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## **Running Head: Attendance of Exercise Referral Schemes in the UK**

### **Attendance of Exercise Referral Schemes in the UK: a systematic review**

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## **Abstract**

### Objective

The aim of this review was to explore attendance of UK exercise referral schemes (ERS), who attends them, why participants drop out of schemes and to compare evaluations of existing ERS with randomised controlled trials (RCTs).

### Design

Systematic review.

### Method

A search of major databases was conducted to identify studies investigating ERS interventions that were based in primary care in the UK, reported attendance-related outcomes and were published in peer-reviewed journals.

### Results

Five evaluations of existing ERS and four RCTs met the inclusion criteria. Method of participant recruitment was the only marked difference between the two types of study. In RCTs and evaluations, rates of referral up take and attendance were varied but comparable. Attendance was generally poor; approximately eighty per cent of participants who took up referral dropped out before the end of programmes. More women than men took up referral (60 vs. 40%) but there was no evidence of higher

attendance in women. None of the participant characteristics reported were consistently associated with attendance. Most of the reasons for attrition and negative comments from participants related to practical problems associated with attending leisure facilities.

## Conclusion

The present review highlighted a high level of attrition in ERS. However, poor measurement and reporting of attendance, and inadequate participant profiling, prevented us from identifying which sections of the population were most likely to attend or drop out. Adequate data collection regimens, beginning at the point of referral would enable us to learn whom exactly ERS are proving successful for.

## **Introduction**

Over the last decade the number of exercise referral schemes (ERS) in the UK has risen dramatically from an estimated two hundred schemes in 1994 [1] to approaching seven hundred in 2001 [2]. However, the dearth of evidence to support their popularity continues to be a source of contention [1, 3-5]. In the past schemes have failed to put in place the necessary processes to enable high quality evaluations [6]. Therefore, when it has come to measuring their effectiveness researchers have been limited by poor quality or incomplete data [6, 7].

In the present climate of evidence-based practice, decisions about policy, design and funding of health promotion interventions are increasingly guided by research [8]. Systematic reviews, are therefore used to guide clinicians, managers and policy makers on the effectiveness of such interventions [6, 8] and can have a direct impact on policy. The lack of rigor in evaluations of ERS has resulted in many studies failing to meet the strict inclusion criteria of systematic reviews, which often preclude studies that deviate from the randomised controlled trial (RCT) model [3, 6]. However, there is increasing opposition to the use of RCTs when evaluating human interventions such as ERS [6, 9-11]. Reasons for this opposition include ethical issues concerning withholding treatment from control patients [3, 10, 11]. There is also a need to consider the consequences of placing greater burden on participants and the participating exercise and health professionals in terms of attrition and adherence to RCT regimens [12]. Moreover, the efficacy of an intervention in an experimental setting might not necessarily reflect its effectiveness in the 'real life' situation [13]. Although a certain level of rigor and methodological coherence is necessary to obtain

meaningful results, as discussed by Mutrie [14], the imposition of strict inclusion criteria has the potential to miss out valuable information.

### **Rationale for review**

In the case of ERS, rather than attempting to demonstrate change in habitual physical activity or other related variables, it is more pertinent to measure attendance of schemes [15]. Briefly, the rationale for focussing on attendance as the main outcome variable is:

- i. Most schemes attempt to monitor attendance
- ii. Attendance can be monitored objectively avoiding the use of self-reported outcomes
- iii. There are a limited number of ways in which attendance can be measured, which should increase comparability between schemes
- iv. Physical activity is notoriously difficult to measure [16]
- v. Where attendance and physiological changes have been monitored, beneficial changes are shown to occur if attendance is adequate [17]
- vi. The relative importance ascribed to development of physical fitness (i.e. physiological adaptations) rather than regular physical activity may be questioned [18]

The primary focus of the present review is how well ERS are attended. We also begin to look at who attends, reasons for attrition, and how participants perceive schemes. The overall focus is therefore narrower than the previous review of ERS by Riddoch

et al. [3] but the inclusion criteria broader. By including both experimental studies of ERS interventions and evaluations of ‘real life’ schemes we can make comparisons between them, both in terms of design and findings, and discuss possible implications of any differences.

