); to compare health status and lifestyle behaviours in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition to this, the study aimed to determine if any association existed between demographic and academic variables and the most prevalent health and lifestyle variables. This will fill a clear gap in the health literature, particularly the literature regarding the HES population in Libya. Although the survey of the literature has shown that a large number of studies have investigated the subject of student health status in the context of developing and developed countries, there is

no evidence that the health of HES has been investigated in Libya, and also there has currently been no other study which compares Libyan HES by region. In addition, the researcher would like to highlight the fact that no other study previously carried out has included a comparison of Libyan HES and those from other countries. It has therefore been impossible to include any similar studies in the literature chapter. However there are some comparison studies in different countries which have been reviewed, and this study therefore make some attempt at addressing that gap. The next chapter will review studies which have concentrated on the lifestyle behaviours of student populations in different countries (fruit and vegetable consumption, physical activity, smoking, and alcohol and drug consumption). In addition, the health promotion programmes in HEI will be discussed in details. In the following two tables (Table 3.1 and 3.2), studies related to students health status will be summarised. For the purpose of simplicity, these studies will be divided into two tables. In the first table, studies conducted in developing countries are summarised, in the second table studies conducted in developing countries are summarised.

Table 3.1: Summary of literature review of student health status in developing countries

Year	Authors	Countries	Variable (s)	Results
2004	Abdel-Khalek & Al-Ansari	Ten Arab countries	Anxiety	Anxiety is one of the most fundamental of all constructs in psychology. Female students tended to be more anxious than males.
2005	Sleskova et al.	Slovakia	Health Status	Female students rated their health worse than males in terms of number of health complaints.
2005	Bostanci et al.	Turkey	Depressive symptoms	This study reported high levels of depressive symptoms among university students in Turkey, and suggested that counselling service for mental health is required.
2006	Kakeshita & Almeida	Brazil	Body perception and BMI	Male students pay less attention to the nutritional status, overweight females were more likely to be concerned and uncomfortable with their body weight.
2006	Adewuya et al.	Nigeria	Depressive disorder	Depression is common amongst Nigerian university students and significantly associated with socio-demographic factors such as female gender, accommodation, large family size, smoking and alcohol consumption.
2007	Bicakci et al.	Turkey	Headache	Headache is a common symptom reported among medical students and it affects their quality of life due to limitation of daily activities.
2007	Chang	Taiwan	Depressive symptoms	Chinese students with elevated depressive symptoms readily acknowledged and expressed cognitive-affective symptoms of depression and they were likely to distance themselves from professional psychological help.
2007	Jackson et al.	Egypt, Kuwait and Lebanon	BMI	Lebanese students had the lowest rates of obesity, and Kuwaiti students had the highest rates of obesity. Egyptians students were intermediate, but were closer to the Kuwaitis in overall obesity prevalence.

2007	Abolfotouh et al.	Egypt	Health-related lifestyles and risk behaviours	The prevalence of unhealthy behaviours (e.g. smoking physical inactivity) among students is of concern. About 28% of students adopted three or more risk behaviours.
2008	Bayram & Bilgel	Turkey	Anxiety and depression	The high prevalence of anxiety, depression and stress symptoms amongst university students in Turkey is alarming, and the primary and secondary prevention measures and adequate support services are needed.
2008	Rab et al.	Pakistan	Anxiety and depression	Overall, 19.5% of students reported depression and 43.7% reported anxiety. Students living at home were significantly less depressed and anxious than those living in university accommodation.
2008	Aniebue & Onyema	Nigeria	Depressive disorder	Overall, the prevalence of depression amongst Nigerian students was 23.3%. Females and smoking and examinations were significantly associated with depressive symptoms.
2008	Oliveira et al.	Barzil	Mental health	The most common reasons cited for students seeking help were course level, living in a university accommodation, difficulties with family, relationships, and poor academic success.
2008	Nur et al.	Turkey	Emotional disorders	High levels of emotional disorders, and the study indicated that university authorities should be aware of these problem and effective measures to address them should be taken.
2008	Baldassin et al.	Brazil	Depressive symptoms	The prevalence of depressive symptoms amongst medical student in Barzil is high and females were more likely to have high levels of depressive symptoms.
2009	Arslan et al.	Turkey	Depression	The prevalence of depression was 21.8%. Health educational programmes are required to address depression information and knowledge.

2010	Al-Qauhiz	Saudi Arabia	Obesity	A total of 22% of students were overweight and 16% were obese. BMI was significantly associated with the frequency of eating with family and also with the frequency of eating dates.
2010	Al-Rethaiaa et al.	Saudi Arabia	Obesity and eating habits	Misperception of body weight was reported by 17.4% and the rates of overweight and obesity among college student was 48%.

Table 3.2: Summary of literature review of student health status in developed countries

Year	Authors	Countries	Variable (s)	Results
2003	Von Bothmer et al.	Sweden	Self-rated health	This study found a positive association between positive effect/optimism and sense of coherence only for female university students.
2003	Stock et al.	Spain, Germany and Lithuania	Health complaints	The highest rates of health complaints were found with respect to headache, nervousness, backache and neck ache. The highest number of complaints came from Spain, the next Germany, followed by Lithuania.
2003	Huang	USA	Obesity and overweight	The study found that 22% of college students were overweight and 5% of students were obese.
2004	Andrews & Wilding	UK	Depression and anxiety	The study indicated that financial difficulties can increase the levels of depression and anxiety and also affect academic performance.
2005	Takakura et al.	Japanese	Health complaints	Students who reported low social support and perceived high demands reported the highest health complaints. Intervention which improves the psychosocial school environment is required.
2007	Curry et al.	USA	Headache	Headache is common health complaint amongst undergraduate populations in the USA. The study indicated that primary care should be provided to assist patients in diagnosing headache types.
2007	Chmara et al.	Poland	BMI	The prevalence of overweight and obesity was much lower than the prevalence of underweight. Around 70% of female students having normal weight wanted to have a lower body weight.
2007	Mikolajczyk et al.	Germany, Denmark, Poland and Bulgaria	Depressive symptoms	Students from Eastern European were more likely to have higher depressive symptoms than Western European students. Perceived income insufficiency, and female gender were

				associated with higher levels of depressive symptoms.
2007	Stock et al.	European countries	Health complaints	The results showed that students in Lithuania and Denmark reported the lowest level of complaints and students from Spain and Turkey the highest level of complaints. Considerably higher percentage of female student reporting health complaints than males.
2008	Simonsson et al.	Sweden	Health complaints	Their results indicated that headache occurred in more than one third of students of both sexes in Sweden.
2008	Mikolajczyk et al.	Poland, Bulgaria and Germany	Self-rated health	Self-rated health is a valid technique for assessing the health of individual and it can be reasonably used to compare the health of students across countries.
2008	Bunevicius et al.	Lithuania	Depressive symptoms	The study showed that depressive symptoms were prevalent in humanities and medical students. It concluded that more attention should be paid to those with low levels of emotional stability.
2009	Rong et al.	Australia and China	Depression	Chinese medical students recognise depression similarly to Australian student but do not consider it a major public health problem.
2010	Mikolajczyk et al.	European countries	Weight perception and BMI	Weight ideals are rather uniform across the European countries, with female students being more likely to perceive themselves as 'too fat' at a normal BMI.
2010	El Ansari and Stock	UK	Health awareness	The study reported significant relationships between health, health behaviours and educational achievement.

CHAPTER FOUR

LITERATURE REVIEW – LIFESTYLE BEHAVIOURS

4.1 Introduction

The previous chapter presented a review of the literature on students' health status. Since one of the objectives of this thesis is to examine the lifestyle behaviours of HES in Libya, an in-depth understanding of the prevalence of both healthy and unhealthy lifestyle behaviours amongst student populations in a range of different countries is deemed crucial. Thus, the main purpose of this chapter is to present a review of the literature on student lifestyle behaviours, which are closely linked with health issues. The remainder of this chapter is as follows; Section one presents a general introduction to students' lifestyle behaviours. Section two presents a review of the literature on body image perceptions and dietary practise. The third section discusses the literature on fruit and vegetable consumption among student populations. The fourth section reviews the literature regarding physical activity. The fifth section reviews the literature on smoking behaviour amongst students from both developing and developed countries. The sixth section details the literature on alcohol and drug consumption. The seventh section discusses the relationship between socio-economic characteristics and lifestyle behaviour. Section eight reviews some health promotion and intervention programmes aimed at higher education students. The last section provides a summary of the literature with regard to lifestyle behaviours.

Attitudes towards both health and lifestyle in general appear to be established early in life, thus setting a pattern for adult life (Leslie et al., 2001). It is possible to detect patterns in health behaviours in young people, and to try and understand beliefs and attitudes which

might contribute to these patterns. International comparisons are especially interesting as they show up variations in behaviours in different cultures. They also can help to show good practice in preventive strategies (WHO, 2005). The most damaging behaviours which contribute to ill-health in students are smoking, poor diet, alcohol and a sedentary lifestyle. It has been found that in developing countries, where there are fewer restrictions on the advertising and access of cigarettes and alcohol there is increasing use of these stimulants amongst students (Moukyer, 2008). Two important studies have revealed significant data concerning developed and developing countries. The European Health and Behaviour Study (2005) was a survey of health behaviours and associated attitudes carried out with 16,483 university students from 21 countries between 1989 and 1991. This study uncovered many variations in the levels of smoking, exercise and diet. It was discovered that females generally had a healthier diet than males, and smoked less, but also did less exercise. There was a wide variation in the knowledge of disease risk, although health behaviour was closely associated with beliefs about health (Steptoe et al., 2002). A survey by the Global Student Health Survey in the United Arab Emirates in 2005 showed that risk taking amongst students was high. Obesity has increased, which can be linked to changes in dietary behaviour and a generally sedentary lifestyle. The protective nature of the family has been weakened by wide-ranging socio-cultural factors. The use of tobacco is also increasing and starts at an earlier age (WHO, 2005).

Lifestyle patterns of behaviour are generally formed during adolescence and the early twenties period; this period is likely to be important in terms of lifestyle behaviours such as smoking (Mazizk & Mzayek., 2000). Young people have impressionable minds and are therefore vulnerable to risk taking behaviour such as, for example, smoking, alcohol, drugs

and promiscuity. Biological and technical advances in recent years have brought about an improvement in socioeconomic and environmental conditions. This has led to a decrease in traditional diseases. However, the emerging health diseases require new strategies in order to protect young people in the future (WHO, 2005).

A review of the current literature on lifestyle behaviours amongst students has not revealed any such research conducted in Libya examining this important issue of lifestyle behaviour in HES, with the sole exception of two studies investigating smoking behaviour among medical student in Libya (Buni, 2006; Singh et al., 2006). Based on previous research conducted in different countries (e.g., Prokhorov et al., 2008; Mao et al., 2009; Kasapila & Mkandawire, 2010; Muttappallymyalil et al., 2010), in the current study five key areas of investigation were selected, to investigate the lifestyle choices of Libya HES. These areas have been shown to be particularly important for student populations (dieting; fruit and vegetable consumption; smoking behaviour; alcohol and drugs; and physical activity). These areas are key aspects of lifestyle that influence the risk factors of major diseases within affluent societies (Steptoe et al., 2002; WHO, 2005).

4.2 Body image perceptions and dietary practice

The section focuses on body image perceptions and dietary practice, and reviews previous studies which have been conducted among students' populations. The section will first provide a general introduction, and then briefly outline the public health issues of body image perceptions and dieting practice among students.

Body image dissatisfaction related to actual or perceived body size is widely reported among young people, especially females, in western countries (Wardle et al., 2005; Malinauskas et al., 2006). There are many socio-cultural pressures, including (and in particular) the mass media, which contribute to the increasingly prevalent idea of a “thin body” as being in some way ideal (Oxington, 2005). The mass media in particular contributes to this increasingly common idea. The pervasive images in the media contribute to this misperception of body weight. Individuals are changing the way they perceive their own body. It has become therefore necessary to understand body image and dietary behaviour in order to avoid unhealthy eating habits and a distorted body image amongst students, as these can contribute to poor health later in the student’s life.

It is more common for young females and adolescents to be affected by body image from a very young age, as they have concerns and anxieties about their body weight and shape and place great importance in these ideas (Bogt et al., 2006; Wardle et al., 2006; Ojala et al., 2007). They can also be very vulnerable to images portrayed by the media (Malinauskas, 2006). Students who are overweight can also have many concerns about their body size and shape, and are thus more prone to problems of depression (Meland et al., 2006). One study has indicated that students who are overweight, although not stigmatized or excluded socially, display more depressive symptoms (Wardle et al., 2005). Weight loss is therefore an issue of concern to many students, and it is often achieved by dieting which, in turn, is a common precursor to an eating disorder. Exercise, slimming plans, fasting, vomiting, skipping food and smoking cigarettes are the most frequently used methods of extreme weight reduction practices, which were reported in a substantial proportion of adolescent females. Actual body weight is less a determinant of weight control practices than perceived

weight, which is an altogether more serious problem. Students who have an inaccurate perception of ideas about their weight and shape are more likely to eventually develop an eating disorder (Brenner, 2004).

4.2.1 Public health issues of body image perceptions and dieting practice among students

Body dissatisfaction can lead to eating disorders; several studies show that many people suffer from this syndrome and add to the incidence of eating disorders among different populations (Sakamaki et al., 2005; Buyukgoze-kavas, 2007; Mikolajczyk et al., 2008). Psychological and behavioural problems arise from body image becoming an obsession (Taylor, 2006). Cheung et al (2007) found that students who perceived themselves to be overweight were at an increased risk of developing eating disorders. The most common eating disorders in the modern Western developed world are anorexia nervosa and bulimia nervosa. Previous studies suggest that physical appearance and body image may influence perceived health, and young people have an increased awareness of body shape and their appearance (Ojala et al., 2007). Young people who are overweight are more prone to diet, and also to develop binge eating disorders.

A worldwide research, carried out by the International Health Behaviour Survey (2005), collected data from 22 countries (Central and Eastern Europe, North-Western Europe, South America, USA, the Mediterranean and Pacific Asia) centred on a self-reported questionnaire which was administered to 18,512 university students. The study concluded that perceived overweight increased systematically across BMI deciles in all countries. More female than male students felt overweight in any decile. Female students had a faster rise of weight loss attempts over the BMI deciles but nevertheless the proportion trying to lose weight in the

highest deciles did not exceed 75%. The conclusions reached were that there are many consistent ideas, amongst which is women's overestimation of weight at a lower BMI and men's underestimation of weight at a higher BMI. Attempts to lose weight and perceptions of being overweight were found to be highest in the Asian region where body weights are generally low, suggesting that local culture and norms could moderate attitudes to weight (Wardle, 2005).

Mikolajczk et al. (2010) conducted a survey in seven European countries (Germany, Spain, Poland, Denmark, Bulgaria and Turkey), this survey considered the relationship between perceived body weight and body mass index based on self-reported height and weight among university students. The survey's key findings were that around 20% of female student with a BMI of 20 kg/m² considered themselves "a little too fat" or "too fat", and the percentage increased to 60% for a BMI of 22.5 kg/m². Male students rarely felt "a little too thin" or "too thin" below a BMI of 22.5 kg/m², but most felt "too thin" with a BMI of 20 kg/m². Weight ideals are rather uniform across European countries, with male students being more likely to perceive themselves as "too thin", and female students being more likely to perceive themselves as "too fat". The study recommended university programmes designed to prevent unhealthy behaviour and eating disorders. Similarly, Ojala et al. (2007) concentrated on a questionnaire which was completed by a sample of adolescents from Europe, Israel and North America. Their results indicated that overweight females are more likely to be trying to lose weight than overweight males. A large majority of females in all the countries surveyed were either trying to (or felt that they should be trying to) lose weight. On the other hand, overweight males often thought that their weight was acceptable or were trying to gain weight. Another study in European countries, this time by El Ansari et al. (2010) looked at

differences in body image perception between university students in two European countries (Denmark and the United Kingdom) through a survey administered to 548 Danish and 816 British university students. Overall, 53% of the total sample perceived themselves as “too fat”, 37.7% as “just right” and 8.6% perceived themselves as “too thin”. The study showed that British students were more likely to perceive themselves as “too fat” than those from Denmark. The study suggested that universities should offer individual counselling for at-risk students in order to prevent eating disorders. Likewise, the requirement for university health promotion programmes was confirmed by Sakamaki et al. (2005), who suggested the necessity for nutrition health promotion programmes for university students, especially programmes emphasizing weight management.

A study of 185 female college student aged 18-24 years, at the East Carolina University Honors Programme (Malinauskas et al., 2006) was used to determine differences in dieting practices, weight perceptions, and body composition of normal weight, overweight and obese female college students. It was found that 83% used dieting for weight loss and believe that they would be 2% to 6% heavier than their current weight if they did not diet. The study demonstrated that most (80%) of the 185 students reported participating in physical activity to control weight, while the most unhealthy methods to promote weight loss were smoking cigarettes and skipping breakfast. It concluded that female students, regardless of weight status, would benefit from open discussion with health educators regarding healthy and effective practices to achieve/maintain a healthy body weight. The findings of this study were in line with the results of a survey based on data from the WHO (Meland et al., 2007) which suggested that female students were more likely to practise dieting and to feel dissatisfaction with appearance and weight.

Overall, dissatisfaction with perceived body size is a serious problem among young people of both sexes; however the problem is generally more serious and widespread among females (Kakeshita & Almeida, 2006; Ojala et al., 2007). The literature expresses serious concerns about eating disorders and dieting behaviours, and indicates that they are increasing, especially among female students. Their aim (female students) is not just to lose weight, but to lose it in the long term. This problem is exacerbated by the mass media, whose images of beauty send a powerful message to young women about what their culture somehow expects them to be, or become (Madrigal et al., 2000). Young girls who wish to emulate these beautiful bodies often develop self-loathing and develop an unhealthy relationship to food and an obsession with dieting. They can then become depressed and withdrawn, and this can lead to serious consequences (Taylor, 2006). A number of researchers (Carroll et al. 2006; Wardle et al. 2006; Mikolajczyk et al. 2010; El Ansari et al. 2010) have recommended the establishment of university programmes to prevent unhealthy dieting behaviours and eating disorders. Therefore, there is a need for preventive programmes and early educational interventions targeted at younger students. However, as long as society, especially the media, continues to stigmatise obesity and apparently reward restrictive eating practises, then the problem will continue. In an ideal world, young people would feel accepted and respected no matter what their body shape or physical appearance.

From the above review the researcher can conclude that eating disorders among higher education students were sometimes related to body image. Several studies showed that many students suffered from body dissatisfaction which has, in some cases, led to eating disorders among students. The prevalence of dieting behaviours and eating disorders among students increased in recent years, especially among female students. More males perceived

themselves as 'too thin' and 'just right' while more females perceived themselves to be 'too fat'. The mass media and diverse social-cultural pressures are thought to cause an increased awareness of thin as being ideal, and to contributed to the misperception of body weight. This indicated that there is a need to investigate factors (e.g. socio-demographic factors and nutrition behaviours) associated with body image perception among students. Carroll et al. (2006) pointed out that a proportion of current smoking activities among college students were related to weight loss intention. Despite wanting to lose weight, current smoking was concomitant with obesity-promoting behaviours such as eating higher calorie foods and eating in front of the television. College based interventions to prevent smoking initiation or promote smoking cessation should include a focus on healthy eating, exercise and healthy ways to lose or maintain weight. Furthermore, in order to prevent eating disorders, higher education institutes should offer individual counselling for at-risk students, and should focus on healthy food choices. The conclusion is that what is necessary is education about self-esteem and nutrition, In addition to this it is also important for people be more critical of unattainable images of beauty that are shown in the media.

The next section reviews the literature on fruit and vegetable consumption, and highlights its importance to the health of individuals.

4.3 Fruit and vegetable consumption

The section focuses on fruit and vegetable consumption and reviews previous studies which have been conducted among students. The section will first describe the health benefits associated with fruit and vegetable consumption, and then briefly review the consumption of fruit and vegetables among students.

A person's university years are a period of transition, with young adults often moving away from a closely supervised family environment towards a much more independent existence (Leslie et al., 2001). During the university stage of their lives, they may develop food patterns which will have a long-term effect on their future lives as adults. Young adults are often ambivalent about their future health and the role that nutrition plays (Ricards et al., 2006). Many diseases which emerge in later life have their origins in the eating patterns of young adults. Previous studies have shown that the majority of university students are not consuming enough fruit and vegetables to prevent diet-related disease (Bowen et al., 2004; Unusan, 2004; Scully et al., 2007). Unusan (2004) studied Turkish students and concluded that they do not consume enough fruit and vegetables. Diet and nutrition are so important during the period of life normally covering higher education, and the close relationship between eating certain foods and good health is evident and important (Soriano et al., 2000). It is therefore very important to find a way to encourage students (and young people in general) to consume more fruit and vegetables, in order to prevent and delay overweight and chronic diseases such as hypertension and cancer (Ann, 2000). According to Bowen et al. (2004) changes in the mean consumption of fat, fruit and vegetables in the population by even a small amount can have an important and significant effect on chronic disease prevalence.

Research has shown that diet, nutrition and health patterns in young adults, like university students, are associated with the development of many diseases not manifested until much later in life (Bogt, 2006). The relationship between the frequent consumption of certain foods and aspects of good health is significant. In recent years, the way of life of university students has undergone many changes (Unusan, 2004). Several authors have studied practices relating

to the nature and range of food variety, dietary and nutrition intake, ways of preparing food, time for eating and quantity of meals and snacks. (Soriano et al., 2000; Bowen et al., 2004). Promoting sufficient intake levels of fruit and vegetables among students is important, because intake of fruit and vegetables provides part of the high nutritional needs necessary for supporting rapid physiological growth and development (Lytle, 2003). However, Richards et al. (2006) indicated that the majority of college students were not consuming enough fruit and vegetables to prevent diet-related disease. Therefore, exploring ways to get young people to eat more fruit and vegetables could assist them in preventing and delaying becoming overweight and developing chronic diseases such as cancer and hypertension.

4.3.1 Health benefits associated with fruit and vegetable consumption

A strong association has been established between fruit and vegetable consumption and a decreased risk of chronic diseases (Stevens et al., 2003; Bowen et al., 2004; Lock et al., 2005). Moreover, fruit and vegetables are good sources of complex carbohydrates, vitamins, minerals, and other substances important for good health. Dietary patterns that include higher intakes of fruit and vegetables are associated with several health benefits, including a decreased risk of some types of cancer (WHO, 2005; Rasmussen et al., 2008). Riboli and Norat (2003) reported that researchers found a strong link between increased fruit and vegetable consumption and decreased risk of chronic diseases such as cancer, heart disease, and strokes. Evidence is also emerging about a positive role for fruit and vegetable consumption in reducing the risk of cataracts, chronic obstructive pulmonary disease and hypertension. Moreover, the World Cancer Research Fund and the American Institute for Cancer Research (AICR) estimated that diets high in fruits and vegetables (more than 400g/day) could prevent at least 20% of all cancer incidence (Ann et al., 2000). In the USA,

Riboli and Norat (2003) reported that both fruit and vegetable consumption are significantly associated with a reduction in the risk of cancers of the lung, oesophagus and stomach. Their findings also indicated that breast cancer is associated with fruit consumption, but not with vegetables.

Lock et al. (2005) considered the global burden of disease attributable to low consumption of fruit and vegetables and reported that a worldwide total of 2,635 million deaths a year are attributable to low consumption of fruit and vegetables. The total worldwide disease could be cut by 1.8% by increasing the consumption of fruit and vegetables to 600g per day per person. This would also reduce ischemic heart disease and ischemic stroke by 31% and 19% respectively. For stomach, oesophageal, lung and colorectal cancer, the potential reductions were 19%, 20%, 12% and 2%, respectively. Their study pointed out:

“The potentially large impact that increasing fruit and vegetable intake could have in reducing many non-communicable diseases. It highlights the need for much greater emphasis on dietary risk factors in public health policy in order to tackle the rise in non-communicable diseases worldwide, and suggests that the proposed intersect oral WHO/FAO fruit and vegetable promotion initiative is a crucial component in any global diet strategy” (2005, p.100).

4.3.2 Consumption of fruit and vegetables among students

The Global Students Health Survey (2005), conducting research in the United Arab Emirates, found that overall, 47.4% of students had usually eaten fruit such apples, oranges, grapes, mango, bananas or melons one or more times per day during the previous 30 days. Male students were significantly more likely than female students to eat fruit one or more times per

day. Overall, students usually ate vegetables, such as tomatoes, cucumbers, lettuce or carrots one or more times per day (WHO, 2005). In contrast, among Turkish university students, Unusan (2004) found that female students were more likely to eat fruit and vegetables, and vegetables were more preferred by female students at lunch and dinner.

Scully et al. (2007) shows that many Australian students do not consume appropriate quantities of vegetables and fruit. Only one in five students consumed an adequate amount of vegetables, while <40% usually ate the daily recommended serving of fruit. Moreover, the results suggested that vegetable and fruit consumption differed according to gender, with males more likely to consume the recommended quantity of vegetables and females more likely to eat an adequate amount of fruit. Similarly, in the United States, Beech et al. (1999) reported low nutrition knowledge levels and low daily fruit and vegetable consumption among students, with significant gender differences in nutrition knowledge. Female students had higher knowledge scores than male students, and female students reported being more confident than male students in their ability to eat five servings of fruit and vegetables each day.

Eating fruit and vegetables regularly can play a protective role against the incidence of cancer. It can also help in the prevention and treatment of hypertension (Ann et al., 2000; Van Duyn & Pivonka, 2000). The American Institute for Cancer Research (AICR) recommended up to 10 servings of vegetables and fruit daily to reduce the risk of cancer, and the Food Guide Pyramid encourages up to 9 servings of fruit and vegetables daily for general good health (Van Dufn & Pivonka, 2000). According to the National Health and Medical

Research Council (2003), the Australian Guide to Healthy Eating, a publication of the Commonwealth Department of Health and Aging (DHA), recommended that adults should consume a minimum of 5 servings per day of vegetables and two servings per day of fruit. This number ensured that at least 70% of the average adult requirements of protein, vitamins and minerals are met (Morgan, 2009). Ann et al. (2000) indicated that at least 20% of all cancer can be reduced by eating five portions of fruit and vegetables a day, which is the same as the US nation's health goals for the Healthy People 2000 Programme.

The literature shows that the majority of university students do not consume enough fruit and vegetables (WHO, 2005; Scully et al., 2007), despite the fact that a strong association has been found between fruit and vegetables consumption and a decrease in the risk of chronic diseases (Riboli & Norat, 2003). In addition, consumption of sufficient levels of fruit and vegetables can reduce the risk of some types of cancers. Five servings of fruit and vegetables is the minimum goal which could prevent at least 20% of all cancer incidences; however, up to ten serving of fruit and vegetables daily is recommended to reduce the risk of different diseases and nine servings for general good health (Ann et al., 2000; Morgan, 2009). Therefore, students should be aware of the benefits of fruit and vegetables and also encouraged to consume sufficient levels of fruit and vegetables. Lifelong healthy eating habits can be encouraged through education health programmes. Students need to develop knowledge about healthy eating and the skills and behaviours of healthy living. Bowen et al (2004) suggest that even a small increase in the consumption of fruit and vegetables can have a significant effect on chronic rates of disease. More research is advisable to enhance understanding of the relationship between the quantity and quality of fruit and vegetable intake (Ann, 2000; Van Duyn & Pivonka, 2000).

The following section provides background details of the importance of physical activity, and recommendations for levels and physical activity amongst student populations from different countries.

4.4 Physical activity

This section focuses on physical activity among student populations and reviews the previous studies which have been conducted amongst student. The section will first discuss promoting physical activity in young adults, and then briefly outline the factors affecting participation in physical activity. Finally, the recommended levels of physical activity will be highlighted

Physical activity can mean different things to different people, for example, it is a health-enhancing lifestyle for public health professionals, while others may see it as a wide range of sports. A useful definition for physical activity has been provided by the WHO (2006):

“Physical activity is generally defined as any bodily movement produced by skeletal muscles that results in energy expenditure above resting level, and exercise is a subset of physical activity defined as: planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness. Physical fitness is a set of attributes that people have or achieve that relates to the ability to perform physical activity” (WHO, 2006. p.4).

4.4.1 Promoting physical activity in young adults

A sedentary lifestyle pattern brings with it an increased risk of heart disease and other prevalent chronic diseases. It is important to increase physical activity, especially in young people (USDHHS, 1998). As suggested by Sparling and Owen (2001), patterns of activity

start young and continue throughout adulthood. It has been estimated that in many industrialised and developing countries less than one third of young people are active enough to bring health benefits for their future. Exercising sufficiently and maintaining normal weight are the most effective ways of avoiding many chronic diseases, for example, cardiovascular disease and diabetes. Participating in adequate physical activity also helps build and maintain healthy bones and muscles, control weight, build lean muscle, reduce fat, reduce feelings of depression and anxiety, and promote psychological well-being (WHO, 2005).

Recent decades have seen significant socio-economic changes in lifestyles. An increased dependence on machines and a corresponding decline in physical activity has been the result of modern technology. Life has become more sedentary and this decrease in physical activity has also affected young people (HCHC, 2004; WHO, 2005). These changes in lifestyle have also affected students in Arab countries, for example, in the United Arab Emirates (UAE). In 2005, the WHO reported that in the UAE, 38.8% of students were regularly spending three or more hours doing sedentary activities per day. There was no great difference in the male and female divide in this respect, with male students at 38% and female students 39.6%. Only 19.5% of students were active every day of the week for at least 60 minutes. A large majority of students (76.9%) were doing insufficient activity. There was a high proportion of female students doing too little exercise, 72.9% of male students, as opposed to 81% female students. Muttappallymyalil et al. (2010) examined self reported physical activity among University Students in Ajman, United Arab Emirates. They found that during the previous month 64.55% had walked briskly every day, 23.6% used a treadmill, 10% fast cycling on a static machine, 8.2% had done aerobics and 4.55% in the motion cycle. Only 10% of the students

were not involved in any activity at all. Their results also revealed that physical inactivity was something which varied between different socio-demographic groups, with males being more active than females. Further, the study points out that additional investigation is needed in the area of physical activity to pinpoint its perceived benefits and barriers, and to encourage more physical activity among young adults in general. Moukhyer (2008) reported that amongst young people in Sudan, many more boys reported being engaged in physical activity than girls, these figures being 92.3% and 41.7% respectively. Older age groups reported much higher rates of inactivity.

In 2001, in Saudi Arabia, a majority (53.5%) of men aged over 19 years were inactive and another 27.5% were active on an irregular basis, with only 19% reporting regular physical activity. It was also noted that amongst the less educated, or those with only one day off per week, the rate of physical activity was lowest. The most important reasons cited for engaging in physical activity were in order to maintain health and lose weight (Al-Rafae & Al-Hazaa, 2001). However, Taha (2008) found that a large majority of Saudi students, of both sexes, were aware that exercise could protect them from certain diseases. Musaiger, (2004) equally found this to be the case in 2004, in Egypt, where only 2% of adults exercised in a typical day (Musaiger, 2004). Likewise, Abolfotouh et al. (2007) showed that 33.8% of students in Alexandria University in Egypt were physically inactive. In conclusion, possible reasons for this inactivity in Arabic countries may be the popularity of sedentary activities like watching television, playing computer games, and using the internet (Taha, 2008).

Similar studies have been conducted in non-Arab countries, Haase et al. (2004) targeted physical activity in university students from 23 countries world-wide (Belgium, Bulgaria, Colombia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, South Korea,

the Netherlands, Poland, Portugal, Romania, Slovakia, South Africa, Spain, Thailand, United Kingdom, United States, and Venezuela) and indicated that a disappointing 40-60% of students knew that physical activity was paramount in avoiding heart disease. In addition, the level of physical activity was well below recommended levels. The countries reporting the lowest levels of physical activity were Germany and Japan for men and Japan for women. The countries with the highest levels of activity were Poland for men and Iceland for women. Levels of activity would appear to be connected to cultural factors and the level of economic development. In 1994, countries in southern Europe, like Portugal, Spain and Greece, reported particularly low levels of physical activity (Hasse et al., 2004). The northern European countries of Finland and Sweden reported higher levels of activity (Hasse et al., 2004). Eastern European countries, especially Hungary, reported much higher levels of physical activity. This reflected the culture and tradition of participation in sport. Despite a considerable amount of publicity to promote awareness of the benefits of physical activity in England and Scotland, the levels of activity there were disappointingly low. The most frequently reported activities in most countries were running or jogging, football, aerobics, and swimming (Steptoe et al., 1997). Regarding European countries, according to the WHO (2006), two thirds of the adult population were insufficiently physically active to achieve optimal health benefits. However, during the last few years, the benefits of a physically active lifestyle have been much emphasised in Europe (Bettina, 2002; Piko, 2000; WHO, 2005).

One piece of research in Brazil (Quadros et al., 2009) assessed the prevalence of physical inactivity among Brazilian university students, and showed that there is a growing trend towards sedentary behaviour among university students in Brazil, and the main risk groups for physical inactivity were female students. They emphasized that further research is

required to determine changes in physical activity levels among university students. The findings of Quadros et al. (2009) study were in line with the results of a survey by Scully et al. (2007) which found a similar pattern in Australia, where more male students than female were involved in physical activity, but this difference also decreases with age. Only 14% of students were engaged in sufficient physical activity. These results should be of concern to policy makers given the before-mentioned importance of physical exercise for avoiding disease and maintaining normal health.

4.4.2 Factors affecting participation in physical activity

Many factors affect participation in physical activity; these include demographic variables, attitudes, knowledge and beliefs about physical activity (Haase et al., 2004; Taha, 2008). Beliefs include perceived benefits which have a positive influence on a person's decision to exercise, and on the other hand perceived barriers with a negative influence (Daskapan et al., 2006). Haase et al. (2004) conducted a study among university students from 23 countries and their results showed a positive link between a belief in the value of health benefits and the likelihood of leisure-time physical activity. Another study of young Europeans, from 21 countries, showed a link between a lack of physical activity and cigarette smoking (Stepote et al., 1997). It was also discovered that groups of students from lower socioeconomic levels were less likely to be physically active. Reasons for this could be that they have less access to sporting facilities and programmes, it is also possible that they have less knowledge of the positive benefits of exercise, and finally that they have less disposable income to finance sporting activities (Stepote et al., 1997).

Further, Muttappallymyalil et al. (2010) claimed that students whose BMI was higher than 30 kg/m², also those with pre-hypertension or hypertension, were engaged in more vigorous physical activity. Taha (2008) indicated that both age and the knowledge that exercise is a protection from obesity were the principal motives for physical activity among male students in Saudi Arabia. He also suggested that:

“Positive long-term lifestyle changes, including physical exercise, need to be established early in life, because cardiovascular risk factors, including obesity, tend to track from childhood to adulthood. Programmes to increase regular physical activity should be established. Such programmes should include health education, increase supervised physical education and physical exercise sessions, competition and prizes, and active involvement of teachers. More intervention efforts need to be directed towards female students in particular, as their knowledge and practice of physical activity were inadequate. Extracurricular physical activity programmes that address the need and interests of all students should be provided by school authorities” (2008, p.354).

The above conclusion suggests that physical activity is a major lifestyle factor, and that it is essential to address the negative impacts of inactivity and the ensuing risks of developing various chronic diseases. Governments still pay far too little attention to the promotion of physical activity compared with others lifestyle factors like tobacco and nutrition. More inclusive action needs to be taken to promote the health benefits of being active (WHO, 2006). Moreover, the above review suggested that a relationship between physical activity and socio-economic factors has been established, and that groups of students from lower socioeconomic levels were less likely to be physically active. Reasons for this could be that

they have less access to sporting facilities and programmes, it is also possible that they have less knowledge of the positive benefits of exercise and finally that they have less disposable income to finance sporting activities. Daskapan et al. (2006) describe two types of barriers, internal and external. Internal ones include lack of energy and motivation, external ones lack of finance, time and social support. Findings suggested that external barriers are more often cited than internal one, the more important being a busy lesson schedule and parent's priorities. There is a need for further research to identify perceived barriers and to recommend changes accordingly.

4.4.3 Recommended levels of physical activity

Health promotion activities in many countries emphasise an increase in physical exercise (Leslie et al., 2001; Dugdill & Stratton, 2007; Baker & Owens, 2008). Physical activity recommendations for public health have been made by the World Health Organization (2007) which recommends 30 minutes of moderate physical activity (including but not limited to sport) per day for adults and at least one hour of moderate-intensity physical activity for children and young people. Similarly, Baker & Owens (2008) suggested that the recommendations propose a total of at least 30 minutes a day of at least moderate intensity physical activity on five or more days of the week. In addition, Dugdill & Stratton (2007) claimed that for obesity prevention it is advised that adults should undertake 45-60 minutes of at least moderate intensity physical activity each day. Moderate intensity activity include walking and leisurely cycling, whilst vigorous activity is that which make you breathe harder, like running, aerobics and certain sports like football and basketball (Sparling and Owen, 2001). Moreover, according to Wallace (2003), the current exercise prescription for the treatment of hypertension is: cardiovascular mode, for 20-60 minutes, 3-5 days per week, at 40-70% of maximum oxygen uptake. Three sessions of vigorous activity per week is

considered a minimum for reducing blood pressure. It is unclear whether durations longer than this can produce significantly greater reductions.

Increased levels of physical activity are associated with improved health. Thus, physical activity is a fundamental means of improving people's physical and mental health. It reduces the risks of many non-communicable diseases and benefits society by increasing social interaction and community engagement (WHO, 2005). Individuals who are relatively inactive are more likely to gain weight than those who frequently engage in physical activity. A study of adults in the USA showed that remaining physically active is associated with the prevention of age-related weight gain, and that therefore an increase in physical activity is an important component of weight loss therapy (WHO, 2000). In addition, it has the benefit of reducing cardiovascular and diabetes risks beyond that produced by weight reduction alone; therefore, physical activity is recommended as part of a comprehensive weight loss therapy and weight control program. Reducing sedentary time is one strategy to increase activity by undertaking frequent, less strenuous activities (NHLBI, 1998). Participation in school sports and physical education during childhood and adolescence are frequently mentioned as factors likely to promote more active lifestyles in adulthood. The literature suggests that both male and female students have good knowledge about some of the benefits of physical activity; however, they have poor knowledge about the role of physical activity in the prevention of diabetes mellitus and hypertension. Health education should concentrate on clarifying these areas. Age, and the knowledge that exercise protects from obesity, were the main determinants of the practice of physical activity among male and female students. These findings support the need for health promotion programmes that increase the physical activity of students (Taha, 2008). Thus, according to the World Health Organization (2006), the low

prevalence of regular leisure-time physical exercise is a cause for concern in many countries, and the encouragement of more active lifestyles is an important component of both national and international public health recommendations.

The rapid socio-economic changes in the past decades have led to significant changes in lifestyle; life has become more sedentary, and students have been affected by changing lifestyles. It has been reported that knowledge about activity and health was disappointing, and physical activity was below the recommended levels in a substantial proportion of students in many countries. The most frequently reported activities among students were running, jogging, football and swimming. Demographic variables, attitudes, knowledge and beliefs about physical activity are some of the factors that influence levels of participation in physical activity. The decrease of physical activity might be explained by the fact that students spend more of their time using the internet and watching television. It is a fact that increased levels of physical activity are associated with improved health, whereas a sedentary lifestyle pattern brings with it an increased risk of chronic illness and heart diseases. The WHO recommends 30 minutes of physical activity per day for at least five days per week for adults and at least one hour of moderate physical activity for children and young people. Therefore, it is essential that sports and fitness facilities are provided for and accessed by as high a proportion of students as possible. Also, future research should be undertaken to identify and remove barriers to fitness. Therefore, sports and fitness facilities should be expanded to increase exercise options for interested students, since physical activity and sporting facilities that are typically available in universities and colleges could provide attractive and accessible opportunities for a high proportion of students. Moreover, universities and colleges should provide information on the benefits and role of physical

activity by increasing supervised physical education and physical exercise sessions, and offering suitable programme courses during the academic year, including a variety of individual and team sports and fitness activities, to help students maintain good physical health, and to teach recreational skills with a potential carryover for leisure-time exercise throughout life (Sparling & Owen, 2001). Further studies into why students may or may not be engaging in the recommended levels of moderate vigorous activity, and the effect of physical activity on health outcomes are needed to help develop effective strategies that facilitate greater participation in physical activities, particularly among female students (Sparling & Owen., 2001; Takakura et al., 2006; Scully et al., 2007).

The next section focuses on smoking behaviour among student populations in different countries, with particular attention to the increasing levels of this health concern among students in Libya and some other Arab countries.

4.5 Smoking behaviour

The fifth section in this chapter focuses on smoking in communities of HES and reviews previous studies conducted amongst student populations in different countries. The section first describes the harmful effects of smoking behaviour and then the public health issues for smoking among student populations, and then briefly outlines the factors associated with smoking.

About five million people die each year from tobacco consumption, by 2020, the use of tobacco is expected to kill more people than any single disease (WHO, 2005). By 2020, tobacco use will cause about 18% of all deaths in developed countries and about 11% of all

deaths in developing countries. Tobacco use is a known or probable cause of about 25 diseases, including heart disease; cancer, stroke, and chronic obstructive pulmonary disease. Most people who use tobacco began to use it prior to the age of 18, the overwhelming majority of smokers begin tobacco use before they reach adulthood. Among those young people who smoke, nearly one-quarter smoked their first cigarette before they reached the age of ten (WHO, 2005). Nawaz & Naqvi (2008) suggested that cigarette smoking is the largest preventable risk factor for morbidity and mortality in developed countries, where at least one in four adults smoke cigarettes.

4.5.1 Harmful effects of smoking behaviour

Tobacco smoking is a major health hazard that influences the risk for many different diseases such as cancer, coronary heart disease and congenital defects in children whose mothers smoke during pregnancy (Carroll et al., 2006; Carcia et al., 2006; Petersen, 2008). Smoking is a major health risk, and also that it is associated with many cancers (Gomes, 2008). Since the 1960s, there has been a clear link between a higher increase in mortality and smoking. The danger of developing certain diseases is about three times higher amongst smokers. Cancers caused by smoking are varied, such as cancer of the lungs, mouth, larynx, bladder, kidney and cervix. Nearly 700 million children breathe polluted air at home due to smoking, and passive smoking or second-hand smoking is also a danger to health (Gomes, 2008).

4.5.2 Public health issues for smoking among students

Saloojee & Chaouki (2007) indicated that legislation to control smoking in most Muslim countries is still at an elementary stage. Limited restrictions on smoking in public places exists and also some restrictions on advertising. Smoking continues to be widely practised in many Muslim countries, especially amongst younger age groups (Mazizk et al., 2004; Khan

et al., 2005; Mandil et al., 2007). Many Muslim countries have considerable gender differences with regard to cigarettes; it being socially acceptable for men to smoke, but not so for women. Consequently, the rate of smoking amongst the male population is considerably higher than for women. In Indonesia in 2007, the male smoking rate was as high as 69%, Turkey 51%, Bangladesh 48% and Nigeria 40%, whilst amongst the female population, the figures were much lower, from 2% -11% (Saloojee & Chaouki, 2007).

The Libyan Secretariat of Health & Environment survey (2009), showed that the prevalence of smoking among Libyan people aged between 25–64 years old was 25.1% (49.6% for males and 0.7% for females), with a mean starting age of 19 years. Out of the total sample, 47.6% were daily smokers, with a mean of 16.9 cigarettes per day. The highest prevalence of smoking (26.8%) was amongst people aged between 25-34 years old (51.5% for males and 0.9% for females), 49.2% of male smokers smoked daily, while none of the female smokers smoked every day.

Singh et al. (2006) conducted a study which focused on smoking amongst senior medical students and its health implications, in Benghazi, Libya, using a questionnaire for data collection (135 males, 105 females). His findings indicted that smoking was a predominantly male phenomenon, and smoking status were 26.7% regular, 6.8% occasional and 3.1% ex-smokers amongst males. The main initiation factor was peer pressure or imitation, the habit establishment factor was easy availability, and perpetuation factor was the continuity of a stressful life. More than half of those surveyed had not thought of quitting, and more than two-thirds of those who had tried did not succeed. Reasons given by non-smokers for not

smoking were religious, social and health by the females, and mainly health by the male students. Finally, the study pointed to the need for prevention programmes for smoking amongst medical students and other sections of the population in Benghazi and the country as a whole, along with cessation interventions. Another study attempts to determine the prevalence of smoking among medical students in the Faculty of Medicine, Tripoli, Libya, conducted by Buni (2006). A total of 1128 students completed the questionnaire, with a response rate of 90% (M 47% & F 53%). The prevalence of smoking in the total sample was 7%, and the results indicated that 95% of the study sample did not receive any specific training at their medical schools on how to support patients who wanted to quit smoking. The study demonstrated that the majority of students strongly agreed that doctors should be more active than they had been in speaking to lay groups about tobacco issues. The conclusion reached was that medical students as future health professionals needed more knowledge and specific training programmes in their school in order to deal effectively and professionally with tobacco issues, particularly on how to encourage patients to stop smoking. Similar recommendations have been made by Nazary et al. (2010) who conducted a study in the Islamic Republic of Iran; their study examined smoking prevalence among male medical science students in Semnan, Republic of Iran. They concluded that there was a need to address smoking behaviour among medical sciences students in Iran.

Recently, another piece of research involved knowledge, attitude and practice of tobacco smoking by medical students (N=215) in Riyadh, Saudi Arabia (Al-Haqwi et al. (2010). A self-administered anonymous questionnaire was used to estimate the prevalence of smoking among medical students. Their results showed that 19% of the total sample smoked tobacco at the time of the study. All were males, which raised the prevalence among male students to

24%. About 94% of the study sample indicated that they understood that smoking could cause serious illnesses. About 90% of the students reported that they would advise their patients to quit smoking in the future, and 88% thought that smoking should be banned in public areas. About 20% thought that smoking has some beneficial effects, mainly as a coping strategy for stress alleviation. The conclusions reached were that despite good knowledge about the hazards of tobacco consumption, about a quarter of the medical students in this study continued to smoke. The study concluded that special efforts should be taken to educate medical students on effective strategies of managing stress during their study, as some thought that tobacco smoking could be used as a coping strategy to face issues such as stress.

Minhas and Rahman (2009) undertook a questionnaire survey amongst the students of three medical colleges in Pakistan, covering 1529 students (985 females and 544 males). Their results showed that 21.55% were or had been smokers, 9.1% were current regular smokers, 0.7% ex-smokers and 11.7% respectively occasional smokers. The proportion of females and males smoking daily was 0.7% and 14.7%. In addition, their results suggested that the proportion of non-smokers who knew about the addictive and harmful nature of cigarette smoking was higher than that amongst smokers. The implications of their study were stated as follow:

“Medical students should be made aware of the harmful effects of smoking and those who wish to stop should be offered help. Implementation of legal restrictions such as prohibition of smoking on campus and at hospitals might discourage some students. Advertisements for tobacco products and their association with adventure and a “macho” image may be a major contributory factor in the high prevalence in men.

Further research into the history and pattern of smoking in these students might throw more light on other causes of this high prevalence” (2009, p.1179).

From the above, it can be concluded that the majority of the literature in developing countries such as Libya, Saudi Arabia, Pakistan and the Islamic Republic of Iran tends to focus on medical sciences students, while other studies conducted in developed countries such as China and USA (Prokhorov et al., 2008; Mao et al., 2009) have focused on students from a range of different disciplines. Smoking in Arab countries and in Islamic countries in general such as Pakistan and the Islamic Republic of Iran, seem to be almost exclusively a male phenomenon, and seems not socially acceptable for women. The prevalence of smoking was much lower in female students than among males. This probably reflects the different social roles of the sexes in these countries, with men allowed more independence, and therefore more likely to take up smoking. In addition, the literature suggests that smoking is still common amongst medical students in spite of awareness of the harmful effects of tobacco use. Curricula at medical schools should include counselling about smoking, and there should be a ban on smoking in hospitals and public places. Tobacco smoking is the single largest preventable cause of death and disease in the world today, and so doctors ought to be better prepared (Nawaz & Naqvi, 2008). Furthermore, it should be a major public health strategy to address smoking among students.

The water pipe (sheesha) is another very popular method of smoking in Arab countries, Water pipe smoking is increasing, especially among young males (although both men and women use it), and that may be due to the fact that water pipe smoking is considered by some

to be less harmful to health than cigarette smoking (Mandil et al., 2007; Mohammed et al., 2006). There are several names given to the water pipe, including sheesha, argileh, goza, hookah and hubble-bubble (Kinshkowsky & Amitai, 2008). It is a traditional Arab method of smoking and is often associated with relaxation and pleasure. Moreover, it can be shared by many people, creating a convivial atmosphere (Mohammed et al., 2006). According to Kinshkowsky and Amitai (2008), the association of the water pipe with Arab culture has seen its ready acceptance in many non-Arab Muslim countries. However, water pipe smoking has been associated with low birth weight among pregnant women, and levels of nicotine or its metabolites in the blood and bodily fluids of smokers can become higher after water pipe smoking, compared to cigarette smoking (Maziak et al., 2004).

Mandil et al. (2007) indicated that the smoking of narghile (sheesha) is common amongst university students in the United Arab Emirates. Their study aimed to estimate the prevalence, patterns and risk factors of tobacco consumption among students at the University of Sharjah. The study's key finding was that the overall reported smoking prevalence among the total sample (1057) was 15.1%, with cigarette smokers representing 9.4% and sheesha smokers 5.6%. While female students comprised only 8.9% of cigarette smokers, they were 26.2% of sheesha smokers. The study also found a positive relationship between smoking and having a smoking family member, having a smoker as a friend, male sex and older age. The survey suggested that:

“An intensification of efforts is needed to prevent young people taking up the habit of smoking and to help those who consume tobacco to swiftly quit before serious complications ensue. Both cigarette and the water pipe still attract young people, including females, not only in the UAE, but also in many other countries of the EMR.

In fact, one-third of the smokers in our study were water pipe smokers, and it was the most common habits among female smokers. This point to the need for effective outreach health education programmes, targeting young schoolchildren, in primary education, before they take up the habit of smoking. Teachers and parents should be involved, and the mass and mini media all brought into action” (2007, p.1458).

This view is supported by Tamim et al. (2007) who surveyed cigarette and sheesha smoking practices among students in Beirut, Lebanon. They reported that designed interventions were needed to increase awareness of the hazards and misconceptions regarding the harmful effects of sheesha smoking.

In Kuwait the situation is slightly different, with the percentage of students smoking sheesha much higher than in Sharjah and Lebanon. According to a study by Mohamed et al. (2006) into current sheesha smoking amongst a sample of 761 students (500 female, 261 male), the sheesha is mainly used intermittently by men when socialising with friends. Their findings revealed that 24.6% of male students, and 5.5% of female students smoked sheesha. The students usually started at the age of 18 or over. Half of the students who smoked did so firstly through peer pressure. Nearly two thirds of the students, both male and female said that their friends also smoked. Most students who did smoke said they would like to give up, and the majority of them also used cigarettes. Further, the study recommended that the authorities should make efforts to:

- Reduce sheesha smoking at home and in the educational environment.
- Help young people address pressures from their peers.

- Reinforce beliefs about the health risks of sheesha smoking.
- Counteract personal beliefs and attitudes that contribute to sheesha smoking.

The aforementioned studies in Arab countries indicate that smoking sheesha is acceptable and widespread amongst university students. Most of the epidemiological studies have been conducted amongst the general adult population, with only a few solely about university students (Kinshkowsky & Anitai, 2004). There appears to be a commonly held view that smoking sheesha is less toxic than cigarettes, as the smoke passes through water which has a filtering effect. However cigarette smoking among students has reached serious proportions (Maziak et al., 2004). Cigarette smoking is still a more serious problem for male students; therefore, it is vital to improve support for students to stop smoking as it has been shown that the majority of them want to quit (Maziak et al., 2003).

In the United States Prokhorov et al. (2008) reported that college years are a crucial time to instigate prevention programmes, to avoid future morbidity and death. They suggested two reasons for this. The first is that the population of a community of college student smokers is large and seem to be a good venue for smoking cessation interventions, although little is known regarding the efficacy of interventions with this population. The second reason is that the community of college students typically come from lower-income backgrounds, which are associated with higher smoking prevalence. Likewise, Europe has suffered from a serious smoking problem amongst young people. The proportion of people smoking in these countries is quite a lot higher than in other countries in the developed world. For example, in Spain, Garcia et al. (2007) looked at the acceptance of tobacco use amongst nursing and

physiotherapy students, using a cross sectional questionnaire survey. Their study showed a significantly high incidence of smoking amongst nursing students, 29.3% of students were current smokers, with 19% smoking in their first year and 41% in their third year. They concluded that there is a great need to improve the curricular content in the area of tobacco including information, prevention, and treatment.

Cigarette and sheesha smoking among HES is on the rise. Although extensive evidence exists to demonstrate that the cessation interventions for student population are limited, it is critical to address the lack of intervention programmes that should be specifically designed for students. Prokhorov et al. (2008) presented a lengthy summary of the literature on smoking behaviour amongst students which emphasised the point that one of the main reasons for smoking prevention and cessation programmes to fail is that, especially amongst young adults, there is less concern about perceived risks. Personal disease risks are not obvious to them and they also hold the belief that serious health risks occur much later in life. By critically reviewing the literature, it has emerged that the undertaking of future research is necessary. It would offer further understanding of the problems, and it is imperative that research continues to focus on the impact of factors which have been shown to be associated with increased smoking behaviour amongst student populations and young people in general.

4.5.3 Factors associated with smoking

The idea that the use of tobacco can reduce body weight is potentially dangerous, because smoking is also associated with psychosocial problems like stress, anxiety and depression (Steptoe et al., 2002). Many female students have been found to make a positive link between weight concerns and smoking (Garcia et al. (2007). The perceived notion that ‘thin is good’

could be seen as having an impact on the initiation of smoking amongst many female students (Honjo & Siegel., 2003). Following the same trend, Carroll et al. (2006) showed that smoking was associated with higher body mass and an intention to lose weight. Links between smoking and weight control are causing many college students to use smoking as a strategy to lose weight (Carroll et al., 2006). The idea that girls have of thinness however, should be challenged. It might be necessary to intervene in the factors that influence the perceived idea that being very thin is a positive value (Honjok & Siegel, 2003).

Mohammed et al. (2006) suggested a number of motivating factors for the prevalence of sheesha smoking amongst students:

- Many students have the belief that smoking sheesha is less harmful than smoking tobacco due to the idea that water filters out the noxious substances.
- The use of water pipes for smoking tobacco is seen as attractive.
- The beautiful artwork on many water pipes is considered by many an exotic tradition and generates a feeling of pleasure and relaxation.
- The use of water pipes by several people at the same time contributes to a feeling of socialising and friendship.
- The use of rolled tobacco leaf, flavouring and molasses when jurak is manufactured allows for different taste preferences. .
- Even the sound of the smoke bubbling through the water adds an auditory sensation.

The health implications of smoking have been extensively studied, and it has been found to be the most significant single cause of avoidable future morbidity and early fatality (Knishkowsky & Amitai, 2004). Gomes (2008) has indicated that the situation with regard to smoking has deteriorated. This is due to the tobacco industry re-directing their attention towards developing world countries in order to avoid strict regulations in more developed countries. Islam strictly forbids tobacco smoking and yet in Muslim countries smoking has become a serious public health concern. Islamic teachings and scientific evidence are two powerful tools in the fight against smoking. Piko (2002) found that this is partly the result of a lack of knowledge about smoking as something which causes disease. Consequently students should be taught about the health risk of smoking and the link it has with many psychosocial problems like stress, anxiety and depression. Steptoe et al. (2002) believe that health education about other areas such as drinking and driving, and unprotected sex has reduced the level of awareness of the dangers of smoking. Carroll et al. (2006), on the other hand, emphasised that smoking should not be viewed as an independent health behaviour, since it is obvious that smoking is closely related to other unhealthy lifestyle choices.

