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Contributions to public health around the world

Abstract

Paramedics have progressed in many developed nations from being primarily a medical transportation service into independent prehospital practitioners, leading to some unique solutions to various issues in public health care policy. Issues such as how to manage increasing Emergency Department (ED) demand have given rise to paramedics establishing specialist roles in non-traditional practice settings (Raven, Tippett, Ferguson, & Smith, 2006).. This is contrasted by the situation in some developing health care systems (according to the WHO), where prehospital care services remain under developed. The more recent contribution to wider public health outcomes made by the emerging paramedic profession needs to be viewed within the context in which it developed. More work needs to be done to describe and understand the contextual nature of the profession, particularly where different roles are performed and training undertaken by prehospital care practitioners. When this context is established, interpreting research conducted in developed systems for use in developing nations may become possible. Furthermore this paper discusses the difficulties in establishing internationally relevant research.

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Paramedic Contributions to Public Health: Can advances in developed nations be contextualised to assist developing countries?

Keywords: Paramedic, education, qualitative research, prehospital care, developing nations

Introduction

Paramedics have progressed in many developed nations from being primarily a medical transportation service into independent prehospital practitioners, leading to some unique solutions to various issues in public health care policy. Issues such as how to manage increasing Emergency Department (ED) demand have given rise to paramedics establishing specialist roles in non-traditional practice settings (Raven et al., 2006). However, healthcare systems differ between countries and countries which are considered by the World Health Organisation (WHO) as having a developing healthcare system (WHO, 2018) should not be considered in the same light as those who have devolved systems, such as the United Kingdom (UK).

This article highlights some challenges in contextualising some recent professional developments that might then allow the interpretation of research for use in nations considered by the WHO as developing. Only by establishing the context can the relevant research

This article highlights some recent professional developments that might be contextualised and then made applicable for developing pre-hospital health services. By establishing the context in which research occurs, interpreting that research will become more transferable between different settings. Furthermore, there are several difficulties in establishing internationally relevant research for paramedic practice.

The Role of the Ambulance Service

Ambulance services play a unique public health role in any healthcare system, given the dual roles of providing emergency and health care services. Traditionally the role has been limited to a transport medium to allow sick or injured people to get to a hospital for treatment. In the late 1960's prehospital care practice began to transform into a profession in its own right in developed countries (O'Meara & Grbich, 2009).

Recognition as a profession remains an important but contentious issue with some commentators agreeing that paramedics have yet to attain professional status, and therefore remain a semi-profession (Eburn & Bendall, 2014; Paramedics Australasia, 2015; Townsend & Eburn, 2014). It is unclear what impact the search for professionalisation in developed nations has on those yet to implement basic prehospital care. Questions also remain about the applicability of research conducted in often vastly different contexts.

The emergence of professional prehospital care practice (paramedic practice) has occurred at different rates in different countries and has been adapted to suit the healthcare system in which it operates. The process of achieving that professional status has varied from country to country due to the different models of practice and education. Through continuing research it is possible to recognise when a unique body of knowledge relating to prehospital care practice develops (Sheather, 2009; Perry, 2016). It is that emergence of a unique body of knowledge which then assists in identifying those attributes unique to the profession (Scalea et al., 2012; Williams, Onsman, & Brown, 2009; Williams, Onsman, & Brown, 2012). Allowing this body of knowledge to inform future education and practice direction remains a challenge in what can be a difficult profession to define.

Prehospital care is an inter-professional and inter-sectorial service that crosses many aspects of health care. What was often a forgotten phase of emergency health care provision has now developed into an integral part of primary, secondary and in some cases tertiary health care models (Raven, Tippett, Ferguson, & Smith, 2006). This expansion may assist in explaining some differences in practice across different health care systems.

In Australia, New Zealand and the United Kingdom paramedics practice as autonomous health care practitioners and often treat people in their own homes without the need to transport them to hospital (Tippett et al., 2008). New and unique ways of managing public health concerns outside of traditional medical practices have been developed as a result of the ability of prehospital care practitioners to determine and meet the health care needs of society (Raven et al., 2006). This move to evidence based independent practice means that prehospital care practitioners are now beginning to determine the scope of their own practice and develop unique solutions to public health issues. Paramedics Australasia (the peak professional body for Paramedics in Australasia and New Zealand) recognise this as one part of the advancement towards professional status (Paramedics Australasia, 2015).