## **Methods**

### *Inclusion criteria*

Five main inclusion criteria were employed:

1. Studies were based in the UK
2. Interventions were based in primary care
3. Interventions involved referral to an exercise professional
4. Attendance-related outcomes were measured
5. Studies were published in peer-reviewed journals

By delimiting the review to studies in the UK we avoided international differences, such as differences between health care systems. The inclusion of only published studies imposed a degree of quality assurance, excluding unpublished ‘in-house’ evaluations.

### *Search Strategy*

The major databases searched included Pub Med, Sports Discuss, Psych Info and Embase. Figure 1 outlines search terms used and results. In addition, known authors in the field were contacted by e-mail for further information on papers in press or in progress. The literature search was conducted during October 2003.

\*\*\*\*\*Insert Figure 1 Here\*\*\*\*\*

Figure 1. Search strategy and total articles found

### *Analysis*

The present review used a qualitative and comparative approach. Quantitative analyses were considered inappropriate given the relatively small number of studies and differences in data reported.

## **Results**

### *Results of Literature Search*

Nine studies met the inclusion criteria, of which one was in press. They were divided into two groups:

- i. Evaluations of existing schemes (n=5) [7, 10, 11, 19, 20]
- ii. Experimental RCTs (n=4) [17, 21-23]

One study in which the RCT model was applied to an existing ERS [24] was excluded because researchers aborted the study due to insufficient numbers. Two further studies were excluded as they were published in a non-peer-reviewed journal [25] and on the Internet [26], respectively.

For the purposes of discussion, evaluations of existing schemes are referred to as *evaluations*, whereas RCTs are referred to as *RCTs* or *trials*. *Attendance*, *adherence*,

and *compliance* were all used, somewhat interchangeably by authors, to describe what is essentially participant attendance of ERS. In the present review this outcome is referred to as '*attendance*'. '*Uptake*' of referral refers to attendance at the initial consultation or first exercise session.

### **Summary of Studies**

Table 1 presents details of existing scheme evaluations, RCT design, and sample demographics. Table 2 summarises attendance outcomes and findings.

### **Discussion of Findings**

Exercise referral schemes have already been the focus of two quite different reviews [1, 3]. Riddoch and colleagues [3] concentrated on changes in physical activity-related outcomes. They found that small but positive short-term changes became less marked as experimental rigor increased and called for more methodologically robust evaluation. In 1994, near the beginning of the ERS proliferation, Fox and colleagues [1] identified and obtained data from approximately two hundred existing UK schemes. Their aim was to investigate the extent and nature of schemes on the basis of routinely collected data. The authors concluded that attendance of inductions (equivalent to 'uptake') was high (60-70%) and that patients rated schemes favourably. However, they criticised the quality of the 'in house' evaluations and questioned the potential public health impact of ERS because of the small proportion of the population that could be reached.

The present review examined how well ERS are attended, who attends them, and reasons for dropout. Similar to Riddoch et al. [3] we delimited our search to published

literature and included experimental studies using ERS-style interventions. This enabled comparisons with 'real life' ERS and raised some interesting points.

*i. Intervention design*

Table 1 provides all details relating to the design of ERS and RCT exercise interventions. There were no marked or consistent differences between interventions in RCTs and evaluations, which is not surprising considering that RCT effectively try to simulate 'real life' schemes. They generally began with an assessment or consultation with an exercise professional [10, 11, 17, 20, 22, 23], although not specified in some cases [7, 11, 21]. Where frequency was specified, participants were encouraged to attend two [7, 17] or three [10, 20] exercise sessions per week. The duration of intervention was ten [7, 17, 20, 23, 27], twelve [10, 22] or fourteen weeks [11], although one RCT lasted two years [21], despite reporting ten-month outcomes.