The World Health Organization, together with the International Union against Cancer, are initiating many educational and awareness raising activities in order to achieve an environment for children which are smoke-free. On 4th Feb 2008, the WHO day, the WHO regional Director for Africa Dr Luis Gomes made the following recommendations regarding the establishment of health prevention programmes in the all member states of the WHO Regional Office for Africa:

- With the aim of changing lifestyles and behaviours various methods are to be employed to raise awareness of the risk factors of cancer from tobacco smoke.

- Second hand exposure to tobacco is full of risks for children's health and a smoke-free environment is to be promoted.
- In order to reduce and prevent tobacco use in the home and public places, the capacity of health personnel is to be increased.
- With the aim of a considerable reduction in cancer morbidity and mortality there should be collaboration between cancer control organisations, tobacco control organisations, public authorities, and health institutions.

All these above recommendations will help to initiate health promotion programmes. Staff and students should be encouraged to quit smoking. The dangerous diseases caused by tobacco, like heart disease, bronchitis, lung cancer and pulmonary disease should be emphasised by educational programmes. There need to be a restriction on tobacco advertising in public places and smoke-free zones need to be promoted. The literature does express serious concern over tobacco smoking amongst student populations, and it is a major health hazard that influences the risk of certain diseases such as cancer and heart disease. It is significantly prevalent among HES around the world. This may be due to the fact that there has been an emphasis on the dangers of different health issues for example, unprotected sex and drinking and driving, consequently this has led to a reduced emphasis on the perception of the dangers of smoking.

In many Muslim countries, high rates of smoking among students have been reported (e.g. Pakistan, United Arab Emirates, Saudi Arabia, Lebanon and Saudi Arabia), and it is mostly a male phenomenon. However, the majority of students recognize that smoking is clearly

associated with different health problems. The relatively high levels of smoking among men may be explained by the fact that in most Muslim countries, the tobacco control legislation is still at a rudimentary stage and the restrictions on smoking in public places is limited. As smoking has increased among students, so the higher education period is likely to be important in terms of smoking. Therefore major public health strategies should be aimed at smoking cessation interventions. Also there should be educational programmes which can provide students with knowledge of the adverse health effects of smoking, and major diseases caused by smoking. In addition, media advertising should be restricted in public places (El Awa, 2008).

The last section with regards to student lifestyle behaviours focuses on the problem of alcohol and drug consumption amongst student populations, and pays particular attention to the health effects of alcohol and drug use.

4.6 Alcohol and drug consumption

This section focuses on alcohol and drug consumption amongst university students, and reviews previous studies which have been conducted amongst HES. The section describes the health effects of alcohol and drug use, and the prevalence of alcohol and drug consumption amongst students from different countries will be highlighted.

The use of alcohol and other addictive products is a global concern (WHO, 2006). Young people who drink alcohol are often more likely to smoke cigarettes, use other drugs and to engage in high-risk sexual behaviour. Problems caused by alcohol can have a negative

influence on the psychological development of students, while it can also be a negative influence on their social life, and leisure time (WHO, 2005). The use of alcohol is most prevalent amongst young adults between the ages of 18-25 (WHO, 1999). Use of alcohol can cause problems for employment and may lead to violent criminal behaviour (WHO, 2005). Young adults are also more likely to be involved in intentional or unintentional injuries or death; however, in most countries, alcohol related deaths are highest in the age group 45-54 years old. The link between the age of starting to use alcohol and its abuse in adulthood makes the study of alcohol consumption in the student population vital (WHO, 2005).

4.6.1 Health effects of alcohol and drug use

Alcohol has been identified as being one of the most harmful risks to a person's health. At least 61 types of injury, illness or death are potentially caused by alcohol consumption (WHO, 2006). The adverse effects of alcohol have been demonstrated for many disorders, including liver cirrhosis, mental illness, several types of cancer, pancreatitis, and damage to the foetus among pregnant women. There are also serious social consequences related to alcohol use, including drink-driving incidents, aggressive behaviour and family related problems (WHO, 2006).

Worldwide, alcohol use causes 3% of deaths (1.8 million) annually, which is equal to 4% of the global disease burden. Across sub-regions of the world, the proportion of the disease burden attributable to alcohol use is greatest in the Americas and Europe, ranging from 8% to 18% of the total burden for males and 2% to 4% of the total burden for females. Besides the direct effects of intoxication and addiction, alcohol use causes about 20% to 30% of oesophageal cancer, liver disease, homicide and other intentional injuries, epilepsy, and

motor vehicle accidents worldwide (WHO, 2005). A study by the World Health Organization and the World Bank ranked the negative effects of alcohol equal to those caused by unsafe sex, and above the use of tobacco in terms of total loss of life and disability (Jernigan, 2001). In addition, chronic diseases amongst drinkers kill many people in the age range 45-54 years old. Moreover, alcohol abuse also contributes to traumatic outcomes that kill at a much earlier age (WHO, 2005). Chronic health consequences may often only appear later in life, while acute consequences are very common in young adults or adolescents. Many injuries, sometimes leading to death, are caused by alcohol use in 15-25 years old. A young person's psychological development can also be impaired by alcohol (WHO, 2005), and alcohol misuse can also lead to anti-social behaviour and depression (Viner & Booy, 2005).

4.6.2 Public health issues of alcohol and drug consumption amongst HES

Due to the ban on alcohol consumption in Islam there is a much lower incidence of alcohol related disease in the Eastern Mediterranean Region. The Global Disease study (2000), found that alcohol is not among the first 15 causes of disability-adjusted life years lost, while in Europe alcohol-related problems rank fourth and in the Americas they rank second. The burden of disease due to alcohol in EMR is, in fact, the lowest in the world. However, the ministries of health in this region met in 2003 and agreed that alcohol is being used "moderately to considerably", with the trend increasing (WHO, 2006). The exact condition of alcohol consumption and related illness in the EMR is still far from clear. According to the WHO Global Status Report on Alcohol 2004, information was available only from 12 out of 21 member states in the Region, while in the Americas it was available for 32 out of 35. The reasons for this could be due to the fact that there is stigma attached to alcohol consumption. In the EMR on the other hand it may indeed be due to the fact that there is a lower prevalence

in the Region. In addition to the volume of alcohol consumption, it is necessary to study the pattern of consumption. Seven countries (Jordan, Lebanon, Morocco, Afghanistan, Islamic Republic of Iran, Somalia and Pakistan) have reported that alcohol is the intoxicating substance most used by young people under the age of 20, however, more resources were devoted in most countries to opiates, followed by cannabis. However, in Morocco, Oman, Pakistan and the United Arab Emirates, irrespective of the different prevalence rates of opiate abuse, alcohol received more attention (WHO, 2006).

Ghandour et al. (2009) surveyed lifetime use and abuse of alcohol and dependence amongst university students in Lebanon: they examined the role of religion amongst various religious faiths, using a self-completed anonymous questionnaire; data were collected on 1837 students from two large private universities in Beirut. Their study showed that Christians were more likely to use alcohol; they also started at an earlier age and were twice as likely to be diagnosed with abuse and dependence. An inverse relationship was found to exist between alcohol abuse and dependence, and practising one's faith. These associations were most strong for Muslims, thus there is a suggestion that religious belief plays a more dominant role in a more proscriptive religion, as indicated in 'reference group theory' (Ghandour et al., 2009). Finally, their findings suggested that:

“Students belonging to conservative religious may be shielded from the opportunity to try alcohol. One an ever drinker, however, religion is not related to the odds of an alcohol use disorder. Religiosity (i.e. belief in God and religious practice) is, nevertheless, related inversely to alcohol-related problems, even among drinkers. Finding from this culturally and religiously diverse Arab country corroborate the

international literature on religion, religiosity and alcohol use, highlighting potential differences between Christians and Muslims” (2009, p.947).

Jodati et al. (2007) examined the students’ attitudes and practices towards drug and alcohol use at Tabriz University of Medical Sciences in the Islamic Republic of Iran. Their results demonstrated that about one third of students surveyed had tried alcohol or drugs at least once in the previous 6 months. 16% had tried alcohol, 6% cannabis, 6% opium and 2% heroin. About 9% reported they were abusing alcohol and 9% other illicit drugs, with two using drugs by injection. One of their important finding was that many students believed that smoking, alcohol and drug use in the dormitory created disruption and an unpleasant atmosphere. Further, the study recommended that:

“Efforts are needed to create a more positive campus culture regarding alcohol and illicit drug use in the Islamic Republic of Iran. This could be achieved by emphasizing the importance of academic study, creating a more stress-free environment for students, facilitating a wider range of social and recreational activities, setting up alcohol and drug awareness and counselling programmes, and notifying parents when students engage in serious of repeated violations of alcohol laws or other drug policies” (2007, p.970).

WHO (2006) carried out research into the consumption of alcohol in the EMR. Fifteen countries reported that alcohol use ranged from moderate to considerable, eleven of these countries admitted that over the previous five years the trend had been increasing. Moderate to considerable use, with a rising trend, is how alcohol is generally viewed in the Region. Six

countries (Morocco, Jordan, Lebanon, Pakistan, Afghanistan and the Islamic Republic of Iran) stated that amongst young people up to twenty years of age, alcohol is the preferred recreational substance. However it is still opiates, followed by cannabis which receives most attention from the public and the policy makers. Exceptionally, Pakistan, United Arab Emirates, Oman and Morocco pay more attention to alcohol.

Religious prohibition and subsequent regulation are considered to be the reasons why alcohol is not seen as imminent health problem in Islamic countries. Nevertheless it is considered to be a potential health threat for young people and a regional policy regarding alcohol abuse needs to be developed.

The Report (2006, p.8) also recommended:

- WHO, in collaboration with other non-governmental organisations and medical and academic institutions should design research and case studies to assess trends and patterns, and measure the extent of alcohol consumption in the region, along with the impact this may have on particular diseases.
- An evidence base needs to be developed in order to help governments stress the impact of the problem both in terms of liver disease, road traffic accidents and violence.
- Awareness amongst the general public needs to be raised about the dangers of alcohol and substance abuse and also about its prevention and treatment.

- Healthy lifestyle programmes need to be developed particularly for young children. This should include cultural and religious values which help to counteract the media's glamorization of alcohol and substance use.
- Different levels of care need to be developed to deal with alcohol related clinical problems, including swift intervention treatments in the Member states which report most concerns.

This view is supported by Lihan et al. (2008) who indicated that alcohol consumption is much higher amongst students in Turkey. A survey conducted among university students reported that 65% of students had been drinking once a month, or more frequently. The survey found that male students tended to have problems with alcohol about three times more often than females. Living in a dormitory seemed to be protective in terms of preventing frequent drinking, and as the educational level of the parents increased, the odds of drinking at least once a month increased. It concluded that in order to prevent alcohol use problems in the future, alternative ways of socialization should be provided for university students. Similarly, in Sudan, Moukhyer et al. (2008) reported that alcohol consumption is much higher amongst boys, and by older boys rather than younger ones. Furthermore, in the United Arab Emirates, the WHO (2005) showed that 81.1% of students were aware of alcohol and drugs; students learnt about them by watching television, movies or videos. Likewise, Abolfotouh et al. (2007) surveyed health-related lifestyle and risk behaviours amongst university student in Alexandria University in Egypt and found that 4% of a sample of 600 students living in university hostels reported drug use. All students reporting drug use were males. The conclusion was that the prevalence of unhealthy behaviours amongst Alexandria University students was of concern.

The literature has shown that few studies have been conducted and published examining alcohol and drug use amongst student populations in the EMR. The literature does, however, express serious concern over the growing number of students who have reported the consumption of alcohol and drugs in different countries of the region (Lihan et al., 2008; Ghandour et al., 2009). Although there is a low prevalence of alcohol use rates, there are pockets of the population in which alcohol related problems are higher. There is growing evidence to suggest that amongst the young there is an increasing degree of hazardous consumption. Various epidemiological studies from several countries indicated that 22% - 50% of students use alcohol, and this trend is on the rise (WHO, 2006).

Moreover, studies have also been conducted in other parts of the world, for example in the United States, as well as worldwide. Turrisi et al. (2006) found that there was a problem amongst college students of high-risk drinking and its related consequences in the USA. Many fatalities, assaults, serious injuries and arrests are the result of this high consumption. The conclusions were that more studies are needed on both underlying themes of alcohol abuse as well as the use of interventions. This will help to develop better interventions which impact drinking behaviour and their harmful consequences for young people. Turrisi et al. (2006) stressed that:

“Problem drinking and related consequences are a major social issue plaguing college campuses across the United States. Each year, alcohol is responsible for fatalities, assaults, serious injuries, and arrests that occur among college students”
(2006, p.401).

Drinking habits among college students in Malawi were investigated by Kasapila and Mkandawire (2010) when they studied 130 current users by means of a self administered questionnaire. They found that more than two thirds of the respondents consumed alcohol moderately (68.5%) and irregularly (67.5%) during daily-life situations, but described themselves as occasional binge drinkers (85.4%). It concluded that there was a high-risk drinking culture among undergraduate students in Malawi, which reflected a pressing need to increase recreational activities and introduce facilities such as gymnasiums and cinemas to keep students away from drinking establishments. The study also reported that further research would need to examine the feasibility of using electronic screening and rapid intervention which would seem to be more appropriate, effective and user-friendly for the Internet literate young people of today than the traditional educational approaches that distribute pamphlets to disseminate alcohol and drug messages.

Cheeseman (2009) concentrated on a questionnaire on alcohol culture which was administered to 902 undergraduate students at the University of Gloucestershire. The survey found high levels of alcohol consumption on Mondays and/or Wednesdays and over half of both females and males reported consuming more than the UK Government's recommended weekly limit of 14 units. Overall, over half of the males and almost half of the females were engaging in heavy drinking on those days, and the gender differences were small, with females representing lower alcohol consumption (48.6%) compared with males (56.5%). Students who lived in university accommodation or in a shared house with other students, studying sport and playing on a sport team were significantly associated with higher consumption of alcohol on Monday and Wednesdays, and less consumption on Friday and

Saturday. The conclusion reached was that drinking on Friday/Saturday is part of the general weekend alcohol culture and not part of an explicit 'student drinking culture'.

A recent contribution to the alcohol consumption literature explored the relationship between alcohol consumption and socio-demographic factors. Specifically, gender, age, parents educational level, religion, monthly income and living arrangement have been linked to alcohol and drug consumption. Ghandour et al. (2009) found some support for relationships. Their findings led them to conclude that believing in God and practising one's faith were related inversely to alcohol abuse and dependence in all religious groups. Lihan et al. (2008) found significant associations between male gender, living alone at home, and residence of the family being in a foreign country, and paternal educational level being in the illiterate/primary school category, with alcohol consumption. Similarly, in an attempt to clarify the factors affecting alcohol consumption among Thai university students through a social-ecological approach as a theoretical framework, Vantamay (2009) showed that there were thirteen independent variables which significantly affected alcohol consumption, they were gender, age, income, attitude towards alcohol, perceived susceptibility of alcohol use, accessibility of alcohol at university, peer pressure, living arrangements, perceived self-efficacy, influence of relations who drink, exposure to alcohol advertising, exposure to anti-alcohol campaigns, and accessibility to alcohol within the community. Results from the study show that the consumption of alcohol is affected by many factors, not just at an individual level, but also by environmental factors, and at an interpersonal, community, institutional and societal level. Therefore it is desirable to consider multi-level preventions in order to prevent alcohol use and abuse amongst university students in Thailand.

In summary, many health problems are caused by alcohol and drug consumption, and there are serious social consequences related to alcohol use. Kasapila and Mkandawire (2010) pointed out that during the 20th century the consumption of alcohol was the custom for older members of society. At the present time, however, there has been a radical break with tradition. Drinking was usually restricted to adults and was seen as ceremonial, and done in a positive way. However, more recently, the use of alcohol is becoming more prevalent amongst younger people. WHO (2006) reported that the low prevalence of alcohol-related problems and alcohol and drug consumption in most countries of the EMR is not an imminent serious public health issue, and the possible explanation is religious prohibition. However, alcohol and drug consumption considered to be a potential threat for the health of the public, especially young people.

In many African countries it is becoming a daily activity to engage in smoking, drinking and using other drugs. The causes of this radical shift in behavioural patterns are still in doubt. However, Zverey (2008) hinted at urbanisation, economic factors and westernisation as contributory factors. There is increased exposure to alcohol consumption through trade and tourism; students being away from home and family, and exposure to peer pressure, all of which are an increasing concern. Therefore, policy is needed to address the problem. The World Health Organization suggested that such a policy should not be the same as other programmes in countries with high incidence of alcohol consumption (WHO, 2006). In order to fully understand the depth of this problem and its impact in the region, more research is required in order to establish a clear idea of the consumption of alcohol and drugs, and to gain more data on trends of alcohol and drugs use. Furthermore, to help students to reduce problems associated with alcohol and drugs use, education programmes should be conducted

targeting the student population, and making the best use of the religious assets in the region. Educational programmes could be carried out in schools to develop student awareness of alcohol related problems. Students needed to be taught communication skills, critical thinking and techniques for refusal in order to avoid problems of alcohol and other drug use. Other areas which need to be addressed are the traditional sub-culture of hiding and denying alcohol related problems (WHO, 2005).

4.7 A review of the relationship between socio-economic characteristics and lifestyle behaviours

Several studies have been carried out to examine the relationship between socio-economic characteristics and lifestyle behaviour variables (e.g., body image perception, physical activity and smoking behaviour) amongst student populations (Kakeshita & Almeida, 2006; El Ansari et al., 2010). Dissatisfaction with body image related to actual or perceived body size is widely reported amongst young people, especially females. Moreover, there are many socio-cultural pressures, including and in particular the mass media, which are contributing to the increasingly popular idea of a “thin body” as being in some way ideal (Wardle et al., 2006; Malinauskas et al., 2006). For example, El Ansari et al. (2010) assessed the factors that are independently associated with body image perception amongst university students in Denmark and United Kingdom. The study found significant gender difference, with females more likely to perceive themselves as being overweight compared to males. In relation to age, the results showed that students aged ≥ 30 years were less likely to feel “too thin” and more likely to feel “too fat” compared with those < 20 years of age. With respect to another socio-demographic factor (university/country), El Ansari et al. (2010), found that Danish students were more likely to perceive themselves as “just right”, while British students were likely to perceive

themselves as “too fat”. Finally, the study future research needs to investigate the relationship between body image perception and the actual BMI measured.

With regard to physical activity, there has been an increased discussion in the literature on the relationship between physical activity and socio-economic factors such as gender, age, income and education level. For example, Gidlow et al. (2006) presented a lengthy literature summary on the relationship between socio-economic position and physical activity; their review was limited to studies from Western countries. Their findings led them to conclude that:

- Students at the higher end of the socio-economic scale displayed higher levels of moderate to vigorous physical exercise and leisure activities than those at the lower levels.
- In several studies, the links between socio-economic level and physical activities were found to be more prevalent in women than in men, although the opposite was the case in one study. This finding might be as a result of recent interest in gender health issues. Furthermore, age emerged as a significant factor in fewer studies.
- Five studies found that education was significantly related to physical activity in multivariate analysis, despite ethnic variations in three of these.
- Income was positively linked to physical activity in nine cross-sectional studies although no relationship was found in six. One study found a negative association.

Smoking is internationally accepted as a major threat to health, and a contributory factor in the development of many serious diseases. With regards to smoking behaviour, Mao et al. (2009) concentrated on a questionnaire on cigarette smoking among college students in China, which was administered to 1874 students from 19 college campuses in Jiangsu province, China. Their findings indicated that a significant gender difference existed in both smoking and the intention to do so. Overall, 53% of the population (70% male and 31% female) stated that they had never smoked and 29% of the sample (49% male and 5% female) admitted they had smoked in the previous 30 days. A quarter of the population declared they were likely to smoke in the following six months. Factors associated with being a past or a current smoker included: male gender, peer pressure, perceived benefits of smoking, low social-economic status, a pro-smoking attitude and involvement in other health risks. One of their most important findings was the urgency to develop smoking prevention programmes for females and cessation programmes for men.

Likewise, in an attempt to clarify the nature of the perceived effectiveness of counselling patients about smoking among medical students in Amman, Jordan, Merrill et al. (2009) found that smokers and male medical students were less likely to believe it was wrong for physicians to smoke in front of patients, or that smoking policy or physician interaction with patients can influence smoking practices. Students believed that physicians could more effectively prevent smoking than influence patients to stop smoking. In their study (Merrill et al., 2009), emphasized the importance of student training on how to counsel patients effectively about smoking prevention and cessation among medical students. Another study conducted in Jordan, this time by Khader and Alsadi (2008), investigated the prevalence of smoking and associated factors amongst university students in Jordan. In their study, the

questionnaires were completed by 712 students, and the results showed that the prevalence of current smoking was 35% (11.4% for females and 56.9% for males). About 80% were cigarette smokers and the majority of smokers smoked daily. They also found a positive association between factors such as: higher number of male friends and family members who smoke; lower academic attainment and higher income; and an increased prevalence of smoking. Similarly, a study by Nazary et al. (2010) showed that the smoking behaviour of family and friends was significantly correlated with smoking in students. In addition, Khader and Alsadi's (2008) findings revealed that students in the faculty of law and religion were less likely to smoke compared to those in other faculties. They concluded that policy-makers needed to initiate antismoking programmes in Jordanian universities, and recommend that:

“The factors identified in this study should be taken into consideration in antismoking programmes to make them more effective and better able to influence the attitudes and behaviours of smokers. Programmes need to be established that involve adolescents and youths as educators and supply them with correct and appropriate information about the health consequences of smoking to educate the community. The Ministry of Education and Higher Education should apply antismoking programmes in all primary and secondary schools and universities. In addition, the media can assist by disseminating the message of quitting smoking to the whole population in Jordan” (2008, p.902).

4.8 Health promotion and intervention programmes for higher education students

This section focuses on health promotion and intervention programmes for HES, and reviews some previous health promotion programmes which have been conducted in different countries such as Turkey, the UK and USA.

Unhealthy lifestyle choices, such as sedentary lifestyle, smoking, alcohol, drug use, and an unhealthy diet often have their roots in a person's time as a student. Also rapid changes in socio-economic situations, especially in the Arab countries, have presented challenges to young people trying to adapt to adulthood. It is therefore of the utmost importance to pay more attention to the primary prevention of non-communicable diseases amongst university students and young people in general. However, the World Health Organisation (2005) indicated that student health promotion and development programmes continue to be insufficiently acknowledged as a vital issue in many countries, especially those in the EMR. There is a general perception amongst policy makers that students, being young, in general are healthy and do not require any more attention or resources.

Furthermore, health-promotion and intervention programmes are still in the early stages in many countries in this region. Therefore, there is a special need for raising the awareness of students in particular about following healthy lifestyles such as physical activity, eating habits, smoking, alcohol and drug use. This can be achieved through educational health programmes, which should highlight priority issues in student health, with specific focus on strategic directions aimed at changing their unhealthy lifestyle and improving their health situation. The information given by such educational programmes should deal not only with behaviour change but also with determinants of behaviour change. The focus of programme

and policy development should address both risk factors and protective factors. The focus on protective factors should target all students, not just those who have problems.

In addition to the above, student health workshops are required to find ways to exercise creativity and responsibility in their communication tools for the promotion of student health development and health messages. To achieve this health workers should receive training on student development, communication, and leadership, and the health message should be delivered by health professional, not only by health educators (WHO, 2005). Previous studies have shown that improving knowledge levels about important issues related to student health can raise awareness about healthy lifestyles, and change student behaviour (Leslie et al., 2001; WHO, 2005; Altun, 2008). As an example, Altun (2008) conducted a study among university students in Turkey, aimed to determine the effects of a health promotion programme on enhancing students' self-care and health promotion behaviour. The results of the Turkey study showed that after the course, the self-care agency and health promotion lifestyle scores of the students increased significantly. The students with lowest scores before the course displayed the most progress after the course. Moreover, the WHO suggests that both the prevention of risky behaviour, and health promotion programmes, which target students, can result in positive health outcomes, not only during the student's time in education, but also throughout adulthood. Well-developed students who were empowered with appropriate life skills had a better chance of remaining healthy (WHO, 2005).

Many student-health promotion and intervention programmes have been conducted in different universities, especially in the UK and the USA. Such programmes are usually

concerned with various lifestyle factors and major areas of student health which have been shown as very important to enhancing the learning environments at universities by removing barriers to learning and actively promoting the emotional wellbeing of students. Programmes are also important to achieve the final outcome of student health promotion such as improving lifestyles reflected in the quality of life for students in general. These are some of the programmes given as examples for such initiatives:

The Student Health Advisor at the Medical Centre at the University of Gloucestershire (2010) is a service which provides student health-promotion programmes. These programmes are designed to promote a positive attitude towards mental health, and they are available to all the students attending the university. The programme has produced a guide aimed at raising awareness of mental health issues, and the support available to students with mental health problems. Moreover, there is a medical mental health specialist for supporting students who are experiencing mental health difficulties. Also is Student Health Advisor provides a wide range of health support including: general support and advice, relationship issues including sexuality, eating disorders, dietary issues, healthy eating, exercise, smoking, alcohol and drugs, sexual health (including contraceptive advice and barrier contraception), and bereavement counselling. For all these services, prior arrangements are not always necessary. The Student Health Advisor works in collaboration with a team network including: accommodation officers, finance advisors and community police officers.

Another initiative in this area is the “University campus setting and the promotion of physical activity in young adults: lessons from research in Australia and the United State (2001)”. This

programme was designed to highlight that physical activity habits during the young adult years are likely to be important influences on habitual physical activity during overall adult life and consequently, have significant implications for long-term health outcomes (Leslie et al., 2001).

The Not-on-tobacco programme (N-O-T) was created by the American Lung Association (ALA) in collaboration with West Virginia University in response to both the growing number of students addicted to tobacco and a lack of effective cessation interventions for students. N-O-T is a group programme designed for students who are daily smokers and who demonstrate some motivation to quit. Major programme goals include helping students quit smoking, reducing the number of cigarettes if unable to quit, increasing healthy lifestyle behaviours and improving life skills such as stress management, decision making, coping, and interpersonal skills (National Cancer Institute, 2010).

Another initiative was the Alcohol Abuse Prevention, Education & Intervention programme at University of Virginia in the United States (2009). This was a programme which aimed to reduce the negative consequences related to the abuse of alcohol and other drugs, and serve as resources for information and services within the university. This health promotion programme recruited and trained a select group of students interested in a variety of health topics. Members undertook three training courses and presented educational programmes on numerous health issues including alcohol and illicit drugs. Also the programme targeted resident staff and orientation leaders with training in multiple alcohol education issues, including how to care for an intoxicated person, intervention techniques, social norms theory,

and the reality of the drinking culture at the university. Moreover, the University Advisory Committee on Alcohol and Substance Abuse considers effective ways to promote short and long-term programmes that minimize drinking and substance abuse among students (University of Virginia website, 2010).

Programmes such as those outlined above can have a significant positive effect on student health, and provide a university and college environments that are more conducive to learning and study. Moreover, these initiatives can have a beneficial impact on health outcomes in later life.

4.9 Summary of literature regarding lifestyle behaviours

This literature review of students' health and lifestyle research has demonstrated that students are a significant population whose health, and health behaviours are important to consider and to research. The literature also suggested that students' risk-taking behaviours with regard to fruit and vegetable consumption and physical activity were a cause for concern (Unusan, 2004; Scully et al., 2007; Taha, 2008; Muttappallymyalil et al., 2010). There are several unfavourable dietary behaviours and sedentary lifestyles that have led to increasing rates of obesity (WHO, 2005). An unhealthy lifestyle is often associated with a lack of information about healthy behaviour, and beliefs that factors which influence health are uncontrollable while diminished emotional satisfaction may also result in poor health (Steptoe & Wardle, 2001). Eating disorders are sometimes related to body image among HES (Oxington, 2005). Several studies showed that many students suffered from body dissatisfaction which has, in some cases, led to eating disorders among students (Ojala et al., 2007; Meland et al., 2007; Mikolajczk et al., 2010). The prevalence of dieting behaviours and

eating disorders among students has increased, especially among female students (Taylor, 2006; Kakeshita & Almeida, 2006). Furthermore, the academic literature shows that the majority of university students do not consume enough fruit and vegetables, despite the fact that a strong association has been found between fruit and vegetable consumption and a decrease in the risk of chronic diseases and a reduced risk of some types of cancers (Morgan, 2009). Five servings of fruit and vegetables is the minimum goal which could prevent at least 20% of all cancer incidences; however, up to ten servings of fruit and vegetables daily have been recommended to reduce the risk of different diseases and nine servings for general good health (Van Dufn & Pivonka, 2000). Therefore, students should be aware of the benefits of fruit and vegetables and also encouraged to consume sufficient levels of fruit and vegetables. Moreover, smoking or tobacco use in general is increasing, starts at a very early age, and a major health hazard that influences the risk of certain diseases such as cancer and heart disease. It is a significant factor among HES around the world (Carroll et al., 2006; WHO, 2008). This may be due to the fact that there has been an emphasis on the dangers of different health issues for example, unprotected sex and drinking and driving, consequently this has led to a reduced emphasis on the perception of the dangers of smoking. In addition, according to a WHO report (2006), a low prevalence of alcohol-related problems and alcohol drugs consumption in most countries of the Eastern Mediterranean Region is not an imminent serious public health issue, and the possible explanation for that may be due to religious prohibition. However, it is considered to be a potential threat for the health of the public, especially young people. More research is required in order to establish a clear idea of the consumption of alcohol and drugs, and to gain more data on trends of alcohol and drugs use. Therefore, it is recommended that strategies are developed and implemented based on the best available scientific research and evidence that is multi-sector, comprehensive, culturally appropriate, and incorporates both policies and action plans, and addresses major health

behaviours. These strategies should aim at promoting healthy lifestyles, reducing risk factors to human health, and be followed by proper evaluation and research to assess trends and direct the development of a prospective plan for youth health promotion (WHO, 2005).

Furthermore, current literature searches have not revealed any similar research which has been conducted in Libya examining this important issue of lifestyle behaviours of HES. With the sole exception of two studies investigating smoking behaviour amongst medical students in Libya, no other study previously carried out has included the comparison of Libya HES by region with regard to lifestyle behaviours. It has therefore been impossible to include any similar studies in the literature review. In addition, during the literature review many studies were examined which compared lifestyle behaviours of student populations from different countries (e.g. Stock et al., 2007; Jackson et al., 2007; Rong et al., 2009; Mikolajczyk et al., 2010). These studies are many and varied. Some studies compared physical activity, for example, while others compared smoking habits. The current research also covered a vast geographical area of Libya. One of the objectives of the present study is to make critical comparisons between students from Libya and those from other countries with regard to the many different variables, and that this study therefore makes some attempt at addressing that gap. Therefore, this investigation aims to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviors (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan HES; to compare the health status and lifestyle behaviours in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition, the study aimed to determine if any association existed between demographic and academic variables and the most prevalent health and lifestyle variables.

From the above discussion it may be concluded that many developing and developed countries (e.g. Egypt, Lebanon, Jordan, Pakistan, China, USA, European countries) have been paying increasing attention to the healthy and unhealthy lifestyle behaviours of student populations. The purpose of this chapter has been to provide an analysis of the literature on lifestyle behaviour amongst students from different developed and developing countries. The following chapter outlines the method and methodology used in this study, along with information about data analysis. In the following tables, studies related to students' lifestyles have been summarized. For the purpose of simplicity, these studies are divided into two tables. In the first table, studies conducted in developing countries are summarised, in the second table studies conducted in developed countries are summarised.

Table 4.1: Summary of literature review of student lifestyle behaviours in developing countries

Year	Authors	Countries	Variable (s)	Results
2002	Bettina	Hungary	Smoking	High smoking rates among student in Hungary and the study pointed for the need of increasing emphasis on smoking-related attitude formation amongst students.
2005	Lock et al.	Worldwide study (Afric, Europe)	Fruit and vegetable consumption	Increasing fruit and vegetable intake could have in reducing many non-communicable diseases.
2005	Khan et al.	Pakistan	Smoking	Smoking was common amongst medical student despite the majority of student recognized the dangers associated with smoking behaviours.
2006	Daskapan et al.	Turkey	Physical activity	External barriers were more important than internal barriers, lack of time due to responsibilities related to the family and social environment and academic success priority over exercise were most reported barriers for physical activity practice.
2006	Buni	Libya	Smoking	Results indicate that medical students as future health professionals needs more knowledge and specific training in order to deal effectively and professionally with tobacco issues.
2006	Singh et al.	Libya	Smoking	Smoking was male phenomenon, and the main ignition factor was peer pressure and habit establishment factor was easy availability. There have been no successful programmes for prevention of smoking in Libya.
2006	Mohammed et al.	Kuwait	Sheesha smoking	About 24.6% of males and 5.5% of the females smoked sheesha. Almost half were encouraged to

				smoke by their friends.
2006	Bogt et al.	Netherlands	BMI and weight perception	Females were more dissatisfied with their weight than males however, the relationship between problem behaviour and weight perception is the same for both genders.
2007	Abolfotouh et al.	Egypt	Risk behaviours	The study results showed that 33.8% were physically inactive and about 28% of the student adopted 3 or more risk behaviours.
2007	Mandil et al.	United Arab Emirates	Smoking	A total of 15.1% of students reported smoking. 9.4% were cigarette smokers and 5.6% waterpipe smokers. The study pointed to the need of health prevention programmes to prevent young people from starting smoking and to help smokers to stop.
2007	Buyukgoze-Kavas	Turkey	Eating Attitudes	This study found a significant correlation between eating disorders and depression.
2007	Jodati et al.	Iran	Alcohol and drugs	Their results showed that many students believed that smoking, alcohol and drug use in the dormitory created disruption and an unpleasant atmosphere.
2007	Meland et al.	Norway	Body image	Older age groups reported dieting and dissatisfaction with weight appearance more often compared with younger age. Females were more likely to report body dissatisfaction.
2007	Tamim et al.	Lebanon	Sheesha smoking	Design interventions to increase awareness towards the hazards misconceived harmless effects of sheesha smoking.
2008	Nawaz and Naqvi	Pakistan	Smoking	Smoking is most harmful habit and it should be classified as medical condition. There is need of prescription therapies for

				patients to quit smoking.
2008	Rasmussen et al.	Denmark	Fruit intake	This study highlighted to the importance of promotion sufficient consumption levels of fruit and vegetables amongst children and adolescents.
2008	Lihan et al.	Turkey	Alcohol	The study concluded that alternative ways of socialization should be provided for the university students in order to prevent alcohol use problems in the future.
2008	Taha	Saudi Arabia	Physical activity	Age and the knowledge that exercise protects from obesity were the main determinants of the practice of physical activity among male students.
2008	Khader and Alsadi	Jordan	Smoking	The prevalence was 35%, and male sex, higher income, lower academic attainment and higher number of friends or family members who smoke were associated with increased smoking.
2009	Ghandour et al.	Lebanon	Alcohol	Believing in God and practising one's faith were related inversely to alcohol abuse and dependence in all religious groups, even among aver drinkers (belief in God only).
2009	Vantamay	Thailand	Alcohol	Alcohol use was affected by multi-level environment factors, including institutional-level, community-level, interpersonal-level and societal-level factors.
2009	Minhas and Rahman	Pakistan	Smoking	Their findings indicated that 14.7% of students were smoking daily, and the prevalence was much higher among males than females.
2009	Merrill et al.	Jordan	Smoking	Smokers and male students were less likely to believe it is wrong for physicians to smoke in front

				of patients. Students believe that physicians can more effectively prevent smoking than influence patients to stop smoking.
2009	Romero et al.	Chile	Tobacco and alcohol	This study found that 23.7% of students were current smokers, and 74% consumed alcohol during the last month.
2009	Quadrors et al.	Brazil	Physical activity	The main risk groups for physical inactivity were female students.
2010	Muttappallymyalil et al.	Ajman, UAE	Physical activity	The prevalence of physical inactivity varied among different demographic groups and females were more inactivity compared with males.
2010	Al-Haqwi et al.	Saudi Arabia	Smoking	Despite good knowledge about the hazards of tobacco consumption, about 25% of the medical students continue to smoke.
2010	Kasapila and Mkandawire	Malawi	Alcohol drinking	There is need to undertake longitudinal and cross-sectional studies on drug use and infectious disease among young people such as college students.
2010	Nazary et al.	Islamic Republic of Iran	Smoking	The smoking behaviour of friends and family was significantly correlated with smoking. Smoking among medical students needs to be addressed.

Table 4.2: Summary of literature review of student lifestyle behaviours in developed countries

Year	Authors	Countries	Variable (s)	Results
2003	Riboli & Norat	USA	Fruit and vegetables	Fruit and vegetable consumption significantly associated with the reduction in the risks of cancers of the lung, oesophagus and stomach. Their findings also indicated that breast cancer is associated with fruit but not with vegetables.
2004	Haase et al.	USA, Europe countries, Mediterranean and Pacific Asian	Physical activity	Disappointing knowledge about activity and health, and physical activity was significantly associated with the beliefs in the health benefits of activity.
2005	Lock et al.	USA	Fruit and vegetables	The results pointed the necessity for greater emphasis on dietary risk factors in public health policy and increase fruit and vegetable consumption for reducing many non-communicable diseases.
2005	Wardle et al.	USA, North-Western Europe, Central and Eastern Europe, Mediterranean, Pacific Asia, and South America.	Body image and weight control	Perception of overweight and attempts to lose weight were in women from highest in Asian countries and lowest in those from Mediterranean countries, revealed that local cultural factors may moderate attitudes to weight.
2005	Sakamaki et al.	Japan	Food habits and shape perception	The study suggests the need of nutrition health promotion programmes for students, especially that emphasizing weight management.
2006	Malinauskas et al.	USA	Dieting practices	The majority (80%) of female students reported using physical, 9% smoking cigarettes and 32% skipping breakfast to control weight.

2006	Turrisi et al.	USA	Alcohol drinking	High-risk drinking and related consequences continue to be problems among college students in the USA.
2006	Gidlow et al.	Western countries	Physical activity	Higher levels of physical activity in those at the top of the socio-economic strata compared with those at the bottom.
2006	Carroll et al.	USA	Smoking, weight loss and obesity	Smoking was associated with the intention to lose weight and BMI. Also smoking related to unhealthy eating and physical activity patterns that engender obesity.
2007	Ojala et al.	Europe, Israel and North America	Weight control	Obese and overweight adolescents were more likely to control their weight and attempts to lose weight.
2007	Garcia et al.	Spain	Smoking	The prevalence of current smokers was 29.3%. The suggested that tobacco information, prevention and treatment are needed.
2007	Scully et al.	Australia	Dietary and physical activity	Overall, 86% of students did not participate in sufficient levels of physical activity, and only one in five students was found to be consuming adequate amount of vegetables.
2008	Prokhorov et al.	USA	Smoking	Smoking cessation counselling intervention holds considerable promise in reducing smoking among college students.
2009	Mao et al.	China	Smoking	There was a significant gender difference in both smoking practice and smoking intention, with more males reported current smoking.
2009	Cheeseman	UK	Alcohol	High levels of alcohol consumption on Mondays and/or Wednesdays. Overall, over half of males and almost half of females are engaging in heavy drinking on these days.√
2010	El Ansari et al.	England and Denmark	Body image	British students were more likely to perceive themselves as 'too fat'. The results suggest that intervention

				programmes are required with focus on health food choices and to support student throughout their studies and provide healthy environments.
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CHAPTER FIVE

RESEARCH METHODOLOGY

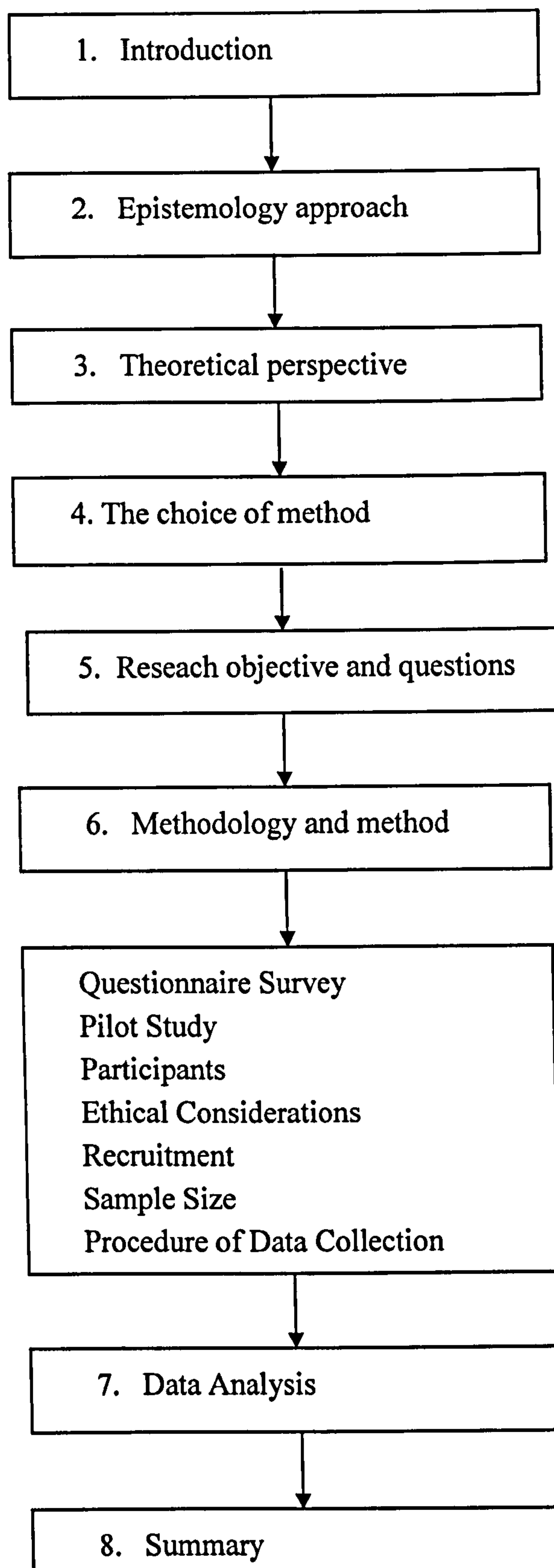
5.1 Introduction

The previous chapter provided a summary of the literature on students' lifestyle behaviours. The purpose of this chapter is to outline the nature of the study and to identify the theoretical perspectives underpinning its methodology. The aim is to provide a clear understanding and a justification for the processes involved in the research approach. This will provide details of the research methodology and method employed (e.g. questionnaire design, sample selection, participants, recruitment, and the ethical considerations involved). The chapter will also describe the quantitative approach adopted as the methodology for this research. This study was undertaken using a survey to achieve the research objectives, as outlined in the introductory chapter (Section 1.7). In order to obtain the required information on the health and lifestyle behaviours of HES in Libya, a general health survey was undertaken, which involves the use of questionnaires administered by the researcher on-site (i.e. at each of the selected HEIs in Libya). A survey can be used to describe a population and can be used to test a conclusion or find out how a particular group differs from other groups (Bryman, 2001). Research is a tool for studying events and learning about them and their interconnections. So, it is vital to choose the appropriate method for a successful research project (Pole & Lampard, 2002).

This chapter is organised as follows (Figure 5.1): Section two describes the theoretical approach underlying the research methodology. Section three explains the research procedures chosen to undertake the research. Sections four and five present the research

question and research objectives, respectively. Section six discusses the methodology and method. Section seven describe the data collection of this study, and includes a presentation of the questionnaire survey, pilot study, participants, ethical considerations, recruitment, sample size, procedure of data collection and response rate. Furthermore, an explanation of each variable is given. The statistical tests employed and the method of data analysis is described in section eight. Section nine will explain the limitations of the methodology. Finally, the last section of the chapter will provide a summary of the chapter contents and provide an overall evaluation of the research process.

Figure 5.1: Chapter five contents



5.2 Epistemological approach

It is important to consider the philosophical approach adopted in order to identify the most appropriate research design, and therefore a clear definition of epistemology is required (Gratton & Jones, 2004). Keith (2003) explains epistemology as referring to the theory of knowledge underlying the reality of how individuals understand what they do and see, and states that it crucially informs both theoretical and empirical interpretation. Particular epistemological positions generate particular ontological ones. Ontology, or how reality is defined, is explained by these the two definitions: according to Crotty (2003) the definition of ontology is the study of being, while Blaike (1993) argued that ontology means “the claims or assumptions that a particular approach to social enquiry about the nature of social reality” (1993, p.6).

Crotty (1998) acknowledged that many researchers expressed bewilderment at the maze of methodologies and methods available to them, and the unclear connections to philosophical underpinnings and theoretical elements. Crotty simplified these interconnections by suggesting that research is divided into four main elements (Figure 5.2).

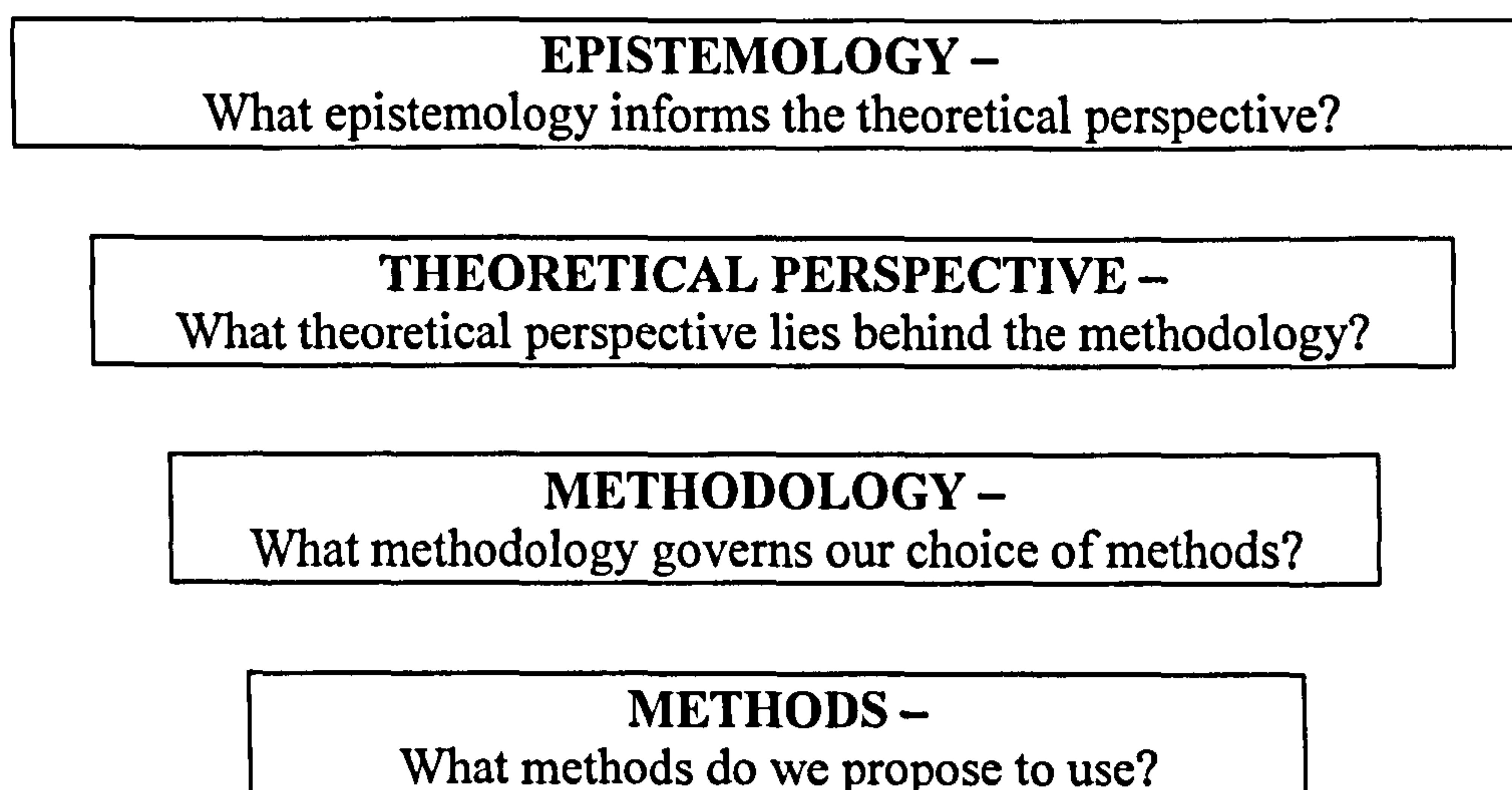


Figure 5.2: Four Elements of Research, adapted from Crotty (1998, p. 4).

This model, although somewhat simplistic, assists in determining the approach of this research in terms of the aim of the study. The current research is situated within objectivism and the theoretical perspective adopted is positivism. This methodology enabled the investigation of health status and lifestyle behaviours of a student population with a survey method, specifically questionnaires, used as the data collection method. The following sections provide a full explanation of these four elements and their relation to the elements used in this study, and a rationale for the choice of methodology and methods.

Saunders et al. (2003) acknowledged that a central point of research is to decide what philosophical approach to adopt. This approach depends on the way that the researcher thinks about the development of knowledge. There are several epistemological positions and this section will consider the three most important positions: objectivism, constructivism and subjectivism. Firstly, the objectivist epistemology: this viewpoint holds that truth exists in objects, independent of any consciousness that may perceive them. Moreover, this truth can be discovered by research, which can produce meaning. If an object is subjected to positivist research, for example the statistical analysis of data, meaning can be extrapolated to show a general truth about reality (Crotty, 2003). A useful definition of objectivism and its ontological claims is that:

“Objectivism is the epistemological view that things exist as meaningful entities independently of consciousness and experience, that they have truth and meaning residing in them as objects (‘objective’ truth and meaning, therefore), and that careful (scientific?) research can attain that objective truth and meaning. This is the epistemology underpinning the positivist stance” (Crotty, 2003, p.5).

From the above the researcher can state how an objectivist position is utilised by generating constructs which are amenable to measurement by statistical analysis. These constructs allow us to understand health status and lifestyle behaviour variables in individuals and compare these variables between people from different countries. When adopting an objectivist position it is important to be aware of its limitations. Gomm (2008, p.21) indicated that objective knowledge is not automatically true – it cannot be claimed that the production of knowledge means that it is true. Instead, knowledge produced by research will only be true in so far as it is open to inspection, so that any errors are likely to have been detected and corrected. So knowledge is objective only to the extent that a researcher is honest about:

1. Assumptions about the nature of reality i.e. ‘things exist as meaningful entities independently of consciousness and experience’.
2. The research questions employed.
3. The methods employed.
4. The presentation of data.
5. The analysis procedures used.
6. The response to research questions.
7. The information required for a reader to come to the same/similar conclusions.

(Gomm, 2008 p. 121).

Secondly, subjectivism, contrary to objectivism, holds that meaning is constructed of the observer of an object, and that this meaning always has its roots in the background of the observer, in such elements as previous life experience, religious beliefs, education, the unconscious mind and dreams (Crotty, 2003).

The third approach to be considered is constructivism. This is a viewpoint which combines elements of objectivism and subjectivism. It holds that meaning is the result of interaction between the observer and the object of observation. While allowing for the possibility that meaning can exist in objects, it holds that this meaning is only uncovered by the application of consciousness to it (Crotty, 2003). The current research project has been conducted through an objectivist epistemology, as it was considered the most appropriate to the aims of the project.

5.3 Theoretical perspective

From the adopted epistemological stance the researcher moves to the chosen theoretical perspective. The theoretical perspective adopted is important because it describes the philosophical stance taken and is inherent in the epistemology, which relates to the theory of knowledge (Crotty, 1998). Therefore, before conducting any academic research in the social sciences, a researcher must give some consideration to the theoretical approach that will underpin the research. Implicit in any research design are assumptions about the nature of reality (ontology), the researcher's own role or acceptance of knowledge in the research (epistemology) and the research process itself (methodology). Within the area of social sciences research, there is often considered to be a continuum of methodologies, having at its extremes on the one hand positivistic methods, and on the other, phenomenological methods. These two paradigms of positivism and interpretivism represent divergent views of the world, and therefore of what research is capable of achieving (Hussey and Hussey, 1997; Patton, 1990).

Positivism is an objective approach whereby observed findings are assumed to be unbiased, accepted as “truth” and regarded as reflecting the laws of nature. According to Denzin & Lincoln (2000), sciences that typically adopt a positivistic approach are psychology, physics, economics and chemistry. Characteristic of positivism is the idea that truth is beyond opinion and bias. Positivistic approaches seek to discover and verify theories, emphasise internal and external validity and place value in structured and statistical analysis. In this view, therefore, a sense of reality exists and researchers aim to study, capture and understand this reality (Denzin & Lincoln, 2000).

Riege (2003, p.77) states that positivists believe that natural and social sciences are composed of a set of specific methods for attempting to discover and measure independent facts about a single apprehensible reality, which is assumed to exist, and to be governed by natural laws and mechanisms. Brustad (2002) points out that positivism assumes that reality is objective and can be described by measurable properties, in a way independent of the observer’s innate characteristics. This approach relies on objective, logical, scientific processes to understand knowledge and meaning. This view suggests that natural laws govern a concrete reality, which is unaffected by perspective, context or consciousness. These natural laws lead to the search for causes and determinants of behaviour. Critics of positivism maintain that the approach does not lead to interesting or profound insights into the complex problems of social reality (Remenyi et al., 1998).

In contrast to positivism, phenomenology does not rely as much on deductive research, but sees more appropriate research methods in those that have an inductive nature, for

discovering and building theory rather than testing theory through analytical generalisations (Riege, 2003). The phenomenological and therefore interpretative paradigm adopts a different view of reality from positivism, with its consequent effects on research design and methodology. Phenomenology holds reality to be 'subjective' (Patton, 1990), and asserts that the researcher is incapable of absencing him or herself from the research process. As a result, phenomenological research places greater emphasis on the collection of qualitative approaches, using techniques such as interviews and observation. Alternatives to these two antithetical paradigms exist; for example, the realist model seeks to combine elements of measurement and interpretation through observation to build a coherent picture of a research subject (Ryan et al., 2002).

The current research aims to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and lifestyle behaviors (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan HES; to compare health status and lifestyle behaviour in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition to this, the study aimed to determine if any association existed between a range of demographic and academic variables and the most prevalent health and lifestyle variables. Consequently, the research employed a quantitative approach, and by using this approach, the relationships between health variables and a set of independent variables were tested using data from a survey method, collected through a questionnaire. As such, this research assumes a reality capable of measurement and interpretation, and employs a standard information gathering tool (questionnaire) to provide the data from which certain conclusions are drawn. These data are also compared with similar data from other countries to provide an international perspective of the health status and

lifestyle behaviours of HES in Libya. Therefore, positivism is the theoretical perspective, a survey research is the methodology, and a questionnaire is used as the method of data collection in this study.

5.4 The choice of method

Given the different epistemological positions, ontological claims, and paradigmatic frameworks available to a researcher, these necessarily lead to different choices of method. Researchers have to decide between a predominantly qualitative and a predominantly quantitative approach at the beginning of any study. Patton (1990) rightly argued that quantitative and qualitative methods constitute alternatives, but not mutually exclusive methods for research. In addition, Patton advocates that the selection should be based on the purpose of the study and the research questions and resources in hand, rather than believing that one must choose to align oneself with a particular paradigm. Furthermore, some researchers have used a combination of the two approaches to increase the reliability of research findings. It is believed that both approaches can complement each other to answer a particular set of research questions. Rudestam and Newton (2000, p.45) confirmed that a combination of qualitative and quantitative methodologies may be a good methodological choice.

