NICE National Institute for Health and Care Excellence

NICE guideline

Physical activity: exercise referral schemes

Public health guideline

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Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guideline partially replaces PH2.

Overview

This guideline covers exercise referral schemes for people aged 19 and older, in particular, those who are inactive or sedentary. The aim is to encourage people to be physically active.

Who is it for?

- Policy makers and commissioners in local authorities and the NHS
- Primary care practitioners and other practitioners with physical activity as part of their remit
- Providers of exercise referral schemes
- Organisations that provide exercise qualifications and accreditation
- Members of the public

What is this guideline about?

This guideline makes recommendations on exercise referral schemes to promote physical activity for people aged 19 and older. It is an update of recommendation 5 in 'Four commonly used methods to increase physical activity' (NICE public health guidance 2).

NICE has already recommended structured exercise programmes to manage specific health conditions, or for rehabilitation after recovery from a specific condition (see box 1). These include stroke, cardiac and pulmonary rehabilitation programmes. They are outside the scope of this guideline.

Benefits of physical activity

Physical activity can play an important role in preventing and managing health conditions such as coronary heart disease, type 2 diabetes, stroke, mental health problems, musculoskeletal conditions and some cancers. It also has a positive effect on wellbeing and mood, providing a sense of achievement or relaxation and release from daily stress. (See Start active, stay active: a report on physical activity from the four home countries' Chief Medical Officers Department of Health 2011.)

The benefits of physical activity are highlighted in a number of NICE guidelines (see box 1 and box 2).

Evidence on exercise referral

The evidence identified specifically looked at exercise referral schemes that try to increase physical activity. The studies included:

- people who are sedentary or inactive
- people who have an existing health condition (for example, coronary heart disease, diabetes or depression)
- people who have other risk factors for disease, such as being overweight or obese, having raised blood pressure or cholesterol levels, or experiencing mild depression, anxiety or stress.

The evidence suggests that these exercise referral schemes have only a marginal added effect relative to other ways of increasing physical activity. (Examples of other approaches include: giving

brief advice and providing information about local facilities and opportunities to be physically active.) The economic evaluation suggests that this added benefit was not likely to be a cost effective use of resources.

However the physical activity programmes offered as part of an exercise referral scheme – and the reasons why people are referred to them – vary considerably. NICE is unable to differentiate between the effectiveness or cost effectiveness of different types of scheme because there is little evidence of effectiveness for specific schemes or subgroups (see recommendations for research).

Other benefits of exercise referral schemes

Exercise referral schemes are popular and they may offer other benefits aside from physical activity, such as helping people to socialise, providing a means of getting involved with the community and providing affordable access to facilities. However, although not excluded from the scope of this work, no evidence of the impact on these outcomes was identified in the evidence of effectiveness and cost effectiveness, so they were not captured in the economic model.

NICE is therefore unable to judge the effect of exercise referral schemes on these outcomes, compared with other interventions that seek to address the same issues.

Who is this guideline for?

The guideline is for primary care practitioners and policy makers, commissioners and other practitioners with physical activity as part of their remit working in local authorities and the NHS. In addition, it may be of relevance to providers of exercise referral schemes, organisations that provide exercise qualifications and accreditation and members of the public. (For further details, see who should take action?)

See about this guideline for details of how the guideline was developed and its current status.

1 Recommendations

This guideline replaces recommendation 5 in 'Four commonly used methods to increase physical activity', NICE public health guidance 2 (2006).

Definition

Exercise referral schemes seek to increase someone's physical activity levels on the basis that physical activity has a range of positive health benefits. In this guideline, exercise referral schemes consist of **all** the following components:

- An assessment involving a primary care or allied health professional to determine that someone is sedentary or inactive, that is, they are not meeting current UK physical activity guidelines. (See Start active, stay active.)
- A referral by a primary care or allied health professional to a physical activity specialist or service.
- A personal assessment involving a physical activity specialist or service to determine what programme of physical activity to recommend for their specific needs.
- An opportunity to participate in a physical activity programme.

Some schemes also review participants' progress at completion of the scheme.

This guideline does not cover structured exercise programmes designed for managing a specific health condition or for rehabilitation following recovery from a specific condition. This includes cancer, cardiac and pulmonary rehabilitation programmes (See box 1.)

Exercise referral for people who are sedentary or inactive but otherwise healthy

Recommendation 1

Policy makers and commissioners should **not** fund exercise referral schemes for people who are sedentary or inactive but otherwise apparently healthy.