All interventions were facility-based. Only one evaluation [10] and one RCT [23] reported the inclusion of home-based activities. Financial incentives were given in some evaluations and trials, which exercise sessions were either free of charge [21, 22] or at a reduced rate [10, 17, 20]. Stevens et al. [23] did not specify whether or not participants had to pay.

The degree of individualization and flexibility in programmes was only made clear in two of the four evaluations [10, 20]. In the remaining evaluations exercise professionals recommended the most appropriate types of activity. The requirement to attend certain sessions was not specified in any evaluations. Two RCTs offered individualised exercise programmes to intervention participants [17, 23], both using

initial consultations to advise individuals on increasing activity levels through attending the leisure facilities. In contrast, the Munro [21] intervention was more rigid and comprised exercise classes for older adults. Despite less flexibility in terms of the format, classes were held at less formal and more varied venues such as community centres and church halls. Finally, Harland et al. [22] offered motivational interviews (single or multiple), with or without vouchers for free access to leisure facilities. The use of vouchers gave participants flexibility in terms of type of activity, times, and facility. Implications of intervention design in relation to attendance are discussed later.

#### *ii. Recruitment*

In the evaluations recruitment tended to be through referral by general practitioners (GPs) during routine appointments [7, 10, 11, 19]. Lord and Green [20] used voluntary health screening visits at GP practices, whereas Hammond et al. (1999) [10] employed additional recruitment through community screening and patient self-selection. In contrast, it was the researchers in the RCTs that recruited participants [17, 21-23]; health professionals had little or no direct involvement. Eligible patients were identified using practice registers [17, 21, 23] with one exception in which individuals were approached during routine appointments, and subsequent postal recruitment [22].

The differences between these recruitment strategies could have implications that must be considered. It is unlikely that people respond to researchers and GPs in the same way. On the one hand, some hold GPs in esteem, especially older adults [28, 29], which comprise a substantial proportion of ERS participants. As a result, a

recommendation from a GP might improve or even be necessary for uptake and attendance [29]. On the other hand, some health professionals perceive barriers to referral [30, 31] and do not prioritise physical activity promotion. Therefore, they may be far more reluctant to promote schemes in comparison with researchers who have a vested interest in recruitment. Fielder and colleagues [24] learned this lesson when they attempted to apply the RCT model to a 'real life' ERS. The researchers' sole reliance on GP referral led them to abort the study after four months as just thirty-eight participants had been recruited.

### *iii. Sample characteristics*

The range in sample size was similar in evaluations and RCTs. Characteristics of participants were generally not well reported, and tended to be limited to age and gender. Participants were exclusively adults (>18 yrs) in both evaluations and RCTs, and age and gender distributions were similar. In keeping with previous findings [1, 32] it appeared that men were harder to recruit, with women accounting for approximately sixty per cent of participants in two evaluations [7, 11] and three trials [17, 22, 23]. Participants were mostly middle- aged and older [7, 11, 17, 22, 23]. In RCTs this was the result of employing specific inclusion criteria. Aside from targeting age groups, two RCTs performed baseline surveys to identify less active individuals [21, 23], and one targeted those with modifiable CHD risk factors [17]. Specific patient targeting was not evident in any of the existing scheme evaluations [7, 10, 19, 20, 33]. Few studies reported the condition for which participants were referred. Weight reduction was most common [10, 11], although Taylor et al. [17] found that overweight was less common than hypertension (48 vs. 61%).

It is not known in any of the five evaluations how many people were offered a referral by their GP and refused. Therefore, response rates to invitations to participate were only available for RCTs and might provide some insight into the proportion of people, who if offered, would accept an exercise referral. These ranged widely, from relatively high (70%) [17] (57%) [23], to low (28.6%) [22](15-20%) [21]. Indeed, researchers in the latter studies resorted to additional recruitment measures to boost numbers.