Punch (1998) referred to qualitative and quantitative researchers as both trying to understand social phenomena, and therefore having a common purpose. However, they are differentiated as follows:

“Quantitative approach conceptualizes reality in terms of variables, and relationships between them. It rests on measurement, and therefore pre-structures data, and usually research questions, conceptual frameworks and design as well. Samples are typically larger than in qualitative studies, and generalization through sampling is usually important, by contrast, qualitative approach deals more with cases. It is sensitive to context and process, to lived experience and to local groundedness, and the researcher tries to get closer to what is being studied. It aims for in-depth and holistic understanding, in order to do justice to the complexity of social life. Samples are usually small, and its sampling is guided by theoretical rather than probabilistic consideration”s (1998, p. 242).

From the above it is clear that differences do exist in the two approaches to method. Quantitative methods are much more systematic than qualitative methods, data are controlled and measured to address the accumulation of facts to determine, e.g., the causes of behaviour. The process of quantitative research typically follows standard procedures, methods, forms of analysis and reporting of results, and results are numerical and data are standardised (Leedy and Ormrod, 2001). Common concerns are questionnaire design issues, samples, reliability and validity. In contrast, qualitative research typically looks at variables in their natural environment. Detailed data are captured through open-ended questions using techniques such as historical analysis interviews and diaries, plus particular observation. Common qualitative methods used include case study, and action research, using techniques such as group interviews, focus groups, structured, and unstructured interviews (Leedy and Ormrod, 2001).

5.4.1 Justification for the use of quantitative approach

Strauss and Corbin (1998) indicated that many researchers acknowledge that qualitative and quantitative methodologies may be complementary in any research design, but the current research project uses only quantitative method. Sarantakos (2005) proposed several reasons for the use of quantitative techniques. Many of these reasons justified adopting the use of this approach in relation to the current research, and most importantly, it is justified to adopt a quantitative approach in this research due to the research gap identified in terms of exploring the health and health-related behaviours of the student population in Libya with the use of such method as suggested by the literature. Also, quantitative methods allow the researcher to collect information of great “breadth”. In order to justify the use of a quantitative method, the advantages of this method are offered and summarised as follow:

- A quantitative method enables researchers to test a theory with a large sample size, and it is possible to measure and survey a great many people via a questionnaire, thus improving the statistical power and ability to compare with other studies. Therefore, the current study used a large sample (Section 5.6.1.11), and Sarandakos, (2005) indicated that the size of a sample in quantitative research needs to be large enough to reflect the attributes of the target population.
- A quantitative method conceptualises reality in terms of variables and the relationships between them. This study of HES in Libya uses a large number of variables and examines the relationships between them. Keith (2003) reported that survey projects which study the relationship between variables are generally more acceptable in academic work than those which study only the distribution of variables, for several interrelated reasons.

- Quantitative methods are those that rely on measurement, and in psychology this includes quantifying attitudes and behaviours. This research project used a questionnaire to measure the health and lifestyle behaviours of the survey population, and was therefore more suited to a quantitative approach.
- Procedures for the analysis of quantitative data, being well developed and codified, bring objectivity to research, in the sense that the results of the analysis do not depend on the researcher, as data can be processed and analysed through SPSS (Statistical Package for the Social Sciences). The data of this study was statistically analysed using SPSS (Statistical Package for the Social Sciences) (e.g. descriptive statistics; Chi-square; logistical regression) which enabled the findings to be compared to studies of a similar nature (Section 5.6.2).
- Another reason for choosing a quantitative survey method is because it means that the survey is designed to produce numerical data and proceeds by measuring variables, and in this study, the researcher is concerned with numerical outcomes, for example percentages and prevalences. To find out just how big the problems of health are, and to assess the prevalence of both healthy and unhealthy lifestyle behaviours among the study population, it is necessary to have statistical data. Creswell (2003) suggested that quantitative positivist research is a method that allows the researcher to answer research questions using the interaction of human responses and data analysis, and the researcher is concerned with numerical outputs and how to derive meaning from them. Therefore, quantitative positivist research states that statistical tools and packages are essential elements in the researcher's toolkit, to produce knowledge usually in the form of statistical or other numerical analysis.

Conversely, positivist and the quantitative methods were criticised by Sarantakos (2005) on four significant points. The first is that quantitative research is restrictive in that it studies only what is perceived by the senses. Secondly, it often leads to 'meaning' that is more closely linked to the beliefs of the researcher than the respondents. Thirdly, method is all important; what cannot be measured is insignificant, reality is adjusted to method and quantity is more important than quality. The last point of criticism is that the design of the research determines what is important and will be studied. This is restrictive and lacks initiative, and limits the effectiveness of research in its attempts to reflect reality.

However, given the researchers concern with breadth, the specific method adopted will take the form of a questionnaire, as this tool best meets the conceptual criteria of measuring achievement goals in the social sciences (Crotty, 2003) and this is an appropriate way to enable rich data to be collected and also to answer the study's five main research questions. Moreover, in order to make generalizations from the data, a quantitative approach has been adopted.

5.5 Research objective and research questions

As stated earlier (Section 1.5 & 1.6) the aim of the present study was to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviours (e.g. smoking, alcohol consumption, and dietary behaviour) of HES; to compare health status and lifestyle behaviours in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition to this, the study aimed to determine if any association existed between a range of demographic and academic variables and the most prevalent health and lifestyle variables. It concludes with

recommendations to improve and develop a health promotion programme aimed at Libyan HES. To achieve these objectives, the study investigated: 1) the health status of Libyan HES; 2) the lifestyle behaviours of HES in Libya. These research questions were addressed with the following objectives:

- To survey the health status of HES in Libya.
- To investigate the prevalence of healthy and unhealthy lifestyles and risk factors of HES in Libya.
- To investigate how health status and lifestyle behaviour in HES of Libya vary by different regions.
- To assess the associations between demographic (e.g. gender, age) and academic (e.g. year of study, residential place during semester) variables and the most prevalent health and lifestyle variables that emerged from the survey.
- To critically compare health status and lifestyle behaviors of Libyan HES with HES from other countries.
- In the light of findings from objectives 1 to 5, to conclude with recommendations to improve and develop health promotion programmes for Libyan HES.

Research Questions

This research focuses on the Libya student population. Several research questions are addressed to investigate the health and health-related behaviours of HES in Libya, which are therefore able to provide fruitful information on the research topic. The following research questions were formulated to achieve the research objectives of this study:

There are five research questions in this thesis, these include:

- What is the health status among Libyan HES, for example, body perceptions and BMI, mental health conditions and general health complaints?
- What are the lifestyle behaviours among Libyan HES, for example, smoking behaviour, physical activity and drug and alcohol consumption?
- Are there differences in health status and lifestyle between Libyan HES by region?
- Are there associations between demographic and academic variables and the most prevalent health and lifestyle behaviour variables?
- Are there differences in health status and lifestyle behaviours of Libyan HES and HES from other countries?

5.6 Methodology and Method

The aim of methodologies and method is to provide the researcher with direction for the research, to help to understand the process and to best address the research purposes. Here an important question needs to be answered: “what methodology and method will be used in the research, and how is this justified?” In the context set by the previous sections, with the philosophical approach following a positivist method, the chosen methodological approach was a questionnaire survey. The section will explain the survey research and justify its choice as the method used, the sampling techniques, the data collecting procedure and data analysis.

5.6.1 Data Collection

The main purpose of a cross-sectional study is to identify developmental stages and to compare differences between groups. A cross-sectional study can compare sub-groups, often different age groups, within populations such as students or patients. A cross-sectional study can also compare gender differences, occupations, disability, types of educational institution and so on (Coolican, 2009). In line with Crotty's (2003) belief that research done in a positivist way may choose a survey and a quantitative method, and employ quantitative methods of statistical analysis to produce convincing outcomes, a questionnaire was used for data collection in this study. This section discusses the process of data collection, including questionnaire survey, questionnaire design, form of questions, measures, types of questions, pilot study, participants, ethical considerations, recruitment, sample size and procedure of data collection.

5.6.1.1 Questionnaire Survey

In previous studies different instruments have been used for data collection to assist answering research questions. A survey can take several forms including a questionnaire, interview, or normative survey (Bryman, 2008). In this study, a written questionnaire was administered (see Appendix 1). A questionnaire is generally considered a more suitable instrument for social research in terms of getting answers to closed questions. Recently, the number of surveys conducted among university and college student populations has increased (Malinauska, 2006; Cheung, 2007; Stock, 2007), and the questionnaire method has been widely used as the instrument of data collection. The use of anonymous questionnaires provides a higher response rate among students, presumably because they find it impersonal and confidential, and when the much lower cost is borne in mind, a the self-reported questionnaire is highly attractive (Bryman, 2001). Other advantages of the questionnaire are

speed and low cost. Also, some students might have a health problem and be reluctant to talk or seek professional help, or in some cases refuse help. This could be due to a number of reasons: students might feel that there is problem, but it is not serious enough, that they should be able to cope on their own, or that they would have to reveal information about themselves or their families which they would prefer to keep private, or that they might have concerns about confidentiality. Therefore, the survey was chosen as an anonymous and voluntary questionnaire to collect a significant amount of data at the population level, rather than using another method such as interviews.

In order to obtain the required information on the health and lifestyle behaviours of students, a general health survey was carried out, which is the commonest used method of data collection in the social sciences. A survey is a technique used to describe a population and can also test a conclusion or find out how one group differs from another (Bryman, 2001). Therefore a key purpose of a social survey is to make a deliberate comparison. This is what was required in order to compare health status and lifestyle behaviours of Libyan HES with those from other countries. In order to allow a comparison to take place, the survey asked questions that the researcher wanted answered.

5.6.1.2 Justification for the use of questionnaire in this study

The questionnaire was chosen, due to the large quantities of information it can gather in an economic and effective manner. This method allowed for a comparison of findings, and is generally seen as authoritative and intriguing, and dependent upon wording that is easily understood (Sauders et al., 2003). Moreover, the questionnaire is a very popular market research tool and one which most people are familiar with. Its main strength is that it allows

the identification and description of a variety of answers on a specific subject and seeks to find a relationship between positions on one set of questions to positions on another (Cameron, 1999). In addition, the questionnaire method was used as the data collection tool in this study due to the highly sensitive and confidential nature of some of the questions, most importantly those relating to mental health conditions (depressive symptoms, anxiety and depression). Confidentiality was also of particular concern due to the fact that both alcohol and drugs are considered illegal and totally unacceptable in Islamic society. Another difficulty encountered when considering interviews as a method, was the culture of Libya with regards to women. The researcher, being male, would never have been considered acceptable to ask personal questions, for example about weight, or height to a female. A related issue was the fact that the questionnaire was to remain highly confidential and all guarantees of anonymity were given. This was in order to promote more honest and confidential responses. However, a limitation in this study was the time element. The researcher was not allowed to interview or give out the questionnaire during students' free time. It was therefore necessary to do this during lecture time and the time allowed was limited to twenty five minutes. This, therefore, precluded the idea of an interview, the time being far too short. This was another reason why the questionnaire was the better method for the Libyan context. In addition, as in this study mainly closed-ended items were used and a questionnaire is more suitable for getting answers to closed questions.

Moreover, according to Sarantakos (2005), the questionnaire survey is one of the most appropriate data collection methods in the social sciences. Questionnaires, as method of data collection have advantages and limitations, which the research must consider. The advantages include:

- The results are produced in a shorter time.
- Using emails or post questionnaires is more cost effective.
- The concept of anonymity is assured.
- The respondents can complete the questionnaires at their own convenience.
- Questionnaires provide a wider coverage, and more respondents can be included.
- Respondents living abroad or widely dispersed can be contacted more easily.

Conversely, there are also some limitations to the questionnaire. Sarantakos (2005) identified a number of disadvantages of questionnaires:

- It is impossible to check whether questionnaires were answered in the correct order.
- They do not provide any additional information.
- Partial responses are sometimes given.
- Respondents need to have the ability to read and understand complex documents.
- There is no guarantee that questionnaires will be completed.

5.6.1.3 Questionnaire Design

A questionnaire is a written investigation in which information is obtained by asking participants to respond personally to a series of predetermined questions (Bryman, 2001). The size of the questionnaire depends on factors such as the research objective, the type of respondents, the methods of analysis and availability of resources. The number of questions ranges from only a few to several hundred; however, a golden rule with respect to questionnaire size is that one should include as many questions as necessary and as few as possible (Sarantakos, 2005). Given the objectives of the current study, a questionnaire was

chosen as the research tool. Hammarstrom and Janlert (1997) indicated that the commonest way to recognise health problems among young people is through self-reported symptoms, and the data collected can be reasonably used to compare students' health across countries. Therefore, self-rated health is widely used in health studies and it is generally accepted as a good predictor of mortality and morbidity (Stock et al., 2003; Sleskova et al., 2005; Musaiger 2004; Stock et al., 2007; Moukhyer et al., 2008). The self-administered questionnaire used in this research was composed of 54 questions. Contents of the items were partially based on those used in previous studies among young adults (Scully et al., 2007; Moukhyer et al., 2008; Mikloajczyk et al., 2008), and it was designed in English, developed from a previously published tool. Since 2003, Ministries of Health and Education around the world have been using the Global Students Health Survey (2005) to periodically monitor the prevalence of important health risk behaviours and protective factors among students. The present study used items from this survey, and also from the following surveys: American College Health Association (2005); the General Health Questionnaire (Gao et al., 2004); The Social Support Questionnaire (Sarason et al., 1983). Several related studies on student health have used questionnaires as an instrument for data collection (e.g., Cheung et al., 2007; Meland, 2006; Kakeshita, 2006 & Stock et al., 2007). Other questions that the current study adapted from previously published surveys ensured that international comparisons could be made on health status and lifestyle behaviours, e.g., Stock et al., 2003; Stock et al., 2007; Moukhyer et al., 2008, El Ansari et al., 2010.

There were several steps in the process of translating the questionnaire into Arabic. First, using previous research questionnaires, the researcher modified it and then translated it into Arabic. Second, a Libyan academic, who specialises in English, translated it back into

English. Third, a comparison was made between the two English versions to check for inconsistencies. Finally, the final version was distributed amongst fellow Libyan students in the UK, in order to check for clarity and comprehension of the translation. The questionnaire was designed to take approximately 20 minutes to complete. The questionnaire in Appendix 1 is divided into seven sections and comprised nine pages when set out on single-sided A4 paper. However, due to the fact that the length of the questionnaire was thought likely to lead to a low response rate, it was decided to reproduce the questionnaire in a double-sided booklet form. The cover included the research title (in large font), Gloucestershire University's emblem, and the date when the questionnaire was distributed. This questionnaire was concerned with the following areas: general health condition; questions referring to present attitude to life; weight and body mass index; mental health condition; general health complaints; fruit and vegetable consumption; smoking behaviour; alcohol and drug consumption; physical activity and questions related to study (Appendix 1).

5.6.1.4 Form of questions

The questions of the questionnaire of the present study were adopted as a result of the review of the literature. There are three types of data available in questionnaires. Some questions ask about opinion, where respondents are asked what they feel about something. Behaviour questions ask what the respondents actually do or did in the past. Attributes questions are about what the respondent is, such as their sex or age (Saunders et al., 2003). A combination of these questions was used in this study. The questions in the questionnaire survey were of two different types: closed-ended and open-ended, both having advantages and disadvantages. Open-ended questions are not followed by any kind of specified choice and each respondent can give a personal response or opinion in her/his own words. The main disadvantage is that the questions are difficult to answer and analyse. The main advantage is

that respondents are able to give their opinions as precisely as possible in their own words. In closed-ended questions, respondents are offered a set of answers and asked to choose the one that most closely represents their opinion: they are easily understood by respondents and their analysis is straightforward. Their major disadvantage is that they may introduce bias, by forcing respondents to choose from given alternatives that might not have otherwise come to mind.

In this study, throughout the questionnaire mainly closed-ended questions were used (see Appendix 1). Closed items require a specific response and usually allow the respondents to choose from two or more fixed alternatives (Byrman, 2001). For instance, “*Where do you live during university/college term time?*” with five options given: 1= I live alone; 2= I live together with my wife/husband; 3= I live with my parents; 4= I live with roommates; 5= other. Another example is, “What is your year in your university?” with six options: 1st year undergraduate; 2nd year undergraduate; 3rd year undergraduate; 4th year undergraduate; 5th year or more undergraduate; the sixth option was: Other, please specify. The reason for mainly closed questions being used was because a critical comparison between health status and lifestyle behaviours of Libyan HES with those from other countries was one of the main aims of the study, and because closed questions are considerably easier for individuals to understand and complete, they therefore increase the reliability of the survey. In addition, some open-ended questions were used to give respondents the opportunity to add other options or to give their opinions. For example, “Have you ever tried to lose weight, if you have tried which method?” The appropriateness of either open-ended or closed-ended questions depends on the objective of the questionnaire, respondents level of information about the topic in question, the extent to which the topic has been thought about by

respondents, the extent to which respondents are motivated to communicate on the topic, and the sample size of the population that is to be studied (Hussey and Hussey, 1999).

5.6.1.5 The choice of instruments and measurements

As mentioned earlier (Section 5.6.1.3), questionnaires were distributed to subjects and the questionnaire included a combination of questions focusing on health aspects and lifestyle behaviours believed to influence students' health, according to previous research. These included health aspect variables (e.g. weight perception and BMI, mental health conditions and health complaints), and lifestyle behaviours of the participants (e.g. body image and dieting behaviour, fruit and vegetable consumption, physical activity, smoking behaviour and alcohol and drug consumption). Table 5.1 outlines the sources for all main components used in the questionnaire, and the sources they were derived from.

Table 5.1: Sources for all main components used in the questionnaire

Component	Source	Items	Measurement scale
Weight perception	Wardle et al. (2005), Ojala et al. (2007), Malinauskas et al. (2006), Mikolajczyk et al. (2008).	3	5-Point Likert scale
Body mass index	US National Institute of Health (1998), WHO (2006), Sakamaki et al. (2005).	1	4 Categories
Depressive symptoms*	Schmitt et al (2003), Chang (2007), Mikolajczyk et al. (2007), Baldassin et al. (2008).	20	6-Point Likert scale
Diagnosed anxiety and depression	The American College Health Association Survey (2005)	2	Yes/No response format
General health complaints	Takakura et al. (2005), Stock et al (2007), Simonsson et al. (2008)	8	4-Point Likert scale
Body image	Wardle et al. (2005), Bogt et al. (2006).	2	5- Perception rating scale
Attempts to lose weight	Malinauskas et al. (2006), Wardle et al (2006), Meland et al. (2007), Ojala et al. (2007)	2	3-Point Likert scale
Fruit and vegetable consumption	Stevens et al., 2003, Richards et al., 2006, Hart et al. (2007)	2	4-Point Likert scale
Physical activity	WHO Global Student Health Survey (2005), Scully et al. (2007).	4	3-Point Likert scale
Smoking behaviour	Khan et al. (2005), Carroll et al. (2006), Khader and Alsad (2008)	3	3-Point Likert scale
Alcohol and drug consumption	Jodati et al. (2007), Moukhyer et al. (2008).	3	3-Point Likert scale

*Two items were excluded; the item concerning the loss of interest in sex was removed before the pilot study based on the researcher's awareness of the Libyan cultural and religious context. After the pilot study it was also decided to remove the item "I feel I am being punished" as it became clear that the students did not feel comfortable discussing this within their religious beliefs and it caused some misunderstanding.

Self-reported questionnaires are a widely used research tool, favoured for their relatively low cost and ease of administration. However, there appear to be inconsistencies in the categories researchers use to measure health status and lifestyle behaviours. In order to make a comparison between studies, a uniform way of measuring health status and lifestyle behaviours is required, especially in view of the fact that one of the study objectives was to compare health status and lifestyle behaviours of Libyan HES with those from other countries. Therefore, the choice of instruments was based on previous studies which have been conducted in different countries to allow a comparison to be made. For example, several studies have been carried out to determine the prevalence of overweight and obesity amongst different populations. Most of these studies used BMI as an indicator for levels of body weight while only a few studies used skin fold measurements (Musaiger, 2004; Bogt et al., 2006). The questionnaire in this study included items relating to perceived body size and appearance, and asked for students' height and weight in order to determine body mass index. BMI was calculated as weight in kilograms divided by the square of height in meters. Participants were classified as underweight ($< 18.5 \text{ kg/m}^2$), normal weight ($18.5 - 24.9 \text{ kg/m}^2$), overweight ($25.0 - 29.9 \text{ kg/m}^2$) and obese ($> 29.9 \text{ kg/m}^2$), in accordance with the categorisation adopted by the World Health Organization (2006) and the US National Institutes of Health (1998). These categories have been used extensively among HES as indicators of weight-related health-problems (Bjornelv et al., 2006; Mikolajczyk et al., 2010), and to evaluate changes in nutritional status, which can affect body reserves differentially (Macias, 2006).

With regards to general health complaints, eight physical symptoms measuring health complaints were included in the questionnaire; i.e., stomach trouble, back pain, heart

problems, headaches, sleep disorders, concentration difficulties, neck and shoulder pain, and depressive mood. These health complaints were adopted from previous studies (Stock et al., 2003; Stock et al., 2007; Mikolajczyk et al., 2008; Simonsson et al., 2008), because these studies were conducted on the same population (HES) in different countries. Respondents were asked the same question regarding health complaints; how often they had experienced the specified complaints during the previous year, reported on a four-point scale measuring if each symptom was experienced: 1= never; 2= rarely; 3 quite often; 4= very often. This was to ensure that international comparisons could be made.

Depressive symptoms were measured using a modification of the Beck Depression Inventory (M-BDI), which was adapted by Mikolajczyk et al (2007), from a test originally developed in Germany (Schmitt et al., 2003, and Schmitt & Maes, 2000). The modification of the original BDI included 20 items measuring depressive symptoms, with a six point Likert scale measuring the frequency respondents had suffered from these symptoms in the previous year (0 = never, 5 = almost always). The study used a cut-off point of the M-BDI scores for screening for clinically relevant depressive symptoms at ≥ 35 , which was recommended for the general population (Schmitt et al., 2006). However, other studies have used different M-BDI cut-off scores, for example Baldassin et al., (2008) used a score of >9 among students in Brazil and Bostanci et al. (2005) used a cut-off score of ≥ 17 amongst students in Turkey. The choice of using a cut-off point of the M-BDI scores for screening for clinically relevant depressive symptoms at ≥ 35 in the present study was made because this score had been used in the study of Mikolajczyk et al (2007) which covered more than one country, whereas the other studies mentioned above covered only a single country therefore, it allowed comparison with students from different countries.

In every question participants were asked to indicate how strongly they had experienced the following emotions during the previous year (I feel sad, I feel discouraged about the future, I feel I have failed, It is hard for me to enjoy things, I feel guilty, I am disappointed in myself, I am critical of myself for my weaknesses or mistakes, I have thoughts of killing myself, I cry, I feel annoyed and irritated, I put off making decisions, I have lost interest in other people, I am worried about my appearance, I have to force myself to do anything, I do not sleep well, I am tired and listless, I have no appetite, and I am worried about my health). It is coded on a six-point scale from: 1= not at all to 6= very strongly. In this study, there was reduction in the number of items from 20 to 18, two items were excluded. The item concerning the loss of interest in sex was removed before the pilot study based on the researcher's awareness of the Libyan cultural and religious context. After the pilot study we also decided to remove the item "I feel I am being punished" as it became clear that the students did not feel comfortable discussing this within their religious beliefs and it caused some misunderstanding.

Anxiety and depression are common challenges to students' mental health (Wardle et al., 2004; Khalek and Alansari, 2004; Rab et al, 2006), and therefore in this study students were asked one question which related to anxiety and depression. This question was based on the American College Health Association Survey (2005); the questions in the American survey were:

"Within the last school year, have you been diagnosed with anxiety?"

"Within the last school year, have you been diagnosed with depression?"

The American College Health Association Survey (2005) asked participants two questions separately, one about anxiety and the other related to depression, thus, the questions used

“School year” In this study, the two questions were combined into one question in order to reduce the number of questions in this study, and “School year” changed to “academic year” to be more suitable for university/college students. “*Within the last academic year, have you been diagnosed with anxiety or depression?*” with two options: 0 = no and 1= yes.

Previous studies have used different instruments to measure anxiety and, for example, the American College Health Association Survey (2005) asked about diagnosed anxiety and depression by using the two questions delated above. Amongst Chinese university students, Rong et al. (2009) used the international depression literacy survey (IDLS) which enquires about general and mental health issues, and also explores attitudes and personal mental health experiences. Bayram and Bilgel (2008) used Depression Anxiety and Stress Scale (DASS-42) amongst students in Turkey. In Pakistan, Rab et al. (2008) used a self-screening tool questionnaire for depression and anxiety. Their scale included 14 questions, 7 for anxiety and 7 for depression, and it had been used before in the Pakistani population (Dodani and Zuberi, 2000). However, the present study used diagnosed anxiety and depression questions which were used by the American College Health Association Survey (2005), and because this was the first study conducted in Libya to collect data on anxiety and depression amongst HES, it used this simple question on the diagnosis of these complaints in order to keep the size of the survey manageable in light of the volume of data to be collected, and more importantly the increased respondent burden a more rigorous instrument would have imposed. In the studies of Rong et al. (2009) and Bayram and Bilgel. (2008), a large number of questions were used to test for the presence of symptoms, but these studies were focused only on this one issue, while the present study also investigated a number of other health status and lifestyle issues.

In addition to this the diagnosis aspect adds to the accuracy of the study, and this question enables comparison with the international studies.

Regarding lifestyle behaviour variables, the choice of instruments was also based on previous studies. For example, body image perception was assessed on a five-point Likert scale adapted from previous studies (Wardle et al., 2005; Bogt et al., 2006). Students were asked: *“In your opinion are you.....,”* with five response options (“Far too thin”, “A little too thin”, “Just right”, “A little overweight”, “Very overweight”). For the analysis, the five options were re-coded into four variables (“Thin”, “Just right”, “A little overweight”, “Obese”). The questions with respect to dieting behaviour were adopted from previous studies (Lowry et al., 2001; Veggi et al., 2004; Meland et al., 2007; Ojala et al., 2007). Measures of current and previous weight control behaviour or dietary behaviour was assessed by asking participants to respond to the single question: *“Do you use any of the following to control or lose weight?”* with options: 1= currently; 2= in the past; 3= never. Those respondents who answered currently or in the past to this item were then asked to indicate *“Which of the listed methods do you use to control your weight?”* Listed weight control: 1= dieting; 2= exercising; 3= skipping meals; 4= vomiting; 5= smoking; 6= taking medicine.

The question that was included in this study with respect to fruit and vegetable consumption asked how often the individual ate fruit and vegetables on an average day. The question was taken from a Food Frequency Questionnaire – FFQ (The National Cancer Institute, 2008) The International Health Behaviour in School –aged Children (HBSC) questionnaire (WHO, 2006), which has been used in data collections in many countries and is subject to on-going

validation studies, as well as other studies, has also used this question (Stevens et al., 2003; Richards et al., 2006; Hart et al., 2007). Moreover, the use of the FFQ question to measure fruit and vegetable intake in epidemiological studies is increasingly being recognised as a valid instrument (Rasmussen et al., 2008). The original FFQ question included several items on fruit and vegetable consumption, but the question used in this study was “*How many servings of fruits and vegetables do you usually have per day?*” rather than a separate question about each kind of fruits and vegetables, because this study examined fruit and vegetable consumption as a healthy lifestyle behaviour. This study used a scale with four items that were rated from: 1= I do not eat fruits and vegetables; 2= one or two; 3= three or four; 4= five or more. A measure of fruit and vegetable consumption is included in the study to allow a comparison with internationally recommended levels, and with the levels of consumption among HES in other countries to aid in the prevention, The WHO and FAO (2003) recommend a minimum of 400g of fruit and vegetables per day for the prevention of chronic diseases. Also the Food Standards Agency in the UK (2001) recommends five servings of fruit and vegetables per day. The aim of this question was to assess the extent to which Libya HES were meeting these levels of consumption.

Physical activity behaviour and sedentary lifestyle were assessed in terms of the following; the frequency and type of current physical activities, and this further categorised into vigorous and moderate physical activity. Gidlow et al., (2006) indicated that leisure-time and vigorous activities are often chosen as they are easier to recall than lower intensity habitual activities such as walking or household chores. The questions measured participation in physical activity and sedentary leisure behaviour were developed from the American College Health Association Survey (2005) and the Global School-based Student Survey (2005).

Physical activity was divided into six categories, and a separate question inquired about each kind of physical activity (exercises to strengthen or tone muscles, vigorous physical activity, moderate physical activity, walking and sitting behaviour), and to ascertain duration and frequency (i.e. number of days per week).

Moreover, to be clear to students, further explanation and examples were given, which included:

- Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal (e.g. heavy lifting, digging, aerobics and fast bicycling).
- Moderate physical activities refer to taking moderate physical effort and make you breathe somewhat harder than normal (e.g. carrying light loads, cycling at a regular pace, and doubles tennis).
- Walking (this includes walking at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise or leisure).
- Seated behaviour (watching television, playing computer games, talking with friends or doing other activities while seated).

Participants who reported doing physical activity were asked to indicate how much time per day he/she usually spent doing the activity, with two options of response: 1= hours, 2= minutes per day and 3= do not know/not sure.

This study examined physical activity as one of the health behaviours that provides essential stimuli for most organs of the human body. To assess physical activity, participants were asked if they had taken exercise over the last 7 days.

In the past 7 days, on how many days did you:

1- *During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling? (Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal).*

2- *During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, cycling at a regular pace, or doubles tennis? (Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal).*

Two options of response: 1= number of days per week; 2= no vigorous/moderate physical activities.

3- *During the last 7 days, on how many days did you walk for at least 10 minutes at a time? (This includes walking at work and at home, walking from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure). With two options of response: 1= number of days per week; 2= no walking.*

4- *How much time did you usually spend doing vigorous physical activities on one of those days?*

5- *How much time did you usually spend walking on one of those days?*

6- *During the last 7 days on a typical day, how much time did you spend sitting?*

For questions numbers 4, 5 and 6 there were three options of responses: 1= hours, 2= minutes per day; 3= do not know/ not sure.

The purpose of including these questions on physical activity levels was to measure the amount of exercise taken by Libyan HES. The World Health Organization (2006) recommends 30 minutes of vigorous and moderate physical activity per day for adults and at least one hour of moderate-intensity physical activity for children and young people. The questions allow an assessment of the extent to which the study population was meeting international standards for moderate and vigorous physical exercise levels.

The questions with regards to smoking behaviour measured current cigarette use, age of initiation of cigarette smoking, attempted cessation of cigarette smoking, and current use of other tobacco products. These questions were developed from the Global Student Health Survey (2006) and the American college Health Association - National College Health Assessment Survey (2006). Smoking behaviour in the past three months was assessed by the question "*How often do you smoke?*" (Cigarettes, pipes, sheesha), coded on a three-point scale: 1=daily; 2= occasionally; 3= never, and participants were defined as smokers (coded 1) if they smoked (daily) at least one cigarette a day, or smoked cigars or a sheeshah or a pipe. Students were also asked: "*If you smoke daily, how many cigarettes do you smoke on average?*", and "*Have you tried to quit smoking within the last 12 months?*" with two options: yes (coded 1) and no (coded 0). Also, in terms of starting age "*How old were you when you first tried a cigarette*" With an open option to report the age. The question related to the starting age of tobacco smoking was developed from the Global Student Health Survey (2005) to be without age options.

Some of the information collected by this study was highly sensitive and thus privacy was of particular concern due to the fact that both alcohol and drugs are considered illegal and culturally unacceptable in the Islamic society in Libya. Therefore, this study examined alcohol as one of the health behaviours that is widely known to increase the risk for different health problems. With respect to alcohol, respondents were asked one question which was adopted from Moukhyer et al (2008), "*Do you drink alcohol?*" with three possible responses: 1= daily; 2= occasionally; 3= never. About drugs, respondents were asked: "*Do you ever use drugs?*" with three possible responses: 1= yes regularly; 2= yes, but only a few times; 3= never. Another question respondents were asked was: "*If yes, which drug(s) have you used?*" There were some options included: 1= ecstasy; 2= marijuana; 3=cocaine; 4= heroin; 5= crack; 6= LSD; amphetamines.

In addition, other variables were also included in this study, for example socio-demographic, academic, and social support variables, to test their relationships with health and lifestyle. This allowed the study to investigate potential correlations between health status and lifestyle variables, and variables specific to the study population.

Social-demographic variables: the questions in this part of the questionnaire related to the socio-demographic status of the respondents. Questions were adopted from the Global Student Health Survey (2005), which were used as part of the American College Health Association Survey (2006). Four variables were used to assess participants' socio-demographic information as independent variables: gender, age, religion, and monthly income situation.

- Gender was determined by the question: “*What is your sex?*” Female is coded as 0, while male is coded as 1.
- Age was determined by the question: “*How old are you?*” Four age groups were created by coding the ages into categories: < 20 years, 20-24.9 years, 25-29.9 years, 30 and older.
- Religion: Participants were asked: “*What is your religion?*” As the majority of Libyan people are Muslims, therefore, just two options were given for this question: 1= Islam and 2= other. There was another question related to religion: “*How strongly do you agree with the following: “My religion is very important in my life?”*” Five options were given for this question: 1= strongly agree; 2= somewhat agree; 3= neither agree nor disagree; 4= somewhat disagree; 5= strongly disagree.
- Monthly income was determined by: “*What is your monthly income at your disposal after paying rent and utilities?*” The respondents had to indicate the amount of money. Then respondents were asked: *Would you say the amount of money you have is insufficient or sufficient?* Self-rated sufficiency of monthly income was coded on a four-point scale: 1= always sufficient; 2= mostly sufficient; 3= mostly insufficient and 4= always insufficient.

Academic variables: participations were asked three questions related to their studies including year of study, subject, and finance of study.

- Year of study: students were asked to indicate their year of study at university or college by: “*What is your year in your university or college?*” There were six options:

1st year undergraduate; 2nd year undergraduate; 3rd year undergraduate; 4th year undergraduate; 5th year undergraduate; other, please specify.

- Subject: Participants were asked to report their subject of study: “*What subject do you study at university/college?*” Moreover, participants were asked one more question related to their study which was: “*How important is it for you to have good grades at university?*” with four possible responses: 1= very important; 2= somewhat important; 3= not very important; 4= not at all important. In this part, the questions were adopted from Mikolajczyk et al. (2008).
- Participants were asked: “*How do you finance your studies?*” The possible responses were: 1= parents’ support; 2= student loan; 3= job during semester; 4= job during breaks; 5= scholarship; 6= other, specify. The same questions were used by Stock et al., (2003).

Social contacts and social support (3 items): social support was originally defined according to the number of people, including family and friends, who supported a person when he/she felt down. In recent times, this has been developed to include also the respondent’s satisfaction with social support. In this study, this was adapted from the citation of Sarason’s standardized measurement instrument, the Social Support Questionnaire - SSQ (Sarason et al., 1983). The following question was used:

“*How many people do you know- including your family and friends- who support you whenever you feel down?*” The answering categories were: 1= none; 2= one person; 3= two - three persons; 4= more than three persons. Three persons and under (low social support) were coded as 0, whilst more than three persons (high social support) was coded as 1.

Furthermore, satisfaction with social support was measured by the following question from Sarason's Social Support Questionnaire (Sarason et al., 1983). "*Are you on the whole satisfied with the support you get in such situations?*" The answering options were on a five-point scale which ranged from "very satisfied" (one point) to "very dissatisfied" (five points).

The area of social contacts was assessed with one item regarding the existing situation "*Where do you live during university/college term time?*" with five options given: 1= I live alone; 2= I live together with my wife/husband; 3= I live with my parents; 4= I live with roommates; 5= other.

In previous studies into the health status and lifestyle behaviours of HES, a range of different research instruments have been used, and in some cases this makes direct comparison difficult, for example, some studies, in collecting data on physical activity, have included an item on team sports played, while others have enquired about individual activity. However, great care was taken in the design of the research instrument to follow where possible the ranges of variables used in previous studies, and also to duplicate their categorisation where possible. The next section will discuss the choice of variables in more detail.

5.6.1.6 Justification of the variables used in this study

I have used the general conceptual framework suggested by Dahlgren and Whitehead (1991, p.20) which contains various features (see Figure 1.1). However, I have modified the framework, selecting the most relevant conceptual features for the group I am studying (i.e. an HES population). The conceptual framework of the present study investigated a range of

variables related to the health status and lifestyle behaviours of student populations, such as body perception and BMI, mental health conditions, general health complaints, dieting, fruit and vegetable consumption, smoking behaviour, alcohol and drug consumption as well as some socio-economic and academic variables. These variables were chosen (and this is highlighted in Dahlgren and Whitehead's framework) due to their applicability to the study and research questions (see Table 5.1). Moreover, these variables have been shown as important for the study group and have been studied extensively amongst HES populations (Mikolajczyk et al., 2008; Arslan et al., 2009; Nazary et al., 2010; Mao et al., 2009; El Ansari et al., 2010). Other variables that were considered but dismissed included health services. For the variables that were not covered in this study such as water sanitation, unemployment, work environment and agriculture and food production, the main reason for these variables not being included in this study was because they were considered to be more generic in nature, and more applicable to the wider context rather than to the individual themselves, and therefore less directly applicable to a student population.

Health variables

As shown by the data presented in Chapter Three, attention to the health of university and college students has increased in recent years (Adewuya et al., 2006; Abolfotouh et al., 2008; Nur et al., 2008; Al-Rethaiaa et al., 2010). The literature has demonstrated that these elements are very important to student populations. Also attention to these areas of health has been emphasised in other countries, including both Arab countries such as Lebanon, Saudi Arabia, Kuwait and Egypt, and non Arab countries such as European countries, and the USA. Therefore, it is vital to draw the attention of Libyan health policy makers with regards to these areas of health, and also to this important population in the Libyan community.

There has been increased discussion in the literature on the problems of body weight, and as discussed above in 3.3.2.1, during the last two decades, the percentage of overweight and obese adults has been steadily increasing and the problem of obesity has become one of the major health problems in the Eastern Mediterranean Region (Musaiger, 2004; Jackson et al., 2007; Al-Qauhiz, 2010; Al-Rethaiaa et al., 2010). It is known that overweight and obesity are correlated with increase in the risk of morbidity (U.S National Cancer Institute, 2004). As discussed in 3.3.2.2, Cancer Research in the UK has suggested that one in seven cancer deaths in men and one in five in women are associated with obesity, and the British Heart Foundation estimates that 5% of coronary heart disease deaths in men and 6% in women are linked to obesity (HCH, 2004). Musaiger (2004) indicated that there is a lack of research on students' health problems, such as obesity in the EMR. In addition, Abolfotouh (2007) suggested that there is a need to promote lifestyle change and to reduce obesity to prevent the occurrence of diabetes and hypertension among Egyptians. Therefore, there is a need for national programmes to prevent and control obesity in the countries of the EMR.

As discussed in Chapter Three (Section 3.4.3), anxiety and depression are common challenges to students' mental health, and according to the literature mental health issues are increasing in severity and number on university and college campuses in different countries, and the situation is in danger of worsening (Bayram & Bilgel, 2008; Arslan et al., 2009; Rong et al., 2009). Therefore, it is important to draw attention to mental health status and evaluate the prevalence of depressive symptoms, anxiety and depression, and to assess the relationship between them and certain other variables. Abdel-Khalek and El-Ansari (2004) investigated anxiety and depression amongst undergraduate students in ten Arabic countries, the

conclusion reached was that there was a need for future research to survey mental health problems amongst student populations.

Although it has been suggested that subjective health and pain complaints are major public health problems that constitute diverse symptoms, few of which have a defined diagnosis or disease (Section 3.5.3), studies have shown that there is an increase in the proportions of students who experience psychosomatic symptoms, and a high prevalence of pain complaints and psychosomatic symptoms has also been found in student population. For example, Simosson et al. (2008) reported that the most common complaints in university students in Sweden were headache and stomach ache. Similarly, Curry et al. (2007) stated that headache was a very common symptom reported amongst the university undergraduate population in the USA.

Stock et al. (2007) reported that most of the complaints highly prevalent in the student populations of seven Europe countries affected as much as 20-50% of students quite often or very often. Headaches and anxiety were highest on the list of health complaints, followed by back or neck aches. As suggested by Curry et al. (2006), screening for student health problems is an important role of the primary care provider. The primary care provider is an optimal role to assist student patients with recognition of their problem type and appropriate clinical management (Curry et al., 2006).

Lifestyle behaviours

There is a growing body of evidence to suggest that lifestyle may have a major impact on health status (WHO, 2006). The cultural/behavioural explanation is that an individual's behavioural choices (e.g., smoking, alcohol and drug use, diet, physical activity, etc.) are responsible for their developing and dying from a variety of diseases. Improvements in behaviour (e.g., reductions in tobacco use, changes in diet, increased exercise, etc.) have also been hypothesized as being responsible for improved longevity, but most analysts conclude that improvements in health are due to the improving material conditions of everyday life (WHO, 2006).

Lifestyle may have a major impact on health status. The effects of an unhealthy lifestyle are cumulative and therefore may have the greatest impact later in life. A healthy lifestyle may help persons to delay the effects of old age, enabling them to lead fulfilling and independent lives for longer (WHO, 2006). Also the WHO Student Survey (2005) which was conducted in many different countries (e.g., United Arab Emirates) used the same health aspects and lifestyle behaviours used in the present study and other studies to test student populations (Carroll et al., 2006; Abolfotouh et al., 2007). In addition, a report by the WHO (2006) stated that:

“Ministries of health and the concerned governmental and nongovernmental sectors faced major challenges in directing the attention of the public to the hazards of risk practices such as smoking and drug addiction. Nowadays, there was special need for raising the awareness of the family in particular about following healthy lifestyle such as physical exercise and healthy eating habits, so that this knowledge could be proactively used while raising children. Many unhealthy practices, such as smoking,

risky sexual behaviour and alcohol and drug addiction, had their roots in adolescence. Preventing risky behaviour and promoting healthy choices among adolescents, in particular, resulted in positive health outcomes, not just during adolescence, but also during adulthood. Well-developed adolescents who were empowered with appropriate life skills had a better chance of becoming healthy, responsible and productive adults, and had better potential for successful productive careers” (2006, p.2)

As shown by the data presented in Section 4.2.1, the university years are a period when students have increasing awareness of their body and body image dissatisfaction related to actual or perceived body size is widely reported among young people, especially females. Particularly in Western cultures, young people who do not fit some idealised perceived body image can experience many problems associated with body dissatisfaction (Meland et al., 2006; Taylor et al., 2006). Body image perception can lead to psychological problems and behavioural disorders, such as eating disorders, which can cause harm to the individual's general health (Taylor et al., 2006). According to Buyukgoze-Kavas (2007) both cross-sectional and cultural studies have revealed that the incidence of eating disorders has significantly increased amongst different populations. Therefore, understanding the body image and dietary behaviour of students is necessary because unhealthy eating habits and distorted body image may contribute to the development of eating disorders which pose a threat to the healthy nutritional state of the students' present and later life (Taylor et al., 2006; Meland et al., 2007). There is a need for future research and development into interventions to target students at risk of developing eating disorders prompted by a misperception of body image.

The academic literature shows that the majority of university students do not consume sufficient fruit and vegetables (as discussed above in 4.3.2), despite the fact that a strong association has been found between fruit and vegetable consumption and a decrease in the risk of chronic diseases (Section 4.3.1). In addition, consumption of sufficient levels of fruit and vegetables can reduce the risk of some types of cancers. Five servings of fruit and vegetables is the minimum goal which could prevent at least 20% of all cancer incidences; however, up to ten serving of fruit and vegetables daily is recommended to reduce the risk of a range of diseases and nine servings for general good health. Previous studies have shown that increasing fruit and vegetable consumption could reduce many non-communicable diseases. Lock et al. (2005) considered the global burden of disease attributable to low consumption of fruit and vegetables and reported that the total worldwide mortality attributable to inadequate consumption of fruit and vegetables is estimated to be up to 2.635 million deaths per year. Also the results revealed that the total worldwide disease could be cut by 1.8% by increasing the consumption of fruit and vegetables to 600g per day. Richards et al. (2006) indicated that the majority of college students were not consuming enough fruit and vegetables to prevent diet-related disease.

The rapid socio-economic changes in the past decades have led to significant changes in lifestyle; life has become more sedentary, and students have been affected by these changing lifestyles. It has been reported that knowledge about activity and its health benefits was disappointing, and physical activity was below the recommended levels in a substantial proportion of students in many countries. This might be explained by the fact that students spend more of their time using the internet and watching television. Demographic variables, attitudes, knowledge and beliefs about physical activity are the factors that influence

participation levels in physical activity. The questions in this part of the survey measured participation in physical activity and sedentary leisure behaviour. The selection of this variable was based upon two primary factors. Firstly, it is recognised that the prevalence of physical inactivity is a major public health issue (WHO, 2006), as physical activity is linked to better health (for discussed of this, see 4.4.1). Studying exercise behaviour in this way will identify the levels of physical activity amongst student populations in Libya and the perceived benefits and barriers to students participating in exercise, which is intended to enable the study to recommend programmes designed to enhance physical activity participation in the study population. It is a fact that increased levels of physical activity are associated with improved health, whereas a sedentary lifestyle pattern brings with it an increased risk of chronic heart diseases and other health risks (WHO, 2006)..

Cigarette smoking is the largest preventable risk factor for morbidity and mortality in developed countries, where at least one in four adults smoke cigarettes (Nawaz & Naqvi, 2008). In many Muslim countries, attitudes to tobacco use are ambiguous, for example, it is socially acceptable for men to smoke but not for women. The prevalence of tobacco use among men in these countries is generally high (as should be clear from section 4.5.2). Thus, tobacco control legislation in most Muslim countries is still at a rudimentary stage, with limited restrictions on smoking in public places and advertising being the most common measures taken (WHO, 2007). The questions in this study measured current cigarette use, age of initiation into cigarette smoking, attempted cessation of cigarette smoking, and current use of other tobacco products. As discussed in Section 5.4.1, tobacco smoking is a major health hazard that influences the risk of contracting many different diseases such as cancer, coronary heart disease and congenital defects in children whose mothers smoke during pregnancy

(Carroll et al., 2006; Carcia et al., 2006; WHO, 2008). Therefore this is an attempt to assess smoking behaviours among Libyan HES.

Many different health problems are caused by alcohol and drug consumption; it is one of the most harmful risks to health, and the adverse effect of alcohol have been demonstrated for many disorders, including liver cirrhosis, mental illness, several types of cancer, and damage to the foetus amongst pregnant women (as discussed in Section 4.6.1). There are also social consequences related to alcohol use, including drink-driving incidents, aggressive behaviour and family related problems (WHO, 2006). Alcohol and drug use and their related consequences are social issues affecting university and college students across many different countries (Turrisi et al., 2006; Vantamay, 2009; Ghandour et al., 2009). A WHO (2006) report showed that there is a low prevalence of alcohol consumption rates in the EMR, and it is not an imminent major health problem. However, it is considered to be a potential threat to the health of the public, especially young people, and there is growing evidence to suggest that there is an increasing degree of hazardous consumption amongst student populations in the EMR (Jodati et al., 2007; Lihan et al., 2008; Ghandour et al., 2009). In light of this concern, it has been suggested that more research is required in order to establish a clear idea of the scale of consumption of alcohol and drugs, and to gain more data on trends in alcohol and drug use, and future research is needed to develop an evidence base to determine the pattern and trend of alcohol consumption in the region and also to raise awareness of the public health problems arising from alcohol consumption, to develop strategies at a national level to address its prevention and treatment. Furthermore, to help students to reduce problems associated with alcohol and drug use, an education programme could be conducted targeting the student population, making the best use of the religious assets of the region.

It is particularly necessary to undertake such research because there is special need to raise the awareness of the student population in particular about these healthy and unhealthy lifestyles, so that knowledge can be proactively used for the student population, and also an investigation of these lifestyles will provide useful information which can be used for broader planning and health strategies.

Social-demographic variables

Often in the social sciences researchers are not only interested in looking at which variables vary, or in predicting an outcome; instead of this, they might want to look at the effect of one variable on another by systematically changing some aspect of that variable (Field, 2005). According to Coolican (2009) a large sample study (in the present study N=1300) selected across age, gender, economic and other relevant sections of society, enables researchers to draw reasonable conclusions about relationships concerning the links between different variables (for example, smoking and gender). Consequently, there has been increasing discussion in the literature about the relationship between socio-demographic variables (age, gender, religion and monthly income) and health status and lifestyle behaviours. These variables were chosen in this study to enable it to draw conclusions about the relationship between different variables and how that relationship might help towards understanding health issues and devising health plans. Pallant (2007) recommended that:

“In studies involving human subjects, it is useful to collect information on the number of people or cases in the sample, the number and percentage of males and females in the sample, the range of ages, and education level, and any other relevant background information” (2007, p. 53).

As examples for the association of these variables with health variables, Stock et al. (2007) found considerable gender differences in the prevalence of health complaints, with female students reporting more subjective health complaints than males. Takakura et al. (2005) found that amongst Japanese students, those with low social support were more likely to have health complaints compared to those with high social support. Social support is one aspect which has been associated with improved health behaviours in previous studies, and Takakura et al., (2005); Hart et al., (2007); and Stock et al., (2007) found that lack of social support was significantly related to a wide range of health problems such as depressive symptoms, anxiety and health complaints. Takakura et al. (2005) indicated that students with low social support were more likely to have health complaints compared to those with high social support. According to Stock et al. (2007) the offer of individual counselling and intervention to increase social support among students and to establish social networks, especially in the first year of studies, would help students to cope with psychosocial and study-related stress and to prevent depressive moods, all together resulting in a higher quality of life for the students.

Furthermore, a review of previous studies on the health of student populations demonstrated that university/education related variables (e.g. year of study, subject, importance of having good grades, academic performance and finance of study), were associated with some health problems amongst student populations such as anxiety and depression (as explained in Section 3.6). Therefore these were used in this study to test this association. For example, financial aspects appears to be a major problem for a great number of students, and lack of adequate funding for courses was shown to be placing an added burden on students with limited resources (Martins et al., 2004; Rab et al., 2008; Oliveira, 2008). There is much

evidence of financial hardship in varying degrees, and it appeared that lack of finances was the greatest stressor affecting students, and it seems reasonable to assume that if students were worried about having enough money to pay bills, buy food and afford transport to and from university, their studies were likely to receive less attention. Moreover, Gidlow et al. (2006) reported that there was consistent evidence of a higher prevalence of leisure-time or moderate or vigorous intensity physical activity in those at the top of the socio-economic status compared with those at the bottom.

Behaviours risky to health and their association with health issues should be recognized and addressed in any health prevention or intervention programmes for student populations. As a result, this study is one of the first studies to examine the association between socio-demographic variables and health and health-related behaviours in the Libyan student population.

Respondent burden

In a study of this kind, it is necessary to consider the respondents' burden, and according to Saratakos (2005) the number of questions within a questionnaire can range from only a few to several hundred; however, the golden rule with respect to questionnaire size is that one should include as many questions as necessary and as few as possible. From the pilot study it was recognised that many students did not read the whole questionnaire and it became clear that some students felt it to be a burden, and others pointed out the problem of the length of the questionnaire. As a result, it was necessary to limit the number of questions in the questionnaire. This also had the knock on effect of limiting the ability to cover in depth more

areas. It was recognised that the length of the questionnaire would potentially deter some respondents.

Similar studies

Research searches have found that similar studies have been undertaken in different countries such as Egypt, USA, European countries (Abolfotouh et al., 2007; Carroll et al., 2006; Mikolajczyk et al., 2010), and one of the objectives in this study was to make a critical comparison between Libyan HES and those from other countries. Therefore, future work will compare the findings of these studies, thus providing insights into the general improvement in health amongst citizens in different countries, and the inequalities observed amongst students populations within nations and the differences in the overall national health amongst both developed and developing nations.

Lack of research

As stated earlier in the Introduction, (Section 1.5) in Libya little research has been undertaken into health and health-related behaviours among student populations. Current literature searches have not revealed any similar studies which have been conducted in Libya examining this important issue of health and health-related behaviours in HES, with the sole exception of two studies investigating smoking behaviours amongst medical students in Libya (Buni, 2006; Singh et al., 2006). However, studies have been conducted investigating students from a large percentage of the population of civilised countries. Therefore, such research will fill a clear gap in the literature, and also provide insight into (1) the health status of HES in areas covered by the variables mentioned in the above tables; (2) the prevalence of healthy lifestyle behaviours such as fruit and vegetable consumption and physical activity;

and (3) unhealthy lifestyle behaviours such as smoking and alcohol and drug consumption amongst HES in Libya. In addition, it will help to establish baseline data regarding the health status and lifestyle behaviours of Libyan students which could be useful for health authorities for planning improvements to the health of this population. Investigations have been carried out on students from a large percentage of the population of civilised countries, and it is therefore surprising that little research has been undertaken regarding the health and health-related behaviours of student populations in Libya. Therefore, investigations such as this study will provide scientific evidence which could be used to as guide and direct the development of the strategies, policies and action plans to address all these major health concerns, and also could be useful for health promotion and risk prevention programmes.

In addition, similar recommendations have been made for future research to develop an evidence base outlining the magnitude, pattern and trend of lifestyles and health impacts (WHO, 2006; Jackson et al., 2007; Nazary et al., 2010). This should help to raise awareness amongst student populations of the public health problems arising from unhealthy lifestyle behaviours. Therefore, in this study, the researcher seeks to extend previous research which has been conducted in Libya (Buni, 2006; Singh et al., 2006) to estimate the prevalence of lifestyle behaviours risky to health and examine the association between them, and socio-demographic and study-related variables, in a representative sample of Libyan HES.

5.6.1.7 Pilot study

Researchers seldom begin a study unless they are confident that the chosen methods are suitable, valid, reliable and effective and free from problems or errors, or at least that they have taken all precautions to avoid any problems in the preparatory stages of the research

(Sarantakos, 2005). The items and questions need to be tested for comprehension, clarity, ambiguity and difficulty of response. Therefore, a preliminary questionnaire was constructed to find out possible weaknesses, inadequacies, ambiguities and unknown problems which might exist and might have to be solved before the main study could begin, and to ensure the effectiveness of the research instrument. Also, it was necessary to ensure that the data collection questions worked in the sense that students could quickly, easily and confidently respond to them.

In this study, a self-administered questionnaire was developed and translated into Arabic. This was performed in duplicate by two independent translators, and then the results were checked for inconsistencies. Then, a preliminary Arabic version of the questionnaire was given to a sample of 75 students attending the undergraduate program of one faculty and who did not participate in the main study. The purpose of this activity was to determine the relevance of the items. After this preliminary study, which resulted in some modification of items and wording, some questions which were not understood by the students were rectified and some which were repetitive were deleted.

Subsequent to the pilot study, several questions were later omitted due to their answers being unduly ambiguous, for example when asked about how many hours were spent sitting during the last week, some students put "one hour". It was decided that this answer was highly improbable and therefore the question was omitted. This is just one example of the reasons for several adjustments in the questionnaire following the pilot study.

5.6.1.8 Participants

The target population of the study was university/college students; all of the students were enrolled at universities and colleges in Libya. The health survey was administered to a sample of 2100 students, with 1567 questionnaires returned, and out of these 1567 respondents, 267 were excluded because they had missing data, and therefore 1300 completed surveys were available for analysis.