Alongside the development towards professionalism have come changes in the way in which prehospital care services are delivered. Raven et al. (2006) discuss the non-traditional roles for prehospital care practitioners throughout the U.K. and Australia, which have the ability to significantly contribute to many public health outcomes, including preventing premature mortality and improving wider health and health promotion. Community Paramedic and Extended Care Paramedic roles have transformed the profession into one that delivers many of these wider public health outcomes (Mason, Wardrope, & Perrin, 2003;

O'Meara, 2003; O'Meara & Grbich, 2009). Not only does prehospital care service delivery attend to urgent health care, the often-neglected aspect of paramedic work is being able to respond to public health issues, such as those mentioned above as well as ED demand. Responding to major incidents such as pandemics is now seen as a key feature of a well established prehospital care system (Tippett et al., 2008).

There are also significant cost savings to be found in treating people in their own homes by employing professional prehospital care practitioners (advanced paramedic). (Varney, Weiland, & Jelinek, 2014; Evan et al., 2013; Ruest, Stitchman & Day, 2012; Pearson, Gale & Shaler, 2014). By utilising prehospital care practitioners in a way traditionally reserved for doctors, a reduction in the overall costs of the public health care system could be achieved in many countries (Raven et al., 2006), although there are few updated economic studies since the introduction of this role in some settings. As developing nations (according to the WHO classification) have limited resources to devote to increasing healthcare demands, encouraging the creation of alternate, safe and less expensive means of meeting public health demands is often a priority.

The role of education in professional development

Professional development in Australia, the UK and other countries has, by and large, occurred through tertiary education. It is through the creation of a knowledge base through evidence-based research (Raven et al., 2006), and then delivered in the tertiary setting, that prehospital care practice has moved closer to becoming a profession (Sheather, 2009; Williams et al., 2009; Williams, Onsman, & Brown, 2010). However, the role of paramedics may be influenced by the variability in the prehospital care education provided in different countries. This, in turn, may limit the type of services provided and ultimately result in delayed progression in improving health outcomes during emergencies.

Critiquing the Literature

Literature, which attempts to examine the role or potential role of prehospital care practitioners in developing countries, is sparse. Therefore, some studies rely on literature that has not had the benefit of peer review and other publications, such as Government commissioned reports, annual reports and unpublished raw data. This 'Grey' literature can provide insights into the role and function of prehospital care practitioners in the absence of peer-reviewed publications.

There are various reasons for this limitation including the lack of consistent terminology for prehospital care practitioners globally (as well as quite different roles, as explained in Table 1.); the difficulty in defining prehospital care practice in terms of the primary, secondary and tertiary healthcare models; the comparative lack of prehospital care research in developing countries and globally; and arguably the most important reason, the lack of a cohesive occupational identity in many developing nations.

A systematic literature search was conducted between September 2014 and September 2015 in support of a study into the impact of a prehospital care education programme in Malaysia (Perry, 2016). Pubmed, Academic Search Complete, Ovid, Embase, and Eric databases, using the terms 'Ambulance' AND 'Malaysia' were explored. Replacing 'Malaysia 'with' developing country as well as replacing 'Paramedic' with 'EMT', 'Technician' and 'Ambulance Officer' and other terms described in Table 1, expanded the search. Once duplicates were removed, there were 220 results across the five databases.

Those articles were then assessed for their relevance based on reference to prehospital care practice and professional development within the developing world, therefore leaving 33 articles. The articles deemed irrelevant had limited reference to prehospital care practice as distinct from hospital practice, or were describing limited studies focused on clinical practice. None of the remaining articles were based on original research. It is reasonable to postulate that one of the reasons for this is the lack of a professional identity for prehospital care practitioners throughout the region and the world, resulting in a lack of common name for the role as well as limited involvement in original research.