In practice referral is the gateway to ERS and according to Stevens et al. [23] the most important component in terms of financial viability. Therefore, several points should be considered. First, targeting strategies need to focus on men. Second, the high average age of participants demonstrates a need to target younger sections of the sedentary population and therefore use ERS for disease prevention as well as for rehabilitation. In a qualitative investigation by Smith et al. [34] none of the twenty-three referring health professionals interviewed thought of ERS as a means of preventing diseases, only for reducing medication. If such misconceptions were addressed the average age of participants would inevitably fall. Third, more thorough patient profiling is necessary at the point of referral. The stage between referral by the health professional and uptake of referral is the first point at which potential participants may choose not to take part. We are aware of only one published study that includes characteristics of patients lost at this stage [35]. In order to better understand whether ERS are indeed ‘widely available to the public’ as intended [36], more information about participants from the point of referral is required to develop strategies to maximise the efficiency of the referral process and to reach neglected sections of the population.

### *iii. Uptake of Referral*

Following referral by the health professional, the next step in the process is ‘uptake’ of referral. Rates of uptake varied widely in both RCTs and evaluations, with no consistent differences between them but overall they were markedly lower than the sixty-seventy per cent reported by Fox and colleagues [1]. This could be attributable to differences in rigor between published and unpublished ‘in house’ evaluations.

Three of the evaluations were retrospective [7, 10, 19] and researchers recontacted people who had previously been referred to schemes. Therefore only those who had already taken up referral were included in the analysis. Differences in data reported in the remaining evaluations and RCTs complicates what can be defined as ‘uptake’. Two evaluations [11, 20] and one RCT [23] reported attendance of initial consultations, and rates varied (35% to 60%). The RCTs by Taylor et al. [17] and Munro [21] reported the proportion of participants that attended one or more exercise sessions. Uptake in the Taylor et al. trial (86%) appears high; however, the eighty-three participants who attended at least one session represent approximately half (49%) all the people who responded to initial invitations but dropped out before randomisation (7:3, intervention: control). Uptake was lowest in the Munro (1997) [21] trial (23%) which offered exercise classes to older adults [21]. This might relate to inflexibility of the intervention or the age of participants. Finally, Harland et al. [22] found that most of the intervention group attended one or more interview (82%), whereas a far smaller proportion of participants who were given vouchers, used them (41%). Again, these figure are less encouraging when calculated as proportions of

respondents who would have been offered interviews (~58%) and vouchers (~29%) before dropouts.

#### *iv. Attendance*

Levels of attendance in evaluations were generally poor. Three evaluations reported that between twelve and eighteen per cent of participants attended their final assessments [7, 11, 20]. In RCTs, Taylor et al. [17] reported that twenty-eight per cent of intervention participants were considered to have 'high' attendance (15 out of 20 sessions) and Stevens et al. (1998) [23] reported similar attendance levels at final assessment (25%). However, in the former trial, 'high attenders' (n=27) represented just sixteen per cent of the potential intervention group (n=168) before dropouts, which is more comparable with the evaluations. Attendance was apparently lowest in the remaining two trials [21, 22]. Harland et al. [22] recorded a total voucher of 670 vouchers for access to leisure facilities were used. This equates to between three and four activity sessions (out of 30) per person in three months. Finally, Munro [21] reported a mean of twenty-five exercise classes were attended per person over a ten-month period, or averaging just 2.5 sessions per month. The most encouraging attendance was reported in the ERS evaluated by Hammond et al. (1997) [10]. The authors reported substantial improvements (from 20 to 56%) over a one-year period following several changes to the ERS programme.