5.6.1.9 Ethical Considerations

Ethical issues should be considered very carefully, before a questionnaire is distributed. Participants have the right to know what will be done with the data and who will have access to their personal information (Punch, 2003). Therefore, researchers should inform the respondents of the nature and aims of the study, and the type of questions within it before they are asked to take part in the project. Researchers should also avoid questions or issues that may cause embarrassment, guilt or risks to the respondents (Saratakos, 2005). Ethical guidelines exist to respect and protect individuals participating in studies. Thomas and Nelson (1996) proposed the following rights of the participants which must be considered by the researcher; the right to privacy or non participation, the right to remain anonymous, the right to confidentiality and the right to expect experimenter responsibility. Researchers should allow respondents to leave unanswered questions for which they do not wish to provide the information required.

These requirements were adhered to in this study with the following procedures. Respondents were informed of the nature, aims of the study and the type of questions by using a participant information sheet (see Appendix 4). In addition, participants were

informed that the questionnaire was anonymous, participation voluntary and the information gathered used only for the purpose of the study. As this study involved adults over the age of 18 years, clearance from the University Ethics Committee was not required. A verbal briefing of the study was given to all students before the questionnaires were handed out. Prior to them completing the questionnaire, informed voluntary consent was obtained from all participants. It was emphasised that participants did not have to take part and they had, at any time, the right to withdraw. Participants were not required to state their name; instead the questionnaires were numbered for the purposes of analysis. Confidentiality was established as only the researcher saw the original data. In addition, from the pilot study it became clear that many students, particularly female students, often declined to be weighed or measured. This therefore led the researcher to rely on self-reported height and weight.

5.6.1.10 Sample Size

Sampling is one of the fundamentals of research, and there are concerns about the right sample size in quantitative research, especially with social investigations. For a number of researchers, sample size is related to the nature of the population as well as the type of analysis employed, and is required to allow statistical inferences, but this is not always the case. Many statistical measures are designed for samples smaller than 30. One other point needs to be noted, it concerns the important relationship between the number of variables and sample size, and it makes sense that the more variables being studied the greater the sample size needs to be, (Keith, 2003). Sarantakos (2005) outlined some important components or characteristics of quantitative sampling:

- The sample size is relatively large
- In most cases it employs statistics

- It occurs before data collection
- It is time consuming
- It involves high costs

The reliability of factor analysis is dependent on sample size, and the common rule is to suggest that a researcher has at least 10 – 15 participants per variable (Field, 2005). Tabachnick & Fidell (2001) agree that it is advisable to have at least 300 cases for factor analysis, and states that 300 a good sample size, 100 as poor and 1000 as excellent. More recently McCollum et al, (1999) have shown that the minimum sample size or sample to variable ratio depends on other aspects of the design of the study. In short, their study indicated that as communalities become smaller, the importance of sample size increases. With a greater degree of communality, relatively small samples (less than 100) may be perfectly adequate. With communalities at a slightly lower level, samples between 100 and 200 can be good enough, provided there are relatively few factors each with only a small number of indicator variables. In the worst scenario of low communalities and a larger number of underlying factors, a sample above 500 is recommended (Field, 2005).

In this study, subjects were selected from different universities/colleges and disciplines including agriculture, business, education, law, mechanical engineering, medical science, medical technology and other sciences. A sample of 2100 male and female undergraduate students were selected for this study, 1567 responses were returned from those students who attended lectures on the day of collection, and the subjects' ages were mostly between 18 -34 years, with a mean age of 20.96 years; the response rate was 74.6%. After internal processing

procedures, 267 incomplete questionnaires were excluded from the sample because they had missing demographic data. The total number of questionnaires used for the analysis was therefore 1300 (N=1300).

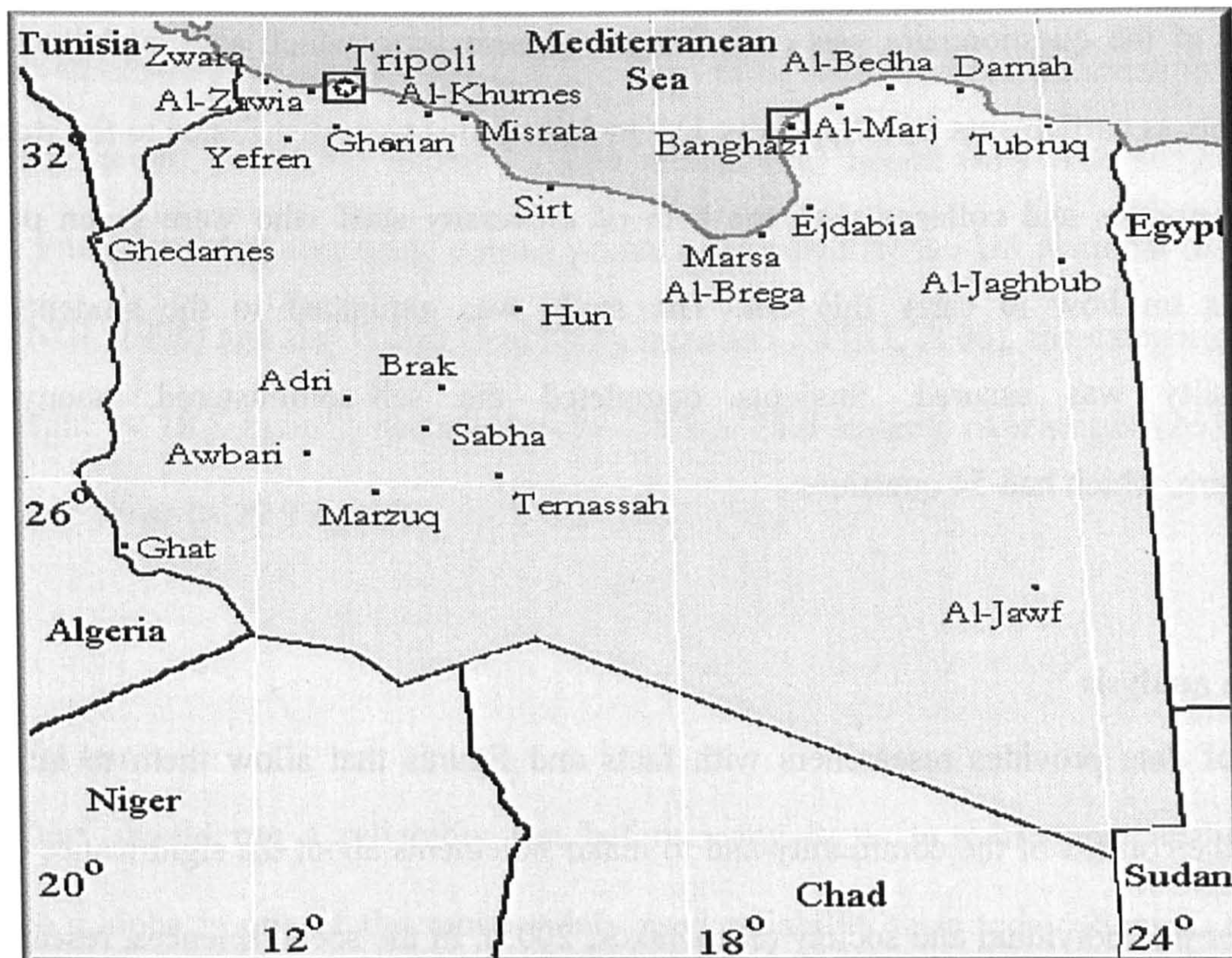
5.6.1.11 Procedure of data collection

The data collection strategy can strongly influence the quality of the data. Better planning for data collection, including a professional and ethical access and approach to respondents, leads to better quality of data. The cooperation of the respondents to answer honestly and conscientiously depends on careful planning and preparation by the researcher, and the researcher should strive for response rates of at least 60%, so the response rate needs to be considered well before the actual data collection (Keith, 2003). The most common method of data collection in the type of survey is the self-reported questionnaire.

There were several steps in the preparation for the data collection. Firstly, a letter of authority and introduction was obtained from the Libyan Embassy in London which invited educational establishments to participate in the research (see Appendix 3), this letter was then distributed to ten universities and five higher education institutes in Libya. Six universities and three higher institutes responded positively. The remaining universities and higher institutes did not give a reason why they decided not to participate. Therefore, the researchers had to deal only with the positive organisations. On the subsequent trip to Libya, each of these establishments was visited, information sheets were distributed, and appointments were made to discuss arrangements for the questionnaire distribution and completion.

In this study, once permission was granted by the universities and colleges targeted by this study, the relevant lecturers for those dates chosen were contacted for their permission to use some of their lecture time to collect the data. Data was collected from different cities in Libya (Misrata, Zawia, Sirt, Sabha, Banghazi and Tripoli), and it was derived from both rural and industrial areas. Respondents were from different disciplines (engineering, medicine, science and humanities), and from nine institutes; six universities (Al-Fateh, Garyounis, Omar El-Muktar, Sebha, Tahaddi and Seventh of October University) and 3 colleges (Higher Medical Technology Institute, Higher Industrial Technology Institute and Higher Computer Technology Institute). The study was conducted between October 2008 and February 2009.

Figure 5.3: Location of Libya cites surveyed in this study in data collection



Before the questionnaires were distributed, a brief introduction to the study's purpose was given, however the participants were not told exactly what the questionnaires were analysing

as this may have affected their responses, therefore threatening reliability. The project was introduced as a study of students' health, and students were assured that the questionnaires did not represent a "test" and that there were no correct or incorrect answers. Emphasis was placed on completing the questionnaire independently, answering honestly and accurately, and assurances were given as to the confidentiality of their responses. Care was taken before each questionnaire was completed to thoroughly explain the type of response required.

Questionnaires were administered personally (on-site) rather than using email or post to elicit a higher response and return rate. Questionnaires were passed around the lecture theatre. Issuing them in this manner meant those who did not want to take part may have felt more at ease as they could have simply passed them on to the next student without being noticed. The front page of the questionnaire was an informed consent form which also explained their ethical rights as participants (see Appendix 1). Questionnaires were distributed to the students in the universities and colleges with the help of university staff who were given precise instructions on how to carry this out. The study was explained to the students and confidentiality was assured. Students completed the self-administered, anonymous questionnaire, which had 54 questions.

5.6.2 Data analysis

Analysis of data provides researchers with facts and figures that allow them to interpret results in the context of the community and to make statements about the significance of the findings for the individual and society (Sarantakos, 2005). In the social sciences, researchers are usually interested in discovering something about a phenomenon that they assume actually exists. Whatever the phenomenon, they seek to explain it by collecting data, and then

using these data to draw conclusions about what is being studied (Field, 2005). As a result, data from the completed questionnaire were input into an SPSS statistical package, 16.0 version, to provide basic frequencies and percentages. This information was presented in frequency tables. A frequency tables provide the number of students and percentage belonging to each of the categories for the variable in question. Before undertaking the analysis itself, the survey data was prepared, through such preliminary activities as data processing and data entry. Also, questionnaire responses were proofread by the researcher, and decisions were made about unclear response situations where a respondent had answered with more than one alternative or had missing data. This resulted in 267 questionnaires being discarded from the study and the data not used in analysis, leaving a total of 1300 questionnaires for the analysis. Once that was done, the questionnaire responses were entered into the computer for electronic data processing. The BMI was calculated as weight in kilograms divided by the square of height in meter, using self-reported information on body weight and height, according to the formula $\text{weight (kg)} / \text{height (m}^2\text{)}$. The subjects were grouped into four categories using cut-off points established by the US National Institute of Health (NIH, 1998) and the World Health Organization (WHO, 2006), the categories being: underweight ($< 18.5 \text{ kg/m}^2$); normal weight ($18.5 - 24.9 \text{ kg/m}^2$); overweight ($25.0 - 29.9 \text{ kg/m}^2$); and obese ($> 29.9 \text{ kg/m}^2$).

Reliability test

Researchers should run a reliability test before using items in subsequent analysis, and Cronbach's alpha is one of the most widely used reliability tests today (Santos, 1999). It measures how well a set of items or variables express a single uni-dimensional latent construct, and it is not a statistical test, it is a coefficient of reliability. According to Bryman,

(2008), “Cronbach’s alpha is an index of reliability associated with the variation accounted for by the true score of the underlying construct. Construct is the hypothetical variable that is being measured”. The Alpha coefficient ranges in value from 0 to 1, the cut off value for being acceptable is 0.70, a higher the score, the more reliable the data , and if the scale shows poor reliability, then individual items within the scale must be re-examined and modified or completely changed as needed (Santos, 1999; Bryman, 2008). In the present study, depressive symptoms scales and general health complaints scales were tested for reliability and the results are shown in Table 5.2.

Table 5.2: Reliability test for depressive symptoms and general health complaints

Scale	N. Items	Cronbach’s Alpha
Depressive symptoms	19	.860
Health complaints	8	.730

With regard to depressive symptoms analysis, the study used a cut-off point of the M-BDI scores for screening for clinically relevant depressive symptoms at ≥ 35 , which is recommended in the general population (Schmitt et al., 2006). The distribution of M-DBI scores was compared for different university/college location and gender using selected percentiles and mean values. In the present study, depressive symptoms scales and general health complaints scales were tested for reliability using Cronbach’s alpha test.

Non-parametric test

Tests are also divided into parametric and non-parametric tests. A parametric test uses the concept of the normal curve, assuming that the variable under investigation is distributed averagely amongst the population. Non-parametric tests do not have previous perceptions about the distribution of the underlying population and therefore do not have such strict requirements. Due to the nature of this research, the data collected in this study does not meet the stringent assumptions of parametric techniques, and it was therefore decided that non-parametric tests would be used to facilitate statistical analyses. Non-parametric techniques are better suited to data that are measured as nominal (categorical) and ordinal (ranked) scales (Pallant, 2007).

Sarantakos (2005) and Black (1999) have documented a number of advantages that can be attained by employing non-parametric tests:

- All kinds of data may be used in the non-parametric method.
- Non-parametric tests make fewer and less strict assumption than parametric tests.
- Non-parametric statistical tests are often easier to learn and apply than parametric tests.
- Non-parametric methods are often a more economical approach since they can save the researcher time, money and labour. This is done by using a large sample of data which is more easily measured.
- Non-parametric tests go to the solution of the problem without testing the parameters of the population.

The disadvantages however of using non-parametric methods are raised as soon as all the assumptions of the parametric methods are achieved and the data is to be measured on an interval or a ratio scale. After coding the responses of the questionnaire data in line with the categories of respondent groups, the data were then transferred to the SPSS computer software package for analysis. The statistical techniques used for the purpose of analysing the data relevant to this research are reviewed in the following section.

1. Descriptive analysis methods

Statistical analysis can generally be categorised into two different kinds, namely descriptive and analytical statistical methods (Pallant, 2007). The former describes the transformation from raw data to a form which is more easily organised and understood for descriptive information. This technique usually involves the calculation of frequency distributions, means, standard deviations, medians and percentage distribution which help the researcher to describe the characteristics of the sample and to answer any specific research questions. Descriptive statistics can be found using a variety of methods, using frequencies, descriptive or exploratory. Nevertheless there are different procedures which are dependent on whether categorical or continuous variable are used. Mostly, this study used frequency distributions, percentage distribution and means. The results are presented in Chapter Six (Sections 6.4, 6.5 and 6.6).

2. Statistical techniques to compare groups

The Chi-square (χ^2) test allows researchers to establish their confidence in a relationship between two variables, within the population. It is used to determine the presence of an association between two variables (Bryman, 2001). Chi-square (χ^2) is a non-parametric test. Sometimes, chi-square (χ^2) tests are called tests of association, for example, in

survey studies, when the number of items falling into the categories are counted: it can be concluded that the values of one variable are associated with the particulars of another (Clegg, 1999). To compare the frequencies between Libyan institutes and gender, the Chi-square (χ^2) test was used. To be significant the “Sig” value needs to be .05 or smaller. If it is not then this means that the proportion of one value is not significant to the other value (Pallant, 2007, p. 259). A P value of ≤ 0.05 was used as the criterion for statistical significance.

Moreover, a systematic comparison was conducted to critically compare the health status and lifestyle behaviours of the Libyan HES with those from other nations (as mentioned above in Sections 3.7. and 4.9). This was conducted by comparing between the findings from research questions 1 to 4 and previously published health status and lifestyle behaviour results for HES from other countries. According to Mikolajczyk et al., (2008) self-reported health status is a valid and reliable measure for assessing the subjective and objective health of individual, and can reasonably be used to compare students’ health across countries.

3. Statistical techniques to explore relationships among variables

Finally, binary logistic regression analysis was used to study the relationships between independent and dependent variables (socio-demographic, health and health-related behaviours) to find how the variables were distributed, and how they were related to each other (Saratakos, 2005). The reason for choosing Binary Logistic Regression analyses here was that all the independent variables (depressive symptoms, anxiety, depression, general health complaints and dieting behaviour) which needed testing with independent variables

were inside the range of 0-1, and Binary Logistic Regression analyses generally coded them as 0-1. The range of the Pearson correlation coefficients was between -1 and +1 (Pallant, 2007), and the sign indicated whether there is a positive association (as one variable increases, so too does the other) or a negative association (as one variable increases, the other decreases) or no relationship. Odds ratios (OR) and 95% confidence intervals were calculated based on logistic models using the enter mode to adjust for other factors.

All the variables (social-demographic and academic variables) discussed in Section 5.6.1.5 were entered into the model in order to test their association with the health and lifestyle variables. The logistic regression analysis was used separately for each dependent variable with all independent variables, as predictors in order to assess the degree of association. The independent variables entered into the logistic regression model were: gender, age, year of study, subject, university/college location, social support, satisfaction with social support, satisfaction with body weight, importance of being thin, levels of body weight, monthly income, finance of study, and living place during the semester. The dependent variables entered into the logistic regression model were: mental health disorders (depressive symptoms, anxiety and depression), health complaints (headache, back pain and sleep disorder), and dieting behaviour. The results are presented in Section 6.7.

5.7 Limitations of the Methodology

Many of the limitations in relation to the research strategy and approach have been highlighted above. It is however, also recognised that further fundamental constraints on this study were the time allowance of the universities, and also the culture of Libya. The questionnaire method was used to collect data in this study due to the highly sensitive and

confidential nature of some of the questions, most specifically those relating to mental health conditions (depressive symptoms, anxiety and depression). Privacy was also of particular concern due to the fact that both alcohol and drugs are considered illegal and totally unacceptable in Islamic society. Another difficulty encountered when considering interviews as a method, would be the culture with regard to women. The researcher, being male would never have been considered, it acceptable to ask personal questions about weight or height for example. A related issue was the fact that the questionnaire was to remain confidential and all guarantees of anonymity were given. This was in order to promote honest, accurate and confidential responses. In this study the time element was also a serious consideration. Out of a concern for the privacy of their students, the university authorities made it clear that the researcher would not be allowed to interview or give out questionnaires during the students' free time. It was therefore necessary to do this during lecture time and this time was limited by the universities and colleges involved to twenty five minutes. Therefore, this limited the number of variables able to be collected. Yet another limitation of the present study is the fact that the respondents' weight and height were self-reported and this may raise questions about the accuracy of BMI values, therefore, the prevalence of overweight and obesity or even underweight may be different than reported herein. Another limitation in terms of depressive symptoms was that the M- BDI was used as a research tool to measure depressive symptoms, but with the validity and reliability of information on the M-BDI possibly restricted to the German population (Schmitt et al., 2006). The range and extent of depressive symptoms amongst students in Libya may have been overestimated by the M-BDI.

Finally, if more time had been available, the researcher could have included more questions in the questionnaire to cover a wider range of variables in order to obtain diversified data. These limitations' will be summarized in the discussion chapter.

5.8 Summary

This chapter has explaining the epistemological position and explained the justification for choices of research methodology and method, based on research questions and research objectives. The study is an attempt to provide research evidence on the health status and lifestyle behaviours of HES in Libya and their relationships with socio-demographic factors. In addition, this chapter discusses the most appropriate methods chosen in order to carry out this research project successfully. It examined the participants, the data collection techniques used, data analysis and ethical considerations. The following chapter presents the research findings derived from the questionnaire survey distributed to HES in Libya, and the data gathered through using the methods detailed above.

CHAPTER SIX

RESULTS

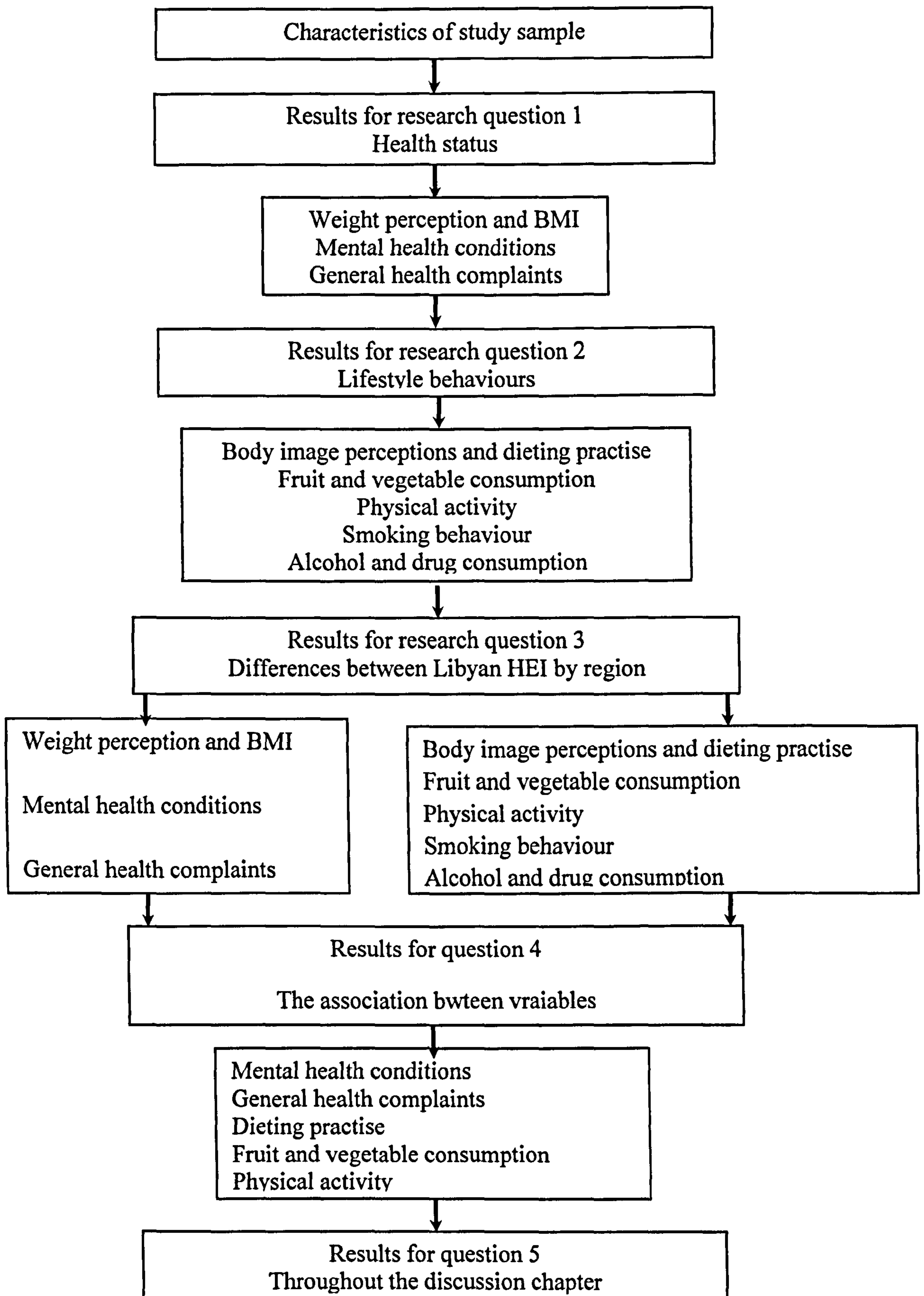
6.1 Introduction

The objective of this chapter is to present the overall findings derived from the questionnaire survey. The results detailed in this chapter are classified and categorised to describe the prevalence of various health indicators and behaviours in the sample population (weight perception and BMI, mental health conditions, health complaints, fruit and vegetable consumption, dieting behaviour, physical activity levels, smoking behaviour and alcohol consumption), broken down by gender. This allows the results to be clearly and concisely compared with previous research carried out in this area. Where appropriate and relevant, results regarding age and gender have been included. These have been omitted from other sections where it has not been considered significant to add this information. Most of the findings presented in this chapter are based on collapsing the response options to questionnaire items. As an example, in the analysis of the results for social support, the responses were collapsed to a two-point scale (0= low social support and 1= high social support). Similarly, for physical activity, the responses were collapsed to a two-point scale (0= not meeting the recommended levels and 1= meeting the recommended levels).

The remainder of this chapter is organised as follows: Section two presents the characteristics of the study sample. Section three provides insight into demographic, social, and economic variables such as: (1) accommodation during the semester; (2) social support; (3) monthly income; (4) finance of study; and (5) the importance of religion. Sections four and five detail survey results for questions number 1 and 2; the data were analysed using tabulations by

genders. Both descriptive and inferential statistics were performed. Frequency, mean and percentages were used to describe various indicator variables such as health status and lifestyle variables. Pearson's Chi-square (χ^2) test was used to test for differences between categorical data. Section six offers findings relating to research question 3, descriptive statistics were performed using tabulations according to Libyan HEI regions. Pearson's Chi-square (χ^2) test was used to compare the frequencies and percentages in the health status and lifestyle behaviours categories between Libyan HEI by region. For question 5, the results will be addressed throughout the discussion chapter by comparing the findings of the present study with those studies which have targeted HES conducted in other countries. Section seven present the findings related to the logistic regression analysis, which was used to examine the association of the factors: gender, age, year of study, subject, quality of life, social support, monthly income, finance of study, living place during the semester and satisfaction with social support, with the variables depressive symptoms: anxiety, depression, health complaints and dieting practice, as dependent variables. The last section briefly summarises the findings and concludes the chapter.

Figure 6.1: Chapter six contents



6.2 Characteristics of study sample

Descriptive characteristics of the study sample are shown in Table 6.1. The sample includes 1300 higher education students, 439 (33.8%) males and 861 (66.2%) females. Through analysis of the responses from the questionnaires and through visiting the nine institutions, it became clear that there were many more female than male students. The growth in female student enrolment in higher education is a positive aspect of the Libyan education policy. The number of female university students has increased dramatically since the last decade (Al-Qazzat, 1997), in addition to female students being enrolled in higher technical institutes. Females were concentrated in the humanities and males in science, engineering and business faculties. Government encouragement has led to increased participation of females in the sciences, especially in medicine in Libya. Social attitudes concerning the appropriateness of females and males working together either in school, or later in the workplace, inhibit more rapid advancement of women into non-traditional professions (El-Hawat, 2003). A discussion of this difference will be provided in the next chapter.

Respondents were from different disciplines (engineering, medicine, science and the arts), and from nine institutes, six universities (Al-Fateh, Garyounis, Omar El-Mukhtar, Sebha, Tahaddi and Seventh of October University) and three colleges (Higher Medical Technology Institute, Higher Industrial Technology Institute and Higher Computer Technology Institute). The study was conducted between October 2008 and February 2009.

Respondents were aged between 18-34 years. The mean age was 20.96, (SD, 2.35 years). It was not recorded who did and who did not return the completed questionnaires, and therefore

it due to the guarantees on anonymity given was not possible to know any further personal information which may have been helpful in order to make conclusions. According to Roth and Parry (1997), people who reply to questionnaire may be atypically receptive; this reduces the generalisability of findings (p.377). The individuals who did return the questionnaires may be those who actually had better health than those who did not.

Table 6.1: Descriptive characteristics of study sample

Variable	Male (N=439) N (%)	Female (N=861) N (%)	Total N (%)
Age (year)			
< 20	109 (25)	251 (29)	360 (28)
20 -24.9	288 (65.5)	560 (65)	848 (65)
25 -29.9	40 (9)	41 (5)	81 (6.2)
≥ 30	2 (0.5)	9 (1)	11 (0.8)
University/college location			
North	126 (29)	152 (18)	278 (21)
South	53 (12)	217 (25)	270 (21)
East	24 (5)	124 (14)	146 (11)
West	236 (54)	368 (43)	604 (47)
Year of study			
Year 1	188 (43)	244 (28)	432 (33)
Year 2	86 (20)	270 (31)	356 (27)
Year 3	82 (19)	237 (28)	319 (25)
Year 4	58 (13)	87 (10)	145 (11)
Year 5	19 (4)	13 (2)	32 (2.5)
Special year*	6 (2)	10 (1)	16 (1)
Place of birth			
Libya	420 (96)	843 (98)	1263 (97)

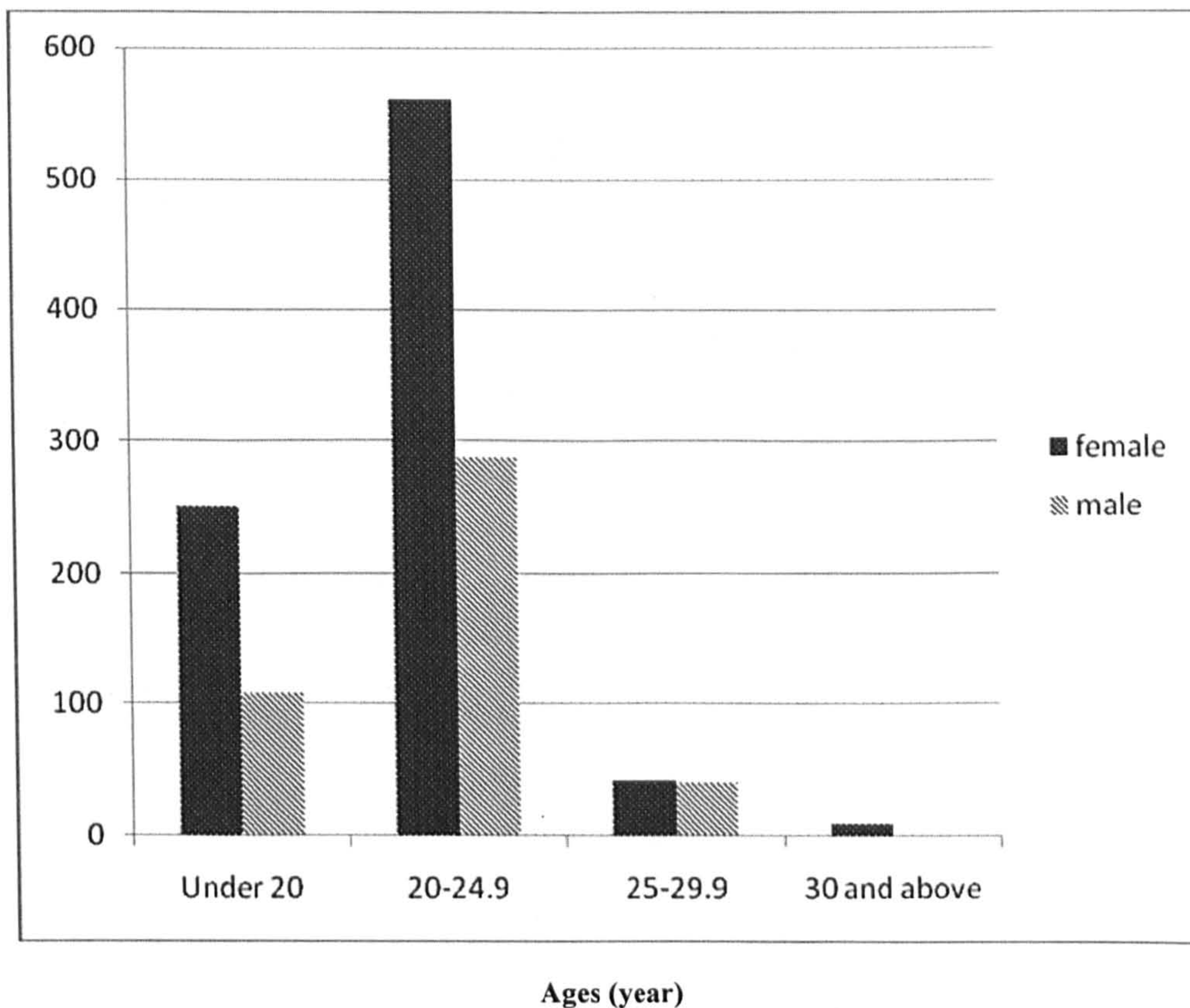
Other	19 (4)	18 (2)	37 (3)
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*Special year = some faculties have one year for training (e.g. medicine faculty).

6.2.1 Age and gender

As can be seen from Figure 6.2, there were significant age differences ($P= 0.007$) of students across the whole sample: while 65.2% of students were between 20 and 24.9 years, and 27.7% under 20 years, 6.2% students were between 25- 29.9 years. Moreover, 0.8% students were ≥ 30 years and above. The ages of 20-24 years are the ‘normal’ age for studying at the higher education level in Libya.

Figure 6.2: Age and gender distribution

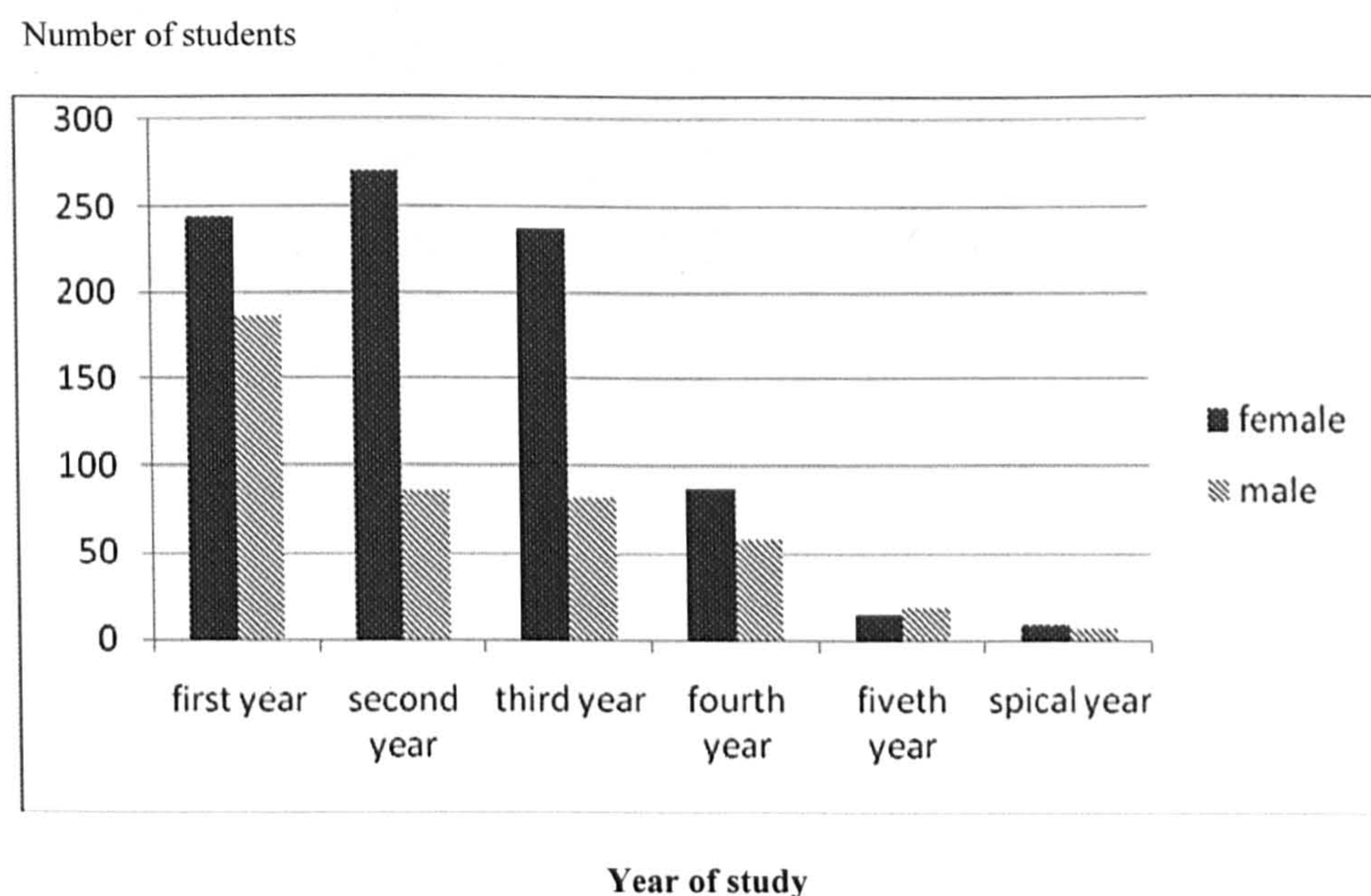


6.2.2 Year of study by gender

As can be seen from Figure 6.3, in the study sample, most students (96.3%) were in their first, second, third and fourth year, and only 3.7% of the sample were in their fifth or special year.

The fifth year is only taken in medicine and in this study one medicine faculty was used. The study showed there was a steady decline in the students' population as a whole from years one to four. There could be four main reasons for this. Firstly, the first year at most universities covers general studies, which are relatively easy compared to second year studies, which causes some students to follow different career options, e.g. find employment. Secondly, there is strong social pressure for women to get married at this age and so many leave universities to do so. Thirdly, financial difficulties may cause students to leave. Finally, some students may underestimate the level of academic difficulty and are forced to leave because they fail their courses.

Figure 6.3: Year of study by gender

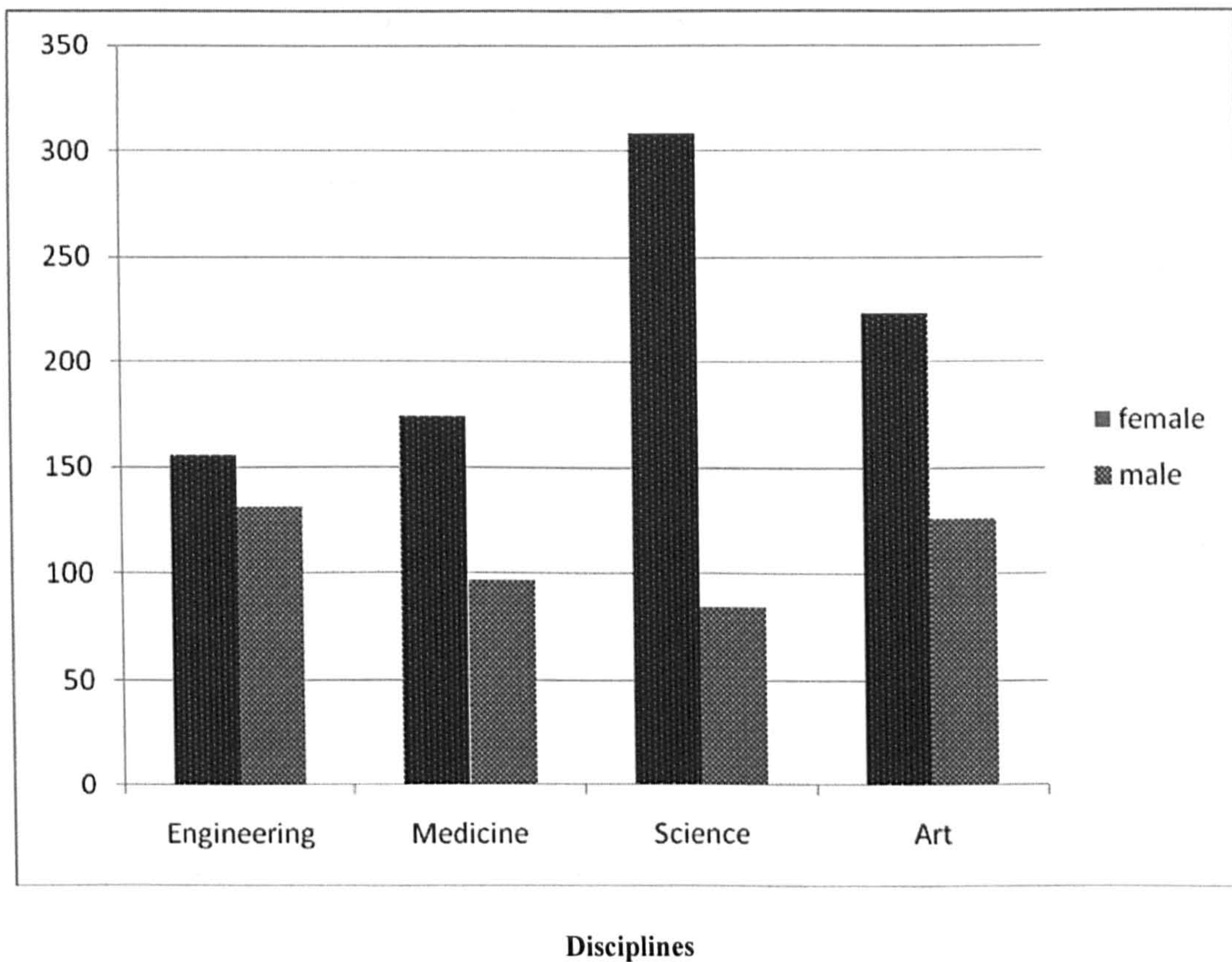


6.2.3 Discipline studied by gender

As shown in Figure 6.4, in the study sample the largest proportion of students, 30.2%, were from the science subjects, 26.8% were from art subjects, 22.2% medicine and 20.8% were from engineering. Also, there was a slight gender separation of science and art, and other subjects in the education system in Libya, with more female students in science and art universities (more explanation will be provided in next chapter).

Figure 6.4: Discipline studied by gender

Number of students



Science = Chemistry, Physics, Maths, Agriculture and Economics; Art= Psychology, History, Geography, Archaeology and Languages.

6.3 Demographic and social economic variables

6.3.1 Accommodation during the semester

Respondents were asked to report where they lived during a semester; as shown in Table 6.2 most respondents (84.7%) reported living with their parents, whereas just 13.7% reported living in university/college accommodation, and 1.6% reported living alone. Female students were more likely to live in their parents' home during study terms.

Table 6.2: Accommodation during the semester by gender

Options	Gender			P-Value
	Female	Male	Total	
Alone	4 (0.5%)	17 (3.9%)	21 (1.6%)	.001
My parents	776 (90.1%)	325 (74%)	1101 (84.7%)	
Accommodation	81 (9.4%)	97 (22.1%)	178 (13.7%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.3.2 Social support

Respondents indicated how many people they knew including their family and friends who supported them when they felt down. Satisfaction with social support was measured by the following question: "Are you on the whole satisfied with support you get in such situations?" Social support in this study was categorized to two groups, low social support (three or fewer persons) and high social support (more than three persons). Overall, 39.5% of students reported having low social support, and 60.5% of students reported having high social support.

As shown in Table 6.3 for the whole total sample, about 66% of the whole sample reported being very satisfied with social support, and 22% reported being somewhat satisfied, whereas only 12% of the total sample were dissatisfied with social support.

Table 6.3: Satisfaction with social support by gender

Status	Gender			P-Value
	Female	Male	Total	
Dissatisfied	90 (10.5%)	62 (14.1%)	152 (11.7%)	NS
Somewhat satisfied	186 (21.6%)	101 (23%)	287 (22.1%)	
Satisfied	585 (67.9%)	276 (62.9%)	861 (66.2%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.3.3 Monthly income

The perception of having sufficient income was high; about three-quarters of students reported having sufficient income. Chi-squared test showed a significant gender difference ($P=0.001$) with more females than males reporting having sufficient income (Table 6.4).

Table 6.4: Monthly incomes by gender

Options	Gender			P-Value
	Female	Male	Total	
Insufficient	198 (23%)	154 (35.1%)	352 (27%)	.001
Sufficient	663 (77%)	285 (64.1%)	948 (73%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.3.4 Finance of study

Overall, three-quarters of students reported that they financed their studies by parental support, whereas just 9.2% of students reported financing their studies by having worked during semester. Most students who reported that their studies were financed by work during a semester were males (Table 6.5).

Table 6.5: Finance of study by gender

Options	Gender			P-Value
	Female (n=861)	Male (n=439)	Total (n=1300)	
Parents' support	773 (89.8%)	231 (52.6%)	980 (77.2%)	.001
Job during semester	32 (3.7%)	89 (20.3%)	120 (9.2%)	
Scholarship	32 (3.7%)	31 (7.1%)	63 (4.8%)	
Students loan	16 (1.9%)	19 (4.3%)	35 (2.7%)	
Job during breaks	8 (0.9%)	69 (15.7%)	77 (5.9%)	

6.3.5 The importance of religion

The majority (97.6 %) of the students of both sexes reported that they agreed with the statement (*My religion is very important in my life*), whereas just 1.7% of students disagreed (see Table 6.6).

Table 6.6: Importance of religion by gender

Options	Gender		Total	P-Value
	Female	Male		
Disagree	10 (1.2%)	12 (2.7%)	22 (1.7%)	.001
Neither	2 (0.2%)	7 (1.6%)	9 (0.7%)	
Agree	849 (98.6%)	420 (95.7%)	1269 (97.6%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.4 Results for research question 1 (Health status)

The first research question of the present study was concerned with the self-reported health status of higher education students in Libya. This was done using some subjective health indicators (weigh perception and BMI, mental health disorders and health complaints). Gender differences in health status were also explored, to assess whether gender differences regarding health status in the three health indicators were present.

6.4.1 Health perception

Distribution of perceptions of health is shown in Table 6.7. Overall, 19.5% of students reported their health as excellent, and a third of the students surveyed perceived their health to be very good, while one third reported it as good, 11.8% as fair, whereas just 2.5% felt that their health was poor. Moreover, students were asked how often they had visited a doctor in the previous 6 months. Libyan students reported a high level of visits to a doctor, more than one third (35%) of the whole sample reported having visited a doctor at least once in the previous 6 months. Female students were (35.5%) slightly more likely to have visited a doctor at least once in the previous 6 months compared to males (32.8%). Dental problems, colds, headaches, and stomach trouble were the most frequent reasons given by students.

Table 6.7: Perceptions of general health by gender

Gender	Options						P-Value
	Poor	Fair	Good	Very good	Excellent	Total	
Female	18 (2.1%)	106 (12.3%)	275 (31.9%)	306 (35.5%)	156 (18.1%)	861 (100%)	NS
Male	15 (3.4%)	47(10.7%)	149 (33.9%)	131 (29.8%)	97 (22.1%)	439 (100%)	
Total	33 (2.5%)	153(11.8%)	424 (32.6%)	437 (33.6%)	253 (19.5%)	1300 (100%)	

6.4.2 Weight perception and BMI

Distribution of body image perception in female and male students is shown in table 6.8. The highest proportion of students (53.8%) rated their weight as “just right”, 24.5 % reported it as “a little over weight”, 18.4 as “thin”. The percentage of students considering their weight as “obese” was considerably lowers (3.3%). A chi-squared test showed no significant gender difference in the proportion of body image perception.

Table 6.8: Perceptions of body weight

Gender	Options				Total	P-Value
	Thin	Just right	A little overweight	Obese		
Female	159 (18.5%)	460 (53.4%)	211 (24.5%)	31 (3.6%)	861 (100%)	NS
Male	79 (18%)	240 (54.7%)	108 (24.6%)	12 (2.7%)	439 (100%)	
Total	238 (18.4%)	700 (53.8%)	319 (24.5%)	43 (3.3)	1300 (100%)	

Distribution of BMI in female and male HES is shown in Table 6.9. The body mass index was calculated as weight (kg) divided by height (m²), and BMI had a range from (13.02-36.89 kg/m²) in females and from (13-45.71kg/m²) in males with mean of 23.39- SD 3.97. BMI classification criteria for underweight, normal weight, overweight and obese used in this study were BMI >20 kg/m², 20.0-24.9 kg/m², 25-29.9 kg/m² and ≤ 30 kg/m², respectively, as described by The National Heart, Lung, and Blood Institute (1998). A few students were obese (4.7%); most of them were males. The percentage of overweight was higher in males than in females (24.1%, 15.1%), and more females (15.6%) than males (12.3%) reported their weight to be underweight.

Table 6.9: Body mass index (BMI) by gender

Gender	BMI Groups						P-Value
	Missing data	Under Weight	Normal Weight	Over Weight	Obese	Total	.001
Female	191 (22.2%)	134 (15.6%)	380 (44.1%)	130 (15.1%)	26 (3%)	861 (100%)	
Male	42 (9.6%)	54 (12.3%)	202 (46%)	106 (24.1%)	35 (8%)	439 (100%)	
Total	233 (17.9%)	188 (14.5%)	582 (44.8%)	236 (18.2%)	61 (4.7%)	1300 (100%)	

Missing data = respondents do not either know their weight or height or both; or do not wish to report it; Underweight = respondents' BMI < 20; Normal weight = respondents' BMI between 20-24.9; Over weight = respondents' BMI between 25-29.9; Obese = respondents' BMI ≥ 30.

6.4.3 Mental health conditions

Depressive symptoms: Due to incomplete responses on the 18 items of the M-BDI, 1.3% of scores based on all items were missing. A chi-squared test showed statistically significant gender differences with respect to gender ($P = .001$). The percentage with scores ≥35 was above 51% among female students, and for male students the percentage was substantially lower (32.6%). The percentage with scores ≥35 for the total sample was around 45%. The cumulative distribution of M-BDI scores is shown in Table (6.10).

Table 6.10: Prevalence of depressive symptoms by gender

Status	Gender		Total	P-Value
	Female	Male		
Not depressed	412 (48.8%)	295 (67.4%)	707 (55.1%)	.001
Depressed	433 (51.2%)	143 (32.6%)	576 (44.9%)	
Total	845 (100%)	438 (100%)	1283 (100%)	

Anxiety and depression diagnosed by health practitioner: Anxiety and depression were measured by the following question: "Have you ever been diagnosed with anxiety disorder or

depression?” The prevalence of anxiety and depression by gender is shown in Tables 6.11 and 6.12. Overall, 8.8% of respondents reported being diagnosed with anxiety and 4.3% depression. The prevalence of anxiety and depression was slightly higher among female students than male (9.5 % and 7.3 %, respectively). A chi-squared test showed no statistically significant gender differences.

Table 6.11: Prevalence of diagnosed anxiety by gender

Anxiety	Gender			P-Value
	Female	Male	Total	
No	779 (90.5%)	407 (92.7%)	1186 (91.2%)	NS
Yes	82 (9.5%)	32 (7.3%)	114 (8.8%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

Table 6.12: Prevalence of diagnosed depression by gender

Depression	Gender			P-Value
	Female	Male	Total	
No	827 (96.1%)	417 (95%)	1244 (95.7%)	NS
Yes	34 (3.9%)	22 (5%)	56 (4.3%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.4.4 General health complaints

General health complaints were measured by the following question: “How often did you have the following problems during the last 12 months?” The symptom checklist included eight items (stomach complaints, heart problems, back pain, headache, sleep disorder,

difficulties to concentrate, neck and shoulder pain and depressive mood). Stomach complaints, back pain and headache were reported as the most prevalent somatic complaints for both sexes. Female students showed the highest rates in most of the categories of complaints, while male students had the lowest rates in most of the symptoms (Table 6.13).

Table 6.13: General health complaints by gender

Complaints	Never		Rarely		sometimes		Quite/Very often		P-Value
	Female	Male	Female	Male	Female	Male	Female	Male	
	%	%	%	%	%	%	%	%	
Stomach trouble	45.2	52.2	20.9	19.4	26.7	24.4	7.2	4.1	NS
Heart problem	50.9	63.8	18.5	19.6	24.9	13.2	6.6	3.4	.001
Back pain	27.9	34.4	24.9	23.9	34.4	29.6	12.9	12.1	NS
Headache	11	17.5	24.4	29.6	42	40	22.5	12.8	.001
Sleep disorders	24.9	33.5	22.4	22.1	33.8	30.3	18.9	14.1	.005
Difficulties to concentrate	16	20.3	25.11	27.1	43.6	38.7	15.3	13.9	NS
Neck/shoulder pain	39.3	35.1	24.6	24.8	24.5	30.3	33.2	34.6	NS
Depressive mood	20.7	29.2	17.7	21.2	11.6	9.8	28.5	15	.001

6.5 Results for research question 2 (Lifestyle behaviours)

The second research question examined the lifestyle behaviours among Libyan higher education students, for example, smoking behaviour, physical activity and drug and alcohol consumption. A gender difference regarding lifestyle behaviours was also identified.

6.5.1 Weight satisfaction and dieting behaviour

Weight satisfaction by gender is shown in Table 6.14. Over a third of the whole group of students were dissatisfied with their weight, with around the same proportion of students who

were very satisfied with their weight. Altogether, 40% of the total sample was somewhat satisfied. Female students were slightly more likely to be dissatisfied with their weight.

Table 6.14: Weight satisfaction by gender

Weight satisfaction	Gender		Total	P-Value
	Female	Male		
Dissatisfied	298 (34.6%)	136 (31%)	434 (33.4)	NS
Somewhat satisfied	319 (37%)	161 (36.7%)	480 (36.9%)	
Very satisfied	244 (28.3%)	142 (32.2%)	386 (29.7%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

Participants were asked to report if they had ever tried to lose weight, and if they had tried the method that was used. Distribution of dieting by method is shown in Table 6.15. Overall, 42% of the students surveyed in this study used at least one unhealthy weight reduction method (e.g. smoking), 27.1% reported currently dieting and 14.8% reported dieting in the past. Most common methods were skipping meals for female students, and exercise for male students. In this study, significant proportions of females used a variety of other unhealthy weight reduction practices, which may restrict nutrient and energy intakes. Also the majority of surveyed students who reported being dissatisfied with their weight were female (68.7%) compared with 31.3% of male students. In total, 40.4% of male students reported using exercise to control weight.

Table 6.15: Dieting method by gender

Methods							
Status	Dieting	Exercises	Vomiting	Smoking	Taking medicine	Skipping meal	Total
Females							
In the past	49	24	1	0	1	62	137
Currently	98	33	2	0	3	126	262
Total	147 (37%)	57 (14%)	3 (0.8%)	0 (0%)	4 (1%)	188 (47%)	399 (46%)
Males							
In the past	13	17	1	2	0	11	44
Currently	23	33	0	3	2	19	80
Total	36 (29%)	50 (40%)	1 (0.8%)	5 (4%)	2 (1.6%)	30 (24%)	124 (28%)

6.5.2 Importance of healthy eating

The importance of healthy eating as a lifestyle behaviour was measured in this study. The distribution of the perception of the importance of eating healthy food is described in Table 6.16. Most participants reported that it was somewhat important or very important (25.5% and 66.2%, respectively), whereas just 8.3% reported that it was not important.

Table 6.16: Importance of healthy eating by gender

Gender	Options				P-Value
	Not important	Somewhat important	Important	Total	
Female	59 (6.9%)	87 (8.4%)	715 (83%)	861 (100%)	.022
Male	49 (11.2%)	37 (8.4%)	353 (80.4%)	439 (100%)	
Total	108 (8.3%)	124(9.5%)	1068(82.2%)	1300 (100%)	

6.5.3 Fruit and vegetable consumption

Participants were asked how many servings of fruit and vegetables they usually had per day. Consumption of fruit and vegetables by gender is shown in Table 6.17. The WHO and FAO (2003) recommend a minimum of 400g of fruit and vegetables per day for the prevention of chronic diseases. Also the Food Standards Agency in the UK (2001) recommends five servings of fruit and vegetables per day. Overall, just 1 in 10 students were meeting the recommended fruit and vegetable level, and just a quarter of the total sample was nearly (three to four times per day) meeting the recommended level (Appendix 5). 89.8% of the total sample did not meet the recommended fruit and vegetable consumption level. No significant gender differences were found for the consumption of fruit and vegetables.