Primary care practitioners should **not** refer people who are sedentary or inactive, but otherwise apparently healthy, to exercise referral schemes.

Exercise referral for people who are sedentary or inactive and have a health condition or other health risk factors

Recommendation 2

Policy makers and commissioners should only fund exercise referral schemes for people who are sedentary or inactive and have existing health conditions or other factors[1] that put them at increased risk of ill health if the scheme:

- Incorporates the core techniques outlined in recommendations 7–10 of 'Behaviour change: individual approaches' NICE public health guidance 49 This includes:
  - recognising when people may or may not be more open to change (see recommendations 8 and 9)
  - agreeing goals and developing action plans to help change behaviour (see recommendation 7)
  - advising on and arranging social support (see recommendations 7 and 10)
  - tailoring behaviour change techniques and interventions to individual need (see recommendation 8)
  - monitoring progress and providing feedback (see recommendations 7 and 10)
  - developing coping plans to prevent relapse (see recommendations 7 and 8).
- Collects data in line with the 'essential criteria' outlined in the Standard Evaluation Framework for physical activity interventions. Specifically: programme details, evaluation details, demographics of individual participants, baseline data, follow-up data (impact evaluation) and process evaluation.
- Makes the data collected available for analysis, monitoring and research to inform future practice.

Primary care practitioners should only refer people who are sedentary or inactive and have existing health conditions or other factors[1] that put them at increased risk of ill health to an exercise

referral scheme if it conforms to the above criteria.

Collating and sharing data on exercise referral schemes

Recommendation 3

This recommendation has been withdrawn. Please see update information for more details.

Box 1 The role of structured exercise programmes in the management of, and rehabilitation following, a health condition

NICE recommends structured exercise programmes tailored to individual need to manage, and for rehabilitation after, certain health conditions, including:

- myocardial infarction (see NICE clinical guideline 172 on secondary prevention)
- stroke (see NICE clinical guideline 162 on rehabilitation)
- chronic heart failure (see NICE clinical guideline 108)
- chronic obstructive pulmonary disease (see NICE clinical guideline 101)
- depression (see NICE clinical guideline 90 for adults)
- low back pain and sciatica in over 16s: assessment and management (see NICE guideline NG59)
- chronic fatigue syndrome/myalgic encephalomyelitis (or encephalopathy) (see NICE clinical guideline 53)

These structured exercise programmes vary in format, the mechanism of referral and content. They include components such as phase 3 and phase 4 rehabilitation activities and structured, tailored and supervised activities delivered by a specialist physical activity and exercise instructor (trained to level 4). They are outside the scope of this guideline.

Box 2 The importance of physical activity in promoting good health and preventing disease

NICE endorses the importance of physical activity as a way to promote good health and prevent disease. We have developed guidelines on physical activity for policy makers, commissioners and practitioners with a remit for increasing physical activity levels. Topics covered include:

- Physical activity: brief advice for adults in primary care (NICE public health guidance 44). Specifically:
  - recommendation 1 Identifying adults who are inactive
  - recommendation 2 Delivering and following up on brief advice
  - recommendation 3 Incorporating brief advice in commissioning
  - recommendation 4 Systems to support brief advice
  - recommendation 5 Providing information and training.
- Walking and cycling (NICE public health guidance 41)
- Promoting physical activity in the workplace (NICE public health guidance 13)
- Physical activity and the environment (NICE guideline NG90).

The absence of NICE guidelines on other physical activity interventions is because they have not been considered by NICE. It does not reflect a judgement on their effectiveness or cost effectiveness.

[1] For example, risk factors for coronary heart disease, stroke and type 2 diabetes.

2 Who should take action?

Introduction

The guideline is for primary care practitioners and policy makers, commissioners and other practitioners with physical activity as part of their remit working in local authorities and the NHS.

In addition, it will be of relevance to providers of exercise referral schemes (including local authority leisure services), organisations that provide exercise qualifications and accreditation and members of the public.

Who should do what at a glance

Who should take action	Recommendation
Commissioners	1, 2
Public Health England	3
Policy makers	1, 2
Primary care practitioners	1, 2

3 Context

Introduction

Increasing how much physical activity someone does can significantly improve both their physical and mental wellbeing and reduce illnesses and disease throughout life. It can also improve life expectancy.