When discussing attendance it is worth considering how it was measured. Given the relative ease with which it can be measured it is somewhat disappointing that only one trial [17] and one evaluation [19] used leisure centre records to objectively monitor the number of exercise sessions attended, and the latter failed to report the outcome

adequately. There should be no need to rely on simply recording the presence of participants at final assessments to determine successful attendance as was the case in four studies (3 evaluations [10, 20, 33], 1 RCT [23]). This not only prevents comparisons between participants with differential levels of attendance but assumes that all those present at final assessment have attended regularly and equally throughout. Surprisingly, there were no notable differences in quality of attendance measurement between evaluations of existing schemes and RCTs, which adds further weight to the argument against excluding from reviews studies that do not adhere to RCT methods [6].

*v. Characteristics of participants who took up referral and/or attended*

Characteristics of participants who attended were even less well reported than baseline sample characteristics and were given in just three evaluations [7, 11, 20] and two RCTs [17, 21]. Despite better uptake in women, subsequent attendance in men was higher than in women in one study [11]. Neither RCT found an association [17, 21] and one evaluation reported higher attendance in women [20], although this was based on a relatively small final sample. Indeed, the size of the study population (n=77) in the evaluation by Martin and Woolf-May [7] could explain the absence of gender- (and age-) attendance relationships.

In other studies the relationship between age and attendance was inconsistent. Evaluations found that increasing age [11] and being retired [20] were associated with better attendance. Conversely, one RCT reported a negative association [21] and another found no relationship [17]. In a review by Hillsdon et al. [5], increasing age was found to reduce participation in primary care health promotion interventions.

However, age of attenders and non-attenders were not sufficiently well reported in the featured studies to enable a comparison.

Various other factors associated with increasing attendance included higher baseline activity levels [17, 21], being in part-time work [20] and the condition for which people were referred [11, 17]. However, none were demonstrated consistently. Only Taylor et al. [17] reported participants' socio-economic characteristics, which were unrelated to attendance.

The content and quality of information available on participant characteristics raises some important issues. Firstly, the possibility that men are at least, if not more likely to attend despite poorer uptake, reiterates the importance of targeting men. Second, there is a clear need to routinely collect more complete participant details and track the progress of each patient. From the data presented we can learn very little about which people are most likely to attend. Detailed participant profiles are necessary at point of referral and each person monitored as they progress to determine who drops out at each stage. This should enable modification of programmes to reduce attrition. Thirdly, a matter of particular concern arising from this review is the failure of all but one study [17] to report socio-economic characteristics in relation to attendance. Although a relationship was not evident in this study, which had a relatively small final sample, socio-economic outcomes have been associated with physical activity elsewhere [37, 38]. Moreover, there is evidence that physical activity promotion schemes tend to attract the white, middle-class, well-educated sections of the population [5, 15, 39-43]. Furthermore, Lowther et al. [44] found that socially and economically deprived individuals responded well to their physical activity

intervention but in practice are often ignored [44]. The countless health benefits associated with regular physical activity [45-47] and consequent potential for physical activity interventions to address ever increasing inequalities in public health [37, 48] makes this an area deserving of more attention.

*vi. Characteristics of successful schemes*

In the present review, success of schemes is judged on the basis of participant attendance. Once again, due to generally high attrition in almost all of the studies it is difficult to relate intervention design to attendance levels. With the exception of Munro (1997) [21], whose two-year intervention had the lowest rate of uptake (and poor subsequent attendance), there was little variation in the duration of interventions. All involved attending facilities and only two studies included home-based activities [21, 23]. The level of tailoring, supervision, and contact with staff were on the whole described inadequately. Five out of the nine studies offered interventions at reduced rate or free of charge [10, 17, 20-22], two of which were conducted in deprived areas [20, 22]. However, the extent to which this influenced uptake and attendance is unclear. This further emphasises the need for improvements in the measurement and reporting of attendance outcomes in order to identify desirable scheme characteristics.