Table 6.17: Fruit and vegetable consumption by gender

Status	Gender		Total	P-Value
	Female	Male		
Not meeting recommended fruit and vegetable level	771 (89.5%)	397 (90.4%)	1168 (89.8%)	NS
Meeting recommended fruit and vegetable level	90 (10.5%)	42 (9.6%)	132 (10.2%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.5.4 Physical activity

Before participants were asked about physical activities, they were asked about how important it was for them to be thin/athletic, and 40% of the sample reported that it was very important for them to be thin/athletic. A chi-squared test showed significant gender difference ($P = .001$) with more females (48%) reporting that it was very important to be thin. For the importance of being athletic, the results were opposite, with a higher percentage (58%) of students reporting that it was very important for them to be athletic, and also the

gender difference was significant ($P = .001$), but with more males (75%) reporting that it was very important being athletic.

Table6.18: Importance of being thin/athletic by gender

Options	Being thin			Being athletic		
	Gender			Gender		
	Female	Male	Total	Female	Male	Total
Not important	212 (25%)	159 (36%)	371 (29%)	197 (23%)	36 (8%)	233 (18%)
Somewhat important	236 (27%)	171 (39%)	407 (31%)	232 (27%)	75 (17%)	317 (24%)
Very important	413 (48%)	109 (25%)	522 (40%)	432 (50%)	328 (75%)	760 (58%)
Total	861 (100%)	439 (100%)	1300(100%)	861(66.2%)	439(33.8%)	1300(100%)

Vigorous physical activity: Vigorous physical activity levels by gender are shown in Table 6.19. The results showed low levels of physical activity among Libyan students, with only 6% of the total sample meeting the recommended vigorous physical activity guidelines. The World Health Organization (2006) recommends 30 minutes of vigorous and moderate physical activity per day for adults and at least one hour of moderate-intensity physical activity for children and young people. A chi-squared test showed significant differences with regard to gender, with nearly four times as many male students practising exercise five or more times per week, and for more than 30 minute per session, with compared with female students (11.2 versus 3.1% respectively).

Table 6.19: Vigorous physical activity, by gender

Status	Gender		Total	P-Value
	Female	Male		
Not meeting recommended vigorous physical exercise levels	834 (96.9%)	390 (88.8%)	1224 (94.2%)	.001
Meeting recommended vigorous physical exercise levels	27 (3.1%)	49 (11.2%)	76 (5.8%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

Moderate physical activity: The majority (94.2%) of students in the sample reported their physical activity levels were insufficient; and only 5% of the total sample met the recommended levels for moderate physical activity. A significantly higher proportion of male students reported that they practised moderate physical exercise than did female students (9.3% versus 2.4% respectively) (Table 6.20).

Table 6.20: Moderate physical activities by gender

Status	Gender		Total	P-Value
	Female	Male		
Not meeting recommended moderate physical exercise levels	480 (97.6%)	398 (90.7%)	1238(95.2%)	.001
Meeting recommended moderate physical exercise levels	21 (2.4%)	41 (9.3%)	62 (4.8%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.5.5 Importance of religion

In the present study, participants were asked about the importance of religion. The majority (97.6 %) of the students of both sexes reported that they agreed with the statement (*My religion is very important in my life*), whereas just (1.7%) of students disagreed (Table 6.21).

This could have an effect on their lifestyle behaviours especially with regard to practices already prohibited under Islam.

Table 6.21: Importance of religion by gender

Options	Gender		Total	P-Value
	Female	Male		
Disagree	10 (1.2%)	12 (2.7%)	22 (1.7%)	.001
Neither	2 (0.2%)	7 (1.6%)	9 (0.7%)	
Agree	849 (98.6%)	420 (95.7%)	1269 (97.6%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.5.6 Smoking behaviour

The prevalence of smoking by gender is shown in Table (6.22). The majority of students (91.5 %) reported that they had 'never' smoked. The overall prevalence of smoking among students was 8.5%. Significantly more male than female students reported smoking (23.4%, 0.9%, respectively). Out of the total survey population, 6% reported that they smoked 'every day', and 2.5% reported that they smoked 'occasionally'. The mean age of starting smoking among current smokers was 17.8 (range 10-26) years. About 67.7% of current smokers were interested to quit smoking.

Table 6.22: Smoking status by gender

Status	Gender			P-Value
	Female	Male	Total	
Never	853 (99.1%)	336 (76.5%)	1189 (91.5%)	.001
Occasionally	7 (0.8%)	26 (5.9%)	33 (2.5%)	
Daily	1 (0.1%)	77 (17.5%)	78 (6.0%)	
Total	861(100%)	439 (100%)	1300 (100%)	

6.5.7. Alcohol and drug consumption

Alcohol consumption is not very common among Libyan students, and only 3.5% reported that they drank alcohol. This was significantly more frequent among male students than female students. What was interesting was that just 0.3% of students reported daily drinking.

Table 6.23: Alcohol consumption by gender

Status	Gender			P-Value
	Female	Male	Total	
Never	852 (99%)	402 (91.8%)	1255 (96.5%)	.001
Occasionally	9 (1%)	33 (7.3%)	41 (3.2%)	
Daily	0 (0%)	4 (0.9%)	4 (0.3%)	
Total	861 (100 %)	439 (100%)	1300 (100%)	

As shown in Table 6.24, overall, 1.6% reported using drugs, and all students who reported using drugs, reported Cannabis use. Male students were significantly more likely than female students to use drugs one or more times during their life.

Table 6.24: Drug use by gender

Status	Gender			P-Value
	Female	Male	Total	
Never	860 (99.9 %)	419 (95.2%)	1278 (98.3%)	.001
Yes, a few times	0 (0%)	14 (3.2%)	14(1.0%)	
Yes, regularly	1 (0.1%)	7 (1.6%)	8 (0.6%)	
Total	861 (100%)	439 (100%)	1300 (100%)	

6.6 Results for research question 3

The third research question was to investigate the differences in students' health status and lifestyle behaviour between Libyan regions.

6.6.1 Distribution of students by discipline and region

The distribution of students by discipline and region is displayed in Table 6.25. Student enrolments at higher education level are represented in all fields with the heaviest concentration of arts students in North and East Libya (40% and 55%, respectively), science students in South and East (51% and 40%, respectively), and Medicine students in West Libya (33.4%). Engineering was heavily represented in North Libya (33%).

Table 6.25: Discipline by region

Regions	Total	Discipline				P-Value
		Engineering	Medicine	Science	Arts	
North	278 (21.4%)	92 (33.1%)	67 (24.1%)	8 (2.9%)	111 (39.9%)	.001
South	270 (20.8%)	42 (15.6%)	1 (.4%)	138 (51.1%)	89 (33%)	
East	148 (11.4%)	5 (3.4%)	1 (.7%)	60 (40.5%)	82 (55.4%)	
West	604 (46.5%)	149 (24.7%)	202 (33.4%)	186 (30.8%)	67 (11.1%)	
Total	1300 (100%)	288 (22.2%)	271 (20.8%)	392 (30.2%)	349 (26.8%)	

6.6.2 Gender distribution by region

Gender distribution by region is shown in figure 6.5. Female enrolments at the higher education level are represented for all Libyan areas and it can be seen that the highest concentration of female enrolment is in West and South Libya (43% and 25%, respectively). Also male enrolments were high in West and North Libya (54% and 29%, respectively). The figure shows that West Libya had the heaviest concentration of female and male students' enrolments (46.5%), of the total number of the sample.

Figure 6.5: Gender distributions by region

Number of students

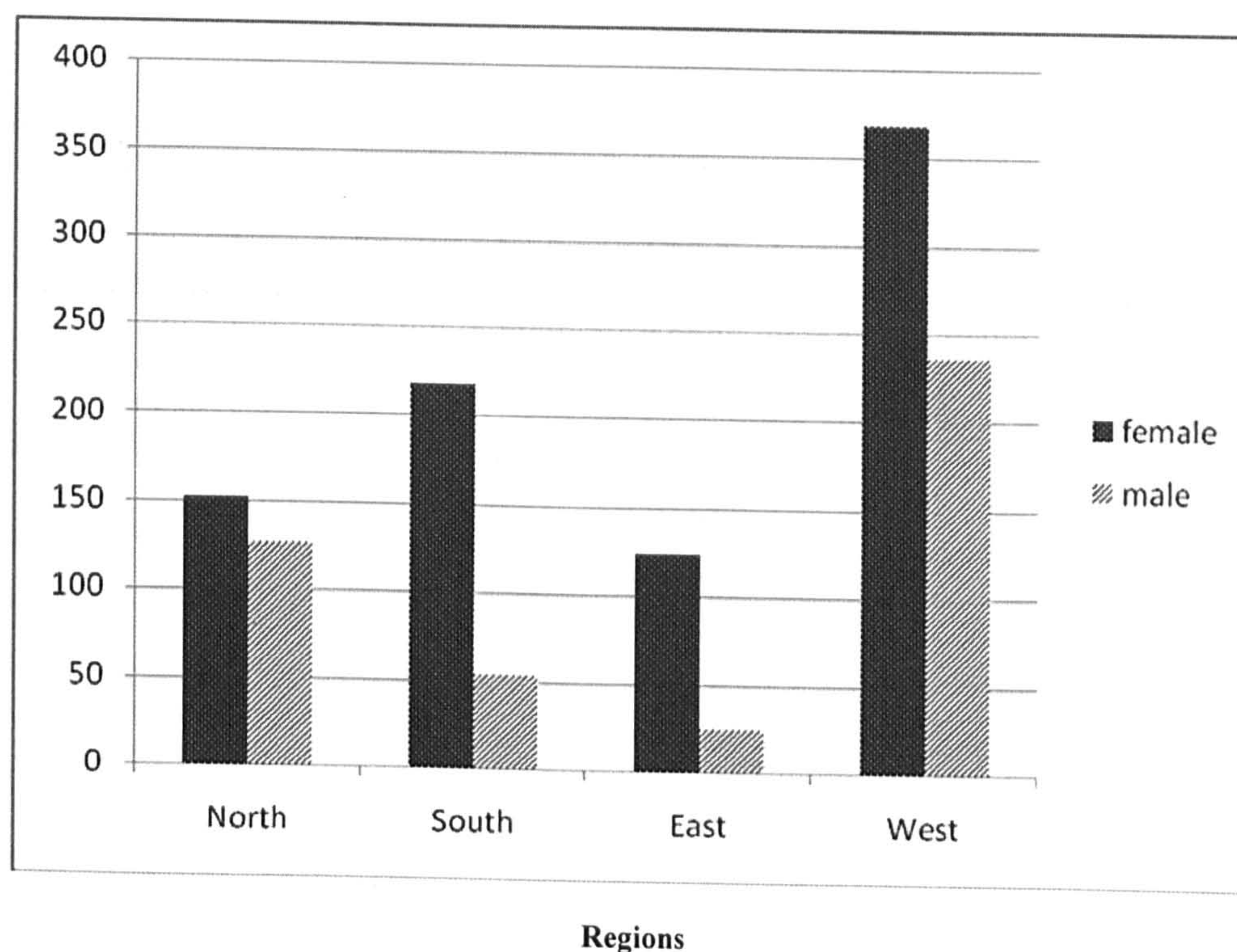


Table 6.26: Baseline demographic and comparison status

Variables	Regions				P-Value
	North N=278	South N=270	East N=148	West N=604	
Gender					<0.001
Female	54.7 %	80.9 %	83.8 %	60.9 %	
Male	45.3	19.6	16.2	39.1	
Age (year)					<0.001
< 20	29.9	13.3	25	33.8	
20 – 24.9	64	73.7	73	60.1	
25 – 29.9	5.4	11.5	1.4	5.5	
≤ 30	0.7	1.5	0.7	0.7	
Monthly income					NS
Insufficient	25.2	24.1	31.1	28.3	
Sufficient	74.8	75.9	68.9	71.7	
Social support					<0.001
Low (three or less)	21.6	14.1	27.2	14.7	
High (more than three)	78.4	85.9	72.3	85	
Satisfaction with social support					<0.001
Dissatisfied	14	9.6	17.6	10.1	
Equivocal	23	13.3	27.7	24.2	
Satisfied	62.9	77	54.7	65.1	

*X-test to compare the higher education institutes; NS = not significant

Health status by region

6.6.3 Body mass index by region

The percentage of participants according to their body mass index is shown in Table 6.27. The results showed that 44.8% of the total sample were 'normal weight'. A chi-squared test showed significant differences. Participants in West Libya had the highest levels of BMI (overweight and obesity) compared to participants from other areas, and obesity was highest in West Libya (6.1%). Conversely, East Libya had the highest proportion of underweight students (17%). High percentages of participants in North, South and East (23.3, 35.6% and 33.1%, respectively) did not know their weight and height compared with just 4.3% of participants in West Libya.

Table 6.27: Body mass index by region

BMI Group	North N=278	South N=270	East N=148	West N=604	Total N=1300	P-Value
Do not know	22.3%	35.6%	33.1%	4.3%	17.9%	.001
Underweight	14.7%	13%	16.9%	14.4	14.5%	
Normal weight	41%	33.3%	34.5%	54.1%	44.8%	
Overweight	17.3%	14.8%	14.2%	21%	18.2	
Obese	4.7%	3.3%	1.4%	6.1%	4.7%	

6.6.4 Mental health by region

Depressive symptoms: Depressive symptoms were measured using a Modified Beck Depression Index (M-BDI), and the cumulative distribution of M-BDI scores by region and gender is shown in Table 6.28. A chi-squared test showed highly statistically significant differences with respect to gender between Libyan areas ($P = .002$). The scores ≥ 35 were

above half of the total sample in East and South Libya, compared to around 40% in both North and West Libya. Overall, samples from North and West Libya were more similar to one another, and the South and East samples likewise, exhibited similarities between each other.

Table 6.28: Depressive symptoms by region

Status	North %	South %	East %	West %	Total %	P-Value
Not depressed	59.5	48.5	45.2	58.4	55	.002
Depressed	40.5	51.5	54.8	41.6	45	
Total	100	100	100	100	100	

Table 6.29 Means of depressive symptoms by gender and region

	Female					Male			
	North N=148	South N=212	East N=122	West N=363		North N=126	South N=52	East N=24	West N=236
Mean	34.4	36.2	39.4	34		27.2	31	25.3	27.6
Median	33	35	39	34		25	28.5	20	26
% with score ≥ 35	47.3	54.2	60.7	47.9		32.5	40.4	25	31.8

Anxiety and depression: The prevalence of anxiety and depression is shown in Tables 6.30 and 6.31. No significant differences between Libyan regions were found in terms of anxiety and depression. The prevalence was nearly similar in all Libya areas, depression was slightly higher in East Libya than other Libya areas. A chi-squared test showed no significant differences

Table 6.30: Prevalence of anxiety by region

Status	North %	South %	East %	West %	Total %	P-Value
No	92.1	92.6	89.9	90.6	91.2	NS
Yes	7.9	7.4	10.1	9.4	8.8	
Total	100	100	100	100	100	

Table 6.31: Prevalence of depression by region

Status	North %	South %	East %	West %	Total %	P-Value
No	95.3	97.4	91.9	96	95.7	NS
Yes	4.7	2.6	8.1	4	4.3	
Total	100	100	100	100	100	

6.6.5 General Health complaints by region

A chi-squared test showed significant differences with regard to the prevalence of heart problems, sleep disorders and depressive moods. There were also considerable differences in the prevalence of complaints in the different regions (sometimes and quite/very often). Overall, students in the East and South reported the highest levels of complaints, while students from the North and West; the lowest. Heart problems, sleep disorders and difficulties in concentrating were consistently lowest in the North and highest in the East. Stomach problems, back pain and depressive mood had a nearly similar prevalence in most areas, but were especially low in West Libya. Among the complaints, headache and depressive mood had the strongest impact on the quality of students' life (Table 6.32). A chi-squared test showed significant differences with regard to heart problems, sleep disorders and depressive moods.

Table 6.32: General health complaints by region

Health complaints	North	South	East	West	Total	P-value
Stomach trouble	31.3%	35.2%	29.7%	31.6%	32.1%	NS
Back pain	46.4%	46.7%	50.7%	43%	45.4%	NS
Heart problem	19.4%	26.3%	31.1%	27.5%	25.9%	.025
Headache	56.5%	59.3%	62.8%	62.6%	60.6%	NS
Sleep disorders	45.3%	53.3%	50.7%	50.3%	49.9%	.005
Difficult to concentrate	52.2%	58.1%	54.1%	58.9%	56.8%	NS
Neck and shoulder pain	43.5%	31.1%	35.1%	38.1%	37.5%	NS
Depressive mood	57.9%	56.7%	55.4%	58.4%	57.6%	.005

Lifestyle Behaviours by region

6.6.6 Dieting practice by region

The prevalence of dieting behaviour by region is displayed in Table 6.33. A chi-squared test showed highly statistically significant differences ($P=.001$) with respect to dieting behaviours between areas in Libya, with more students reporting that they had used at least one method of weight reduction from West and South Libya than students from East Libya.

Table 6.33: Prevalence of dieting practise by region

Status	North %	South %	East %	West %	Total %	P-Value
Never	62.7	56.7	74.3	52.8	58.2	.001
In the past	14.4	14.1	8.1	16.9	14.8	
Currently	23	29.3	17.6	30.3	27.1	
Total	100	100	100	100	100	

The prevalence of weight reduction practices by region is shown in Table 6.34. Skipping a meal, dieting (slimming tablets), and exercise (41.7%, 35%, and 20.5%, respectively) were

reported in a substantial proportion of students in all Libyan areas as weight reduction methods. Participants in West and South Libya (47% and 43.3%, respectively) were more likely to use at least one dieting method, whereas participants in East Libya (25.7%) were less likely to practice a dieting method for weight reduction. A chi-squared test showed no significant differences.

Table 6.34: Distribution of dieting methods by region

Method	North %	South %	East %	West %	Total %	P-Value
Dieting	35	32.2	35.1	36.5	35	NS
Exercises	18	19.3	10.8	23.1	20.5	
Vomiting	1.0	0.9	0	0.7	0.8	
Taking medicine	1.0	0.9	5.4	0.7	1.1	
Smoking	0	0.9	0	1.4	1.0	
Skipping meal	45	46.8	48.6	37.5	41.7	
Total	100	100	100	100	100%	

6.6.7 Consumption of fruit and vegetables by region

Table 6.35 presents the consumption of fruit and vegetables by region. A high proportion of Libyan students did not meet the recommendation for consuming fruit and vegetables every day in all Libya areas. The highest or most frequent intake was found in East Libya (16.2%), whereas the least frequent intake was in North Libya (7.9%). A chi-squared test showed no significant differences between Libyan areas in terms of the frequent intake of fruit and vegetables.

Table 6.35: Consumption of fruit and vegetables by region

Region/status	North N= 278	South N= 270	East N= 148	West N= 604	Total N= 1300	P-Value
Not meeting recommended fruit and vegetable level	92.1%	88.5%	83.8%	90.9%	89.8%	.006
Meeting recommended fruit and vegetable level	7.9%	11.5%	16.2%	9.1%	10.2%	
Total	(100%)	(100%)	(100%)	(100%)	(100%)	

6.6.8 Physical activity by region

The prevalence of physical activity, at recommended levels, by region is displayed in Tables 6.36 and 6.37. A chi-squared test showed significant differences with regard to physical activity. The prevalence of inactivity varied markedly across the country sample, ranging from 97.3 in East Libya to 88.5% in North Libya for vigorous, and from 97% in East Libya to 89.9% in North Libya for moderate physical activity. These results showed that East Libya had the lowest levels of physical activity, while the highest levels were in North Libya. Walking was the most frequent exercise among students in all Libyan areas; half of the total sample reported that they exercised using walking, whereas the results for vigorous and moderate physical activities were more similar to one another.

Table 6.36: Prevalence of vigorous activity by region

Status	North %	South %	East %	West %	Total %	P-Value
Not meeting recommended level	88.5	95.6	97.3	95.4	94.2	.001
Meeting recommended level	11.5	4.4	2.7	4.6	5.8	

Table 6.37: Prevalence of moderate activity by region

Status	North %	South %	East %	West %	Total %	P-Value
Not meeting recommended level	89.9	96.7	97.3	96.5	95.2	.001
Meeting recommended level	10.1	3.3	2.7	3.5	4.8	

6.6.9 Smoking behaviour by region

The prevalence of smoking behaviour by region is shown in Table 6.38. Overall, only 8.5% of the total sample was smokers, and just 6% smoked daily. A chi-squared test showed significant differences, with the highest level of smoking in North Libya, whereas South Libya had the lowest level.

Table 6.38: Prevalence of smoking by region

Status	North %	South %	East %	West %	Total %	P-Value
Never	87	95.2	93.9	91.2	91.5	.023
Occasionally	4	1.1	.7	3	2.5	
Daily	9	3.7	5.4	5.8	6	
Total	278	270	148	604	1300	

6.6.10 Alcohol and drug consumption by region

The prevalence of alcohol and drug consumption by region is shown in Table 6.39 and 6.40. In general, very low levels of alcohol and drug consumption were reported as daily use (0.3%

and 0.6%, respectively). A chi-squared test showed significant differences with regard to alcohol consumption, but not with drug use. North Libya had the highest levels of both alcohol and drug consumption. South and East had the lowest levels in terms of alcohol consumption, and East Libya had the lowest level for drug use.

Table 6.39: Prevalence of alcohol consumption by region

Status	North %	South %	East %	West%	Total %	P-Value
Never	94.2	98.9	98	96.2	96.5	.023
Occasionally	4.7	1.1	2	3.6	3.6	
Daily	1.1	0	0	0.2	0.3	
Total	278	270	148	604	1300	

Table 6.40: Prevalence of drug consumption by region

Status	North %	South %	East %	West%	Total %	P-Value
Never	97.1	99.3	99.3	98.2	98.3	NS
Occasionally	1.1	0.4	0.7	1.5	1.1	
Daily	1.8	0.4	0	0.3	0.6	
Total	278	270	148	604	1300	

6.7 Results for research question 4

The fourth research question was to assess the association between demographic and academic variables, and the most prevalent health and lifestyle behaviour variables. As discussed in Chapter Five (Section 5.6.1.6), researchers are often interested to know whether there is any relationship between two or more variables, rather than simply the distribution of the variables (Field, 2005). There are several ways in which any two variables could be related; for example, they could be positively related, which would mean that they tend to

increase or decrease together; negatively related, which would mean that one tends to increase as the other decreases, or alternatively not related at all. In the present study, binary logistic regression analysis was used to study associations between socio-demographic factors as independent variables, and health factors and lifestyle behaviours as dependent variables among students. Since the prevalence of underweight (14.5), overweight (18%) and obese (4.5%), smoking (2.5% occasionally and 6% daily), alcohol (3.2% occasionally, and 0.3% daily) and drug consumption (0.6%) in the studied group were low, further analysis focused on the more prevalent variables of mental health conditions, health complaints and dieting behaviour.

6.7.1 Logistic regression analyses regarding mental health conditions

Depressive symptoms: Table 6.41 shows the effect of each independent variable on depressive symptoms. As stated above (Section 6.4.3), 17 responses provided insufficient or no data on depressive symptoms and these were excluded from the regression analyses. A total of 10 independent variables were entered into the model (gender, age, subject, year of study, HEI location, social support, satisfaction with social support, monthly income, finance of study and living place during the semester). Five variables were found to be significantly associated with depressive symptoms. The first variable which had a significant association with depressive symptoms was gender. Female students were twice as likely as male students to have score ≥ 35 . The second variable was subject; students who studied medicine had on average a lower score of depressive symptoms than those studying engineering. The third variable was satisfaction with social support; the reported incidence of depression increased with decreasing satisfaction with social support. Compared to students who were satisfied with their social support, students who were 'somewhat satisfied' with their social support

were 1.36 times more likely to be depressed, and students who were dissatisfied were twice as likely to be depressed. The fourth variable was monthly income. The reported incidence of depression increased by 1.56 times with decreasing perceived sufficiency of income. The last variable was finance of study. A high depression score was also significantly associated with the method of students financing their studies. Students who had a job, whether during the semester or during breaks, had lower depression scores of 0.65 times and 0.59 times, respectively, compared with those financing their studies by parental support alone (Table 6.41).

Table 6.41: Logistic regression model for associations with depressive symptoms

Variable	%	Odds ratio	95% CI	p-value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	2.16	1.70 – 2.75	0.001
Age				
<20 (reference)	28	1.0		
20 -24.9	65	1.10	0.81 – 1.49	NS
25 – 29.9	6.2	1.42	0.81 – 2.48	NS
≥ 30	0.8	0.25	0.05 – 1.21	NS
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	0.60	0.42 – 0.87	0.007
Science	30.2	0.92	0.65 – 1.30	NS
Arts	26.8	1.03	0.73 – 1.46	NS
Year of study				
First (reference)	33	1.0		
Second	27	1.07	0.78 – 1.47	NS
Third	25	1.24	0.87 – 1.76	NS
Fourth	11	0.97	0.61 – 1.52	NS
Fifth	2.5	1.51	0.70 – 3.22	NS
Special	1	0.62	0.20 – 1.96	NS
HEI region				
North (reference)	21	1.0		
South	21	1.15	0.78 – 1.70	NS
East	11	1.31	0.84 – 2.05	NS
West	47	1.08	0.79 – 1.48	NS
Social support				
High (reference)	82.5	1.0		
Low	17.5	1.76	0.85 – 1.61	NS
Satisfaction with social support				
Satisfied (reference)	66.2	1.0		
Somewhat satisfied	22.1	1.36	1.04 – 1.78	0.001
Dissatisfied	11.7	2.39	1.61 – 3.28	0.001
Monthly income				
Sufficient (reference)	73	1.0		
Insufficient	27	1.56	1.19 – 2.03	0.001
Finance of study				
Parents support	84.8	1.0		
Job during semester	9.2	0.65	0.45 – 0.98	0.040
Job during breaks	5.9	0.59	0.36 – 0.97	0.039
Living place during the semester				
My Family (reference)	84.7	1.0		
Alone	13.7	0.94	0.39 – 2.27	NS
Accommodation	1.6	1.25	0.91 – 1.71	NS

CI = confidence interval, HEI = higher education institute

Diagnosed anxiety: Table 6.42 explains the association of each independent variable with anxiety. The logistic regression model was applied to assess the association between anxiety and socio-cultural factors. The results confirmed an association between five socio-cultural factors as independent variables with anxiety as a dependent variable. The first variable was age; the incidence of reported anxiety increased with older age students, those between 20–29.9. Students in the age range 20–24.9 years were twice as likely to be anxious, and students at the age of 25–29.9 years were three times more likely to be anxious compared with students under 20 years. The second variable was social support. Students reporting low social support (three or fewer persons) were twice as likely to be anxious. The third variable was satisfaction with social support, the probability of depression increased with a decrease in the satisfaction with social support. Students who were dissatisfied with their social support were twice as likely to be anxious, compared with satisfied students. The fourth variable was living place during the semester; it was observed that students who were living in university accommodation were three times more likely to be anxious compared with those living at home. The last variable which was significantly associated with anxiety was depressive symptoms, students with a higher depression M-BDI score were shown to have a significantly greater risk (OR=2.42) of being anxious compared with students with low depression M-BDI scores (Table 6.42).

Table 6.42: Logistic regression model for associations with anxiety

Variable	%	Odds ratio	95% CI	p-value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	1.47	0.94 – 2.29	NS
Age				
<20 (reference)	28	1.0		
20 -24.9	65	1.99	1.19 – 3.31	0.008
25 – 29.9	6.2	2.92	1.28 – 6.64	0.010
≥ 30	0.8	1.81	0.21 – 15.00	NS
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	1.50	0.81 – 2.77	NS
Science	30.2	1.09	0.60 – 1.98	NS
Arts	26.8	1.48	0.83 – 2.65	NS
Year of study				
First (reference)	33	1.0		
Second	27	1.06	0.63 – 1.80	NS
Third	25	1.21	0.72 – 2.05	NS
Fourth	11	1.34	0.70 – 2.57	NS
Fifth	2.5	0.33	0.04 – 2.55	NS
Special year*	1	2.59	0.70 – 9.57	NS
HEI region				
North (reference)	21	1.0		
South	21	0.75	0.39 – 1.43	NS
East	11	1.17	0.58 – 2.37	NS
West	47	1.22	0.73 – 2.05	NS
Social support				
High (reference)	82.5	1.0		
Low	17.5	2.05	1.32 – 3.17	0.001
Satisfaction with social support				
Satisfied (reference)	66.2	1.0		
Somewhat satisfied	22.1	1.25	1.41 – 3.94	NS
Dissatisfied	11.7	2.35	0.78 – 2.02	0.001
Monthly income				
Sufficient (reference)	73	1.0		
Insufficient	27	1.13	0.74 – 1.73	NS
Finance of study				
Parents support	84.8			
Job during semester	9.2	1.62	0.91 – 2.89	NS
Job during breaks	5.9	0.48	0.16 – 1.38	NS
Living place during the semester				
My Family (reference)	84.7	1.0		
Alone	13.7	0.99	0.56 – 1.77	NS
Accommodation	1.6	2.97	1.03 – 8.53	0.040
Depressive symptoms				
No beck depressed (reference)	55	1.0		
Beck depressed	45	2.42	1.61 – 3.62	0.001

Satisfaction with body weight				
Very satisfied (reference)	29.7	1.0		
Somewhat satisfied	36.4	1.32	0.83 – 2.44	NS
Dissatisfied	33.4	0.79	0.47 – 1.30	NS

*Special year = some faculties have one year for training (e.g. medicine faculty).

Diagnosed depression: Table 6.43 explains the association of each independent variable with depression. A total of 12 independent variables were entered into the logistic regression model. The results showed that after adjustment for all factors, some of the predictors were independently associated with depression. The first variable was year of study; students in the special year of study were four and a half times more likely to be depressed compared with first year students. The second variable was social support; a higher probability of depression was accompanied by lower levels of social support. Students with low social support were two times more likely to be depressed compared with those who had high social support. The third variable was satisfaction with social support, the probability of depression increased with a decrease in the satisfaction with social support. Students who reported somewhat satisfied with their social support were three times more likely to be depressed compared with those who were satisfied. The fourth variable which was significantly associated with depression was depressive symptoms; students with a higher depression M-BDI score were at a significantly greater risk (OR=3.44) of being depressed than students with low depression M-BDI score (Table 6.43).

Table 6.43: Logistic regression model for associations with depression

Variable	%	Odds ratio	95% CI	p-value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	0.82	0.46 – 1.45	NS
Age				
<20 (reference)	28	1.0		
20 -24.9	65	1.33	0.62 – 2.25	NS
25 – 29.9	6.2	2.83	0.97 – 6.54	NS
≥ 30	0.8	0.00	0.00 – 0.00	NS
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	1.65	0.69 – 3.94	NS
Science	30.2	1.02	0.41 – 2.53	NS
Arts	26.8	1.91	0.84 – 4.31	NS
Year of study				
First (reference)	33	1.0		
Second	27	0.73	0.34 – 1.57	NS
Third	25	1.03	0.51 – 2.08	NS
Fourth	11	0.73	0.26 – 2.00	NS
Fifth	2.5	0.57	0.07 – 4.39	NS
Special	1	4.50	1.18 – 17.19	0.028
HEI region				
North (reference)	21	1.0		
South	21	0.64	0.24 – 1.73	NS
East	11	1.89	0.79 – 4.52	NS
West	47	0.94	0.45 – 1.96	NS
Social support				
High (reference)	82.5	1.0		
Low	17.5	2.58	1.42 – 4.67	0.002
Satisfaction with social support				
Satisfied (reference)	66.2	1.0		
Somewhat satisfied	22.1	2.86	1.39 – 5.89	0.004
Dissatisfied	11.7	1.93	0.98 – 3.78	0.055
Monthly income				
Sufficient (reference)	73	1.0		
Insufficient	27	1.65	0.95 – 2.88	NS
Finance of study				
Parents support	84.8	1.0		
Job during semester	9.2	0.69	0.24 – 1.97	NS
Job during breaks	5.9	0.22	0.03 – 1.66	NS
Living place during the semester				
My Family (reference)	84.7	1.0		
Alone	13.7	0.98	0.45 – 2.15	NS
Accommodation	1.6	0.86	0.10 – 6.83	NS
Depressive symptoms				
Not Beck depressed (reference)	55	1.0		
Beck depressed	45	3.44	1.88 – 6.29	0.001
Satisfaction with body weight				
Very satisfied (reference)	29.7	1.0		
Somewhat satisfied	36.4	0.93	0.47 – 1.83	NS
Dissatisfied	33.4	1.00	0.52 – 1.93	NS

6.7.2 Logistic regression analyses regarding general health complaints

For these analyses we used three health complaints which had the highest rates of prevalence among students (headache, back pain and sleep disorder) were used. A total of 10 independent variables were entered into the model (gender, age, subject, year of study, HEI region, social support, satisfaction with social support, monthly income, finance of study and living place during the semester). The results showed that after adjustment for all factors, some of the predictors were independently associated with complaints (Tables 6.44, 6.45 and 6.46). The analyses revealed four factors being independently and consistently associated with two complaints (headache and sleep disorder). These factors were gender, age, year of study and finance of study.

Headache: Table 6.44 explains the effect of each independent variable on headache. The first variable which was significantly associated with headache by regression analysis was gender; it was observed that female students were 1.65 times more likely to suffer from headaches compared with male students. The second variable was age: students in the second group (20 – 24.9) were by 1.37 times more likely to suffer from headaches compared with students under 20 years old. The third variable was year of study, which was significantly associated with headache: students who were in the second and third year of studies were more likely to suffer from headaches compared with first year students (1.35 and 1.40, respectively). The last variable which was significantly associated with headache was finance of study: it was observed that the probability of headaches decreased by half when students had a job during the vacation compared with students who reported that they financed their studies through parental support (Table 6.44).

Table 6.44: Logistic regression model for associations with headache

Variable	%	Odds ratio	95% CI	p-value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	1.65	1.29 – 2.12	0.001
Age				
<20 (reference)	28			
20 -24.9	65	1.37	1.05 – 1.78	0.018
25 – 29.9	6.2	1.21	0.73 – 2.01	NS
≥ 30	0.8	0.29	0.07 – 1.13	NS
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	1.34	0.94 – 1.91	NS
Science	30.2	1.05	0.75 – 1.48	NS
Arts	26.8	0.82	0.58 – 1.15	NS
Year of study				
First (reference)	33	1.0		
Second	27	1.35	1.10 – 1.80	0.38
Third	25	1.40	1.04 – 1.89	0.025
Fourth	11	0.98	0.67 – 1.44	NS
Fifth	2.5	2.12	0.96 – 4.69	NS
Special	1	1.32	0.47 – 3.71	NS
HEI region				
North (reference)	21	1.0		
South	21	0.97	0.66 – 1.41	NS
East	11	1.18	0.76 – 1.85	NS
West	47	1.14	0.84 – 1.56	NS
Social support				
High (reference)	82.5	1.0		
Low	17.5	0.98	0.73 – 1.32	NS
Satisfaction with social support				
Satisfied (reference)	66.2	1.0		
Somewhat satisfied	22.1	1.21	0.84 – 1.74	NS
Dissatisfied	11.7	0.99	0.75 – 1.30	NS
Monthly income				
Sufficient (reference)	73	1.0		
Insufficient	27	1.01	0.78 – 1.31	NS
Finance of study				
Parents support	84.8	1.0		
Job during semester	9.2	0.71	0.48 – 1.04	NS
Job during breaks	5.9	0.49	0.30 – 0.78	0.003
Living place during the semester				
My family (reference)	84.7	1.0		
Accommodation	13.7	0.79	0.57 – 1.09	NS
Alone	1.6	0.38	0.15 – 0.92	NS

Back pain: Table 6.45 explains the association of each independent variable with back pain. Only three variables were found to be significantly associated with back pain. The first variable significantly associated with back pain by regression analysis was year of study. It was observed that students in the third year were one and half times more likely to suffer from back pain compared with first year students. The second variable was satisfaction with social support: students who were somewhat satisfied or dissatisfied with their social support were 1.52 and 1.29 times more likely to suffer from back pain respectively compared with students who were satisfied with their social support (Table 6.45).

Table 6.45: Logistic regression model for associations with back pain

Variable	%	Odds ratio	95% CI	<i>p</i> -value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	1.23	0.97 – 1.58	NS
Age				
<20 (reference)	28	1.0		
20 -24.9	65	1.19	0.92 – 1.55	NS
25 – 29.9	6.2	1.24	0.82 – 2.21	NS
≥ 30	0.8	0.51	0.13 – 1.96	NS
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	0.92	0.65 – 1.30	NS
Science	30.2	1.24	0.89 – 1.74	NS
Arts	26.8	1.03	0.74 – 1.44	NS
Year of study				
First (reference)	33	1.0		
Second	27	1.01	0.76 – 1.35	NS
Third	25	1.50	1.12 – 2.02	0.006
Fourth	11	1.15	0.78 – 1.69	NS
Fifth	2.5	1.61	0.78 – 3.30	NS
Special	1	0.99	0.36 – 2.76	NS
HEI region				
North (reference)	21	1.0		
South	21	0.82	0.56 – 1.18	NS
East	11	0.99	0.65 – 1.53	NS
West	47	0.82	0.61 – 1.11	NS
Social support				
High (reference)	82.5	1.0		
Low	17.5	0.99	0.73 – 1.32	NS
Satisfaction with social support				
Satisfied (reference)	66.2	1.0		
Somewhat satisfied	22.1	1.52	1.07 – 2.15	0.018
Dissatisfied	11.7	1.29	0.99 – 1.69	0.059
Monthly income				
Sufficient (reference)	73	1.0		
Insufficient	27	1.17	0.90 – 1.50	NS
Finance of study				
Parents support	84.8	1.0		
Job during semester	9.2	1.09	0.75 – 1.60	NS
Job during breaks	5.9	1.10	0.69 – 1.76	NS
Living place during the semester				
My Family (reference)	84.7	1.0		
Accommodation	13.7	0.84	0.60 – 1.15	NS
Alone	1.6	1.29	0.54 – 3.08	NS

Sleep disorder: Table 6.46 explains the effect of each independent variable on sleep disorder. Five variables were found to be significantly associated with sleep disorder. The first variable was gender: it was observed that female students were 1.40 times more likely to suffer from sleep disorder compared with male students. The second variable was age: the findings revealed that students who were older than 20 years old were more likely to suffer from sleep disorder. The highest probabilities of sleep disorder were found among students older than 30 years, who were four times more likely to suffer from sleep disorder compared with students under 20 years old. The third variable was subject: students who studied medicine, science and arts were one and half times more likely to suffer from sleep disorder compared with students who studied engineering. The fourth variable was year of study. This was also significantly associated with sleep disorder, students who were in the second, third and fourth year of studies were more likely (OR= 1.52, 1.79 and 1.93, respectively) to suffer from sleep disorder compared with first year students. The last variable which was significantly associated with sleep disorders by regression analysis was finance of study. It was observed that the probability of sleep disorder increased with students who had a job during the semester by 1.12 times compared with students who financed their studies by parents support (Table 6.46).

Table 6.46: Logistic regression model for associations with sleep disorder

Variable	%	Odds ratio	95% CI	p-value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	1.40	1.10 – 1.80	0.007
Age				
<20 (reference)	28	1.0		
20 -24.9	65	1.64	1.27 – 2.13	0.001
25 – 29.9	6.2	2.18	1.31 – 3.61	0.002
≥ 30	0.8	3.99	1.0 – 15.39	0.045
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	1.67	1.20 – 2.35	0.003
Science	30.2	1.84	1.35 – 2.50	0.001
Arts	26.8	1.88	1.37 – 2.58	0.001
Year of study				
First (reference)	33	1.0		
Second	27	1.52	1.14 – 2.02	0.004
Third	25	1.79	1.33 – 2.40	0.001
Fourth	11	1.93	1.31- 2.84	0.001
Fifth	2.5	1.25	0.61 – 2.56	NS
Special	1	1.73	0.62 – 4.77	NS
HEI region				
North (reference)	21	1.0		
South	21	1.07	0.74 – 1.56	NS
East	11	0.96	0.62 – 1.47	NS
West	47	1.24	0.91 – 1.68	NS
Social support				
High (reference)	82.5	1.0		
Low	17.5	1.14	0.85 – 1.54	NS
Satisfaction with social support				
Satisfied (reference)	66.2	1.0		
Somewhat satisfied	22.1	1.46	1.03 – 2.07	NS
Dissatisfied	11.7	1.07	0.63 – 1.60	NS
Monthly income				
Sufficient (reference)	73	1.0		
Insufficient	27	1.05	0.82 – 1.36	NS
Finance of study				
Parents support	84.8	1.0		
Job during semester	9.2	1.12	1.03 – 2.07	0.033
Job during breaks	5.9	1.00	0.81 – 1.39	NS
Living place during the semester				
My Family (reference)	84.7	1.0		
Accommodation	13.7	1.19	0.87 – 1.64	NS
Alone	1.6	0.76	0.32 – 1.83	NS

6.7.3 Logistic regression analyses regarding dieting practise

Table 6.47 explains the association of each independent variable on dieting behaviour. Logistic regression analysis was used to identify the determinants of the practice of dieting behaviour among students while controlling for other variables. A total of 11 independent variables were entered into the model (gender, age, subject, year of study, HEI location, importance of being thin, satisfaction of body weight, levels of body weight, smoking behaviour, physical activity and fruit and vegetable consumption). Five variables were found to be significantly associated with the practice of dieting behaviour which were: gender, age group, importance of being thin, satisfaction with body weight and BMI (see Table 6.47). Significant association ($p = 0.000$) was found in respect to gender; female students were one and half times more likely to practice dieting behaviour than male students. Also students who were in the age range between 25–29.9 year were twice as likely to practice dieting behaviour as other age groups. Students who reported that being thin was very important for them were seven times more likely to practice dieting compared with those who reported ‘not important’, and those who reported as ‘somewhat important’ were three times more likely to practice dieting compared with those who reported ‘not important’ for being thin. Satisfaction with body weight was significantly associated with dieting behaviour; students who were somewhat satisfied with their body weight were six times more likely to diet compared with those who were satisfied, and those who were dissatisfied were two and half times more likely to practice dieting compared with students who were satisfied with their body weight. Other variables which were significantly associated with dieting behaviour by regression and analysis were overweight and obese. It was observed that overweight and obese students were more than four times as likely to practice dieting behaviour, compared with underweight students (Table 6.47).

Table 6.47: Logistic regression model for associations with dieting practise

Variable	%	Odds ratio	95% CI	p-value
Gender				
Male (reference)	33.8	1.0		
Female	66.2	1.87	1.41 – 2.47	0.001
Age				
<20 (reference)	28	1.0		
20 -24.9	65	1.15	0.82 -1.60	NS
25 – 29.9	6.2	2.38	1.32 – 4.30	0.04
≥ 30	0.8	1.57	0.42 – 5.77	NS
Subject				
Engineering (reference)	22.2	1.0		
Medicine	20.8	0.98	0.65 – 1.43	NS
Science	30.2	0.99	0.68 – 1.46	NS
Arts	26.8	1.10	0.74 – 1.62	NS
Year of study				
First (reference)	33	1.0		
Second	27	0.87	0.62 – 1.23	NS
Third	25	0.96	0.65 – 1.41	NS
Fourth	11	0.73	0.44 – 1.21	NS
Fifth	2.5	0.67	0.27 – 1.66	NS
Special	1	0.93	0.93 – 2.96	NS
HEI region				
North (reference)	21	1.0		
South	21	1.13	0.73 – 1.74	NS
East	11	0.56	0.32 – 0.97	NS
West	47	1.45	1.02 – 2.06	NS
Importance of being thin				
Not important (reference)	28.5	1.0		
Somewhat important	31.3	2.96	1.95 – 4.49	0.001
Very important	40.2	7.04	4.77 – 10.40	0.001
Satisfaction with body weight				
Very satisfied (reference)	29.7	1.0		
Somewhat satisfied	36.9	5.92	4.09 – 8.57	0.001
Dissatisfied	33.4	2.77	1.90 – 4.05	0.001
Levels of body weight				
Underweight (reference)	14.5	1.0		
Normal weight	45	1.43	0.93 – 2.20	NS
Overweight	18	4.63	2.92 – 7.32	0.001
Obese	4.5	4.41	2.35 – 8.29	0.001
Smoking behaviour				
Never (reference)	91.5	1.0		
Occasionally	2.5	1.32	0.63 – 2.76	NS
daily	6	0.63	0.35 – 1.12	NS
Physical activity (vigorous)				
Not meet recommended levels (reference)	94.2	1.0		
Meeting recommended levels	5.8	1.50	0.87 – 2.58	NS
Physical activity (moderate)				
Not meet recommended levels (reference)	95.2	1.0		
Meeting recommended levels	4.8	1.07	0.58 – 1.97	NS
Fruit and vegetables				
Not meeting recommended levels (reference)	65.3	1.0		
Meeting recommended levels	35.7	0.88	0.68 – 1.14	NS

6.7.4 Logistic regression analyses regarding fruit and vegetable consumption

To test the probability of association between fruit and vegetable consumption as a dependent variable and demographic and health factors as independent variables, a total of 10 independent variables were entered into the model (gender, age, year of study, importance of being thin, importance of being sporty, place of living, HEI region, levels of body weight, dieting behaviour and physical activity). Only one variable was found to be significantly associated with fruit and vegetable consumption, which was the importance of being thin. Compared with students who reported that it was not important for them to be thin, students who reported that it was very important for them to be thin were 1.38 times more likely to eat fruit and vegetables (see Appendix 7).

6.7.5 Logistic regression analyses regarding physical activity

To test the probability of association between physical activity as a dependent variable and demographic and health factors as independent variables, a total of 13 independent variables were entered into the model (gender, age, year of study, importance of being thin, importance of being sporty, finance of study, place of living, HEI region, smoking behaviour, alcohol consumption, depressive symptoms level, levels of body weight and dieting behaviour). Only two variables were found to be significantly associated with physical activity practices, which were gender and HEI region. Compared with female students, male students were three times more likely to meet the recommended levels of exercise. Also students from East Libya were three times less likely to practice physical activity compared with students from North Libya. Compared with students from North Libya, students from West Libya were five times less likely to practice physical activity (see Appendix 8).

6.8 Summary of results

The main objective of this chapter was to present the findings from the survey. As mentioned earlier in both Chapters One (Section 1.5) and Five (Section 5.5) there are five research questions addressed by this thesis. The overall aim of the present study was to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviors (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan higher education students (HES); to compare health status and lifestyle behaviours in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition to this, the study aimed to determine if any association existed between demographic and academic variables, and the most prevalent health and lifestyle variables.

The first research question concerned the health status of HES in Libya. *‘What is the health status among Libyan HES, for example, quality of life, health perception, body weight, mental health conditions, and general health complaints?’* Regarding health status, the sample shows low rates of obesity, overweight, and underweight. Conversely it shows high rates of depressive symptoms but low rates of mental health disorders such as anxiety and depression. Health complaints were mostly high, with stomach complaints, back pain and headache reported as the most prevalent somatic complaints. The findings indicate gender differences in most of the health indicators used; female students rated their health worse in comparison with males.

Research question two explored lifestyle behaviours among HES in Libya, through the question *‘What are the lifestyle behaviors among Libyan HES, for example, dietary behavior,*

fruit and vegetable consumption, physical activity, smoking behavior and drug and alcohol consumption?.' In general, the results of these analyses indicated that the sample of HES from Libya report low levels of healthy lifestyle behaviours in terms of physical activity and fruit and vegetable consumption. A high proportion of Libyan students did not meet the recommendation for consuming fruit and vegetables every day, and also for vigorous and moderate physical activity. However, students in Libya were less likely to engage in risky health behaviours such as smoking and alcohol and drug consumption. The findings of this study indicate gender differences in terms of lifestyle behaviours; female students reported less smoking and alcohol and drug consumption, but also less physical activity compared with males.

As regards the third research question '*Are there differences in health status and lifestyle behaviors between Libyan HES by region?'*' The present results suggest that there were statistically significant differences between Libyan regions with respect to levels of body weight, depressive symptoms and general health complaints in terms of heart problems, sleep disorders and depressive mood. The proportions of overweight and obesity in West Libya were higher compared to other Libyan areas, and for underweight the percentages were very similar in all areas. South and East Libya had the highest proportions of students who did not know their weight and height or did not wish to report them. Depressive symptoms were more prevalent in East and South Libya, compared to North and West Libya. No significant differences were found in terms of anxiety and depression. The prevalence was very similar in all Libyan areas, except that depression was slightly higher in East Libya than in other Libyan areas. The highest rates of complaints were found with respect to back pain, heart problems and headaches among students from East Libya, while students in North Libya had

the lowest rates in most of the health complaints with the exception of neck and shoulder pain. In addition, statistically significant differences were found with respect to lifestyle behaviours between Libyan areas, with the exception of drug consumption. A high proportion of students in all Libyan HEIs did not meet the recommendation for consuming fruit and vegetables or for participation in physical activity. North Libyan students were more likely to undertake physical activity. Eastern Libyan students were found to eat more fruit and vegetables compared to students from other areas. Students from North Libya were more likely to engage in risky health behaviours such as smoking and alcohol and drug consumption.

In addition, research question four assessed the associations between demographic and academic variables and health and lifestyle behaviours variables “*Are there associations between demographic and academic variables and the most prevalent health and lifestyle behaviour variables?*”. The logistic regression analysis revealed substantial associations between the factor satisfaction with social support, and mental health disorders. The analysis also showed two factors to be independently and consistently associated with most of the health factors and the groups of complaints. These factors were female gender and satisfaction with social support. As regards the fifth research question of this study, which aimed to critically compare health status and lifestyle behaviours of Libyan HES with HES from other countries, through the question ‘*Are there differences in the health status and lifestyle behaviors of Libyan HES and HES from other countries?*’. This will be answered through a discussion of the findings. The following chapter will present a discussion of the results and their implications for practice and further research.

CHAPTER SEVEN

DISCUSSION

7.1 Introduction

In this chapter, the outcomes of the study presented in chapter 6 are discussed, classified and categorised under relevant subheadings including, gender differences regarding student enrolment in Libyan institutions, discussion of findings regarding health status (weight perception and BMI, mental health conditions and general health complaints), and discussion of findings regarding lifestyle behaviours (dieting behaviour, fruit and vegetable consumption, physical activity, smoking, alcohol and drug consumption). The similarities and differences are compared with the literature, when applicable, and group differences, such as gender, are specified for an in-depth investigation. The discussion begins by presenting the gender differences regarding student enrolment in Libyan institutions.

7.2 Gender differences regarding student enrolment in Libyan HEI

As stated earlier in Chapter Two (Section 2.2), the study population included many more female than male students (see Figure 6.2). It could be the case that there were more female than male students across all higher education institutions in Libya as a whole. However, despite contacting the relevant Libyan authorities, the researcher has been unable to find this information regarding gender balance in Libyan higher education. Nevertheless, drawing on research from the last twenty years there has been a significant improvement in educational opportunities at all levels for Arab women, for example, in Kuwait, Bahrain and Qatar, female enrolment in higher education has overtaken male enrolment (56% in Kuwait, 53% in Bahrain, and 57% in Qatar) (Al-Qazzat, 1997). A young woman, nowadays, has much better opportunities to complete schooling and attend college than her mother's generation. Arab

governments are determined to increase opportunities for a college education for girls (Al-Qazzat, 1997) so it is highly likely that the same trends are evident in Libya and may explain the higher proportion of female participants in this study. There is a strong conviction that no real political, social or economic development can happen without the emancipation of women (Al-Qazzat, 1997). The education of women has been shown in many Arab studies to be the cornerstone for improving not just the status of women, but also social change in general, from family life to the economy (Al-Qazzat, 1997). It is also an important point to note that the education of women is vital in the fight against population explosion. Many studies in countries like Morocco, Tunisia, Jordan and Egypt show that illiterate mothers have far larger families than educated mothers (Al-Qazzat, 1997). These studies also show that education will usually postpone marriage by at least two years (Al-Qazzat, 1997). It was also revealed that men whose mothers had a low level of education tended to oppose the granting of equal political rights to women. Also, women's participation in public life is closely related to their level of education. So, as more opportunities have developed for women in the Arab world, their chances to integrate and move up the employment ladder have also increased. Many Arab women have already distinguished themselves as teachers, doctors, judges, lawyers, poets, novelists, chemists, physicist, journalists and cabinet members (Al-Qazzat, 1997).

Due to the lack of evidence about the gender disparity in Libyan HEI, the researcher speculates that there could be four main reasons for the predominance of female students in Libyan higher education. Firstly, there has been an increase in the number of women wanting to follow careers outside the home. Secondly, women felt that an education gave them better marriage prospects. Thirdly, in Libya at the time of the study, men were more likely to want

to find employment than to continue their education, as Libya has become a more materialistic and status-based society. Fourthly, men are often encouraged to study abroad, whilst on the other hand this is positively discouraged for women, due to reasons of tradition or marriage. Consequently, grants to study abroad are rarely given to women¹.

The liberal arts, humanities, social sciences and law had the highest representation of females at tertiary education level in Libya. Women comprise more than half the students studying these subjects in many other Arab countries for example (70% in Saudi Arabia, 75% in Sudan, 56% in Kuwait, and 52% in Tunisia (Al-Qazzat, 1997)). This preponderance has several reasons: firstly, these fields are traditionally considered to be more popular with women; and secondly, it is easier and cheaper for universities to expand these departments rather than fund technical departments and facilities (Al-Qazzat, 1997). A concentrated effort to increase technical facilities and to encourage women to enrol in them has led to a decline in women's enrolments in the arts in Algeria and Syria (Al-Qazzat, 1997). Another factor which may influence this trend away from Libya is the fact that there are plentiful, well-paid job opportunities in the technical field (Al-Qazzat, 1997). Also, some companies will pay students in advance to study these subjects. The fields of medicine, pharmacy, dentistry and nursing have also attracted a large number of Arab women. They constituted a considerable percentage of the enrolment in Lebanon, Tunisia, Kuwait, Egypt, Algeria, Iraq and Syria (Al-Qazzat, 1997). Medicine is a special case; as it is considered to be a prestigious and acceptable profession for women, especially as many women patients prefer to be treated by women doctors (Al-Qazzat, 1997). In Arab societies, the medical profession needs a large

¹ For example, at the University of Gloucestershire in 2010, there are more than 60 Libyan students, and out of this number only 6 female students. In spite of this, figures for Arab women going to university do indicate that women are keen to take their place in education and to find employment in the work place.

proportion of women, especially in obstetrics and gynecology. All of these factors may have an influence on the predominance of women among the study population. The following section will discuss the findings with respect to health status.

7.3 Discussion of the findings regarding health status

The present study examined a variety of factors associated with self-reported health (Weight perception and BMI, mental health conditions and health complaints), and highlighted important health related behaviour (dieting, fruit and vegetable consumption, physical activity levels, smoking behaviour, alcohol consumption) in a population of young people who were higher education students in Libya. Self-related health has been used in studies of young adults in different countries. Mikolajczyk et al. (2008) indicate that self-related health subject investigations using diverse populations in different countries would be beneficial. Providing data on the health status and prevalence of many risk factors related to leading causes of mortality and morbidity among higher education students is considered to support the development of health promotion strategies for this population.