Models of Practice and Terminology

The difficulty searching in the literature is compounded by the inconsistency in practice standards, models of Emergency Medical Service (EMS) provision as well as inconsistencies in terminology internationally. As models of practice differ around the world, so too do the terms used to describe those who undertake prehospital, or ambulance, care. In the UK, Australia and New Zealand the term ‘paramedic’ has been reserved for those who can be described as professional or semi-professional and ‘ambulance officer’ has been used to describe the role generally. Other terms available and used elsewhere are ‘Emergency Medical Technician’; ‘Ambulance Practitioner’; and ‘Medic’. The table below (Table 1) highlights the complexities of international comparisons of ambulance systems, based on the terminology and education level of those involved with prehospital care.

Table 1: Role Definitions of Prehospital Care Practitioners in Selected Countries

Country		Brief Course (up to 4 weeks)	Short Course (up to 6 months)	Degree or Diploma (2 to 3 Years)	Post Graduate or Internal Training post Degree/Diploma
Australia	part of the state-run system	✓	✓	✓	✓
	Roles & Name	Community 1st Responder (Some states) Community Responder First Aider	Patient Transfer Ambulance Officer	Emergency Ambulance Paramedic (some states have differing sub-levels)	Emergency Ambulance Helicopter retrieval Primary Care roles and hospital avoidance. Known as Intensive Care Paramedic, Rescue Paramedic, Retrieval Paramedic or Extended Care Paramedic
	Professionally registered	✗	✗	Recent change ✓	Not in this role Registered as a paramedic
United Kingdom	part of the state-run system	✓ (some)	✓	✓	✓
	Roles & name	First aid and first response, First Aider. Community First Responder	Paramedic Assistant, Emergency Care Assistant, Technician	Emergency Ambulance, Paramedic	Emergency Ambulance Home care, hospital avoidance and primary care roles Paramedic Practitioner Advanced Care Paramedic Emergency Care Practitioner
	Professionally registered	✗	✗	✓	Not in this role Registered as a paramedic
Malaysia	Part of the state-run system	✓	✓	✓ (uncommon qualification)	✗ (not found)
	Roles	Emergency Ambulance, Patient Transfer	Emergency Ambulance, Patient Transfer	Emergency Ambulance, Patient Transfer	

Name	EMT, Paramedic, Medic	EMT-B, Paramedic, Medic	EMT, Paramedic, Medic	
Professionally registered	X	X	X	

Note: This table is illustrative of the differences and does not seek to represent a comprehensive picture of all aspects of the systems presented. All information sourced from the following: Ong et al., 2013; Paramedics Australasia, 2014; Perry, 2016; Roudsari et al., 2007; S.A. Ambulance Service, 2008; S.A. Ambulance Service, 2015; St John Ambulance of Malaysia, 2014.

Comparisons of skill sets may be even more complex and few have sought to describe this in the literature. One possible explanation for the differences between those developed and less developed nations is in part historical and government policy relating to health system design. One common denominator across all four examples is the charitable organisation St John, or more correctly 'Most Venerable Order of the Hospital of St John of Jerusalem' (Howie-Willis 1983). At the time of British colonisation in Asia Pacific regions, St John re-emerged in the late 1880s England after the suppression of religious orders by Henry VIII (Howie-Willis 1983). Other regional and geo-political influences which have shaped health care system design includes the adoption of universal health care such as those introduced by the UK (National Health Service) and later in Australia (Medicare). While in Malaysia and Singapore, religious and ethnic influences need to be considered in the development of their mixed health care system design which includes a civil defence service as ambulance providers. In the mixed public-private Australian system, the regional differences in each state-based system provide additional challenges for comparison.

Even in areas where similar terms are used, they may have different meanings and this complicates the interpretation of research output. Terms such as 'Paramedic' could mean a university educated professional

with a post-graduation year of supervised practice in parts of Australia, or in Malaysia simply someone who has had a few hours training. Likewise, models of prehospital care practice can differ between physician led (such as the systems in the United States of America and Norwegian systems), or Paramedic led (such as New Zealand and Australia).