Reasons given by participants for dropping out and how they perceive schemes can provide some insight into aspects of ERS that promote or discourage attendance. Two evaluations reported such reasons, which included illness and injury [7, 20], lack of time, work pressure, wanting to attend with someone, transport problems [7], and sessions stopping for holidays/school holidays [20]. These mostly relate to practical problems associated with attending leisure facilities.

Nevertheless, two evaluations found that, in general, schemes were perceived favourably, even by those who did not complete programmes [19, 20]. Specific positive comments related to the appropriateness of programmes and supportiveness of staff [7]. Negative comments were not surprisingly common to the reasons for attrition and to themes that have emerged in qualitative investigations of ERS [28, 29]. These related to inappropriate level of programmes [7], lack of staff support [7, 17], disliking the gym environment [17], and inconvenient session times [17]. Barriers cited by participants in the Munro [21] trial included the desire to attend with someone and practical barriers, such as transport.

The evaluation by Hammond et al. [10], a rare example of a scheme in which regular evaluation and modification appeared to be integral components, further emphasises the importance of these points as the changes made to the scheme they described addressed most of these issues and subsequent attendance levels were more than doubled. Changes included: provision of classes specifically for ERS participants and specific groups (e.g. the obese), provision of transport, additional sessions for those who worked, sessions for close others, and increased appreciation of client needs by leisure centre staff.

Others have judged the success of physical activity promotion interventions on the basis of changes in physical activity and related outcomes [3], whereas this review defines success in terms of attendance. Despite this difference, some intervention components associated with ‘success’ elsewhere relate to themes that have emerged in this discussion. These include being home-based and not involving facility attendance

[32, 42], promoting moderate intensity exercise and walking [3, 5, 42], tailoring interventions to the individual [3, 49], and having enthusiastic staff [3]. Other intervention components linked with positive outcomes include having regular follow-ups [42, 50], long-term follow up [50], providing supervision and equipment [50], and employing a low cost policy [3].

## **Conclusion**

In conclusion, the present review included a relatively small number of studies but has raised several interesting points. First, attrition in ERS is apparently very high; approximately eighty per cent of participants, who take up referral, drop out before the programme ends. This suggests that many participants are inappropriately referred as previously noted [3, 35] thus highlighting the importance of effective patient targeting. Alternatively, regular attendance of leisure facilities might simply present too many problems for the majority of people.

Second, the lack of attention given to obtaining good quality attendance data, even in RCTs, is surprising as it is surely the most important outcome upon which all others are dependent. High quality objective measurement of attendance is easily achieved and should enable us to identify existing associations between attendance and other factors such as participant characteristics and scheme components that were not evident in the present review.

Third, as recognised elsewhere [13] we cannot continue to ignore those who fail to take up referral or dropout of schemes. This requires collecting data on participants from the point of referral to enable comparison between those who fail to progress

past this stage, dropout at subsequent stages, and complete schemes. Ideally data would be available on those who refuse referral but in practice this is unlikely to be feasible.

The fourth point relates to the extent of participant profiling. More data must be collected on participants and, in particular, it is imperative that we identify socio-economic bias in ERS through some kind of socio-economical profiling. Failure to attempt this might mean that a sizeable proportion of the population continue to be neglected by ERS [44].

Finally, the potential implications of differences between RCTs and 'real life' schemes should be recognised and more energy put into high quality applied research involving 'real life' ERS. Those involved in schemes must recognise the importance of routinely collecting accurate and adequate data to enable quality evaluations [7]. Relying on retrospective evaluations is not satisfactory and processes should be implemented at the design stage so that they are not necessary.

Overall, future modifications may well involve diversification of schemes away from the facility-based model, at least in part, which would overcome several potential barriers simultaneously (transport problems, not wanting to attend alone, cost of attendance, inconvenient times of sessions, dislike of gym environment, etc). However, as the majority of current ERS remain facility-based we are obliged to determine which members of the population are being targeted and why others miss out or are put off attending schemes in order that ERS are effective for no more than a small minority of potential participants.

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