7.3.1 Weight perception and BMI

The prevalence of underweight, overweight and obesity in higher education students has recently been investigated in different countries (Kakeshita & Almeida., 2006; Jackson et al., 2007; Chmara et al., 2007; Al-Qauhiz et al., 2010). However, there are only a few studies concerning their prevalence in the Libyan population. Based on self-reported height and weight, the categories underweight, overweight and obesity were classified according to body mass index and WHO criteria. In the present study, the overall prevalence of overweight and obesity among the student population of both sexes in Libya is based on the BMI (overweight from 25 -29.9, and obesity ≥ 30). This study demonstrates that, as a whole, the prevalence of

underweight, overweight and obesity among Libyan students was 14.5%, 18.2% and 4.2% respectively. For female students, it was 15.6%, 15.1% and 3%, respectively, while it was 12.3%, 24.1% and 8% for male students, respectively (Table 6.9). The prevalence of obesity was higher in males than females (3% in females versus 8% in males); with regard to overweight there was also a higher proportion of males than females who were overweight (15% in females versus 24% in males). When combining both overweight and obesity as a reflection of weight problems, their prevalence in both sexes was 23% of the sample as a whole. The prevalence of overweight and obese in men (32%) was nearly double that of women (18%).

When comparing these results with the general population in Libya, the findings from the current research are lower than the findings of the Libyan Secretariat of Health & Environment survey (2009), which found that 31% of men aged between 25 – 34 years were overweight, and 16.8% were obese. For women with same age, the survey showed that 28.2% were overweight, and 28.9% were obese, using the same classification (overweight from 25 - 29.9, and obesity \geq 30). The present study showed that more males (8%) were obese compared with females (3%). Conversely, the results of the survey mentioned above (2009) showed that more women (28.9%) were classified as obese than men (16.8%), and these findings of the Libyan Secretariat of Health & Environment survey (2009) are in line with a study conducted by Al-Qauhiz, (2010), who reported that more females were classified as obese (Section 3.3.2.1).

The results affirmed that one quarter of Libyan students considered their weight as “a little too fat”. When comparing the results with students from other countries, the findings from this study in relation to the perception of body weight as “a little too fat” are similar to a study demonstrating that 22% of university students in Turkey who rate themselves the same, but lower than those in Germany, where 51% of students considered themselves “a little too fat” (Mikolajczyk et al., 2010). In contrast, with regard to the perception of body weight, the findings of the present study showed that 18.4% of students considered themselves as “a little too thin”, and this percentage was lower than the percentage reported among university students (30%) in Poland (Mikolajczyk et al., 2010). When the perception of body weight in university students was assessed using the same perception rating scale in a sample of seven European countries, namely Denmark, Germany, Bulgaria, Poland, Spain, Lithuania and Turkey, gender differences with regard to body perceptions were found, with female students more likely to perceive themselves as “too fat”, while male students were more likely to perceive themselves as “too thin” (Mikolajczyk et al., 2010). However, the results of the present study did not show any gender differences regarding body perceptions. This wide range of difference could be due to cultural differences in the perceptions of body weight. To the best of the researcher’s knowledge, no other studies have compared body perception among Libyan students with students from other countries, although comparative studies involving different countries have been presented.

The present study found a gender difference in overweight and obesity prevalence amongst students in Libya, with more males self reporting height and weight measurements that were classified as overweight or obese. Some previous studies (Chmara et al., 2007; LSHES, 2009) have shown significant gender differences in the prevalence of overweight and obesity among

students. In particular, several studies conducted in Asia and Europe (Taiwan, Finland and Austria) showed higher rates among males than females (Oner et al, 2004). The researcher observed high gender differences in overweight and obesity prevalence amongst students in Libya, with more male students registering as overweight or obese. It is interesting to note that the incidence of overweight and obesity among males was around twice as high as among females. This would appear interesting given that in the Libyan culture, male students, in comparison to female students, have many more opportunities to do sports such as jogging or football, which are useful factors in weight management. On the other hand, women have had far fewer opportunities due to social traditions which mean that women cannot practise outdoor sports. Several factors, such as a change in dietary habits, socioeconomic factors, and inactivity, determine obesity and overweight in the Eastern Mediterranean Region. As a result of these factors, there have also been calls for an urgent need for national programmes to prevent and control obesity in the countries of this region (Musaiger, 2004).

Based on self-reported weight and height, respondents' BMI was calculated in this study, and compared with other studies which used the same methods of self-reported weight and height, and also the same BMI classification: the results are presented in the table below. A total of 17.9% of the sample of Libyan students did not report their weight or height or both.

Table 7.1: Comparison with other survey data regarding BMI

Country	Year of study	Number of respondents	Underweight	Normal weight	Overweight or obese
			<18.5	18.5-24.9	≥25.0
Libya	2010	1300	14.5	44.8	22.9
Egypt	2007	600	2.8	71.8	25.2
Polan	2007	718	15.3	81.2	3.5
Japan	2005	124	20.2	78.1	1.8
Korea	2005	141	28.6	70.7	0.8

Sources with their country of origin: (Abolfotouh et al., 2007. Egypt), (Chmara et al., 2007. Poland), Sakamaki et al., 2005. Japan & Korea). The numbers in the above table are percentages.

The results of the present study reported high levels of overweight and obesity, the published record does contain studies that reveal similar or lower rates. For instance, Abolfotouh et al. (2007) report similar rates amongst students at Alexandria University in Egypt, where 25.2% of students were overweight or at risk of becoming overweight. In addition, in comparison with the statistics above, the findings of this study in relation to overweight and obesity showed that the rates reported among higher education students in the present study are much higher than those reported in students from other countries such as Poland, at 3.5% (Chmara et al., 2007), Japan with 1.8%, and Korea only 0.8% (Sakamaki et al., 2005), using the same classification. The high prevalence of sedentary behaviour amongst HES in Libya could be a possible explanation for why Libyan HES had higher prevalence of overweight and obesity (see Tables 6.19 and 6.20 for more detail).

Furthermore, in a study of obesity among male university students in Saudi Arabia, assessed using BMI, the prevalence of overweight and obesity was 21.8% and 15.7% respectively (Al-Rethaiaa et al., 2010), whereas, the prevalence of overweight and obesity amongst Libyan

students was 24.15 and 8%, respectively. Therefore there was a lower prevalence of overweight amongst male Saudi students when compared to Libyan students, but male Saudi students had a higher prevalence of obesity. These results are in line with the data presented in Chapter Three, which suggests high levels of overweight and obesity in Arab countries such as Kuwait, Egypt and Saudi Arabia. Previous studies (Musiger et al., 2004; Al-Qauhiz, 2010) suggest factors associated with overweight and obesity among people in the Arabian Gulf countries: these include a tendency to afternoon napping, availability of domestic help, area of residence, family size, income, eating between meals and the number of meals eaten per day. This view is supported by Al-Rethaiaa et al., (2010) who found a significant association between BMI and visceral fat level, snack consumption rate and the frequency of eating dates (the fruit) amongst college students in Saudi Arabia. Musiger et al., (2003) and Belahsen & Rouibi, (2006) suggest some other factors which are relevant to overweight and obesity rates, including changes in dietary habits, social demographic factors, a tendency to a sedentary lifestyle, and certain other factors (see Section 3.3.2.2 for more detail).

Regarding underweight, relatively high percentages of underweight were noted in Japan and Korea. There are very few data in the literature concerning the prevalence of low BMIs amongst student populations. Low BMI scores are usually found more frequently among females than males (Chmara et al., 2007; Ojala et al., 2007).

In general, the findings of this study reveal that there is a low prevalence of obesity and overweight among Libyan students, however participants also showed low levels of physical activity and consumption of fruit and vegetables (Table 6.17 & 6.19), which have both been

found by to be important factors in weight control (Scully et al., 2007; Abolfotouh et al., 2007). The accuracy of body mass index values has been called into question, this is due mainly to the fact that height and weight, the two variables involved in estimating body mass index, were self-reported in the present study. This has led to the conclusion that there may have been a serious underestimation of the prevalence of overweight and obesity. This concern is exacerbated by the fact that data on height and weight from a large proportion of students (18%) is missing (Table 6.9). In the Arab Gulf countries, Al-Rethaiaa et al. (2010) indicated that food habits have undergone rapid changes due to developments in socio-economic status. These changes have led to the health of people with obesity being one of the major risk factors for chronic diseases such as hypertension and diabetes. For non Arab regions such as Europe, the greater social pressure to be thin has been seen as one of the main factors behind body shape. However, for Libyan HES, possible reasons are not known and explanations cannot be provided as to why the results of this study occurred. Descriptive and more in-depth information by qualitative research could be employed to understand more fully the reasons behind these results. In general, there may have been many factors, such as home environment, body image, school environment, beliefs and attitudes, lack of health awareness, and cultural conditions, which may have been linked with obesity and overweight, but were not able to be investigated (Musaiger, 2004). Low body weight at younger ages could be the result of numerous factors, including a more active lifestyle, a higher metabolic rate, or weight concerns during adolescence and younger youth. In the pursuit of thinness, young people are more likely to engage in weight control measures such as dieting, smoking or excessive exercising (Che, 2002). Despite the relatively low rates of health problems regarding body weight in Libya, according to Jackson et al. (2007) and Abolfotouh et al. (2008), obesity has become one of the major health problems in the Eastern Mediterranean Region, and it is known that overweight and obesity are correlated with an increase in the risk

of morbidity (National Cancer Institute, 2004). Therefore, future research concerned with weight disaffection and problems with body shape such as obesity, overweight and underweight, as well as factors contributing to the occurrence of these problems, should be undertaken. Such research can be used to underpin practice such as health programmes to control problems with body weight.

7.3.2 Mental health conditions

Depressive symptoms

The findings from this study in relation to depressive symptoms showed a significant proportion of students produced M-BDI scores ≥ 35 . Overall nearly 45% of students had M-BDI scores ≥ 35 , and there were statistically significant differences with respect to gender, with more female students having an M-BDI ≥ 35 than male students (Table 6.10). The findings from this study in relation to anxiety and depression also revealed that overall 8.8% of students reported anxiety and 4.3% reported depression (Table 6.11 & 6.12). The study also found a gender difference, with female students on average having higher rates of anxiety than male students (9.5% compared to 7%), but lower rates of depression (4% compared to 5%).

Moreover, the results of current study showed considerable differences in mean depression scores across the Libyan regions, with higher scores in East Libya (39.4%) for female students and higher scores in south Libya (31%) for male students. An interesting finding was that in East Libya there was the lowest mean for both male students and for the combined scores of all Libyan areas (Table 6.29). There were also statistically significant differences with respect to gender in both East and West Libya ($P = .001, .001$, respectively), with more female students having M-BDI scores ≥ 35 than male students, and for West Libya 47.9% of

females and 31.8% of males had M-BDI scores ≥ 35 . These differences are interesting but it is difficult to speculate about the reasons for differences in mean depression scores in the regions of Libya, but it is perhaps relevant that south Libya is a very underdeveloped region, with few of the facilities for social life and recreation available in the north, and this might account for the high average mean scores for males in this region.

In the sample of this study, the six variables which were found to be significantly associated with depressive symptoms by regression analysis were 'gender', 'subject', and 'satisfaction with social support', 'monthly income' and 'finance of study' (Table 6.41). The main risk groups for depressive symptoms were females, medicine students, students who were dissatisfied with their social support, students reporting insufficient monthly income, and those who had a job during the semester and breaks. These findings support those of previous studies (Mikolajczyk et al., 2007; Oliveira et al., 2008; Rab et al., 2008). For example, Mikolajczyk et al. (2007), in a study among university students in Germany, Denmark, Poland and Bulgaria, found that 'perceived income as insufficient' was associated with higher levels of depressive symptoms, however, they did not find any relationship between gender and depressive symptoms across the four countries they studied. In the present study, a significant association was found with regard to finance of study, and the results showed that students who had a job during semester were 0.65 times less likely to be depressed (95% CI = 0.45 – 0.98) compared with those who were financing their studies by parental support. Students who had job during breaks also were 0.59 times less likely to be depressed (95% CI = 0.36 – 0.97) compared with those who were financing their studies by parental support. It is possible therefore that parental support is, in financial terms, insufficient in many cases, and that those students with jobs enjoyed this financial benefit in addition to parental support.

Similarly, amongst Brazilian students, Oliveira et al. (2008) found that students whose main source of income was a scholarship and those who lived in the campus residence hall were also proportionally overrepresented amongst the campus mental health service clients. Likewise, Rab et al. (2008) stated that Pakistan; students living in university accommodation were significantly more anxious and depressed compared with those living at home, as discussed in chapter 3 (Section 3.7). This study also found a gender difference in terms of the incidence of depressive symptoms, with female student on average having higher depression scores than male students, with an odds ratio of 2.16 (95% CL=1.70 – 2.75), which means females were more than twice as likely to report depressive symptoms than males. This result supports the findings of Mikolajczk et al., (2007); Baldassin et al., (2008); and Aniebue & Onyema, (2008). These gender differences were also in line with the results of a survey of college student in Taiwan (Chang, 2007) which found that female students were more likely to seek professional psychological help than male students (Section 3.4.3). Abdel-Khalek and Al-Ansari (2004) stated that female vulnerability to mental health problem is associated with some type of genetic predisposition, rather than purely environmentally determined gender differences.

Although there is no data available for mental health disorders in the general population or among students in Libya, it is possible to compare these findings with data from European countries. It has already been discussed in section 3.4 that mental health problems are relatively more prevalent in student populations, and this section compares the prevalence of depressive symptoms between Libyan HES and those from other countries.

Table 7.2: Comparison with other survey data regarding depressive symptoms

Country	Number of respondents	Year of study	Cut-off value (M-BDI)	Gender	
				Male	Female
Libya	1300	2010	≥ 35	32.6	51.2
Germany	565	2007	≥ 35	22.8	26.7
Denmark	334	2007	≥ 35	12.1	24.9
Poland	562	2007	≥ 35	27.3	45.5
Bulgaria	685	2007	≥ 35	33.8	42.9

Sources: Mikolajczyk et al., 2007. The numbers in the above table are percentages.

When comparing the results with students from other countries, the findings of this study in relation to depressive symptoms showed that a large proportion of students in the study population had M-BDI scores ≥ 35 . Moreover, the present study found a gender difference, with a higher score amongst female students as compared to male students, and this was the case in all countries, but the female Libyan students had the highest depressive symptoms prevalence, as shown in the above Table (7.2). This is inconsistent with a previous study conducted among university students in Turkey by Bostanci et al., (2005). In comparison with the statistics above, the M-BDI scores in the sample of the present study were closer to another study, which showed that 33.8% of university students in Bulgaria had M-BDI scores ≥ 35 , but higher than those reported in Germany, Denmark and Poland with respect to male students (Mikolajczyk et al., 2007), as shown in the table above.

The total percentage of depressive symptoms (scores ≥ 35) in the present study was 45%. This was higher than the result in some other studies, for example that of Baldassin et al., (2008) which demonstrated that symptoms of depression were prevalent (score >9) in 38.2% of medical student in Brazil. In addition, when the prevalence of depressive symptoms was

assessed using the BDI scores ≥ 17 in a sample of university student in Turkey, it was found that 26.2% of students had depressive symptoms (Bostanci et al., 2005). In terms of the lower prevalence of symptoms of depression when compared to the present study however, all studies mentioned here used lower cut-off values to assess the prevalence of depressive symptoms compared to the present study, and the values used varied considerably between >8 and ≥ 35 . According to Benefield (2006) the situation is dangerous if students display five or more symptoms of major depression at the same time for a period of two weeks or longer, such as anxiety, decreased energy, sadness, sleep disturbances, loss of interest in usual activities, feeling of worthlessness or thoughts of suicide and weight changes; and in these circumstances students should seek professional help. In order to fully understand the expression of mental health conditions amongst student populations, Chang, (2007) suggests that further research that includes concurrent clinical assessments is required. One limitation of Benefield's study in terms of depressive symptoms was that the M- BDI was used as a research tool to measure depressive symptoms, but with the validity and reliability of information on the M-BDI possibly restricted to the German population.

Anxiety and depression

Regarding anxiety and depression, the present study also found a gender difference in terms of anxiety, with female students on average reporting higher levels of anxiety than male students (Table 6.11), but lower rates of depression (Table 6.12), and the result of more male students being diagnosed with depression contradicts previous findings ((Rab et al., 2008; Bryram & Bilgel, 2008). This finding is also reflected in data observed from seven other Arabic countries, namely Kuwait, Saudi Arabia, Emirates, Oman, Egypt, Syria and Lebanon, in research conducted by Abdel-Khalek and Alansari (2004). While the present study shows a

higher prevalence of depression among male students, the logistic regression analyses did not show any significant association between gender and being diagnosed with anxiety or depression. Conversely, it was also shown that female students were more likely to be depressed than males (Section 3.6), and some other previous studies that investigated the prevalence of depression among college and university students using different rating scales found higher levels of depression amongst female students (Rab et al., 2008; Bryram & Bilgel., 2008). This view is supported by Inam et al. (2003) who suggested that females experience higher levels of mental health problems compared to males: they found that 60% of students at the University of Ziauddin in Pakistan had anxiety and depression, of whom 60% were female. Also Aniebue & Onyema (2008) confirmed that female students were more likely than males to experience depression. Data from Libyan students implies that women have higher levels of stress (anxiety and depressive symptoms) than men. Different studies (e.g. John et al., 1997; Rosal et al., 1997; Sleskova et al., 2005) have suggested various possible reasons for this: Firstly, women are in general more prone to report their concerns about the amount and complexity of material they had to cover for their studies. Secondly, women tend to have higher self-expectations and therefore they more often feel a lack of competence. Lastly, there also exists a tendency for females to over report symptoms involving medical or psychological problems. However, Abdel-Khalek and Al-Ansari (2004) stated that female vulnerability to anxiety is associated with some type of genetic predisposition, rather than purely environmentally determined gender differences.

In addition, in this study, after adjustment for all variables, the researcher found that some of the predictors were independently associated with anxiety and depression (age, year of study, social support, satisfaction with social support, living place during the semester and

smoking). Similarly, among Brazilian university students, Oliveira (2008) found that 'subject', 'course level', 'finance of study', and 'living place during the semester' were associated with mental health disorders. The association found between levels of social support and satisfaction with social support on the one hand, and a student's place of residence being 'at home' on the other, suggests that the support offered by a typical extended Arab family is sufficient to make students less likely to suffer from anxiety and depression. This finding suggests an implication for futures research into family support, such as through the use of qualitative research techniques, to try to understand how these factors are related. This would allow for more in depth data to be collected, which could potentially provide further insight and explanation into this gender difference.

Moreover, the results of logistic regression analyses (Table 6.42 & 6.43) show that the odds ratio of being anxious or depressed increased with decreasing perceived social support (OR= 2.05 for anxiety, and 2.58 for depression), and also satisfaction with social support was significantly associated with a decrease in the odds ratio of being diagnosed with anxiety and depression (OR =2.35 and 1.93, respectively). These findings support those of Mikolajczyk et al., (2007) and Takakura et al., (2005). Therefore, the low rates of anxiety and depression might be explained by the high levels of social support which were reported by students who participated in this study (60.5% of students reported having more than three people supporting them). In general, people in Libya, and the wider Arab world, tend to live in extended family groups, with several generations sharing the same house. Furthermore, Libyan students tend to have a relatively large number of siblings, and this fact, taken together with the high proportion of student who reported their accommodation during semester to be 'at home' helps to explain the high levels of social support enjoyed by Libyan

HES. Previous studies (Mikolajczyk et al., 2007; Takakura et al., 2005) suggest that students with adequate social support have greater protection from major life stress factors, and also adjust better to stressful situations. A reduction in social support may thus explain part of a rise in depression, because insufficient social support has been found to be a major risk factor in mental disorder, especially when people are faced with major stress. When students' social support was lacking, their risk of health complaints greatly increased (Faculty Advisory Council and the Student Advisory Committee 2007). Therefore, these low rates of anxiety and depression might be explained by the high level of dependency of Libyan students on their parents, which decreases the costs of housing and food and increases parents' financial support, and by the generally low cost of living in Libya.

A possible explanation for the finding of a low percentage of students (females and males) who reported being diagnosed with anxiety and depression is that, in our sample, most students were living with their families (84.7%) (see Table 6.2 for more detail). In this study, accommodation during the semester was significantly associated with being diagnosed with anxiety, and the results showed that students who were living in university accommodation were more likely to be diagnosed with anxiety (OR= 2.97) compared with students who were living at home, a finding which agrees with the study of Rab & Nasir, (2008). Accommodation during the semester was found to be the most important reason associated with depression among university students in Pakistan (Section 3.6). In Pakistan, a significantly higher rate of depression was found among students living in college accommodation compared with those living at home, and there was a tendency for more students residing in college accommodation to report anxiety than those living at home (Rab & Nasir, 2008). Another possible factor for the low rate of anxiety and depression among

HEI students in Libya is 'sufficient income' (73% of students reported having sufficient income), especially with the availability of free higher education in Libya (Table 6.4). It was observed in the present study that the probability of being diagnosed with anxiety increased with decreasing perceived sufficiency of income. Most of the sample of Libya students reported financing their studies by parental financial support (see Table 6.5 for more detail), so there was no need for students to devote additional time to working while studying. This is in contrast with students from European countries, where students have to deal with various life stressors, for example, academic stressors, developing their independence, separation from parents, tuition fees, and housing, especially with generally high costs of living. As a result, some students in European countries devote additional time to working while studying. According to Mikolajczyk et al., (2007), there was an association between income perceived as insufficient and a higher incidence of depressive symptoms among European university students (Section 3.4.3). However, Abdel-Khalek and Al-Alansari (2004) indicated that the anxiety score of any given person is the end product of both biological and psychosocial factors, and their interaction. Furthermore, response style, especially a wish for social desirability and the tendency to hyperbole, have an impact on anxiety scores.

The study found that the level of depressive symptoms in higher education students in Libya was high, while the levels of depression and anxiety were low. There are four possible reasons for this. Firstly, the symptoms may not have reached a level that could conclude in a diagnosis. Secondly, the students themselves may not recognise the symptoms and seek medical help. Thirdly, this could be due to a lack of medical services on campus. Finally, the lack of diagnosis may be due to the fact that students are reluctant to seek medical help or answer questions honestly due to the stigma of a

diagnosis of depression and anxiety. Moreover, the analyses revealed that age was associated with being diagnosed with anxiety but not with being diagnosed with depression (Tables 6.42 & 6.43). Older age students had an odds ratio of 1.99 (95% CL = 1.19 – 3.31) for the age group between 20 – 25.9 years, and 2.29 (95% CL = 1.28 – 6.68) for the age group between 25 – 29.9 years, compared with the younger age (< 20 years). Special year students were four times more likely to be depressed compared with first year students. In addition, it was observed that students who never smoked were less likely to be diagnosed with depression OR = 0.41(95% CL= 0.18 – 0.95) compared with students who smoked daily. However, smoking was not significantly correlated with being anxious (Table 6.42). This study showed that there was no statistically significant relationship between mental health indicators such as anxiety and depression and certain independent variables such as ‘gender’, ‘monthly income’ and ‘finance of study’. However, previous studies (Mikolajczyk et al., 2007; Rab & Nasri, 2008; Oliveira et al., 2008) have shown that these variables do have a significant relationship with mental health disorders such as anxiety and depression. As the present results refutes past findings, and the incidence of diagnosed depression in the current study is statistically insignificant, possible reasons for this have to be considered. Previous studies used for comparison did not investigate only diagnosed depression, but rather combined questions investigating symptoms of anxiety and depression with a question concerning diagnosis. Possibly this study’s reliance on a single question has skewed the results for this variable, due to an unwillingness by students to report diagnosis, or the general low rates of diagnosis in the country as a whole, or due to some other clinical factor. As shown in Table 6.13, the cases of ‘no’ (95.7%) were the overwhelming majority, whereas for group ‘yes’ (4.3%), the statistical size was close to zero. The overall percentage of students answering ‘no’ for depression was 95.7%. The same assumption can be made

for anxiety. Another limitation connected to this study is the absence of base line information regarding the mental status of the student population in Libya at the beginning of their studies. Indeed, there is a lack of statistical information on the mental health status of the Libyan population as a whole, which makes comparison with this finding very difficult. Despite this fact, there is a high cost to both the individual and to society of anxiety and depression, especially amongst students who have a high rate of mental health disorders. Baseline data can be obtained by screening at the entry to school and university level, further evaluation by a psychiatrist can also help. Intervention strategies can be put in place by following and monitoring the extent of anxiety and depression and by more attention to students who have high levels of anxiety and depression (Inam et al., 2003; Bunevicus et al., 2008). Moreover, Rab et al. (2008) have made useful recommendations for further studies to evaluate the potential risk factors such as loss of parents, past history of systemic and mental illness and family history of mental illness (Section 3.4.3).

With regards to anxiety and depression, and in agreement with the findings of the present study, studies in other countries such as Turkey and China (Arslan et al., 2009; Rong et al., 2009) reported that anxiety and depression are common symptoms in the university student population. However, in comparison with other studies, this study found lower rates of anxiety and depression among HEI students in Libya compared with students from other countries. For example, when anxiety and depression in Pakistan University students were assessed using a hospital anxiety and depression scale, it was found that 19.5% of students reported depression and 43.7% reported anxiety (Rab et al., 2008). This represents a higher prevalence of anxiety and depression amongst university students in Pakistan when compared

to the rates reported by the present study (8.8% and 4.3%, respectively). Furthermore, when the prevalence of depression was investigated using Beck Depression Inventory and the Medical Outcomes Study Short Form-36 (SF-36) in a sample of university student in Turkey, the results showed that the prevalence of depression was 21.8% (Arslan et al., 2009), and Bayram & Bilgel (2008) using Depression Anxiety and Stress Scale (DASS-42) found higher rates of depression and anxiety (27.1% and 47.1% respectively) amongst Turkish university students. However, it is not possible to compare the results of this study with the aforementioned studies (Arslan et al., 2009 and Bayram & Bilgel, 2008) due to differences in the methods employed by each study, and this wide range of prevalence of anxiety and depression may be due to different instrument being used, and the lower rates amongst Libyan students may be due to the fact that participants in the present study were asked about a medical diagnosis, and therefore, lower rates of anxiety and depression were reported amongst Libyan HES.

In general, the current study found a low rate of anxiety and depression among HEI students in Libya compared with students from other countries. It must be recognised that the specific question about anxiety and depression in this study asked about a medical diagnosis of these conditions (Section 5.6.1.5). This leaves open the possibility that some respondents were suffering from one or both of these conditions without being aware of it, or without acknowledging or admitting it, or without having been diagnosed. Therefore, our findings suggest that social and cultural factors, such as gender, social support, and income seem to play a major role in influencing self-reported health, especially mental health. Similarly, observational studies have reported a strong link between mental health problems and the rate of smoking and alcohol misuse (Adewuya et al., 2006; Arslan et al., 2009). Psychiatric

disorders were three times more common among young people who reported regular alcohol use than among those who did not drink, and about half of the frequent cannabis users had a mental health disorder compared with only one in 10 of those who reported never having used cannabis (Maughan, 2004). This view is supported by Viner and Booy (2005) who stated that alcohol misuse in adolescence is associated with depression, and antisocial behaviours. University and college life has become more stressful for many students, and this stress can cause symptoms to become worse, along with coping with the contrast between school and university work, working independently, exams, housing and money worries, all of which can cause anxiety and depression (Andrews & Wilding, 2004; Benefield, 2006). Mikolajck et al. (2007) suggested that young people who are, as yet, not participating fully in a professional life might therefore have different reactions or be influenced in a different way by social and political change. Moreover, important somatic symptoms of depression such as eating disorders and sleep disorders can be caused by factors such as changes in sleep patterns before exams due to studying up all night, and may not always indicate depressive symptoms (Khawaja & Bryden, 2006). As stated earlier in Chapter Three (Section 3.4.3), the high levels of co-morbidity during university years are associated with an increased risk of suicide, therefore counselling and confidential mental health services are required in order to evaluate student depressive symptoms and also to help students to recognize their depression and request appropriate treatment (Baldassin et al., 2008). Therefore, further research is needed, preferably with larger samples to find out whether mental health status is related to lifestyle behaviours (e.g. smoking, alcohol and drug use). It would be helpful to accurately identify perceived health status and subsequently recommend changes for promoting health among students and young people in general. It has already been suggested that campus mental health services can reduce the problems of mental health disorders among student

populations (Danile et al., 2007; Oliveira, 2008) (Section 3.4.3). The following section will discuss the results with regards to general health complaints.

7.3.3 General health complaints

The outcome of this study showed that a number of physical health complaints, including headache (19%), back pain (13%), difficulties in concentration (15%) and depressive moods (24%) were reported very often (Table 6.13). When combining two response (sometimes and very often), as a reflection of these problems with general health complaints, their prevalence in both sexes was 60% for headache, 45.5% for back pain, 57% for difficulties in concentration, and 58% for depressive mood, and these complaints were the most prevalent somatic complaints within both sexes. Female students showed the highest rates in other categories of complaints, while male students had the lowest rates in most of the symptoms.

These findings support previous studies (Hadjistavropoulos et al., 2007 Stock et al., 2007; Abolfotouh et al., 2007). However, Stock et al. (2003) suggest that students are a comparatively healthy population due to their young age and high education level. However, the results of their study indicate certain health problems which are common in the student population, and some of these problems were also found in the present study's population. There were also considerable differences in the prevalence of complaints in the different areas in Libya. Overall, students from the East and South regions reported the highest levels of complaints, while students from the North and West the lowest. Heart problems, sleep disorders and difficulty in concentrating were consistently lower in the North and higher in the East. Stomach problems, back pain and depressive moods had a nearly similar prevalence

in most areas, but were especially low in West Libya. Among complaints, headache and depressive mood had the strongest impact on the quality of student life (see Table 32).

Although there is no data available for health complaints in the general population or among students in Libya, it is possible to compare these findings with data from other countries. Data used to compare the prevalence of general health complaints (percentage reporting the symptoms quite/very often) was based on data from surveys conducted amongst university students from seven countries (Stock et al., 2007).

Table 7.3: Comparison with other survey data regarding general health complaints

Complaints	Libya N=1300	Denmark N=548	Lithuania N=1,031	Poland N=572	Bulgaria N=701	Germany N=770	Spain N=658	Turkey N=1,037
Stomach complaints	6.2	10	18	22	25	22	25	26
Back ache	12.6	28	21	36	35	40	46	42
Headache	19.2	27	29	45	45	39	36	41
Sleep disorder	17.3	23	17	19	29	28	24	45
Neck/shoulder ache	11	39	16	34	29	45	33	45
Depressive moods	23.9	13	35	20	29	22	26	33

Sources: Stock et al. (2007). The numbers in the above table are percentages.

The data presented in Chapter Three (Section 3.5.3) suggests that rates of general health complaints amongst HES in Libya are relatively low, when compared with the literature reviewed in Chapter Three which contains studies that show much higher rates (see Table 7.3). For instance, when the prevalence of health complaints in seven European countries, namely Spain, Germany, Lithuania, Denmark, Bulgaria, Turkey and Poland were assessed

using the same self-reported checklist in a sample of 5,317 university students, it was found that these symptoms were highly prevalent in the student population, affecting as much as 20-50% of students quite often or very often. The highest rates of complaints were found to be backache, headaches or neck/shoulder ache (Stock et al., 2007). Overall, a higher prevalence of complaints was reported when compared to the findings of the present study, in which the percentage of the Libyan student population reporting these symptoms quite often or very often varied between about 6-24%. The patterns of the most important complaints in Libyan students was similar to that in German and Spanish students, but at even lower levels. Furthermore, Libyan students' scores were also lower than the levels of health complaints reported among students in Slovakia, where a study found that in total, only 29.2% of all respondents reported no health complaints at all, (Sleskova et al., 2005).

In addition to the above, when comparing the results with students from other countries, the findings of the present study regarding the prevalence of health complaints are lower than those reported among students from Alexandria University in Egypt, where Alolfotouh et al. (2007) found higher rates of complaints, 51% for example, with stomach trouble, 31.3% headache and 31% insomnia, using the same research method, whereas the prevalence of health complaints amongst student populations in Libya with regards to stomach trouble, headache and insomnia were 6.2%, 19.2% and 17.3%, respectively. It is interesting to speculate why Libyan students had lower levels of complaints compared with other students in different countries; this may be explained by the fact that the majority of Libyan students reported that they financed their studies with their parent's support. Another possibility is that most Libyan students reported that they lived at home, and these two factors have been shown to have an important effect on the health of the student population. Moreover, among

Libyan students the highest rates of complaints were found with respect to depressive moods, headaches, back pain, and difficulty sleeping. A study conducted by Mikolajczk et al., (2007) showed high levels of reported depressive moods among students in European countries, and those experienced by female students tended to be more frequent, due to low levels of social support. Conversely, the findings of the present study regarding depressive moods were relatively high, however, students in Libya reported high levels of social support (Table 6.3). This result is the opposite to what the figures for social support would suggest, and the possible reasons are not known, however this might be discovered through the use of qualitative research.

In line with other previous studies (Curry and Green, 2006; Bicakci et al., 2007) which have shown that headaches are a common symptom in the HES population, the findings of the present study revealed that headaches frequently occur in HES of both genders in Libya, and sixty percent of respondents indicated that they experienced headaches either sometimes or very often. This is a similar result to that of Curry and Green, (2007), who determined the prevalence of headaches in a sample of 104 university students in the USA using the same screening tools. It was found that 60% of the total sample reported that headaches interfered with their usual activities. In addition, Bicakci et al. (2007) assessed the prevalence of headaches among university students in Turkey and indicated that it was identified in 50.7% of the total sample. It is not possible to compare the results of Bicakci et al. with the present study due to differences in methodology and subject selection. However, it suggests that headaches are one of the most common health complaints in university undergraduate populations.

Logistic regression analysis using 11 factors as independent variables and three complaints (headache, back pain and sleep disorder) as dependent variables showed that year of study was the only factor independently associated with all three complaints. The factors 'gender', 'age' and 'finance of study' were each associated with two of the complaints (Headache and sleep disorder). This finding is in line with Bicakci et al. (2007), which suggested that health complaints affect the quality of life due to the limitation of daily activities. On the other hand, the variable 'satisfaction with social support' was found to be significantly associated only with back pain, and the variable subject was found to be significantly associated with just one complaint (sleep disorder, see Table 6.44, 6.45 & 6.46). However, Takakura et al. (2005) found that students with low social support were more likely to have health complaints compared with students with high levels of social support (Section 3.6). The findings regarding the association of health complaints to gender (male students were less likely to suffer from health complaints compared with female students) were in agreement with the findings of a study in seven European countries conducted by Stock et al., (2007). Also, the factor subject of study was associated with two of the complaints. Compared with students studying an engineering subject as a reference category, those studying medicine and science were more likely to suffer from sleep disorder and back pain. Conversely, Stock (2003) found that students studying engineering were more likely to suffer from neck/back pain compared with students studying health subjects.

This study also reports differences with respect to gender; for example, male students were less likely to suffer from psychosomatic complaints, and female students reported significantly worse health status in terms of the number of their health complaints. The results showed that most complaints were significantly more often reported by females, and a

chi-squared test showed significant gender difference, these differences being highest for headaches, heart problem, sleep disorders and depressive moods, while they were less pronounced for back pain, difficulty in concentration and neck/shoulder ache. Similar results were also reported from other studies (Sleskova et al., 2005; Abolfotouh et al., 2007; Simonsson et al., 2008). For instance, at the University of Alexandria in Egypt, a significantly higher proportion of female students than males had poor perceived health status and more perceived symptoms (Abolfotouh et al., 2007). Similarly, Simonsson et al. (2008) found gender differences with regard to health complaints, with male students reporting fewer and less frequent symptoms than female students in Sweden. Sleskova et al. (2005) found that female students in Slovakia rated their health worse than male students on all indicators, and pointed to the fact that it is possible that women find the stresses and strains of student life more difficult than their male counterparts, and that in general female students mostly reported more health complaints.

The high level of back pain among students, especially Libyan students, may be due to a more sedentary lifestyle, indicated by a lower level of reported physical activity, with just 5% of the total sample found to be meeting the recommended levels of physical activity in Libya (Table 6.19 & 6.20). The results regarding physical activity can also help to explain why students in Libya had high rates of psychosomatic complaints. It could be concluded that low physical activity levels had the main effect on health complaints among both male and female students, because, according to Mikolajczyk et al. (2008), better health was found to be associated with higher levels of physical activity. The findings revealed that students in Libya reported high levels of subjective health complaints, and this could affect their study and life in general. For example, sleep disorder problems might also be serious enough to affect their

academic performance, and from the above discussion the researcher can suggest that headaches are a very common symptom among student populations, and can affect the quality of life, due to a limitation of daily activities (Bicakci et al., 2007). As stated earlier in Chapter Three (Section 3.5.1), Curry et al. (2007) indicated that screening for headaches is an important role of the primary care provider, who is in an optimal position to assist patients with the recognition of headache types and the appropriate clinical management. Furthermore, health counselling and education aimed at increasing healthy behaviours amongst the student population could reduce more serious diseases later in life (Stock et al., 2007). The health needs of higher education students could be studied further by investigating potential positive and negative factors affecting their health. This study did not uncover the cause of the relatively fewer complaints about health amongst Libyan students. In order to provide the data necessary to contribute to a better health programme, further studies are recommended to investigate contributing factors associated with higher levels of health complaints such as social, structural, and cultural influences.

7.4 Discussion of findings regarding lifestyle behaviours

7.4.1 Dieting and body image

To the best of the researcher's knowledge, there has been no previous study into eating attitudes and behaviour which has targeted the student population in Libya, and in this study, dieting was explored to assess the occurrence of disordered eating attitudes and behaviours among students in Libya. The findings from this study in relation to dieting behaviour suggest that significant proportions of students are engaged in unhealthy dieting practices. For example over one-third (33.4%) of the total sample were dissatisfied with their body weight (Table 6.14), and the perception of being overweight and attempts to lose weight were generally high. Furthermore, about 40% of the total sample had used at least one dieting

method (Table 6.15). The findings from this research project support those in previous research (Wardle et al., 2006; Scully et al., 2007; Ojala et al., 2007).

In the present study, the five variables which significantly correlated with dieting behaviour by logistic regression analysis were gender, age, importance of being thin, dissatisfaction with body weight and overweight and obese students (Table 6.47). The concern to lose weight was more prevalent among female students than male students, and older age students particularly those 25-30 years, were more likely to practise weight control methods than those of younger age. Also those who were dissatisfied with their body weight and overweight and obese students were more likely to be engaged in current attempts to lose weight and had tried at least one method to control weight. Chmura et al. (2006) shows that in their study, women consistently perceived themselves to be overweight, or heavier than they actually were, and reported a wish to be thinner. The study's findings with respect to gender were in agreement with the study of Ojala et al. (2007), which also found that female students, overweight and obese students were more likely to be trying to lose weight compared with male students of normal weight. However, the study is in contrast with Taha (2008) with respect to physical activities; the present study did not find any interaction between vigorous and moderate physical activities, but they did find that vigorous and moderate physical activities were associated with dieting behaviour. Although Carroll et al. (2006) found that smoking was significantly associated with trying to lose weight amongst college students in the United States, conversely, this study did not find any association between smoking and trying to lose weight, even though it did directly assess the use of smoking as one method of weight control. Other factors found to be associated with dieting behaviour in the present study were satisfaction with body weight and levels of body weight. These findings support

those of other studies which suggest that young people who perceive themselves as overweight or obese are more likely to practice dieting behaviour, especially females (Malinauskas et al., 2006; Ojala et al., 2007). Also, students surveyed in this study who reported that being thin was very important for them were seven times more likely (OR= 7.04, 95% CL= 4.77 – 10.40) to use at least one method of weight control.

The results of this study showed that dieting (i.e. slimming plans), exercise and missing meals were the most frequently used methods for trying to lose weight among students in Libya (Table 6.15). These results support findings from previous studies (Wardle et al., 2006; Malinauskas et al., 2006). For example, Wardle et al. (2006) reported similar methods employed by students in Eastern and Western Europe and in the USA. Similarly, Wong et al (1999) reported that exercising, reading nutrition information and missed meals were more frequently used among students in Taiwan, and that missing lunch was a very common method of dieting used by male college students in Taiwan. In the United States, Malinauskas et al. (2006) found that the majority of students (83%) used dieting for weight loss, and 80% of students more typically preferred exercise as a form of weight loss. Similarly, Haase et al. (2004) state that students who believed in the health benefit of physical activity as a good method to control weight had been identified as correlates of physical activity levels. Kessler (2004) indicated that unhealthy dieting behaviour including fasting, diet pills, vomiting and laxative use were the most common methods used for weight loss amongst students in Cyprus. Actual body weight is less a determinant of weight control practices than perceived weight, which is an altogether more serious problem. Students who have distorted ideas about their weight and shape are more likely to eventually develop an eating disorder (Brener, 2004).

Although there is no data available for body image in the general population or among students in Libya, it is possible to compare these findings with data from other countries. The comparison in this section was based on a self-administered questionnaire which assessed body image perception and attempts to lose weight and the results are presented in Tables 7.4 and 7.5. The figures used to compare attempts to lose weight were based on data from the International Health and Behaviour Survey (IHBS), which was conducted amongst university students from 22 countries (Wardle et al., 2005).

Table 7.4: Comparison with other survey data regarding body image perception

Country	Year of study	N	Thin %	Just right %	Too fat
Libya	2010	1300	18.4	53.8	24.5
England	2010	816	8	30	61
Denmark	2010	548	10	49	40

Sources: El-Ansari et al., (2010). The numbers in the above table are percentages.

When Libyan students were compared with those from selected countries in Europe, namely England and Denmark, the results showed that a higher proportion of European students felt that they were 'too fat'. The statistics above show that students who perceived themselves as 'too thin' were more likely to be from Libya, whereas, students who perceived themselves as 'too fat' were more likely to be from England and Denmark (El-Ansari et al., 2010). Studies showed that body image dissatisfaction is widely reported amongst students in Western countries, especially among female students (Ojala et al., 2007; Meland et al., 2006).

Table 7.5: Comparison with other survey data regarding attempting to lose weight

Country	Male %	Female %	Region
Libya	6.5	20.5	Africa
England	15	48	North-Western Europe
Germany	18	42	
USA	25	59	America
Romania	15	50	Eastern Europe
Slovakia	24	49	
Italy	18	45	Mediterranean countries
Spain	24	38	
Thailand	26	54	Pacific-Asian countries
Japan	39	70	
Colombia	21	50	South American countries
Venezuela	21	51	

Sources: Wardle et al. (2005). The numbers in the above table are percentages.

In comparison with the statistics in Table 7.5, the pattern for students trying to lose weight was more diverse; however, both male and female students from Libya showed the lowest levels of trying to lose weight of all countries. Among female students, there were high levels of trying to lose weight in almost all countries, and students from Asian countries had the highest levels (Wardle et al., 2005). As an illustration of this point, Sakamaki et al., (2005) found that the highest proportion for both sexes was among Japanese university students, who desired body weights that were lower than their actual body weight.

Gender-related differences were evident in the present study: there was little statistical difference between genders concerning perceived body weight, with the prevalence almost

the same for both sexes for a perception of being 'too fat'. On the other hand, the results with respect to attempts to lose weight showed that females were more likely to be engaged in attempts to lose weight. Similarly, female students were more likely to perceive themselves as 'too fat' compared to male students in European countries, namely England and Denmark. The data presented in Chapter Four contains research that describes similar trends; for example, Kakeshita and Almeida, (2006) reported that amongst university students in Brazil both male and female student had a distorted self-perception of body image, overestimating or underestimating it, but females were more likely to be dissatisfied with their body weight. This view is also supported by other studies (Malinauskas et al., 2006; Ojala et al., 2007), as has already been discussed in 4.2.1. A possible explanation is this gender disparity might be socio-economic, cultural and political differences between the countries, involving factors such as income, gender roles, and social rights, which could cause positive attitudes towards thinness (Wardle et al., 2005; Chmara et al., 2006). The present study suggests that further research would be useful to fully understand the variation between genders and countries.

Overall, dissatisfaction with perceived body size is a serious problem among young people of both sexes, however the problem is generally more serious and widespread amongst females (Meland et al., 2006; Ojala et al., 2007). Even women with a 'normal' and healthy body weight ratio often desire to have a lower weight (Mikolajczk et al., 2010). This problem is exacerbated by the mass media (Madrigal et al., 2000). Young female students report a very low body image satisfaction about their real or perceived body shape. The images of beauty distributed by the media are powerful messages about what a culture expects of women (Wykes & Gunter, 2005; Taylor, 2006). More female students in this study reported that it was very important for them to be thin, and also it was found to be more important than to be

sporty. Therefore, this may be the main reason for dieting behaviour, i.e. that there exists an ideal of the slender body among women which places an emphasis on being slim to be beautiful. The results confirmed gender differences in body image perception; significant gender differences were found in this study, nearly half of female students (46.3%) had tried to lose weight compared with less than one-third (28.2%) of male students. The possible explanation for this difference might be due to males in Libya feeling less pressure to lose weight. According to Malinauskas et al. (2006), females try to lose weight to achieve a socially endorsed ideal of the beautiful body. Among university students from 22 countries (North-western Europe, USA, Central and Eastern Europe, the Mediterranean, Pacific Asia, South America), Wardle et al. (2006) confirm that women with lower BMI tend to overestimate their weight, whilst men with higher BMIs underestimate their weight. The general perception of being overweight, and consequent attempts to lose weight, are usually ineffective. Kakeshita & Almeida's research (2004) found that 87% of female students overestimated their body size. In contrast, 73% of obese men underestimated their body weight, and dieting was also found to be increasing, mostly among female students. Mikolajczk et al. (2010) showed a distinct difference between the sexes regarding satisfaction with weight, with girls showing much higher levels of general dissatisfaction than boys. Women on the other hand tend to carry about 20% extra body fat for reasons of fertility. Among university students in Japan and Korea, Sakamaki et al. (2005) showed that a comparison of BMI distribution between both countries indicated the highest value in the normal category, and a very low rate of obesity, however, the majority of female students in both countries had a desire to be thinner.

Amongst the factors motivating these body weight loss methods were peer pressure, media pressure and also the idea that extreme methods were not harmful (Taylor, 2006). Moreover, Grigg et al. (1996) found that peer pressure, media pressure and the perception that extreme dieting strategies were harmless were the motivating factors for unhealthy and disordered eating behaviours in Australian female adolescents. Likewise, Tiggeman & Hargeraves (2002) suggests that the mass media and diverse socio-cultural pressures are thought to cause an increased awareness of thin as being ideal and contribute to the misperception of body weight. However, this study did not examine the motivating factors for unhealthy dieting behaviours in its population. This indicates that there is a need to investigate factors associated with body image perception with those cited by Tiggeman and Hargeraves (2002) and Grigg et al. (1996), and also more specifically factors such as socio-demographics and nutrition behaviours among students in Libya. Kessler (2004) found that in colleges in the United States, many students were using strategies like laxatives and self-induced vomiting to lose weight. There are many socio-cultural pressures, including and in particular the mass media, which are contributing to the increasingly pervasive idea of a “thin body” as being in some way ideal. The general misperception of body weight is due, to a very large degree, to the image portrayed constantly by the media. The way in which individuals and society in general evaluate body weight has been highly influenced by the effects of the media. Wide variations amongst countries and across socio-cultural norms have led to a large difference in the number of people affected by body dissatisfaction (Tiggemann & Hargeraves, 2002). Understanding body image and the dietary behaviour of students is necessary, because unhealthy eating habits and distorted body image may contribute to the development of eating disorders, and according to Cheung et al. (2007) students who perceive themselves to be overweight are at an increased risk of developing eating disorders. Nassaer (1997) states that it is interesting to note the difference between Arab culture and Western society in the

regard. It has traditionally been considered in Arab culture that a fuller figure is considered beautiful and a symbol of fertility, womanhood and family care. However western societies associate beauty with thinness. Nevertheless, the attitudes and behaviours of the younger generation in Arab culture have been changing in recent times and have been becoming more influenced by western ideas and values (Al-Subaie, 1999). Similar to other rapidly developing and rapidly acculturating countries, in Libya this conflict between traditional values and modern western ideals has been felt by the younger generation (Eapen et al., 2006).

It is more common for young females and adolescents to be affected by body image, and the pernicious effects that these images have on young people need to be better and further explored. Weight loss is therefore an issue concerning many students and it is often achieved by dieting, which, in turn, is a common precursor to an eating disorder (Mikolajczyk et al., 2008). Previous studies (e.g Carroll et al., 2006; Meland et al. 2007) showed that dissatisfaction with body shape or weight leads to dieting behaviour, and students who are dissatisfied with their weight are at risk of developing eating disorders. Eating disorders and dieting behaviours are increasing especially amongst female students. Their aim is not just to lose weight, but to lose it in the long term. The National Heart, Lung and Blood Institute (1998) in the UK found evidence to suggest that long term body weight loss can be successful if accompanied by some form of therapy. Early educational interventions could help to prevent eating disorders and to enable young people to feel accepted and respected regardless of their weight and body shape (Kakeshita & Almeida, 2004).

7.4.2 Fruit and vegetable consumption

The findings of this study in relation to fruit and vegetable consumption suggest that a significant proportion of students fell short of the WHO recommended advice of eating five portions of fruit and vegetables daily, specifically, only one in ten students were found to be consuming an adequate amount of fruit and vegetables (at least 5 times a day) (Table 6.17). However, 25% of the sample nearly met the daily recommended (three –four times) servings of fruit and vegetables (see Appendix 5). Despite this, knowledge of the benefits of fruit and vegetable consumption was known, for example, by around three quarter of all students in this study who reported that it was important to eat healthy food such as fruit and vegetables (Table 6.16).

When comparing the results with the general population in Libya, the findings of this study are in agreement with the finding of the Libyan Secretariat of Health & Environment survey (2009). This survey found that 97.4% of both men and women aged between 25-34 years in Libya were not meeting the recommended levels of fruit and vegetable consumption (at least five servings per day). In a wider age group (25-64), the same percentage (97%) of people aged between 25-64 was not meeting the recommended levels of fruit and vegetable consumption. There was slightly more fruit and vegetable consumption among students in East Libya, and the possible reasons behind this finding may be that this region is predominantly an agricultural area, which may have had an obvious impact on both availability and price, and therefore consumption. According to Dris (2005), there are low levels of fruit and vegetable consumption in North Africa (Libya, Tunisia, Algeria, and Morocco), and the West Asian countries (Kuwait, United Arab Emirates, Syria, Lebanon and Jordan), and the levels in these countries are lower than in European countries. The low

consumption of fruit and vegetables in West Asian and North African countries can be attributed to the lack of a clear and efficient strategy to develop the agriculture of the region. Furthermore it is likely that this has been exacerbated by the economic crises, population growth, pollution, harsh climatic conditions and other natural catastrophes, and disease contamination affecting crop yields. As a result, consumers on low incomes often do not have access to affordable nutritious food from which they can select a healthy diet (FAO, 2005).

Binary logistic regression showed that only the 'importance of being 'thin' was significantly associated with fruit and vegetable consumption, compared with students who reported that it was not important for them to be thin, students who reported that it was very important for them to be thin were more likely by 1.38 times (95% CI = 1.01 – 1.88) to consume fruit and vegetables regularly. The outcomes of this study also suggest that fruit and vegetable consumption does not differ according to gender, and binary logistic regression test showed that there was no significant association between gender and fruit and vegetable consumption (see Appendix 5). Most studies exploring gender differences in dietary behaviour among students show a trend for females to have a more frequent intake of fruit and vegetables than males (Rasmussen et al., 2006). However, Scully et al. (2007) found that in their study males were more likely to consume the recommended quantity of fruit and vegetables than females. One possible reason for the absence of any association between gender and fruit and vegetable consumption in our sample may be the very low levels of fruit and vegetable consumption among all participants in our sample; as shown in Table 6.20 the cases of 'not meeting recommended levels' were 90%, the overwhelming majority, whereas the group 'meeting the recommended levels' were 10%. In general, there are several possible explanations for the low levels of fruit and vegetable consumption among students. One may

be that it is possible that the emphasis in health education for young people on the dangers of other aspects of lifestyle, for instance, smoking, alcohol and drug consumption, has led to a reduced emphasis on the importance of fruit and vegetable consumption in terms of health.

The data presented in Chapter Four (Section 4.3.2) suggest that levels of fruit and vegetable consumption amongst Libyan HES are very low, with only 10.2% of the total sample meeting the recommended daily consumption (five servings per day), and in this context the literature contains research that shows higher or similar levels of consumption in this area. For example, Scully et al. (2007) found that 20% of Australian students were meeting the daily requirement of five servings of fruit and vegetables, and 39% nearly meet the recommended daily amount (three servings), while Al-Rethaiaa et al. (2010) indicated that most university students in Saudi Arabia did not frequently consume fruit and vegetables, with the exception of dates which were eaten more regularly. These findings were similar to those of Richards et al. (2006), who reported that many students in the USA did not consume appropriate quantities of fruit and vegetables. However, a direct comparison between this study and the two studies mentioned (Al-Rethaiaa et al., 2010; Richards et al., 2006) could not be made because of the different methods used. For example, the current study regarded the recommended daily consumption to be five servings per day, but did not specify the kinds of fruit consumed, whereas other studies have used a measure of three daily servings to be sufficient. A review of the published literature on this area (Al-Rethaiaa et al., 2010; Richards et al., 2006) showed that the majority of college students were not consuming enough fruit and vegetables to prevent diet-related disease, but also revealed that there was an overall lack of research with respect to assessing fruit and vegetable consumption amongst student populations. Special attention should be paid to the importance of increasing levels of fruit

and vegetable consumption amongst student populations because this could help students to prevent and delay the onset of weight problems, in addition to which a strong association has been established between fruit and vegetable consumption and a decreased risk of chronic diseases such as cancer and hypertension (Lock et al., 2005), as explained in 4.3.1. Further research would also help to assess students' perceptions about fruit and vegetables, and what barriers they face to increased consumption, and also what motivations and messages might be effective in promoting increased consumption.

Due to the lack of qualitative evidence, further possible suggestions for these findings include the cost of fruit and vegetables. In addition, as most fruit and vegetables often need more preparation than convenience foods, and also need to be stored in a fridge, this could be perceived as a disincentive to students, who usually share a fridge or do not have access to one at all. This may limit student choice of fruit and vegetables eaten, and limit their choice of fruit and vegetables bought, and as result they may avoid them. Therefore, students should be aware of the health benefits of eating more fruit and vegetables, and should be encouraged to increase their fruit and vegetable consumption as part of disease risk reduction, healthy eating, and maximizing good health. Furthermore, this would help them to achieve their recommended energy requirements per day. Again, with more male students rating their eating habits as poorer than female students, there is no further information as to why male students chose not to meet recommended eating habits. It could have been due to the suggestions mentioned above, but again further investigation is required.

Since the majority of students were not consuming enough fruit and vegetables to prevent disease, finding a way to get students and young people in general to eat more fruit and vegetables could assist them in preventing and delaying overweight and chronic diseases such as cancer and hypertension (Richards et al., 2006; Rasmussen et al., 2008). Continued attention on increasing fruit and vegetable consumption is a practical and important way to optimize nutrition to reduce disease risk and maximize good health (Ann et al., 2000). According to Bowen et al. (2004), changing the mean consumption of fat, fruit, vegetables, and grain consumption in the population by even a small amount can have an important and significant effect on chronic disease rates. Current scientific evidence also suggests a prophylactic role for fruit and vegetables in the prevention of coronary heart disease, and evidence is accumulating for a protective role in the prevention of strokes (Ann et al., 2000). Also, according to the Food and Agriculture Organization (2003), “fruit and vegetables are good sources of complex carbohydrates, vitamins, minerals, and other substances important for good health”. Therefore, students should be made aware of the health benefits of eating more fruit and vegetables, and encouraged to increase fruit and vegetable consumption as part of disease risk reduction and healthy eating. Universities can also take a variety of steps to promote healthy food behaviours, and university programmes can provide students with information that supports healthy choices. Education programmes for university personnel can help them recognize and properly refer at-risk students.