Professionalism and Education within Prehospital Care Practice

Professionalism and education are uniquely interwoven. There is no universally accepted definition of what makes a profession, nor what contributes the professionalisation of an industry. Definitions by Greenwood (1984), van Mook et al. (2009) and Townsend and Luck (2013) provide a brief comparison of the attributes of a profession/al. Greenwood (1984) offers a succinct definition of a profession, which includes a systematic body of theory and authority, while van Mook et al. (2009) suggests that the expertise in a particular area contributes to professionalism. Townsend and Luck (2013) discuss the mastery of complex tasks and skills in a context of knowledge of some department of science or learning. Consistent with most definitions of professionalism is the understanding that a specific body of knowledge and authority exists, often in the form of recognition around that knowledge.

There is some evidence in healthcare services considered by the WHO to be developed that education can lead to improvements in patient care (Andrew et al.,2015; Giddens, et al., 2012; Spaite et al., 2000). Yet, advocates for the use of medically controlled treatment protocols rather than an educated professional workforce base remain (Halter et al., 2011). This increasingly divergent debate within this emerging profession has been the subject of continuing research, however is unclear from the literature if any one model of service provision has particular advantages for ambulance services seeking further development.

Furthermore, few, if any, studies have considered the impact of non-tertiary training courses in terms of professional development.

The existence of a body of knowledge without the acceptance of this by associated professions (in particular the medical profession which currently control prehospital care practice in many parts of the developing world) would be unlikely to lead to the same innovations as seen in a truly professional and independent prehospital care practice. It is anticipated and expected that the outcome of the associated improvement in education standards is the ability of ambulance prehospital care practitioners to act more as independent practitioners in their own right, rather than being under the control of Medical staff (Reeve et al 2008).

The evidence for non-medical professionals being involved in emergency care and expanded out of hospital medical care is mounting, but is not overwhelming. Despite this, some countries, such as Germany and the United States of America largely remain convinced that prehospital care should be physician led (Roudsari et al., 2007).

Professionalism and Research in Paramedic Practice.

Professionalism depends on both education and research (Greenwood 1984). Research in practice produces evidence for practice and allows paramedics to claim rationality for clinical decision-making which relates to treatment choices (Jones et al 2016) and / or transportation (Sheffield, O'Meara & Verrinder 2016). Following medical orders or even clinical protocols do not create conditions for autonomous practice. Even when paramedics themselves establish clinical protocols, without evidence to support them, paramedics

cannot claim professionalism rather it is just the perpetuation of a series of established and reinforced organisational culture practice (Reynolds 2008).

The research literature to date has little to say about how paramedics make emergency clinical decisions in prehospital care with a recent systematic review finding only four studies relating specifically to this topic (Sheffield, O'Meara & Verrinder 2016). What was established from this review is that clinical decision making requires relevant practical experience; protocols to guide decision making; education; referral processes and holistic health care (Sheffield, O'Meara & Verrinder 2016) To date, paramedic research has used mainly quantitative methodologies and methods to explore the functions and efficacy of various treatments in prehospital care. While these studies have provided useful information in describing the context and functions of an ambulance service, they necessarily do not reflect the future potential of professional Paramedics working in prehospital care. While there have been 'generic' qualitative studies, to gain this information more sophisticated qualitative designs must be utilised (Cooper, Endacott, & Chapman, 2009; O'Meara et al., 2015). In addition, few studies have been led by paramedics and may have been guided by researchers using very different frames of reference.

Clearly, paramedic practice would benefit from forms of qualitative research in ways that would demonstrate to the public and to other professional groups that professional practice is underpinned by evidence. Paramedics themselves must carry out pre-hospital research rather than rely on the viewpoints from other professional groups. In this way paramedic science will develop and paramedic practice will be acknowledged as a profession and a discipline in its' own right.

Conclusion

As paramedic professional development has occurred in different healthcare systems at different times and at a different pace internationally, there is a substantial difference in educational programs and in paramedic practice. In the UK, Australia and some other countries paramedic education is keeping pace with other allied health care professional education, such as Nursing. However the research output does not appear to be. Paramedics need both higher education and research output in order to be established as a credible profession. Once established on this pathway it is clear that a significant contribution to public health care can be achieved within the global community.

Establishing internationally relevant research in an emerging profession with varying definitions and developmental phases across the globe has specific challenges. These challenges can only be overcome by understanding the context in which research is conducted and more attention should be paid to describing such differences.

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