7.4.3 Physical activity

Published studies on university-based physical activity are entirely lacking in Libya. It is important therefore to monitor trends in physical activity in young adults, and to understand factors such as attitudes and knowledge of health benefits that may be associated with activity

levels (Haase et al., 2004). The findings from this study in relation to physical activity show that the physical activity levels reported by the majority of students were insufficient in relation to international guidelines of WHO (2007). Only 5% students met the internationally recommended levels of moderate and vigorous physical activity (Table 6.19).

When comparing the results with the general population in Libya, the findings of this study show a lower level of moderate and vigorous physical activity than the findings of the Libyan Secretariat of Health & Environment survey (2009). This survey by the Libyan Secretariat (2009) found that 22.4% of both men and women aged between 25 -34 years in Libya were participating in moderate physical activity (26% for men, and 18.5% for women). With regards to vigorous physical activity, the survey (2009) showed that 36.6% of both sexes of the same age were doing vigorous physical activity (44% for men, and 29% for women). However, the survey of the Libyan Secretariat of Health & Environment (2009) did not show the total percentage of people who were meeting the recommended levels of physical activity (30 minutes for at least five days per week) or show the number of days people in Libya exercised per week, and so it was not possible to compare with our results with regards to meeting recommended levels of physical activity. However, the findings of the present study are in agreement with the findings of the Libyan Secretariat of Health & Environment survey (2009) in terms of gender differences. Also, the findings show that, in Libya, men were more likely than women to engage in physical activity. Furthermore, it is clear from the results of this study presented above that students in North Libya were more active. The highest percentages of students who met the recommended levels of physical activity were from the North (Table 6.36 & 6.37). There are two possible reasons behind this finding. Firstly, there is a much greater availability of facilities, for instance, fitness centres and sports clubs in the

north of the country. Secondly, inhabitants of large, modern cities are more likely to be subjected to pressures to improve body image.

When comparing the present study with studies from other countries, the results of this study suggest a lower prevalence of leisure time physical exercise among higher education students in Libya than that reported in the literature (Muttappallymyalil et al., 2010; Quadros et al., 2009), as discussed in Section 4.4.1.

Table 7.6: Comparison with other survey data regarding physical activity

Physical Activity	Duration	Libya		United Arab Emirates	
		N	%	N	%
Moderate	Nil	1124	86.5	17	15.5
	<= 30 minutes/day	145	11.1	33	30
	>= 30 minutes/day	31	2.4	60	54.5
Vigorous	Nil	1113	85.6	64	58.2
	<= 30 minutes/day	148	11.2	36	32.7
	>= 30 minutes/day	39	3.2	10	9.1

Sources: Muttappallymyalil et al. (2010). The numbers in the above table are percentages.

In comparison with the statistics above, the prevalence of physical inactivity observed in the present study was higher than that reported amongst university students in the United Arab Emirates in study conducted by Muttappallymyalil et al., (2010). When the prevalence of physical activity was assessed using the same method employed in the present study, in a sample of one hundred and ten university students in Ajman, UAE, it was found that only 15.5% did not do any moderate physical activity and 58.2% did not do any vigorous physical

activity, whereas, the prevalence of physical inactivity amongst students in Libya was 86.5% for moderate physical activity and 85.6% for vigorous physical activity. In addition to these figures, the above statistics showed higher levels of both moderate and vigorous physical activity among students in the UEA for both ≤ 30 minutes/day, and ≥ 30 minutes/day (Muttappallymyalil et al., 2010). Moreover, the prevalence of physical activity observed in the present study was also lower than that reported in Brazil by Quadros et al., (2009). In a sample of 762 Brazilian university students, it was found that the prevalence of physically inactivity was only 13.8% (Quadros et al., 2009), in other words clearly there were lower levels of physical inactivity amongst Brazilian university students when compared to the finding of the present study.

The practice of physical exercise was reported by low proportions of both male and female students in Libya. However, even in view of the growing trend worldwide with regards to an inactive lifestyle among HES during their study years (Abolfotouh et al., 2007; Taha, 2008), the levels found amongst Libyan students are a matter of concern, especially when considering the young average age of the respondents (mean age 20.9 years). The World Health Organization (2002) indicated that participating in adequate physical activity throughout the life span and maintaining normal weight are the most effective ways of preventing many chronic diseases, including cardiovascular disease and diabetes. As discussed in Chapter Four (section 4.4.2), there were two types of barriers with respect to physical activity prevalence, internal ones, including lack of energy and motivation, and external ones, such as lack of finance, time and social support (Daskapan et al., 2006). Therefore, further research is necessary to identify which perceived barriers are preventing

Libyan HES from taking sufficient physical activity, so that recommendations can be made by policy and decision makers.

A possible explanation for these generally low levels of physical activity among Libyan students may be the lack of knowledge or belief in the health benefits of physical exercise. Several studies (Daskapan et al., 2006; Taha, 2008) have shown a marked association between physical activity and belief in the health benefits of exercise. A cross-sectional survey carried out by Haase et al. (2004) with 19,298 university students from 23 countries (from Europe, South Africa, Thailand, the United States and Venezuela), showed that physical activity was positively associated with the strength of belief in the health benefits of physical activity. Haase et al. (2004) also found that physical activity was below recommended levels in a substantial proportion of students, and the study also found that knowledge about activity and health was lacking, with only 40 -60% being aware that physical activity was associated with a lower risk of heart disease. By the same token, another study found that beliefs in the health benefits of exercise were consistently associated with physical exercise, as was the desire to lose weight. Also, a lack of physical exercise was associated with cigarette smoking among both male and female students, with 40.7% of inactive male students being smokers. However, Haase et al., (2004) suggest that improving knowledge about health effects should not be expected to be an effective physical activity promotion strategy, even in less developed countries.

In the Libyan student population, over 94% of males and females felt that they did not participate in enough physical activity. Despite an extensive literature review, no studies were

found which could provide insight into why males and females reported their physical activity levels to be insufficient. Possible suggestions could be due to the number of students who are unemployed, and as men traditionally tend to be more likely to have manual jobs than females, they are more likely to perceive that they are not as active as they would wish to be. Moreover, there is usually a cost involved, which, due to students' financial situation and reliance on state benefits, may be prohibitive. Gidlow et al. (2006) suggested that there is likely to be a lower prevalence, or lower levels of physical activity, among those at the lower end of the socio-economic strata compared with those at the top. A WHO survey (2000) indicated an imbalance between knowledge of physical activity levels and perceptions of physical activity and health. Findings suggest that Libyan students may also not be aware of the health benefits of exercise, which results in a lack of motivation and energy required to participate in physical activity. Also, access may be a barrier, or the fact that there may be no emphasis on the health benefits of regular physical activity among the general population. It is clear that physical activity levels in the Libyan student population are very low, but again it is not apparent why. Therefore, qualitative methods of research would need to be implemented in order to establish the reasons behind this finding.

The current study showed that, among male students, the prevalence of regular physical activity was higher than female students. There was an association between gender and physical activity; male students were three times more likely than female students to have met international recommendations for physical activity (vigorous physical activity 95% CI = 1.55 – 5.63 and for moderate physical activity 95% CI = 1.33 – 5.41) (see Appendix 6). This supports findings by Quadros et al. (2009) who found the same trend in Brazil, and also Taha, (2008) who found that female students in Saudi Arabia were the main risk groups with regard

to physical inactivity. Findings from this study are also similar to findings by Daskapan et al. (2006), who conducted research among university students in Turkey. More female students reported a lack of physical activity and were overweight. However, the opposite was the case in Gidlow et al. (2006) who indicated that several studies reported that physical activities were more prevalent in women than in men (Section 4.7). In general, the low levels of physical activity amongst female students in Arab culture could be explained by behavioural as well as socio-cultural factors, as women have fewer opportunities to go outside the home, whereas men can be more independent, and share exercise with their peers (Abolfotouh et al., 2007). Due to the cultural difficulties facing women in taking regular physical exercise, it may be helpful for decision-makers at Libyan HESI to consider providing exercise facilities targeted solely of women, where cultural norms could be respected while allowing women the opportunity to take the exercise necessary for their good health. Other possible reasons which may be related to this difference are: lower social support from family and friends and lower enjoyment of activity, being unemployed for female students; and lack of time due to responsibilities related to the family and social environment; all of these could be a reason for female students' lower participation in physical activity, especially within the Arabic culture. Another possible reason for insufficient activity among both male and female students in Libya may be the availability of facilities and services such as the Internet, which tend to promote sedentary leisure-time activities rather than physically active leisure activity, and may also result in a significant decrease in the amount of student participation in physical activity, especially with the lack of sports and fitness facilities on campus which could provide more options for higher numbers of students to be engaged in physical activity.

High proportions of students in Libya were not meeting the recommended levels of physical activity, yet this study has found no previous work that has assessed barriers to physical activity for the university student population or even young people in general in Libya. However, studies published in other countries identify certain benefits and barriers to physical activity amongst university students and young adults in general (Haase et al., 2004; Gidlow et al., 2006; Daskapan et al., 2006). Moreover, physical activity habits during university years, or even the young adult years are likely to be important influences on habitual physical activity during the whole of adult life, and consequently have significant implications for long term health outcomes (Leslile et al., 2001). In general, there are many factors that can affect participation in physical activity; these include demographic variables, knowledge, attitudes and beliefs about physical activity. Buckworth & Dishman (1999) suggest that there are two cognitive variables which account for physical activity levels: perceived benefits and perceived barriers. Perceived benefits can positively influence the participation in an activity, whereas barriers can have negative influences. Daskapan et al. (2006) divided perceived barriers into two categories: internal barriers (lack of energy, lack of motivation, lack of self-efficacy, and fatigue), external barriers (lack of resources, lack of social support and lack of time). In a study among university students in Turkey, they found that perceived external barriers seemed more important than perceived internal barriers. Two internal barriers, lack of motivation and fatigue, were widely cited among sedentary teenagers and young people. To help students maintain good physical health, to reach the recommended levels for physical activity amongst students, and to promote recreational skills which have an effect on leisure-time exercise throughout life, sports and fitness facilities in university and college campus should be expanded, together with the implementation of educational programmes and courses during the academic year. There may also be some benefits from encouraging the mass media to provide information on the importance and relevance of a

physically active lifestyle. Perhaps there may be advantages to a more general strategy of making physical activity programmes available to all students and the general population, and putting resources into promoting them widely. Also, further research is needed to discover and to accurately identify perceived barriers and then recommend changes to enhance physical activity among the student population, as well as young people in general.

7.4.4 Smoking behaviour

As far as is known, few previous smoking cessation interventions have targeted the HES community in Libyan (Buni, 2006; Singh et al., 2006). Moreover, according to Singh et al. (2006), there have been no successful programmes for primary or secondary prevention of smoking among students, or indeed any other sections of the population in Libya. Studies that focus on smoking among students tend to focus on current smokers (Carroll et al., 2006). Therefore, in this study the researcher also focused only on current smokers. The results showed low rates of smoking among students in Libya (6%), and the results revealed that smoking is an almost exclusively male phenomenon in Libya (17.5% for males, and 0.1% for females) (Table 6.22).

When comparing these results with the general population in Libya, the findings of this study in relation to smoking showed a relatively low prevalence of smoking amongst students in Libya compared with the survey conducted by the Libyan Secretariat of Health & Environment (2009), which showed higher rates of smoking: for example 26.8% of people aged between 25–34 years were smokers (51.5% for men, and 0.9% for women). The Libyan Secretariat of Health & Environment Survey (2009) also revealed that 25.1% of people aged between 25–64 were smokers (50% for men, and 0.7% for women). The results of this survey

confirm the impression gained from the results of this study with regards to smoking; that it is a male phenomenon in Libya.

In agreement with the findings of the present study, Buni (2006) found a similar pattern of frequent smoking behaviour in a representative sample of university students in the Faculty of Medicine in Tripoli-Libya (Section 4.5.2). On the other hand, the prevalence of smoking found by this study was significantly lower than previous study conducted by Singh et al., (2006), whose study indicated that 26.7% of medical students at University of Garyounis in Libya were daily smokers. However, there is one possible explanation for the low prevalence (in total, 6%) which may be due to the fact that most students in the sample of this study were females, and according to the study of Singh et al. (2006) smoking is a predominantly male phenomenon among students in Libya. Moreover, the Libyan Secretariat of Health & Environment survey (2009) showed that only 0.9% of women aged between 25 -34 years were smokers, and none of them were daily smokers.

The present study found significant differences with respect to gender ($P = 0.001$), with more male student (6%) reporting being smokers compared with female students (0.1%) (Table 6.22). This finding is in agreement with the findings of the survey conducted by Libyan Secretariat of Health & Environment (2009), the results of this survey showed that 51.5% of male people ages between 25–34 were smokers compared with only 0.9% of female people. The same gender patterns of smoking were reported in a previous study of higher education students in Libya as discussed by Singh et al. (2006) and Buni, (2006), as shown by the data presented in 4.5.2. Furthermore, the main risk groups for smoking behaviour were male

students in different Arab countries such as Sudan; Jordan; Kuwait; Saudi Arabia (Modammed et al., 2006; Moukhyer et al., 2008; Khader & Alsadi, 2008; Al-Haqwi et al., 2010) and also, these results strengthen previous findings in non-Arab countries carried out by Carroll et al., (2006); Minhas & Rahman, (2009); and Mao et al., (2009). Compared to females, male students were more likely to smoke and started at earlier age. According to Buni (2006) and Singh et al. (2006), smoking was a largely male phenomenon among university students in Libya, in addition to which they smoked more cigarettes on a daily basis. Similarly, in Pakistan, Khan et al. (2005) found that more male than female students (22% and 3.8%, respectively) were smokers at the University of Karachi. The Organization of the Islamic Conference (OIC) member countries confirmed that the use of tobacco amongst men is socially acceptable and very high. Smoking amongst women continues to be socially unacceptable, especially in countries like Libya. Local traditions in Libya may contribute to these gender differences. However, it is worth noting here that female correspondents to the questionnaire may not have felt able to report honestly on a habit which is considered to be unacceptable. It has also been observed that smoking prevalence has not risen among women in Libya in recent years (personal observation). In this study, it was shown that only 0.9% of cigarette smokers in our study were female (0.8% occasionally, and 0.1% daily).

The data presented in Chapter Four (Section 4.5.2) suggest levels of smoking behaviour amongst Libyan HES are low, compared with the published record which contains research that describes higher levels (Minhas and Rahman, 2009; Khader and Alsadi, 2008).

Table 7.7: Comparison with other survey data regarding smoking behaviour

Country	N	Year of study	Percentage of smoking		Total rates %
			Male %	Female %	
Libya	1300	2010	17.5	0.1	6.0
United Arab Emirates	1057	2007	33	3.9	15.1
Jordan	340	2009	26	7	11.8
Pakistan	1529	2009	14.7	0.7	9.1
China	1874	2009	49	5	29
Saudi Arabia	215	2010	24	0	24
Malawi	130	2010	29	17.6	26.2

Sources with their country of origin: (Mandil et al., 2007. United Arab Emirates), (Merrill et al., 2009. Jordan), (Minhas & Rahman, 2009. Pakistan), (Mag et al., 2009. China), (Al-Haqwi et al., 2010. Saudi Arabia) (Kasaplia & Mkandawire, 2010. Malawi). The numbers in the above table are percentages.

In comparison with the statistics above, especially the results from other Arabic countries, the rates in the present study are lower than those reported in the United Arab Emirates, where 15.1% of all students reported themselves as smokers, (Mandil et al., 2007), Jordan 11.8% (Merrill et al., 2009), and much lower than the rate reported in Saudi Arabia, where 24% of male students reported themselves smokers, (Al-Haqwi et al., 2010). Furthermore, when comparing the results with other non-Arabic countries, the prevalence of smoking among Libyan students was lower than that reported among students in Pakistan, 9.1%, (Minhas & Rahman, 2009), and much lower than China, 29% (Mag et al., 2009), and Malawi, 26.2% (Kasaplia & Mkandawire, 2010). This disparity may be due to the fact that the majority of respondents in the present study were females, and previous studies have demonstrated that smoking is an overwhelmingly male phenomena in Libya, as discussed by Buni (2006) and Singh et al. (2006), (Section 4.5.2). Typically though, this gender division is the same in Arab culture in general (United Arab Emirates, Jordan and Saudi Arabia) and also in non-Arab

countries, as shown by the data presented in the table above for China and Malawi. With respect to gender differences, it is not surprising that the figures show more male smokers than female, and this could be explained by the fact that smoking is more socially acceptable for men than women in Arab culture. Abdel-Khalek and Al-Ansari (2004) indicated that in Arab tradition, there is a cultural favouritism of men over women, and that sons are given more freedom, authority and responsibility than daughters.

The relatively low prevalence of smoking amongst the student population in Libya may also be explained by the percentages of perceived obesity and overweight (4.7% and 18%, respectively) which is comparatively low, with over the half of students in our sample perceiving their body weight as 'just right' whereas only 3.3% perceived it as 'obese' (Table 6.8). According to previously conducted studies on dieting and smoking, there is an association between weight concerns and smoking behaviour among female students (Honjo & Sieget, 2003). Carroll et al. (2006) conversely found that smoking was associated with higher weight, and the intention of lose weight among male students. Since the positive association between weight concerns and smoking behaviour among students has been established therefore, it could be one possible reason of the low prevalence of cigarette smoking in our work. The reasons given for abstinence by female non-smokers were religion, social and health factors, whereas health was mainly cited by the male respondents. Also the reasons given by smoking males were easy availability, imitation and a stressful life, and in Oman, Al-Riyami & Afifi (2002), found that relaxing, having friends smoking and leisure were the reasons most often given by smokers. Data also suggest that the environment plays a role in smoking prevalence. Research shows that smoking was a means of control in an otherwise uncontrollable environment (McNeill, 2001). It has also been suggested that people

smoke as a coping mechanism to deal with the stresses of their everyday lives (Al-Haqwi et al., 2010). A more likely explanation for such findings is the culture of younger people which can also be seen to be a contributing factor, and peer pressure naturally affects young people more than older ones. Furthermore, young people may as yet not have felt the long-term effects of smoking.

A review of previous studies suggested that cigarette smoking is a major health problem among students (Carroll et al., 2006; Minhas & Rahman, 2009; Al-Haqwi et al., 2010), and by evidence smoking is related to a substantially increased risk of mortality from lung cancer, heart disease, stroke, chronic disease and a range of other medical conditions (Gomes, 2008). In Saudi Arabia, Al-Khadra (2003) found that smoking was the main risk factor for having acute myocardial infarction in young people. However, some students may not be aware of the potential risks that smoking has upon their health, yet the findings from this research project and those of previous research suggest that high proportions of smokers in student populations were interested in stopping smoking, and high percentages of these planned to stop smoking in the future, and some of them already had made an attempt to stop in the previous year. For example, in the present study, results showed that 67% of smokers were interested to stopping smoking, and among students at the University of Alexandria in Egypt, 90% wanted to reduce their smoking, but just 77% had tried to do so during the past year. In this context, in Pakistan, Khan et al. (2005) found that among medical students, over half of smokers planned to quit smoking in the future. Although the reasons for this desire to stop smoking are not known; they may be for health or financial reasons, but the important finding is that they wanted to give up. The World Health Organization (2003) has indicated that relatively low public and political support for anti-tobacco legislation results from a poor

understanding of the health risks associated with cigarettes. A lack of information about health care also leads to unhealthy lifestyle choices such as smoking behaviour (Khan et al., 2005). Saloojee & Chaouki (2007) reported that where education programmes about the dangers of cigarettes have been introduced, there is a reduction in smoking. Ghouri et al. (2006) states that in the majority of Muslim country's anti-smoking laws are only at a very early stage, they have only limited restrictions of cigarettes smoking in public places. Buni (2006) indicates that 89% of students think that the government should introduce financial penalties for the sale of cigarettes to minors. It has been argued that the most important and significant step a government can take to reduce the numbers of people smoking is to increase the cost of cigarettes in the first place (Saloojee & Chaouki, 2007). Because of the unequal sample of this study (more females respondents when smoking is known to be a predominantly male phenomena in Libya), our results may not characterize the general population of Libyan university students. There is a need for future research to be carried out with larger sample groups, to accurately identify the extent of this health concern, and then recommend changes.

7.4.5 Alcohol and drug consumption

The findings of this study in relation to alcohol and drug consumption show that alcohol and drug consumption is not common among Libyan students. Findings indicate that, only 3.5% reported that they drank alcohol, and of this only 0.3% of students reported drinking alcohol daily (Table 6.23). With regards to drug consumption, results showed that overall 1.6% of respondents reported using drugs, and all students who reported using drugs reported Cannabis use. Male students were significantly more likely than female students to use alcohol and drugs one or more times during their life. However, it is worth restating that

cultural strictures against the use of alcohol and drugs are very strong in Muslim countries (WHO, 2006).

When compared with results from the general population of Libya, the findings of this study are in agreement with the findings of the Libyan Secretariat of Health & Environment survey (2009), which found that 86.4% of men aged between 25-64 years in Libya and 99.4% of women of the same ages had never drunk alcohol. Only 2.3% of men reported that they had drunk alcohol in the previous month, and no women reported that they had drunk it in the previous month. Given the very low general incidence of drug and alcohol consumption in the population as a whole, one of the more interesting findings was that students in North Libya were more likely to have consumed alcohol and drugs compared with students from other Libyan areas. It is clear from the data presented above that there was a much higher prevalence of alcohol and drug consumption in Al-Fateh University in the capital city Tripoli, situated in North Libya. There are probably four main reasons for this: firstly, Tripoli, like all capital cities, is much more multi-cultural, with many foreign visitors and workers based in the city. This can affect the traditional Libyan way of life, for example, regarding alcohol and drug consumption, dress and music. Secondly, it has a much higher cost of living, which places additional pressure on students. Thirdly, these products are much more easily available. Finally, there are weaker ties to the family network and so students may feel more able to behave differently.

The prevalence of alcohol consumption observed in the present study was lower than that commonly reported in the literature, especially in non-Islamic countries, (Lihan et al., 2008; Vantamay, 2009; Cheeseman, 2009; Kasapila and Mkandawire, 2010). This supports

previous findings reporting low rates of alcohol and drug consumption among students in Islamic countries (WHO, 2006; Moukhyer et al., 2008; Ghandour et al., 2009).

Table 7.8: Comparison with other survey data regarding alcohol consumption

Country	Libya	Turkey	Iran	Malawi	Thailand	UK	Chile
N	1300	1720	173	130	1200	902	569
Year of study	2010	2008	2007	2010	2009	2009	2009
Total rates	3.5%	65%	16%	67.5%	41.2%	66%	74%

Sources with their country of origin: (Lhan et al., 2008, Turkey), (Kasapila and Mkandawire, 2010, Malawi) (Cheeseman, 2009, UK), (Jodati et al., 2007, Iran), (Romero et al., 2009, Chile), (Vantamay, 2009, Thailand). The numbers in the above table are percentages.

As can be seen from the figures above, students in Libya had the lowest levels of alcohol consumption, and this was not a surprising result. It was expected that Libyan HES would display lower levels of alcohol consumption compared to other student populations, especially those from non-Islamic countries, and the published record does contain research that describes higher levels: this could be due to the lack of availability and also the cost of alcohol. A further possibility is that alcohol consumption is forbidden under Islamic tradition, and the lower prevalence of alcohol and drug related problems in Libya can be perceived as a direct consequence of the predominant religious beliefs and culture. Ghandour et al. (2009) examined alcohol consumption and the role of religiosity in alcohol use in Christian, Druze and Muslim university students in a survey conducted in Lebanon. The study found that alcohol use more common in Christians, but also that believing in God and practising one's faith were associated with lower alcohol consumption in all religious groups, and this association was strongest for Muslims, indicating that religiosity may play a large role in alcohol consumption (as discussed above in 4.6.2). Shaun (2008) suggested that there are

many possible reasons why students in the UK choose to binge on alcohol. The first possible reason is the low price, which means that student can buy large amounts of alcohol with only a small amount of money. A second possible reason for students bingeing on alcohol is peer pressure, which influences young people's behaviour and attitudes towards alcohol. However, while these may be contributory factors, it also the case that heavy alcohol uses has been endemic in youth culture in the UK for many generations. In general, awareness about the dangers of alcohol abuse needs to be raised amongst student populations.

As different research instruments have been used for assessing health status and lifestyle behaviours amongst student population, this makes the situation difficult to understand. Sarkin et al. (2000) stated that comparing prevalence rates across studies is problematic, due to the use of different measures and scoring protocols. Therefore, in order to make comparison between different studies, a uniform way of measuring health status and lifestyle behaviours of student populations is required, particularly in view of the fact that some studies only include, as an example, self-reported weight and height when measuring BMI, whereas others include actual measured of weight and height. Having a common measure for the collection of data would make results more reliable and direct comparison easier. However, the information in this study was collected by self-reported measures of health status and lifestyle behaviours, and it can be concluded that Libyan HES reported lower levels of healthy lifestyle behaviours such as fruit and vegetable consumption and physical activity, and also lower levels of unhealthy lifestyle behaviours such as smoking and alcohol consumption. Further research is required in order to understand why these behaviour patterns were found, and a comparative study between student populations regarding different health aspects and lifestyle behaviours is especially recommended.

In the context of the population of this study, past research has suggested that young people are more likely to consume alcohol and drugs than older people (WHO, 2005; Moukhyer et al., 2008). In Libya, this does not seem to be the case, with respondents showing no significant variation from the general population on Libya, and this could be due to the lack of availability and also the cost of alcohol and drugs. Another possible reason for these findings maybe those students in Islamic countries are more aware of the potential risks of alcohol and drug consumption. A further possibility is that alcohol and drug consumption are banned in Islam, and the lower prevalence of alcohol and drug related problems in Libya can be perceived as a direct consequence of the predominant religious beliefs and culture, therefore, it is not surprising that low rates of alcohol and drug consumption were reported, especially with most of students in our sample (92.5%) reporting that their religion was very important in their life, and the results of analyses regarding the importance of religion can help to explain why Libyan students had low levels of alcohol and drug consumption. However, as students predominantly are young people, alcohol and drugs can be perceived as a potential threat for the future (WHO, 2006). The World Health Organization suggests that alcohol is not considered to be a serious or imminent public health danger in Islamic countries due to the religious attitude and consequent regulation of alcohol. However, it is still considered to be a possible threat for young people (WHO, 2006). Nevertheless, in Libya, the prevalence of alcohol and drug consumption, with their consequent health problems, is far from clear. The World Health Organization (2006) identified at least 61 different types of injury, illness or death caused directly or indirectly by alcohol, however because the use and sale of alcohol and drugs is against the law in Libya, respondents may have been unwilling to admit their involvement in the use of alcohol.

Despite the present study's finding a low prevalence of alcohol and drugs reported among the student population in Libya, the possibility is still open that alcohol and drug consumption

may be concentrated in small groups of students. The population profile in the Eastern Mediterranean Region is young, and there is increasing evidence that a high degree of alcohol and drug consumption amongst youths and students is developing (WHO, 2006). As explained by the data presented in 4.6.2, many studies have shown serious concern over the growing number of students who reported that they consumed alcohol and drugs in different countries of the region, such as Turkey, Iran, Lebanon and Sudan (Jodati et al., 2007; Lihan et al., 2008; Moukhyer et al., 2008; Ghandour et al., 2009). According to a WHO report (2006) the status of alcohol consumption and related harm in the EMR is far from clear, and information about alcohol consumption was available from only 12 out of 21 member states in the region, while in the Americas it was available from 32 out of 35. A real need has developed to design research and to increase the evidence base to study the patterns of alcohol and drug consumption in Libya. There needs to be an increase in the awareness of health problem related to alcohol and drug consumption. An integrated strategy needs to be developed at national level to prevent these trends and to fully take advantage of the religious and cultural traditions in Libyan society regarding the use of alcohol or drugs. Policy-making also needs to seriously address the subculture of hiding and denying the use of these substances. The government also needs to consider the impact of increasing globalisation on Libya, including the influence of workers from different cultural background, for example, workers in the tourism industry, migrant workers, and foreign companies working in Libya. All of these can have an economic benefit, but also a social influence, especially tourism. As discussed in Chapter Four (Section 4.6.2), the WHO has suggested some recommendations for the ERM with respect to a regional policy for alcohol abuse being developed.

In Chapter Five (Section 5.6.1.5), an explanation was provided for using the particular questionnaire employed in this study to allow direct comparison between Libyan HES and those from other countries; one of the main objectives of the study. An investigation into the health status and lifestyle behaviours of HES in Libya compared with those from different countries was intended to provide information on whether health inequalities exist between the two groups. Therefore, the research question addressed in this investigation was; ‘Are there differences in the health status and lifestyle behaviors of Libyan HES and HES from other countries?’ This research question has been addressed by comparing health status (e.g. BMI, mental health conditions and general health complaints) and lifestyle behaviours (e.g. body image and attempts to lose weight, fruit and vegetable consumption, physical activity, smoking behaviour and alcohol consumption) of Libyan HES with those from other countries. From the above discussion and the results found it can be concluded that the current study found a lower rate of anxiety and depression among HEI students in Libya compared with those from other countries. Also the prevalence of physical inactivity observed in the present study was higher than that reported amongst HES in other countries. The prevalence of smoking behaviour and alcohol consumption observed in the present study was lower than that commonly reported in the literature. However, as different research instruments have been used for assessing health status and lifestyle behaviours amongst student population, this makes the situation difficult to draw definitive conclusion from. Sarkin et al. (2000) stated that comparing prevalence rates across studies is problematic, due to the use of different measures and scoring protocols. Therefore, in order to make comparison between different studies, a uniform way of measuring health status and lifestyle behaviours of student populations is required, particularly in view of the fact that some studies only include, as an example, self-reported weight and height when measuring BMI, whereas others include actual measured of weight and height. The use of a common measure

would have made more reliable data and direct comparison easier. However, the information in this study was collected by self-reported measures of health status and lifestyle behaviours, and it can be concluded that Libyan HES reported lower levels of healthy lifestyle behaviours such as fruit and vegetable consumption and physical activity, and also lower levels of unhealthy lifestyle behaviours such as smoking and alcohol consumption. Further research is required in order to understand why these behaviour patterns were found, and a comparative study between student populations regarding different health aspects and lifestyle behaviours is especially recommended.

The final chapter of the thesis will conclude with a review of findings of the study, and provide a summary of the study's contribution to knowledge, along with certain recommendations. The implications of the findings for practice and research are explained and provide further information into the under-researched area of the health status and lifestyle behaviours of HES in Libya.

CHAPTER EIGHT

CONCLUSIONS

8.1 Summary of the research

The present study is important, not only because it has the potential to make a major contribution to improving the health of the HES population in Libya, but because it makes substantial progress in understanding the health of the student population in Libya, and amongst Libyan HEI by regions. In addition to this contribution to knowledge it also provides a comparison of the health differences between Libyan HES and those from other countries, knowledge and information not previously available in this area of study. In a country such as Libya, which is still in the early stages of research in this area, this study represents a contribution to the existing literature, as current literature searches have not revealed any similar research which has been conducted in Libya examining this important issue of health and lifestyle behaviours in HES. Furthermore, no other study previously carried out has included a comparison of higher education institutions in Libya with regard to lifestyle behaviours. In common with research in other countries, including both Arab and non-Arab countries, this study has largely concentrated on the health of university and college students, covering students studying a wide range of subjects and at different stages of their academic careers. Additionally, the target population of this project is an important one, as students form a large percentage of the population in proportion to their age group in developed countries, and include a significant proportion of those most likely to be highly economically productive in later life. It is therefore surprising that little research has been undertaken with regards to the health status and lifestyle behaviours of higher education students in Libya, prior to this study.

The aim of the present study was to investigate the health status (e.g. weight perception and BMI, mental health conditions and general health complaints), and the lifestyle behaviours (e.g. smoking, alcohol consumption, and dietary behaviour) of Libyan higher education students (HES); to compare health status and lifestyle behaviours in the different regions of Libya; and to compare Libyan HES with those from other countries. In addition to this, the study aimed to determine if any association existed between demographic and academic variables, and health and lifestyle variables. To achieve this aim, the study investigated: firstly, the current health status of Libya HES (e.g., weight perceptions and BMI, mental health condition, health complaints), and secondly, their lifestyle behaviours (e.g., fruit and vegetable consumption, dieting, physical activity, smoking, and alcohol and drug consumption). Finally, the study aimed to compare the results for students attending Libyan HEI in the different regions of the country, and subsequently to compare Libyan HES with those from other countries.

Chapter one of this thesis presented the main determinants of health and definitions of the health factors investigated, together with a rationale for the research, the significance of the study population, a background of the study, the aim of the research, the research questions, and finally the objectives of the study. In essence, Chapter one outlined the structure of the thesis layout. Chapter two provided an introduction and general background to the study, in particular providing contextual data concerning Libya, with a focus on certain areas relating to health including demographic trends, the emphasis placed on education by the Libyan state, agriculture, the economy, the public health sector, and food consumption.

An investigation into the health status and lifestyle behaviours of HES requires an understanding of a number of areas related to health and lifestyle factors, especially their implications to health and their prevalence. To provide this understanding a thorough review of the literature was undertaken and presented in two chapters; Chapter three focused on the literature review, relating it to the some aspects of the health status of student populations (weight perceptions and BMI, mental health conditions and general health complaints). Chapter four reviewed previous studies on student populations, conducted in both developed and developing countries, with regards to lifestyle behaviours (body image and dietary practice, fruit and vegetable consumption, physical activity, smoking behaviours, and alcohol and drug consumption). From the discussion presented in these two chapters, it can be concluded that students in many different environments and social contexts face a range of health problems and challenges, and practise certain unhealthy lifestyle behaviours (for example; physical inactivity, smoking, alcohol and drug consumption) to a greater or lesser extent. The literature suggests that these behaviours are prevalent and have been increasing among student populations in recent years. However, it is clear from reviewing the literature that those responsible for health have been paying increasing attention to these unhealthy lifestyle behaviours in many different developed and developing countries such as Lebanon, Saudi Arabia, Turkey, China and Australia. Recent research highlights the importance of health educational programmes in efforts to increase students' awareness of behaviours such as smoking, physical inactivity and alcohol and drug consumption. In addition, the review of the literature revealed that several studies using self-reported health indicators have been carried out very recently among student populations in many different countries (for example Oliveira et al., 2008; Arslan et al., 2009; Mikolajczyk et al., 2010; Nazary et al., 2010; Mao et al., 2010; El Ansari et al., 2010). In light of the increasing prevalence of unhealthy lifestyles, and in view of the paucity of research into this area in Libya, it is important to point out that

this study covered a multitude of variables of health status and lifestyle behaviours, as mentioned above, whereas many previous studies identified in the literature review confined themselves to a narrower range of variables.

The method used in the present study to investigate the health status and lifestyle behaviours of the Libyan student population were explained in Chapter five, which included a presentation of the research questions, research objectives, the method of data collection, the questionnaire survey population and sample selection, the pilot study, administrative procedures of the questionnaire, and the response rate. The statistical tests applied to the data were also explained. The questionnaire was chosen as a research method due to the opportunity it provides to collect large quantities of information, which can be gathered in a cheap and effective manner. Moreover, the questionnaire is a very popular market research tool and one with which most people are familiar. Its main strength is that it allows identification and description of a variety of answers on a specific subject, and enables a researcher to find a relationship between positions on one set of questions to positions on another (Sarantakos, 2005). The first version of the questionnaire was translated and used for the pilot study, and the pilot study ensured that the most appropriate methods were being used to ascertain the factors required, and that this would lead to further in-depth analysis, as well as highlighting any problems in sampling or technique. The questionnaire was designed to be a self-administered written questionnaire, and it consisted of a majority of questions which were more closed in nature, and which included the required variables of health status and lifestyle behaviours. Demographic information was also collected, including data for a wide range of related study information such as year of study, subject and living arrangement during the semester, and others. Information explaining what the study entailed was read out to the students at each venue. Questionnaires were distributed to students during their lecture

time and volunteers were provided to help with administration. The total number of students who completed the survey, after discarding incomplete questionnaires, was 1300. No student was identifiable through the questionnaire. The study had a response rate of 74.6%. The data were analysed using interval statistics, including descriptive analysis, Chi-square and binary logistical regression, through the Statistics Package for Social Scientists (SPSS) version 16.

Analysis of the responses to the questionnaire survey was presented in Chapter six. In light of the five research questions outlined in Chapter one (1.5) and Chapter five (5.5), this chapter provided a detailed analysis that set out to answer these questions. The analysis of the data was partly quantitative, and the quantitative treatment of the data allowed for some comparisons to be made between genders, the different Libyan regions and between HES in Libya and HES from other countries. The results of the descriptive analysis regarding health status and lifestyle behaviours were discussed in Chapter seven and suggestions are made for research and practice implications. Finally Chapter eight summarised the findings of this study and presented the contribution of knowledge. Recommendations were also made for educational programmes more relevant to students, addressing their attitudes and promoting the overall health of the student population. At this point some general answers are given to the questions posed at the beginning of Chapter Five (Section 5.5).

8.2 Summary of the findings regarding health status

Health status and lifestyle behaviours were studied by assessing weight perception and BMI, mental health conditions, health complaints, dieting behaviour, fruit and vegetable consumption, physical activity levels, smoking behaviour, and alcohol and drug consumption.

The conclusion from the results can be summarised in the following key points.

The research question addressed in this investigation with respect to health status was; *'What is the health status among Libyan HES, for example, weight perception and BMI, mental health conditions, and general health complaints?'* The proportion of students who perceived themselves as 'thin', 'just right', 'a little overweight', or obese were 18.4%, 53.8%, 24.5%, and 3.3% respectively. No significant gender difference was found with respect to the perception of body weight. Participants were classified according to BMI, as underweight (14.5%), normal weight (44.8%), overweight (18.2%) or obese (4.7%). In the group studied nearly half of the total sample was classified as normal weight, and there were lower rates of obesity and overweight, however, only one third of the students were very satisfied with their weight, and about 42% of the participants had tried at least one unhealthy weight reduction method. The most common methods of dieting were skipping meals for female students, and exercise for male students. In general, overweight and obese students were more likely to be engaged in current attempts to lose weight, especially females and those who reported that it was either 'somewhat' or 'very important' for them to be thin.

Depressive symptoms were assessed using the Modified Beck Depression Inventory (M-BDI) with a cut-off point score for screening for clinically relevant depressive symptoms at ≥ 35 , which was recommended in the general population (Schmitt et al., 2006). Depressive symptoms were found to be common among HES in Libya; a total of 45% met the criteria for depressive symptoms. There appeared to be many factors which played a role in students' health status. Gender seems to have been significant, with female students (51.2%) more likely to have had higher scores for depressive symptoms than male students (32.6%). The factors that were significantly associated with higher scores (≥ 35) of depressive symptoms in the students included female gender, medicine as the subject of study, satisfaction with social support, monthly income, and finance of study. In addition, the results showed that overall,

8.8% of students reported that they had been diagnosed with anxiety, and 4.3% diagnosed with depression. Students living in university accommodation were significantly more anxious than those living at home, but no significant association with depression was found. Those who had high social support were less anxious and depressed, and those who were dissatisfied with their social support were more likely to be anxious and depressed.

Health complaints in this study were measured by using a symptom checklist with a self-administered questionnaire. A high prevalence of complaints was reported amongst students, with 6-24% of the student population suffering from one or more of the surveyed symptoms 'quite often' or 'very often'. Depressive moods (24%) and headache (19.2%) had the strongest negative impact on quality of life. Female students were significantly more likely to report health complaints. The gender difference was found across a range of complaints, with the sole exception of neck/shoulder pain, which was more prevalent in male students. Those having a job during semester and during breaks were more likely to report sleep disorders and headaches.

An overall conclusion from this section is that in general the prevalence of overweight and obese was much higher than the prevalence of underweight, but with the highest number of respondents in the normal category of BMI. There was however, a high prevalence of depressive symptoms, but low rates of diagnosed anxiety and depression. There were relatively high levels of reported headache, depressive mood and neck/shoulder pain symptoms among HES in Libya. The following section will present a summary of the findings regarding lifestyle behaviours.

8.3. Summary of the findings regarding lifestyle behaviours

The research question addressed in this investigation with respect to lifestyle behaviours was; *'What are the lifestyle behaviors among Libyan HES?'* Health can be influenced by lifestyle behaviours, for instance body image and dietary behavior, fruit and vegetable consumption, physical activity, smoking, and alcohol and drug intake, all of which make a major contribution to levels of illness and death in all age groups (WHO, 2006). The results suggested that a significant proportion of Libyan students were not maintaining the recommended advice of eating five portions of fruit and vegetables daily. In terms of physical activity levels, the results indicated that students' physical activity levels were insufficient, and only a few students were achieving the levels considering necessary to the maintenance of good health by the WHO in its physical activity recommendations. Therefore students were at a higher risk of developing health problems, and of developing contributory factors such as obesity. However, with respect to unhealthy lifestyle behaviours, the results of this study indicated clearly that the prevalence of risk taking behaviours among students in Libya were low. It was found that students' risk-taking behaviours were low regarding both smoking and alcohol and drug consumption, and confirmed that these risky behaviours are almost exclusively a male phenomenon. Alcohol and drug use is not widespread in Libyan society, and the low rates among students in Libya can be perceived as a direct consequence of the predominant religious beliefs and culture, but that does not mean such behaviour does not exist.

The research question addressed in this investigation with respect to the differences between Libyan regions was; *'Are there differences in health status and lifestyle behaviors between Libyan HES institutions by region?'* From the answers presented in Chapter Six (see Section 6.6) it appears that participants in West Libya had the highest levels of BMI (overweight and

obesity) compared to participants from other areas, and obesity was highest in West Libya (6.1%). Conversely, East Libya had the highest proportion of underweight students (17%). The results revealed that students from West and South Libya were more likely to report that they had used at least one method for weight reduction compared with students from East Libya. Furthermore, there were also considerable differences in the prevalence of depressive symptoms in the different of HEI locations. Overall, the scores ≥ 35 were above half of the total sample in East and South Libya, compared to around 40% in both North and West Libya. Overall, samples from North and West Libya were more similar to one another, and the South and East samples likewise exhibited similarities between each two areas. No significant differences between Libyan HEI were found in terms of anxiety and depression. The prevalence was nearly similar in all Libya areas; although depression was slightly higher in East Libya than other Libya areas. There were also considerable differences in the prevalence of complaints in the different areas in Libya. Overall, students at intuitions in the East and South reported the highest levels of complaints, while students from the North and West the lowest. Heart problems, sleep disorders and difficulty in concentrating were consistently lowest in the North and highest in the East. Stomach problems, back pain and depressive moods had a nearly similar prevalence in most areas, but were especially low in West Libya.

With respect to healthy lifestyle behaviours, there was a slightly higher level of fruit and vegetable consumption among students in East Libya, and the possible reasons behind this finding may be that this region is predominantly an agricultural area, which has an obvious impact on both availability and price. Furthermore, it was clear from the results of this study presented above that students in North Libya were more active, and the highest percentage of students who met the recommended levels of physical activity were from this area. Moreover,

with respect to unhealthy lifestyle behaviours, the results showed that the highest level of smoking was found in North Libya, whereas those from South Libya had the lowest level. Also one of the more interesting findings was that students in North Libya were more likely to have consumed alcohol and drugs compared with students from other Libyan areas. It is clear from the data presented above that there was a much higher prevalence of alcohol and drug consumption in Al-Fateh University in the capital city Tripoli, situated in North Libya.

The research question addressed in this investigation with respect to the associations between demographic and contextual variables and the more prevalent health and lifestyle behaviours was; *'Are there associations between the more prevalent variables and health status and lifestyle behaviours?'* From the answers presented in Section 6.7 the logistic regression analysis revealed substantial associations between female gender, medical students, those dissatisfied with social support, students with insufficient income, those having a job during the semester and breaks; and having M-BDI scores ≥ 35 . The main risk groups for anxiety were students aged 20-30 years, students with low social support, those living in university accommodation, while the high risk groups for depression were students in special year, and students dissatisfied with their social support. In addition, the factors female gender, students aged 20-25 years, second and third year students, and students having job during breaks, were associated with increased prevalence of headaches. In addition, third year students, and students dissatisfied with their social support were associated with an increased prevalence of back pain. After adjustment for demographic characteristics, female gender, older age, medicine and science students, second, third and fourth year students, and students having a job during semester were associated with an increased prevalence of sleep disorder. In relation to dieting practise, the factors female sex, students age 25-30 years, students who

reported the importance of being thin, dissatisfied with their body weight, overweight and obese students were the main determinates of unhealthy dieting practise.

An investigation into health status and lifestyle behaviours between Libyan HES and those from other countries was intended to provide information on whether health inequalities existed between the two groups. Therefore the research question addressed in this investigation was; *'Are there differences in the health status and lifestyle behaviors of Libyan HES and HES from other countries?'* It was hypothesized that differences between the two groups existed and therefore, that health inequalities would be evident between Libyan HES and those from other different countries. This research question was addressed by comparing perceptions of health status and lifestyle behaviors. The results of the present study reported high levels of overweight and obesity, similar to rates amongst students at Alexandria University (Abolfotouh et al., 2007). The findings from this study in relation to overweight and obesity showed that the rates reported among higher education students in the present study are much higher than those reported in students from other countries such as Poland (Chmara et al., 2007), Japan and Korea (Sakamaki et al., 2005). However, there was a lower prevalence of obesity amongst Libyan male students when compared to Saudi male students (Al-Rethaiaa et al., 2010). The M-BDI scores in the sample of the present study were close to the rates reported among university in Bulgaria and higher than those reported in Germany, Denmark and Poland with respect to male students (Mikolajczyk et al., 2007). However, in comparison with other studies, the study found a lower prevalence of anxiety and depression amongst university students in Libya compared with rates reported amongst student in Pakistan (Rab et al., 2008), and also lower than that reported amongst university student in Turkey (Arslan et al., 2009; Bayram & Bilgel, 2008). The rates of general health complaints amongst HES in Libya were lower than those reported amongst students in six European

countries, namely Spain, Germany, Lithuania, Denmark, Bulgaria and Poland (Stock et al., 2007). Furthermore, it was also lower than the levels of health complaints reported among students in Slovakia (Sleskova et al., 2005), and at Alexandria University in Egypt (Alolfotouh et al. 2007).

In addition, the levels of fruit and vegetable consumption amongst Libyan HES were very low, with only 10.2% of the total sample meeting the recommended daily serving (five portions per day). The levels were lower than those reported amongst Australian students (Scully et al., 2007). The prevalence of physical activity levels observed in the present study was lower than that reported amongst university students in the United Arab Emirates (Muttappallymyalil et al., 2010). Moreover, higher levels of physical activity were found amongst Brazilian university students when compared to the finding of the present study (Quadros et al., 2009). The results of this study indicated clearly that the prevalence or risk taking behaviours with respect to smoking and alcohol and drug consumption among student in Libya were low. The results showed a lower prevalence of smoking behaviour among HES in Libya in comparison with those from other Arabic countries, for example, the United Arab Emirates (Mandi et al., 2010), Jordan (Merrill et al., 2009), and much lower than the rate reported in Saudi Arabia (Al-Haqwi et al., 2010). Furthermore, when comparing the results with other non Arabic countries, the prevalence of smoking among Libya students was much lower than the prevalence reported among students in Pakistan (Minhas & Rahman, 2009), China (Mag et al., 2009), and Malawi (Kasaplia & Mkandawire, 2010). The possible explanation may be due to the fact that the majority of respondents in the present study were females and previous studies have demonstrated that smoking is predominantly a male phenomena in Libya, as discussed by Buni, (2006) and Al-Amari, (2006). With regard to alcohol consumption, the prevalence of alcohol consumption observed in the present study

was lower than that commonly reported in the literature, especially in non-Islamic countries (Kasapila & Mkandawire, 2007; Lihan et al., 2008; Vantamay, 2009; Cheeseman, 2009), and the possible explanation for that may be due to unavailability and religious prohibition.

The main conclusion to be drawn from this section is that a high proportion of students did not meet the recommended levels of physical activity or fruit and vegetable consumption, and the levels observed amongst the sample of this study were lower than those reported in the literature. Overweight and obese students were more likely to be engaged in attempts to lose weight and/or to have tried to control their weight. With respect to risk taking behaviours, low levels of smoking and alcohol and drug consumption were found. Those from North of Libya were more likely to meet the international recommended level of physical activity, but also more likely to be engaged in risk taking behaviours such as smoking and alcohol and drug consumption. In view of the findings outlined above, recommendations regarding the establishment of educational health promotion and intervention programmes targeting student populations are now addressed. Through further research and improvements in health services for students' population, health problems can be reduced and therefore the quality of life for students can be improved. This could be achieved for instance, by specific policies and subsequent action plans addressing major health behaviours (e.g. similar to the programmes mentioned in chapter four). The policies and strategies should aim at promoting healthy lifestyles and reducing risk factors to student health, and they should be developed with rigorous evaluation and research to assess their effectiveness, trends and direct the development of subsequent plans for student health promotion. Next, the implications of the findings for practice and research are explained, and further information is provided about the under-researched area of the health status and lifestyle behaviours of HES in Libya.

8.4 Implications for Practice

The results have shown that there are several implications for health education and the results support the opportunity for partnership working to promote the health status of HES. Policy and strategy makers, ministries of education and health, health promotion agencies, researchers, higher education leaders, physical activity specialists, mental and physical health professionals could work together towards the aim of improving the health status of this group. There are implications for the professionals and agencies that work with student health in addition to local health promotion services that are involved in planning healthy living opportunities and services.

There is a wealth of opportunities for improving health through both education and practice, these may include:

- The prevalence of overweight and obesity (23%) was high in comparison with other survey data, and obesity increases the likelihood of various diseases, particularly certain types of cancer, heart disease, type 2 diabetes and osteoarthritis. An effective way to prevent becoming overweight or obese is by healthy eating and regular exercise (Wasfi et al., 2004). Therefore, to prevent overweight and obesity nutrition education intervention programs for HES are required, especially programmes emphasizing healthy food choices, and physical activity uptake. Students should be provided with more information about their nutrition, to improve their awareness of healthy food choices. Moreover, there is need to promote lifestyle change and to reduce levels of overweight and obesity amongst student. This will be challenging as the majority of the study sample were physically inactive, and for whom there are also cultural barriers to becoming more active. Health professionals should therefore emphasise the importance of physical exercise in combination with healthier eating

practices, whilst HEI's could ensure suitable physical activity opportunities are made available to all students, regardless of gender. Interventions should highlight the importance of sport, and promoting healthy body weight by exercising regularly, as both a healthy lifestyle and as a safe method for controlling and losing weight.

- Dissatisfaction with body image is more widely reported amongst female students; therefore psychosocial programs could be developed. These programs could also help to avoid misperceptions of body image as well as preventing the development of eating disorders among both sexes. Data reviewed indicates that high levels of this dissatisfaction already exist amongst female students (El Ansari et al., 2010; Al-Rethaiaa et al., 2010). So in order to be most effective the programs should be introduced at this early stage. Previous studies suggests that programs should target many areas such as: understanding that body shape is not immutable and can change; the benefits of healthy and proper nutrition; a discussion of the negative effects of dieting together with the positive effects of moderate exercise; development of strategies to resist the effects of peer pressure and the influence of the media and finally an acceptance of a wide variety of body shapes (Sakamak et al., 2005; Al-Rethaiaa et al., 2010). Given the increasingly widespread problems of eating disorders, there is clearly a need for psycho-educational approaches which focus on healthy food choices including strategies for safe dieting as an integral part of any nutritional education and weight loss intervention program (Ojala et al., 2007). College and universities may be excellent settings to address misperception regarding body weight in order to prevent unhealthy behaviour amongst student populations. In addition healthy eating groups offering health and weight management programs could be offered, these would include information regarding safe weight loss, exercise and BMI information. These groups might also offer coaching and ongoing support.

Moreover, interventions should highlight the association between quality of life and body image perception among students. Such an intervention should draw attention to the significance of healthy and supportive environments acknowledging the association between quality of life and body image perception.

- As part of a national public health agenda, one of the key areas for public health action should be a greater emphasis on the promotion of policies aimed at increasing the levels of physical activity both of the student population and young people in general. A two pronged approach is vital here: firstly the negative implications of physical inactivity and the ensuing risk of developing a whole range of chronic disorders must be fully explained and secondly the reverse side of the coin, i.e. to develop students' knowledge about healthy lifestyles and the skills and behaviour of healthy living. It is important that universities and colleges provide information about the benefits and role of physical activity and could increase physical activity sessions and education. Courses could be offered during the academic year in a variety of individual and team sports and fitness activities which would help students maintain good physical health. This would also teach recreational skills with a potential carryover for lifelong leisure time activity (Sparling & Owen, 2001; Powell & Taha 2008). Higher education institutions should provide a range of indoor and outdoor facilities on campus, offering reduced membership rates to local sports centres; this would particularly help lower socio economic groups (WHO 2006). Leisure centres and opportunities for physical activities should be made much more available to all students with sensitivity to cultural and gender differences especially in Libyan society. In terms of service planning, facilities, such as leisure centres, and physical activity opportunities should be more accessible to students, especially women. This would enable students to be provided with more convenient access to these activities.

- Student populations need to be given information about the adverse effects of smoking and all major diseases caused directly and indirectly by smoking (Khader and Alsadi, 2008). Educational programs and major public health strategies need to be established and aimed at smoking cessation interventions, also with the aim of helping students who are already regular smokers to reduce their number of cigarettes and to quit smoking. Prokhorov et al. (2008) discovered that amongst US college students smoking intervention programs can reduce the prevalence of smoking. Furthermore, media advertising of cigarettes should be severely restricted in public spaces. Media should also be used to help disseminate the message of quitting smoking to the whole population in Libya. Finally, since smoking tobacco is the single most preventable cause of death and disease in the world today (Khan et al., 2005), policies could be developed, as in parts of Europe, prohibiting smoking in all public places. Specific training in counselling about smoking could form part of the core medical training at Medical School thus enabling future doctors to be better prepared to protect both themselves and future patients from the dangers of tobacco smoking.
- National health promotion programs should put greater emphasis on an increased intake of fruit and vegetables up to 600g per day, as a minimum policy goal. Lock et al. (2005) stated that an increase in fruit and vegetables up to 600g per day could have a significant impact in reducing many noncommunicable diseases (as discussed in 4.3.1). It could reduce the total worldwide burden of disease by 1.8%, in particular it could reduce ischemic heart disease and strokes by 31% and 19% respectively. For stomach, oesophageal, lung and colorectal cancer, the potential reductions were 19%, 20%, 12% and 2% respectively. Policies should be promoted which target not only individual behavioural change but also cultural change regarding the general consumption of more fruit and vegetables, for example interventions similar to the

five-a-day campaign in Europe. Action could also be taken on agriculture, food labelling, advertising, nutritional information, nutrition programs and differential food taxation with the aim of removing obstacles for people and to enhance their ability to choose healthy diets. Students in particular should be targeted to improve their diets through programmes to improve their food preparation and cooking skills, and to encourage their choice of more fruit and vegetables generally in their purchasing behaviours. Educational health programs must encourage lifelong healthy eating habits. Richards et al. (2006) suggest exploring ways to get students eating more fruit and vegetables and to help them avoid becoming overweight and thus developing chronic diseases such as cancer and hypertension. Food and nutrition programs should be introduced which inform university and college students about healthy eating, these programs would be an ideal opportunity to help students develop good cooking skills and to learn about different food and making healthy eating choices.

- The variables insufficient monthly income and having a job during the semester and breaks were significantly associated with higher levels of depressive symptoms, which is in line with the findings of previous studies (Oliveira et al., 2008; Rab et al., 2008), and certainly finance appears to be a major problem to some students. Consequently, students who are stressed by their financial situation may not complete their education, and this can worsen their financial situation. Any intervention in this area should focus on financial counselling among students in order to teach them how to deal with financial issues. Such an intervention would be especially beneficial to first year students, as it would increase their knowledge and awareness of financial matters throughout their academic careers. Information about the causes of stress can further guide professionals on campus concerned with treating such difficulties. This may lead to lower levels of stress and improve academic performance, due to

enhanced coping skills amongst students. Since depressive symptoms like anxiety and depression are so prevalent amongst HES students, a counselling service offering mental health assistance should be made available at all universities and colleges. This counselling service should offer 'pre-counselling' sessions. This is so that students entering University who already have some difficulties can be helped to find a way of preventing the escalation of the problems to the point that a 'cure' is needed. These counselling facilities should be run by people with a clinical background or counselling psychologists. They should also have the means to reach out to students from poorer backgrounds or with poor school performance. It was also mentioned by Bostanci et al. (2005) that since the lack of social activities and student facilities were indicated to be a serious problem then Universities should consider improving such facilities. Moreover, programs of mental health can help students to develop positive mental attitudes and life skills, like for example communication, problem-solving, critical thinking and ways to cope with emotions and crises. Additionally these programs could offer prevention, assessment and treatment. It is imperative to recognize at an early stage any students with emotional disturbances or academic dysfunction and equally important for them to have access to such services.

- Individual counselling sessions and health oriented courses should be offered to help to address health issues. Students, especially in their first year of studies often suffer from stress related to psychosocial and study related problems, therefore there should be interventions to increase social support networks. This would result in a higher quality of life for the students and a more positive and rewarding experience (Stock et al 2007). Moreover, to obtain more specific information about health determinants and gender differences amongst student population and young people in general, analyses of more complex models accounting for other explanatory variables for

example, satisfaction with social support, financial situation and health risk behaviours such as smoking behaviour and alcohol and alcohol and drug consumption are required.

- Although Libya has a low prevalence of alcohol and drug consumption amongst the HES population it could still be perceived as a potential threat for the future (WHO 2006). Moreover, due to the influence of culture and religion, alcohol and drug intake may be concentrated in pockets of students, for example those based in Tripoli. Turrust et al. (2006) recommends the development of an evidence base to determine more fully the trend and pattern of alcohol and drug consumption in Libyan HES. Whilst this research provides further insight into consumption patterns further research would provide a fuller understanding of the scope of the problems and point to appropriate interventions which would impact behaviour leading to alcohol abuse and its adverse consequences. Integrated strategies at national level need to raise awareness amongst students about health and problems related to substance abuse. Better use could be made of the religious and cultural legacy of the country in the control of public health problems.
- Health prevention or intervention programs for student populations should properly address the high level of health complaints, for example headache, back pain and sleep disorders in students in Libya, also their associations with other variables, for instance gender, having a job during semesters and the year of study. Psychosocial and symptomatic complaints could be avoided by offering health counselling and other measure to increase healthy behaviour. The primary care provider is in the best position to help patients with recognition of health complaints and it is recommended that individual counselling and health oriented courses be offered. Furthermore, since

the first year of study is particularly stressful, interventions to help students create a social support network would help them to cope with stress related to psychosocial and study related problems. This could also possibly prevent depressive moods which would eventually lead to a higher quality of life for the students. However, if students were more physically active and consumed more fruit and vegetables it is possible that these complaints may be reduced as a consequence of an improved lifestyle.

- Focus group interviews with students should be conducted to elicit in-depth information about student problems as well as their suggestions for improvement (Abolfotouh et al., 2007). Engaging with the population group is known to develop more effective interventions and may result in a general university health service that could be potentially involved in promoting health and encouraging students to access the support they need, both in individual universities, and in all universities across Libya in the future.

The researcher consider this thesis to be a substantial and unique contribution to the field of student health in Libya, but also finds a number of areas which require further research, accordingly the following section discusses the implications of the study for further research.

8.5 Implications for Research

The findings of this research project provide a number of potential directions and implications for further research. These are detailed below:

1. It is worth reflecting that this study did not fully investigate whether students' body image perceptions were accurate or not. BMI should have been measured and

included in the analysis in order to truly reflect this. If BMI had been measured, a proper classification of whether students were under, normal or over weight would have been possible. In order to fully appreciate whether students are misperceiving their body image, future research needs to investigate the relationship between body image perception and actual measured BMI (Brener, 2004; Wardle et al., 2006). This would allow more accurate assessments about which students need interventions. A three by three table could be used for this purpose, by classifying students as either under, normal or over weight and also according to their body perceptions (too thin, just right or too fat). Furthermore, future research is also needed which develops interventions to target students at risk of developing eating disorders prompted by misperception of body

2. Efforts to develop an improved understanding of why some health problems and unhealthy lifestyles exist among students and the factors that they perceive to affect these problems and lifestyles would have been useful to help explain some of the findings. This information could also be used to reduce health issues and improve the quality of life for the student population, through the development of intervention and identification programmes in the future.
3. An investigation into the perceived barriers to improved physical activity levels and fruit and vegetable consumption. Without knowing these barriers it would be difficult to try to develop strategies to address these deficits.
4. An investigation into dietary intake. This could be achieved through food diaries. This would allow researchers to see exactly what students are eating and it may also be interesting to know why they chose the food they did, for example, because it

was provided for them or because they thought it was good for them. This may also provide information towards an understanding of student's knowledge of nutrition.

5. Research into the student population's knowledge of health issues. For example, the effects of smoking, alcohol, physical inactivity, poor diet and fruit and vegetable consumption on their health. This could help with health promotion and education in this population.
6. Research should be undertaken to explore the body image and eating habits of HES, and also the health education/promotion programmes available to students, focusing on the importance of positive body image, healthy weight range and healthy eating practices and lifestyle.

In Chapter five (Section 5.7) a number of limitations to this study were outlined. In the light of the discussions and conclusion above, it is necessary to extend, and in some cases revise these limitations. In the following section, the revised limitations of the current study are noted.

8.6 Limitations

Although the research project has produced useful information regarding the health and lifestyle behaviours of higher education students in Libya, several limitations of this research project have been identified, and the results presented should be seen in light of the weaknesses and strengths of the study. These include the following:

Firstly, this study was conducted with a high level of consideration towards the participants, and towards the reliability and validity of the data collection and analysis. However, as with

all studies there are limitations, which in this case included a reliance on the participants to give true and accurate information about themselves. The guarantee of anonymity should have encouraged the participants to answer honestly. Although ethnic origin was not a requested variable, the researcher could see that most participants were of Libyan origin and, as university students, it can be assumed that they were of a high level of education as they were enrolled on degree courses. The participants were taken from a sample of different universities and colleges and consisted of undergraduate students, in order to sample a variety of ages. In addition to this, the use of a questionnaire as the research tool enabled a large number of students to participate in the study.

Secondly, another limitation in this study was the time element. The researcher was not allowed to conduct interviews or distribute the questionnaire during the students' free time. It was therefore necessary to do this during lectures, and the time allowed for this process was limited by the universities to twenty five minutes. This, therefore, precluded the possibility of interviews, the time being far too short. This was another reason why the questionnaire was the better method in this study, but it had the effect of limiting the number of variables as well, plus potentially the completed return rate.

Thirdly, although a large response rate was achieved (75%), this was possibly due to additional techniques used to ensure data collection. Examples of these techniques were the delivery of the survey instrument (questionnaire) via the key workers (teaching staff), and the offer of assistance to respondents in completing the survey. This may have influenced the answers provided, as individuals may have felt pressured to provide answers they believed teaching staff wanted.

Fourthly, in the present study, the respondents' weight and height were self-reported, and this may raise question about the accuracy of BMI values, therefore, the prevalence of overweight

and obesity or even underweight may be higher than reported herein. Also there was a large amount of missing data about height and weight (18% of respondents). In the case of these respondents, it is possible that they were overweight or obese, or even underweight. However, Mikolajczyk et al. (2008) suggest that self-related health status is a reliable and valid measure for assessing the subjective and objective health of individuals, and can be reasonably used to compare student health across countries.

Fifthly, one limitation in terms of depressive symptoms was that the M- BDI was used as a research tool to measure depressive symptoms. However, a deficiency of this tool is that its validity and reliability is possibly restricted to the German population. However, as stated in section 5.6.1.6 this tool was used to allow a comparison between other literatures on student populations. The range and extent of depressive symptoms amongst students in Libya may have been overestimated by the M-BDI. In addition to this, the M-BDI does not necessarily distinguish general distress from anxiety symptoms and depression (Richter et al., 1998). Since there is little information on mental health problems in Libya per se it is not possible to draw conclusions from this assumption.

Sixthly, the study shows that there was no statistically significant relationship between mental health disorders (anxiety and depression) and some independent variables such as 'gender' and 'monthly income'. However, previous studies (Abdel-Khalek & Alansari, 2004; Mikolajczyk et al, 2007; Rab & Nasri, 2008) have shown that these variables do have a significant effect on mental health disorders such as anxiety and depression. As these results refute past findings, a possible explanation may be the limited quantity of data collected, or that as mental health problems are not widely acknowledged in Libya that respondents may have been reluctant to answer honestly. As shown in Table 6.15 the cases of respondents answering 'no' (96%) to depressive symptoms were the overwhelming majority, whereas for

the group 'yes' (4%), the statistical size was close to zero. The same conclusion can be made for anxiety.

8.7 Conclusion of the study

Several important conclusions can be drawn from the results of this study. This study highlights the current situation of health status and lifestyle behaviours among HES in Libya by assessed weight perceptions and BMI, mental health conditions, general health complaints, dieting behaviour, fruit and vegetable consumption, physical activity levels, smoking behaviour, and alcohol and drug consumption, and also compares the results with other international and European survey data. This study records the highest value for students in the normal category of BMI, together with a low obesity rate. It also indicates a high prevalence of depressive symptoms and relatively low rates of anxiety and depression. The main risk groups for depressive symptoms were female, those who were dissatisfied with their social support and students who had a job during the semester or breaks. There was some evidence that with respect to health complaints the rates of headache, depressive mood and neck/shoulder pain were higher in the sample of the study compared to other complaints. There was a significant association between dieting behaviour and the variables female, dissatisfaction with body weight and overweight and obese students. Although it can be concluded that Libyan students were less likely to engage in risky health behaviours such as smoking and alcohol and drug consumption, it is also true that students in Libya were less physically active and consumed less fruit and vegetables than those from other countries, while they were also more likely to receive social support. From the results, it can be concluded that disparities in health status and lifestyle behaviours were apparent in Libyan students when compared to other students, especially with respect to lifestyle behaviours. It was expected that differences would exist between the two groups. After exploring the

participant's perceptions of health and lifestyle behaviours, this expectation was found to be accurate in some respects. These disparities are not general, but are quite specific, for example, the consumption of alcohol in European students is higher, and seems to be more socially acceptable, than among Libyan students. Whilst the differences in alcohol and drug consumption are more easily explained, due to the influence of the Islamic religion, other differences in terms of eating habits and the tendency to a sedentary lifestyle are more subtle and less easily understood. Further research is required in order to understand why these differences exist. In addition, further research should focus on factors identified as prevalent, and through further research and improvements in the study environment for student populations, health problems can be reduced and therefore their quality of life can improved. Next, recommendations emerging from the study are presented.

8.8 Recommendations

Health promotion and risk prevention strategies for the student population should be given top priority and this should be guided by evidence based scientific research such as presented in this study. This should be complemented by ongoing evaluation to assess trends and continue to inform and direct the development of strategies and interventions in Libya. Health promotion and intervention programmes such as those mentioned in Chapter four (Section 4.8) and in Section 8.4 in this chapter, could have a significant positive effect on student health, and provide a university and college environment more conducive to learning and study. Moreover, these initiatives can have a beneficial impact on health outcomes in later life. The study suggested some recommendations which can be used as guide for policy makers and the public alike. The recommended strategies and action plans should include the following:

- It is essential to establish health education/promotion programmes amongst student populations, focusing on the importance of positive body image and promoting healthy practices in controlling weight to prevent overweight and obesity.
- More attention should be paid to promoting physical activity, and it should be recognized as a fundamental component of public health work. Moreover, physical activity and sporting facilities should be available on campuses, providing attractive opportunities to a high proportion of students, including both equal opportunities for men and women to participate.
- Life skills education should be provided to promote physical, mental and social health and reduce the health issues experienced by the student population.
- Efforts should be made to raise awareness of the potential for public health problems arising from alcohol and drug consumption, and the best use should be made of the Libyan culture's religious assets in the promulgation of education programmes for the prevention of unhealthy behaviours.
- Higher educational institutions can also take a variety of steps to promote healthy food behaviour and provide students with information which can help them to recognize healthy choices (e.g. fruit and vegetables) and create healthy eating habits that can impact their future, including healthy cooking information and support, such as healthy cooking sessions, for both male and female students.
- Tobacco control legislation should restrict advertising and ban smoking in public places such as educational institutions, health care facilities, and public transport. It should also require health warnings on the danger of smoking.

- Providing student-friendly health services is still in its primary stages in higher educational institutions in Libya. Further developing these services and integrating these recommendations for health interventions is critical for responding to the health and lifestyle needs of students.
- Health education programmes and policy development should concentrate on both risk factors and protective factors explicitly. The focus on protective factors should target all students, male and female, and not just those who have problems.
- More support is needed for scientific research to obtain more specific information and better understanding with regard to health status and lifestyle behaviours among HES in Libya. Therefore, comprehensive study into student health and lifestyle behaviours covering wide a range of areas related to the health of student population should be undertaken with a specific in-depth analysis of associated risk factors, and actual measurement such as weight and height. Finally, the study's contribution to knowledge will be explained.

8.9 The study's contribution of knowledge

The major contribution of this thesis is that it has investigated the current state of health status and lifestyle behaviours amongst students in Libya. This study is the first of its kind in Libya and, therefore, it is hoped, provides useful insights, policy implications and recommendations for researchers and professionals. This study is expected to be helpful to the Libyan government (for example the Ministry of Health, Education and specific university authorities, and respective policy and decision makers). In addition, this research provides understanding of the relative importance of different aspects of health and lifestyle behaviours of HES in the different Libyan regions, and identifies the association between the

most prevalent health and health related behaviours and certain demographic and academic variables. It also provides analysis of some differences in health status in comparison with HES in other countries as a result of the particular health and lifestyle behaviours of HES in Libya. Further, as its subject has not been undertaken previously in Libya, and as such it fills a gap in knowledge in this area; the results of this study will be important to help inform health promotion and intervention programmes, and can be used as baseline-data to create or improve university health programs and for planning to address the health needs of students.

The results of this study provide unique information regarding the health and lifestyle status of students in Libya. However, whilst unique and novel in that it has not been undertaken previously, and despite the large sample size in terms of its student population, this study may not characterize the entire higher education student population in Libya. It is therefore necessary to suggest that further research is undertaken because there is so little information on student health and lifestyle behaviours in the higher education context, in Libya. It is recommended that further research should be carried out with larger sample groups, and additional research elements, so that interventions can then be developed and evaluated. An example of the kind of research which could be conducted might be an 'over time, same cohort' study, whereby students are monitored over time to measure the long term effects of health interventions, while a control group provides data on students who experienced an extra health related input. The data collected by this study could also be used as an important basis for building national awareness, developing health policies and to address preventable causes of disease. The present study added to these findings by contributing information on a particular segment in the population: young adults who were higher education students. As

such it provides a starting point and baseline-data for these developments in health enhancing promotion politicise and strategies to be built upon.

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Appendices

Appendix 1 English Questionnaire

UNIVERSITY OF GLOUCESTERSHIRE

[]

QUESRTIONNAIRE

STUDENTS' HEALTH

DATE []

Dear students

We would like to ask you to fill out the following questionnaire. The questionnaire deals with students' stress and health. The aim of this study is to develop a health promotion program based on the data collected which would be offered to students at your university in the future. Your participation in this study is voluntary. By filling out this questionnaire you agree to participate in this study. Your answers are anonymous and will be used for scientific research purposes only

Instruction for filling out this questionnaire

Please answer all questions honestly. Since the questionnaires will be read by a scanner, please use a black or dark blue ink pen and place the questionnaire on a hard surface like a table before writing on it.

There are no right or wrong answer. Please mark the field which corresponds to your point of view the most/the closest.

Example:

1. How satisfied do you feel today?

Not at all	A little	Somewhat	Quite Satisfied	Satisfied	Very satisfied
[]	[]	[]	[]	[]	[]

Witten fill-ins please write in block and capital letters in the given field. Keyword-answers are fully sufficient.

Example:

Other: UNIVERSITY.....

First we would like to ask you about your general health condition.

.....

1. How would you describe your general health?

Excellent	Very good	Good	Fair	Poor
[]	[]	[]	[]	[]

2. To what extent do you keep an eye on your health?

Not at all	Not much	To some extent	Very much
[]	[]	[]	[]

3. Have you seen a medical practitioner (excluding dentist) in the past six months?

No Yes; how often? Times

What were the reasons?.....

4. During the past twelve months, have you been so ill that you had to stay in bed?

No Yes; how often? Times

What was the illness?.....

5. Do you regularly take any medication?

No Yes, what kind?.....

Why?.....

6. To what extent do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
There should be no smoking on The university premise at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking should be allowed in marked area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alcohol should not be sold at The university.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

.....

The next part is about health problems and various strains in your life.

7. How often did you have the following problems during the last 12 months?

	Never	Rarely	Sometimes	Quite/Very often
1. Stomach trouble/Heartburn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Back pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Rapid heartbeat, Circulatory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Headaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Sleep disorder/insomnia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Difficulties to concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Neck and shoulder pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Depressive mood

9. Considering once again your current situation:

- To what extent do you feel burdened overall?

.....

8- The following questions refer to your present attitude to life. In every question please indicate how frequently you have experienced the following feelings during the past few days.

1. I feel sad.
2. I feel discouraged about the future.
3. I feel I have failed
4. It is hard for me to enjoy things.
5. I feel guilty.
6. I am disappointed in myself.
7. I am critical of myself for my weaknesses or mistakes.
8. I have thoughts of killing myself.
9. I cry.
10. I feel annoyed and irritated.
11. I have lost interest in other people.
12. I put off making decisions.
13. I am worried about my appearance.
14. I have to force myself to do anything.
15. I don't sleep well.
16. I am tired and listless.
17. I have no appetite.
18. I am worried about my health.

9. Have you ever been diagnosed with:


1- Anxiety Disorder Yes No

2- Depression Yes No

10. How many people do you know-including your family and friends-who support wherever you feel down?

None	One person	Two-three persons	More than three persons
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Are you on the whole satisfied with support you get in such situations?



Very satisfied Very dissatisfied

12. If you consider the quality of your life: How did things go for you in the last four weeks

Very badly Badly So So Quite well Very well


.....
The following questions refer to your fruit and vegetable consumption and physical activity.

13. How many servings of fruits and vegetables do you usually have per day (1 serving = 1 medium piece of fruit, 1/2 cup chopped, cooked or canned fruits/vegetables, 3/4 cup fruit/vegetable juice, small bowl of salad greens, or 1/2 cup dried fruit)?

I don't eat fruit

and vegetables 1 - 2 3 - 4 5 or more

14. How important is for you to eat health?



Very important Not at all import

.....
15. We would like to ask some questions about your current and past experiences with dieting.

	Currently	In the past	Never
1. Have you ever tried to loss weight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. If you have tried, which method?

(Dieting, exercises, vomiting, taking medicine, skip meal, taken small helpings).

In the past 7 days on how many days did you:

16. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling? (Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time).

Days per week No vigorous physical activities (skip to question 19)

17. How much time did you usually spend doing **vigorous** physical activities on one of those days?

Hours minutes per day Do not know/ not sure

18. During the **last 7 days**, on how many days did you **moderate** physical activities like carrying light loads, cycling at a regular pace or double tennis? Do not include walking. (Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about physical activities that you did for at least 10 minutes at a time).

Days per week No moderate physical activities (skip to question 20)

19. How much time did you usually spend doing **moderate** physical activities on one of those days?

Hours minutes per day Do not know/ not sure

.....
20. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time? (This includes walking at work and at home, walking to travel from place, and any other walking that you might do solely for recreation, sport, exercise, or leisure).

Days per week No walking (skip to question 23)

21. How much time did you usually spend **walking** on one of those days?

Hours minutes per day Do not know/ not sure

22. During that **last 7 days** on a typical day, how much time did you spend **sitting**?

Hours minutes per day Do not know/ not sure

23. What is your height?

cm

24. What is your weight?

kg

25. When did you measure your weight for the last times?

Yesterday	Last week	Last month ago	Some months year ago	More than one	Do not know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

26. In your opinion are you...

Far too thin	A little too thin	Just right	A little overweight	Very overweight
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. How satisfied are you with your current weight in general?

Very satisfied	Somewhat satisfied	Somewhat dissatisfied	Very dissatisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28. In your opinion are you muscular (males) / athletic (females)?

—————
Not at all Very much
[] [] [] [] []

29. How important is it for you?

—————
Very important Not important at all

Being thin [] [] [] [] [] [] [] []
Being athletic/sporty [] [] [] [] [] [] [] []

.....
The next part is about smoking, drugs and alcohol.

30. Within the last three months, how often did you smoke? (Cigarettes, sheesha, pipes).

Daily Occasionly Never
[] [] []

31. If you smoke daily: How many cigarettes do you smoke on average?

I smoke daily about [] cigarettes

32. How old were when you first tried a cigarette? [] years.

33. Have you tried to quit smoking within the last 12 months? Yes No
[] []

34. Have you ever use/used drugs?

[] Yes, regularly [] Yes, but only a few times [] Never

35. If yes, which drug(s) have you used?.....

(ecstasy, marijuana, cocaine, heroin, crack, LSD, amphetamines)

Daily Occasionly Never

36. Do you drink alcohol? [] [] []

37. In the last three months, have you been drunk?

No 1 to 2 times 3 to 4 times 5 or more times
[] [] [] []

.....

Now we would like to ask you a few questions about your studies.

38. What is your year in your university?

- 1st year undergraduate
- 2nd year undergraduate
- 3rd year undergraduate
- 4th year undergraduate
- 5th year or more undergraduate
- Graduate or professional
- Other, please specify.....

39. What degree or discipline do you study at university/ college?.....

40. How important is for you to have good grades at the university?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Very important | somewhat important | Not very important | Not at all important |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

41. How do you rate your performance in comparison with your fellow students?

- | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Much better | Better | The same | Worse | Much worse |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

.....
Now some personal details.

42. How old are you?

43. What is your sex? Female male

44. What is your nationality?.....

45. Where were you born? Libya other, please specify.....

46. What is your religion?

None Islam other, please specify.....

47. How strongly do you agree with the following statement?

"My religion is very important in my life?"

- | | | | | |
|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

48. What is your monthly income at your disposal after paying rent and utilities?

[] (in £, please sum up your income from all sources)

49. Would you say the amount of money you have is ...

Always sufficient Mostly sufficient Mostly insufficient Always insufficient

[]

[]

[]

[]

50. How do you finance your studies? (Please check all that apply)

[] parents' support

[] job during semester

[] scholarship

[] student loan

[] job during breaks

[] other, please

specify:.....

51. What is the highest degree that your parents have?

Mother

Father

No formal education

[]

[]

Primary school

[]

[]

Secondary school

[]

[]

High school

[]

[]

Bachelor's degree

[]

[]

Master's degree

[]

[]

Ph.D. or equivalent

[]

[]

52. What is your marital status?

Single []

Married []

53. Do you have children?

Yes []

No []

If yes, how many?

I have [] children (please indicate the number)

54. Where do you live (during university/ college term time)?

[] I live alone

[] I live together with my wife/h

[] I live with my parents

[] I live with room mates

[] Other.....

Thank you.

1- كيف تصف حالتك الصحية بشكل عام ؟

غير جيدة متوسطة جيدة جيدة جداً ممتازة
▽ ▽ ▽ ▽ ▽

2- إلى أي مدى تحافظ على صحتك ؟

إطلاقاً ليس كثيراً إلى حد ما كثيراً جداً
▽ ▽ ▽ ▽

3- هل ذهبت إلى الطبيب خلال الستة أشهر الأخيرة ؟

لا نعم
▽ ▽

إذا كانت الإجابة نعم : كم مرة ▽

وما هو المرض

4- خلال 12 شهراً الأخيرة هل كنت مريضاً إلى درجة البقاء في السرير؟

لا نعم
▽ ▽

إذا كانت الإجابة نعم : كم مرة ▽

وما هو المرض

5- هل تتناول دواء أو علاج بانتظام ؟

لا نعم
▽ ▽

إذا كانت الإجابة نعم : ما نوعه

ولماذا

6- إلى أي حد تتفق مع هذه الجمل ؟

لا اوافق بشدة	لا اوافق	اوافق	اوافق بشدة	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يفترض التدخين ممنوع داخل الجامعة
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	الكحول ينبغي أن لا يباع داخل الجامعة
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	توجد مأكولات وأطعمة صحية كافية متوفرة داخل الجامعة

ثانياً : أسئلة حول المشاكل الصحية والمتاعب المتنوعة:

7- متى غالباً كانت لديك المشاكل الصحية اللاحقة خلال 12 شهر الأخيرة:-

النوع	إطلاقاً	نادراً	بعض الأحيان	غالباً جداً
1- آلام وحرقة في المعدة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2- آلام في الظهر	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3- سرعة ضربات القلب / مشاكل دموية / دوخة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4- صداع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5- اضطرابات النوم (أرق)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6- صعوبة التركيز	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7- آلام الرقبة والكتفين	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8- تؤثر عصبي (قلق)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8- إلى أي مدى تشعر بالإرهاق والتعب مع النقاط التالية :

النقاط	إطلاقاً	بقوة شديدة
1- الدراسة بشكل عام	<input type="checkbox"/>	<input type="checkbox"/>
2- الامتحانات - الاختبارات - البحوث والتقارير	<input type="checkbox"/>	<input type="checkbox"/>

- 3- فقد أو نقص الممارسة العملية أو المتعلقة بالدراسة.
- 4- احتمالية فرصة العمل السيء
- 5- مشاكل مع والديك
- 6- مشاكل مع زملائك الطلاب
- 7- مشاكل مع الأصدقاء
- 8- العلاقة مع أشخاص آخرين مهمين
- 9- السكن
- 10- مشاكل صحية
- 11- الوضع المالي
- 12- معدل العمل الدراسي
- 13- العزلة في الحياة العامة
- 14- قلة الوقت من أجل الدراسة
- 15- ظروف العمل السنية

16- أخرى:

إطلاقاً
بقوة شديدة



بالتركيز على وضعك الحالي

9 - إلى أي مدى تشعر إنك مهموم عموماً ؟

▽ ▽ ▽ ▽ ▽ ▽

10: أسئلة حول ظهورك ومواقفك في الحياة :

من فضلك أن تشير إلى كم مرة تكررت معك الأحاسيس اللاحقة خلال الأيام الماضية :

بقوة
شديدة



إطلاقاً

النقاط

▽ ▽ ▽ ▽ ▽ ▽

1- اشعر بالحزن

▽ ▽ ▽ ▽ ▽ ▽

2- اشعر بالخوف من المستقبل

▽ ▽ ▽ ▽ ▽ ▽

3- اشعر بالإخفاق والضعف

▽ ▽ ▽ ▽ ▽ ▽

4- اشعر بصعوبة التأقلم مع الأشياء

- 5- أشعر بالذنب
- 6- اشعر بخيبة الأمل
- 7- انتقد نفسي لضعفي وأخطائي
- 8- فكرت في الانتحار
- 9- أحياناً أبكي
- 10- أشعر بالانزعاج والغضب
- 11- فقدت اهتمام الناس الآخرين
- 12- أتردد في صنع القرار
- 13- أنا أقلق على مظهري

- النقاط
- إطلاقاً
- بقوة شديدة
- 14- أحتاج للتشجيع للقيام بأي شيء
- 15- لا أنام جيداً
- 16- متعب وكسول
- 17- قلة الشهية
- 18- اشعر بالقلق على صحتي

11- هل شخصت من قبل طبيب على أنك تعاني؟:

- 1- اضطرابات وقلق لا نعم
- 2- حالة كآبة لا نعم

12- أسئلة حول إحساسك وشعورك خلال الشهر الأخير :

- النقاط
- إطلاقاً
- بقوة شديدة
- 1- متى غالباً شعرت بأنك كنت غير قادر على تنظيم الأشياء المهمة في حياتك .

2- متى غالباً شعرت بالثقة في مهاراتك في قيادة وعلاج مشاكلك الخاصة .

▽ ▽ ▽ ▽ ▽

3- متى غالباً شعرت بالأمور كانت تسير حسب طريقتك وتنظيمك .

▽ ▽ ▽ ▽ ▽


4- متى غالباً شعرت بالصعوبات كانت تتراكم بشكل كبير وعدم قدرتك على التغلب على هذه الصعوبات .

▽ ▽ ▽ ▽ ▽

13- كم عدد الناس الذين تربطك بهم علاقة قريبة مع احتساب أفراد عائلتك والذين يشجعونك عند شعورك بالإحباط ؟

لا أحد	شخص واحد	2-3 أشخاص	أكثر من 3 أشخاص
▽	▽	▽	▽

14- هل أنت مرتاح بشكل تام مع تشجيعك للنجاح في مثل هذه المواقف أو الحالات ؟

مرتاح جداً				غير مرتاح جداً
▽	▽	▽	▽	▽

15- إذا فكرت ملياً بجودة حياتك كيف كانت الأمور معك خلال الأربع الأسابيع الأخيرة ؟

جيدة جداً	جيدة	متوسطة	بسوء	بسوء جداً
▽	▽	▽	▽	▽

ثالثاً : الأسبوع اللاحق حـول تناولك للطعام:

16 - كم مرة تتناول الخضراوات والفواكه عادة خلال اليوم ؟

(مرة = قطعة واحدة متوسطة من الفاكهة - $\frac{1}{2}$ كوب معصور - فواكه أو خضراوات مطبوخة أو معلبة - $\frac{3}{4}$ كوب عصير الفاكهة أو الخضراوات - صحن من السلطة الخضراء - نصف كوب فواكه جافة).

لا أكل الفواكه والخضراوات	2-1	4-3	5- أو أكثر
∇	∇	∇	∇

17 - متى غالباً تتناول الأطعمة التالية ؟

النسقاط	إطلاقاً	4-1 أوقات في الشهر	أيام متعددة في الأسبوع	يومي	أوقات متعددة في اليوم
1- سكريات (شكولاته / حلويات أخرى).	∇	∇	∇	∇	∇
2- حلويات (مرطبات).	∇	∇	∇	∇	∇
3- وجبة خفيفة (تصبيرة).	∇	∇	∇	∇	∇
4- غذاء سريع أو معلب (بيتزا - هامبورجا).	∇	∇	∇	∇	∇
5- فواكه طازجة.	∇	∇	∇	∇	∇
6- سلطة خضراوات غير مطهية.	∇	∇	∇	∇	∇
7- خضراوات مطبوخة.	∇	∇	∇	∇	∇
8- عصائر ، فواكه طبيعية.	∇	∇	∇	∇	∇
9- مشروبات غازية.	∇	∇	∇	∇	∇
10- اللحوم ومنتجاتها.	∇	∇	∇	∇	∇
11- أسماك ومنتجات بحرية.	∇	∇	∇	∇	∇
12- الحليب ومشتقاته.	∇	∇	∇	∇	∇
13- منتجات الحبوب (خبز القمح - الشعير - الدقيق).	∇	∇	∇	∇	∇

▽ ▽ ▽ ▽ ▽

19- بعض الأسئلة المتعلقة بنظام الحماية الغذائية (الرجيم) ؟

- | السؤال | إطلاقاً | في الماضي | حالياً |
|---|---------|-----------|--------|
| 1- هل تحاول إنقاص وزنك | ▽ | ▽ | ▽ |
| 2- إذا نعم ما هي الطريقة التي اتبعتها أو تتبعتها (نظام غذائي - تمارينات رياضية - التقية - استعمال دواء - التدخين - ترك وجبة رئيسية - (غداء - عشاء - إفطار)) | | | |
| 3- هل تحاول أن تأكل أقل للتحكم في وزنك ؟ | ▽ | ▽ | ▽ |
| 4- هل تشتري وتاكل أطعمة أقل دهن ؟ | ▽ | ▽ | ▽ |
| 5- هل تحسب كمية الدهون (كيلوجرام) في الأطعمة للتحكم في الوزن ؟ | ▽ | ▽ | ▽ |
| 6- هل تحسب كمية السرعات الحرارية في الأطعمة للتحكم في الوزن ؟ | ▽ | ▽ | ▽ |
| 7- هل تتبع أي طريقة خاصة لإنقاص الوزن ؟ | ▽ | ▽ | ▽ |

رابعاً : أسئلة حول النشاطات الجسمية وممارسة الرياضة؟

14

20- في خلال 7 الأيام الماضية كم مرة قمت بالآتي :-

7 6 5 4 3 2 1 0

1- قمت بتمرينات رياضية لتقوية العضلات.

2- نمت بشكل كافي حتى شعرت بالاسترخاء في الصباح ؟

21- قمت بتمرينات رياضية قوية (رفع أقال ثقيلة - ركض - درجات سريعة) على الأقل لمدة 10 دقائق .

(التمرينات الرياضية القوية هي التي تتطلب جهد قوي وتجعل تنفسك أصعب من المعتاد)

(نعم) كم يوم في الأسبوع

7 6 5 4 3 2 1 لا

▽ ▽ ▽ ▽ ▽ ▽ ▽ ▽

22- كم الوقت الذي تستغرقه عند قيامك بالتمرينات الرياضية القوية؟

ساعة	دقيقة	لا اعلم
▽	▽	▽

23- قمت بتمارين رياضية معتدلة (رفع أثقال خفيفة – درجات عادية) على الأقل لمدة 10 دقائق

(التمارين الرياضية المعتدلة هي التي تتطلب جهد متوسط وتجعل تنفسك أصعب بقليل من المعتاد ولا تشمل رياضة السير على الأقدام)

(نعم) كم يوم في الأسبوع

7	6	5	4	3	2	1	لا
▽	▽	▽	▽	▽	▽	▽	▽

24- كم الوقت الذي تستغرقه عند قيامك بالتمارين الرياضية المعتدلة؟

ساعة	دقيقة	لا اعلم
▽	▽	▽

15

25- في خلال 7 الأيام الماضية كم يوم مارست رياضة السير على الأقدام على الأقل لمدة 10 دقائق؟ :-
(يشمل المشي في المنزل – العمل – المشي كنوع من الرياضة أو الترفيه)

(نعم) كم يوم في الأسبوع

7	6	5	4	3	2	1	لا
▽	▽	▽	▽	▽	▽	▽	▽

26- كم الوقت الذي تستغرقه في رياضة السير على الأقدام عادة يومياً؟

ساعة	دقيقة	لا اعلم
▽	▽	▽

27- خلال 7 الأيام الماضية كم الوقت الذي قضيته جالساً (كمبيوتر – إنترنت – مع الأصدقاء)؟

ساعة	دقيقة	لا اعلم
▽	▽	▽

16

28- كم يبلغ طولك ؟

.....

30- متى قمت بقياس وزنك آخر مرة ؟

لا أعلم	أكثر من سنة	قبل عدة أشهر	الشهر الماضي	الأسبوع الماضي	أمس
▽	▽	▽	▽	▽	▽


31- في رأيك هل أنت ؟

نحيف جداً	نحيف	مقبول	زيادة قليلة	زيادة كبيرة
▽	▽	▽	▽	▽

32 – هل أنت راضٍ عن وزنك الحالي بشكل عام ؟

غير راضٍ جداً	غير راضٍ إلى حد ما	راضٍ إلى حد ما	راضٍ جداً
▽	▽	▽	▽

33- هل في رأيك أن شكل جسمك رياضي؟

إطلاقاً						إلى حد كبير
▽	▽	▽	▽	▽	▽	

34- هل تحاول :

السؤال	إطلاقاً	في الماضي	حالياً
1- أن تأكل بقصد تقوية وزيادة نمو عضلات جسمك.	▽	▽	▽
2- تستخدم أغذية خاصة لتقوية عضلات جسمك .	▽	▽	▽

35- كم هو مهم لديك :

إطلاقاً			إلى حد كبير
---------	--	--	-------------

1- أن تكون نحيفاً

2- أن تكون رياضياً

36- كيف شعرت بمظهرك خلال الأربع الأسابيع الماضية ؟

السؤال	إطلاقاً	ناراً	بعض الأحيان	غالباً	غالباً جداً	دائماً
1- هل شعرت بالقلق عن شكل جسمك وأنتك يجب أن تعمل رجم ؟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2- هل قارنت وزنك مع الآخرين وشعرت أن وزنك مخالف للآخرين ؟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3- عندما تنظر إلى جسمك هل تشعر بأنك سمين ؟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4- هل امتنعت عن الذهاب إلى مكان أو مناسبة اجتماعات بسبب شعورك بالخجل من مظهرك ؟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5- هل تشعر بالقلق لرؤية أشخاص آخرين لمنطقة بطنك أو حزامك ؟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6- هل تتجنب المواقف التي يمكن لأشخاص آخرين رؤية جسمك (تغيير الملابس / السباحة) ؟	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

خامساً : هذا الجزء حول التدخين والكحول والمخدرات :

37- خلال الثلاث أشهر الماضية -- متى كنت غالباً تدخن (سيجارة - الببية - الشيشة) ؟

إطلاقاً	أحياناً	يومي
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

38- إذا كانت مدخن كم معدل السجائر التي تدخنها يومياً ؟

سجارة . أنا أدخن حوالي

سنة ؟ 39- كم كان عمرك عندما بدأت التدخين

20

40- هل حاولت أن تتف عن التدخين خلال 12 شهر الماضية ؟

نعم لا

▽

21

41- هل تتناول المخدرات ؟

إطلاقاً نعم مرات قليلة نعم بانتظام

▽

22

42- إذا كانت إجابتك بنعم ما نوع المخدرات الذي تتناولها ؟

.....

23

43- هل تتناول المشروبات الكحولية؟

إطلاقاً أحياناً يومي

▽

24

25

44- خلال الثلاث الأشهر الماضية كم مرة تناولت مشروبات كحولية ؟

إطلاقاً 2-1 مرات 3-4 مرات أكثر من 5 مرات

▽

سادساً : هـ ذ الج ز ح و ل دراسـتـك

45- ما هي السنة الدراسية التي تدرس بها الآن بالجامعة/المعهد ؟

الأولى الثانية الثالثة الرابعة الخامسة (إضافية) امتياز سنة خاصة

▽

▽..... أخرى بالتفصيل

46- ما هو تخصصك أو موضوع دراستك ؟

.....

47- كم هو مهم لديك الحصول على درجات عالية في نتائجك بالجامعة/المعهد ؟

غير مهم ليس مهم جداً مهم إلى حد ما مهم جداً
▽ ▽ ▽ ▽

26 48- كيف ترى معدل نتائج دراستك مقارنة بزملائك الطلاب الآخرين ؟

أسوأ جداً أسوأ متشابه أفضل أفضل بكثير
▽ ▽ ▽ ▽ ▽

سابعاً : بعض الأسئلة الشخصية :

▽ 49- كم عمرك ؟

أنثى 50- الجنس : ذكر

51- جنسيتك ؟

52- مكان الميلاد ؟

53- الديانة :

54- إلى أي درجة تتفق مع هذه الجملة (ديانتك مهمة جداً في حياتك)؟

لا أتفق بشدة لا أتفق إلى حد ما لا أتفق أتفق إلى حد ما أتفق بشدة
▽ ▽ ▽ ▽ ▽

مكان آخر

شكراً لمشاركتك في هذا الاستبيان

University of Gloucestershire

استبيان حول :

صحة الطلاب

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Appendix 3: Letter from Libyan Embassy

العلاقات الخارجية بين الشعوب والديبلوماسية



الجمهورية العربية الليبية الشعبية الاشتراكية العظمى

المكتب الشعبي - لندن

الشؤون الثقافية

التاريخ: 2008/07/04

الرقم الإشاري: 08-325-ت

إفادة

يفيدكم القسم الثقافي بالمكتب الشعبي - لندن بأن الأخ/ خالد عبدالله احمد خليل موفد للدراسة على حساب المجتمع بالساحة البريطانية لنيل الدرجة: الدقيقة في مجال: صحة المجتمع، اعتبارا من: 2006/08/01 والى 2010/07/31. نأمل منكم تقديم المساعدة للمعني حتى يتمكن من جمع البيانات المتعلقة بدراسة.

أعطي له هذا التعريف بناء على طلبه وذلك لإستعماله فيما يخوله القانون ويعتبر رسمي بعد التوقيع والختم.

والسلام عليكم ورحمة الله وبركاته...

د. سعد عبدالعزیز مناع

المستشار الثقافي

المكتب الشعبي الليبي - لندن



- أي كشط أو تغيير في هذا التعريف يعتبر ملغى.
- صورة الى ملف الطاب رقم: 4916
- صورة الى الملف الدوري العام.

www.culturecorner.org.uk

61-62 Ennismore Gardens, London SW7 1NH Tel: 020 7581 4142 Fax: 020 7581 2393

Appendix 4: Information sheet

Dear: Students

This study aims to explore the health status and lifestyle behaviours of Libyan HES, and also to compare the health status and lifestyle behaviours of the Libyan HES with those from other countries, in doing so it will promote research that will contribute to what is currently known regarding student health. Therefore, the work of this PhD will fill a clear gap in this knowledge and contribute to the well-being of the Libyan student population. In addition, the participation is voluntary and the questionnaire is anonymous, therefore participants are not required to state their name; instead the questionnaires are numbered for identification purposes in the analysis. Confidentiality, only the researcher will see the original data

Appendix 5: SPSS output for consumption of fruit and vegetables

q16.fruit.veg * q50.sex Crosstabulation

			q50.sex		
			female	male	Total
q16.fruit.veg	i dont eat fruit and vegetables	Count	46	33	79
		% within q50.sex	5.3%	7.5%	6.1%
	1 to2 times	Count	506	251	757
		% within q50.sex	58.8%	57.2%	58.2%
	3 to 4 times	Count	219	113	332
		% within q50.sex	25.4%	25.7%	25.5%
	5 or more	Count	90	42	132
		% within q50.sex	10.5%	9.6%	10.2%
	Total	Count	861	439	1300
		% within q50.sex	100.0%	100.0%	100.0%

Appendix 6: SPSS output for prevalence of physical activities

Table (1) Vigorous and moderate physical activity by gender

Number of days	Vigorous activities			Moderate activities		
	Gender			Gender		
	Female N (%)	Male N (%)	Total N (%)	Female N (%)	Male N (%)	Total N (%)
No activity	625 (73)	203 (46)	828 (64)	620 (72)	201 (46)	821(63)
1 day	54 (6)	36 (8)	90 (7)	58 (7)	32 (7)	90 (7)
2 days	51 (6)	34 (8)	85 (6.5)	52 (6)	35 (8)	87 (7)
3 days	53 (6)	57 (13)	110 (8.5)	52 (6)	53 (12)	105 (8)
4 days	25 (3)	27 (6)	52 (4)	29 (3)	38 (9)	67 (5.2)
5 days	22 (3)	22 (5)	44 (3.4)	21 (2.5)	22 (5)	43 (3.3)
6 days	7 (1)	12 (3)	19 (1.5)	8 (1)	11 (2)	19 (1.5)
7 days	24 (3)	48 (11)	72 (5.5)	21 (2.5)	47 (11)	68 (5.2)
Total	861 (66.2)	439 (33.8)	1300(100%)	861 (66.2)	439 (33.8)	1300(100)

Table (2) Time for vigorous and moderate by gender

Time	Vigorous activities			Moderate activities		
	Gender			Gender		
	Female N (%)	Male N (%)	Total N (%)	Female N (%)	Male N (%)	Total N (%)
Do not know	168 (71)	118(50)	286 (60)	168 (70)	138 (57)	306 (64)
10 -30m*	2 (1)	4(2)	6 (1)	10 (4)	6 (3)	16 (3)
31-60m	8 (3)	2 (1)	10 (2)	0 (0)	2 (1)	2(0.4)
61-150m	59 (25)	112(47)	171 (36)	63 (26)	94 (39)	157 (33)
Total	237 (100)	236 (100)	473(100)	241 (100)	240 (100)	481 (100)

m* = minute

Appendix 7: SPSS output for Binary logistic regression for fruit and vegetable consumption

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1648.099 ^a	.035	.048

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1								
q50.sex(1)	-.084	.160	.272	1	.602	.920	.672	1.259
q45.study.year			4.382	5	.496			
q45.study.year(1)	.020	.163	.015	1	.902	1.020	.741	1.404
q45.study.year(2)	-.122	.185	.436	1	.509	.885	.616	1.271
q45.study.year(3)	-.343	.240	2.042	1	.153	.709	.443	1.136
q45.study.year(4)	.043	.402	.012	1	.915	1.044	.475	2.295
q45.study.year(5)	-.925	.675	1.877	1	.171	.397	.106	1.489
AGEGROP			1.912	3	.591			
AGEGROP(1)	.132	.156	.712	1	.399	1.141	.840	1.551
AGEGROP(2)	-.120	.306	.153	1	.696	.887	.487	1.617
AGEGROP(3)	-.389	.719	.293	1	.588	.678	.165	2.775
q15.quality.lif			11.780	2	.003			
q15.quality.lif(1)	-.109	.232	.220	1	.639	.897	.569	1.413
q15.quality.lif(2)	.333	.218	2.330	1	.127	1.395	.910	2.139
thin			4.181	2	.124			
thin(1)	.322	.158	4.181	1	.041	1.380	1.013	1.880

thin(2)	.172	.152	1.273	1	.259	1.188	.881	1.601
sport.im			.073	2	.964			
sport.im(1)	.035	.189	.035	1	.853	1.036	.715	1.499
sport.im(2)	-.004	.168	.001	1	.979	.996	.717	1.382
Financ.g			2.883	2	.237			
Financ.g(1)	.301	.227	1.768	1	.184	1.352	.867	2.108
Financ.g(2)	.344	.266	1.668	1	.197	1.410	.837	2.375
plc.living			4.525	2	.104			
plc.living(1)	-.319	.197	2.604	1	.107	.727	.494	1.071
plc.living(2)	.579	.462	1.574	1	.210	1.785	.722	4.413
U.C.Location			1.994	3	.574			
U.C.Location(1)	.216	.208	1.075	1	.300	1.241	.825	1.867
U.C.Location(2)	.127	.231	.304	1	.581	1.136	.723	1.785
U.C.Location(3)	-.036	.166	.046	1	.830	.965	.697	1.335
Subject.group			12.166	3	.007			
Subject.group(1)	-.214	.192	1.250	1	.264	.807	.554	1.175
Subject.group(2)	-.191	.181	1.107	1	.293	.826	.579	1.179
Subject.group(3)	.339	.179	3.572	1	.059	1.403	.988	1.994
Constant	-.968	.323	8.989	1	.003	.380		

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1 BMI.no.m			1.780	3	.619			
BMI.no.m(1)	-.221	.170	1.699	1	.192	.801	.574	1.118
BMI.no.m(2)	-.148	.288	.263	1	.608	.863	.490	1.518
BMI.no.m(3)	-.053	.176	.091	1	.763	.948	.671	1.339
dieti.group(1)	.048	.148	.105	1	.746	1.049	.785	1.402
Constant	-.593	.093	40.779	1	.000	.553		

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-.589	.058	103.427	1	.000	.555

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1 Newvigourous(1)	.462	.264	3.048	1	.081	1.587	.945	2.664
Newmoderateactv(1)	-.156	.301	.270	1	.603	.855	.475	1.541
Constant	-.609	.060	102.095	1	.000	.544		

Appendix 8: SPSS output for Binary logistic regression for physical activity

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	498.864 ^a	.060	.166

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1								
q50.sex(1)	1.084	.329	10.875	1	.001	2.958	1.553	5.634
q45.study.year			2.056	5	.841			
q45.study.year(1)	-.328	.357	.844	1	.358	.720	.357	1.451
q45.study.year(2)	-.283	.386	.536	1	.464	.754	.354	1.607
q45.study.year(3)	-.703	.527	1.777	1	.183	.495	.176	1.392
q45.study.year(4)	-19.030	6782.242	.000	1	.998	.000	.000	.
q45.study.year(5)	-18.856	9470.794	.000	1	.998	.000	.000	.
AGEGROP			2.111	3	.550			
AGEGROP(1)	.036	.314	.013	1	.909	1.037	.560	1.918
AGEGROP(2)	-.120	.716	.028	1	.867	.887	.218	3.612
AGEGROP(3)	1.632	1.166	1.959	1	.162	5.115	.520	50.301
q15.quality.lif			1.184	2	.553			
q15.quality.lif(1)	.568	.522	1.184	1	.277	1.765	.634	4.914
q15.quality.lif(2)	.477	.504	.895	1	.344	1.612	.600	4.330
thin			2.370	2	.306			
thin(1)	-.151	.336	.202	1	.653	.860	.445	1.661
thin(2)	.328	.312	1.104	1	.293	1.388	.753	2.561
sport.im			6.536	2	.038			

sport.im(1)	-.461	.562	.674	1	.412	.630	.210	1.896
sport.im(2)	.548	.437	1.567	1	.211	1.729	.734	4.075
Subject.group			5.005	3	.171			
Subject.group(1)	.367	.433	.718	1	.397	1.444	.617	3.377
Subject.group(2)	.630	.410	2.364	1	.124	1.878	.841	4.193
Subject.group(3)	.817	.378	4.666	1	.031	2.263	1.079	4.747
Financ.g			.778	2	.678			
Financ.g(1)	-.180	.447	.162	1	.687	.835	.348	2.006
Financ.g(2)	.292	.433	.454	1	.500	1.339	.573	3.128
plc.living			1.369	2	.504			
plc.living(1)	.375	.349	1.153	1	.283	1.455	.734	2.886
plc.living(2)	.460	.706	.425	1	.514	1.585	.397	6.319
U.C.Location			7.333	3	.062			
U.C.Location(1)	-.693	.444	2.432	1	.119	.500	.209	1.195
U.C.Location(2)	-1.288	.577	4.979	1	.026	.276	.089	.855
U.C.Location(3)	-.642	.336	3.653	1	.056	.526	.272	1.016
Constant	-4.015	.754	28.332	1	.000	.018		

Following physical activity

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	483.140 ^a	.011	.029

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	9.199	6	.163

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1			4.167	2	.125			
q37.smoke.3.mont								
q37.smoke.3.mont(1)	.747	.634	1.390	1	.238	2.111	.610	7.307
q37.smoke.3.mont(2)	.770	.438	3.100	1	.078	2.161	.916	5.093
q43.alcohol.drink			1.314	2	.518			
q43.alcohol.drink(1)	.663	.578	1.314	1	.252	1.940	.625	6.022
q43.alcohol.drink(2)	-19.136	20009.444	.000	1	.999	.000	.000	.
beckdepressed(1)	.044	.259	.028	1	.866	1.044	.629	1.734
dieti.group(1)	.437	.280	2.439	1	.118	1.548	.895	2.679
BMI.no.m			1.607	3	.658			
BMI.no.m(1)	.023	.316	.005	1	.942	1.023	.551	1.900
BMI.no.m(2)	-.909	.749	1.474	1	.225	.403	.093	1.748
BMI.no.m(3)	-.121	.371	.106	1	.745	.886	.428	1.835
Constant	-2.948	.229	165.901	1	.000	.052		

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	428.152 ^a	.053	.165

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	9.928	8	.270

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1								
q50.sex(1)	.989	.357	7.662	1	.006	2.690	1.335	5.419
q45.study.year			2.527	5	.772			
q45.study.year(1)	-.174	.403	.185	1	.667	.841	.381	1.853
q45.study.year(2)	-.462	.467	.980	1	.322	.630	.252	1.572
q45.study.year(3)	.022	.503	.002	1	.966	1.022	.382	2.737
q45.study.year(4)	-1.234	1.111	1.234	1	.267	.291	.033	2.570
q45.study.year(5)	.330	1.166	.080	1	.777	1.391	.142	13.661
AGEGROP			.299	3	.960			
AGEGROP(1)	.182	.355	.263	1	.608	1.200	.598	2.407
AGEGROP(2)	.283	.662	.183	1	.669	1.327	.362	4.862
AGEGROP(3)	-17.573	11518.435	.000	1	.999	.000	.000	.
q15.quality.lif			1.272	2	.530			
q15.quality.lif(1)	.052	.468	.012	1	.912	1.053	.420	2.637
q15.quality.lif(2)	-.271	.456	.354	1	.552	.762	.312	1.863
thin			1.999	2	.368			
thin(1)	-.074	.368	.040	1	.841	.929	.451	1.911
thin(2)	.374	.344	1.177	1	.278	1.453	.740	2.854
sport.im			5.511	2	.064			
sport.im(1)	.146	.654	.050	1	.823	1.158	.321	4.173
sport.im(2)	.934	.555	2.838	1	.092	2.545	.858	7.546
Financ.g			.050	2	.975			
Financ.g(1)	.064	.456	.020	1	.888	1.066	.437	2.605
Financ.g(2)	-.076	.534	.020	1	.887	.927	.325	2.642
plc.living			2.150	2	.341			

plc.living(1)	.499	.370	1.823	1	.177	1.648	.798	3.401
plc.living(2)	-.395	1.078	.135	1	.714	.673	.081	5.565
U.C.Location			4.878	3	.181			
U.C.Location(1)	-.657	.486	1.829	1	.176	.519	.200	1.343
U.C.Location(2)	-.999	.582	2.947	1	.086	.368	.118	1.152
U.C.Location(3)	-.546	.364	2.250	1	.134	.579	.284	1.182
Subject.group			7.081	3	.069			
Subject.group(1)	.297	.461	.416	1	.519	1.346	.545	3.322
Subject.group(2)	-.221	.489	.204	1	.652	.802	.308	2.091
Subject.group(3)	.827	.395	4.393	1	.036	2.287	1.055	4.956
Constant	-4.123	.815	25.613	1	.000	.016		

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Step 0 Constant	-2.987	.144	433.141	1	.000	.050

Omnibus Tests of Model Coefficients

	Chi-square	df	Sig.
Step 1 Step	10.724	9	.295
Block	10.724	9	.295
Model	10.724	9	.295

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	3.685	7	.815

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1	q37.smoke.3.mont			3.549	2	.170			
	q37.smoke.3.mont(1)	.500	.757	.436	1	.509	1.649	.374	7.274
	q37.smoke.3.mont(2)	.869	.480	3.271	1	.071	2.383	.930	6.109
	q43.alcohol.drink			.753	2	.686			
	q43.alcohol.drink(1)	.159	.705	.051	1	.821	1.173	.295	4.668
	q43.alcohol.drink(2)	1.098	1.270	.747	1	.388	2.997	.249	36.148
	beckdepressed(1)	.274	.291	.887	1	.346	1.316	.743	2.328
	dieti.group(1)	.096	.324	.088	1	.767	1.101	.584	2.076
	BMI.no.m			3.347	3	.341			
	BMI.no.m(1)	.561	.341	2.709	1	.100	1.752	.899	3.416
	BMI.no.m(2)	.095	.641	.022	1	.882	1.099	.313	3.860
	BMI.no.m(3)	-.128	.445	.082	1	.774	.880	.368	2.107
	Constant	-3.407	.273	155.421	1	.000	.033		