For example, physical activity can help prevent and manage more than 20 conditions and diseases including coronary heart disease, some cancers, diabetes, musculoskeletal disorders, mild to moderate depression and obesity (Start active, stay active: a report on physical activity from the four home countries' chief medical officers Department of Health 2011). Evidence also indicates that being sedentary is an independent risk factor for certain diseases such as coronary heart disease and type 2 diabetes, even when achieving the recommended physical activity levels (Lee et al. 2012).

Most adults in England do not meet the national recommended levels of physical activity. In 2008, based on self-reporting, 39% of men and 29% of women aged 16 and older met the recommended minimum (Health Survey for England 2008: physical activity and fitness Health and Social Care Information Centre 2009).

In 2013, The Health Survey for England (population chapter, Health and Social Care Information Centre 2013) re-analysed the 2008 data using the revised national recommendations published in 2011 (see 'National guidelines, resources and indicators' below). It estimated that 65–66% of men and 53–56% of women were meeting the new recommendations in 2008 – and probably continued to do so up to 2012.

Physical activity levels vary according to income, gender, age, ethnicity and disability. Generally, women are less active than men and people tend to be less active as they get older. Leisure time physical activity levels are also lower among certain minority ethnic groups, people from lower socioeconomic groups and people with disabilities ('Start active, stay active: a report on physical activity from the four home countries' chief medical officers').

During 2007/08, an estimated 300 million consultations took place with primary care practitioners, with the average patient attending 5.4 consultations (Trends in consultation rates in general practice: 1995/1996 to 2008/2009: analysis of the QRESEARCH database QRESEARCH and

Health and Social Care Information Centre 2008). Every consultation provides an opportunity to promote physical activity (Boyce et al. 2008).

Lack of physical activity: the costs

Public Health England's Health impact of physical inactivity estimates that low levels of physically activity could be the cause of up to 36,815 premature deaths in England a year.

In 2006/07 physical inactivity cost the NHS an estimated £0.9 billion, based on the occurrence of diseases that can be prevented by being physically active (Scarborough et al. 2011). This is a conservative estimate because other health problems, such as osteoporosis and poor mental health, can also be exacerbated by a lack of exercise. There are also wider economic costs, for example sickness absence from work, estimated at £5.5 billion per year.

In 2008 the Department of Health's Be active, be healthy estimated that the average cost of physical inactivity for every primary care trust in England was £5 million.

National guidelines, resources and indicators

In 2001, the Department of Health developed the National quality assurance framework for exercise referral. It focuses primarily on schemes that take place in leisure centres or gyms and involve supervised exercise programmes. This framework aimed to improve existing schemes and help develop new ones. It is currently being updated.

In 2010 the British Heart Foundation National Centre for Physical Activity and Health published an exercise referral toolkit advising how exercise referral schemes could be designed, implemented and evaluated.

In 2011, the Chief Medical Officers of England, Scotland, Wales and Northern Ireland issued joint UK physical activity guidelines for people of all ages ('Start active, stay active: a report on physical activity from the four home countries' chief medical officers').

For adults, the guidelines recommend being active daily and accumulating at least 150 minutes of moderate-intensity activity, or 75 minutes of vigorous activity, in bouts of 10 minutes or more during each week. The guidelines also recommend avoiding being sedentary for prolonged periods (such as sitting for long periods of time). There are additional recommendations on strength for all groups, and to help improve balance among older people.

To help achieve the recommendations, the Department of Health has recently updated its Let's get moving physical activity care pathway. This is a systematic approach to identifying and supporting adults who are not currently meeting the national recommended level of physical activity.

The revised Department of Health Public health outcomes framework for England, 2013–2016 also highlights the importance of encouraging physical activity and reducing sedentary behaviour (see domain 2).

4 Considerations

This section describes the factors and issues the Public Health Advisory Committee (PHAC) considered when developing the recommendations. Please note: this section does not contain recommendations. (See recommendations.)

Background

4.1 The PHAC noted that many of those involved in commissioning, developing and delivering exercise referral schemes believe they are an effective use of public money. This is evident in the number of schemes, the popularity of referrals and anecdotal reports of an increase in physical activity levels and other health benefits among participants. However, the economic analyses demonstrated that these schemes are less cost effective than giving brief advice, as recommended in physical activity: brief advice for adults in primary care (NICE public health guidance 44). That is because they have a very small additional effect and are relatively expensive. See 4.11–4.20 for further details.

4.2 The PHAC acknowledged that people can be grouped together in a variety of ways. These different categories helped clarify exactly who would benefit. People were grouped as follows:

- Sedentary or inactive but otherwise healthy. Although within the scope of this guideline, PHAC did not consider exercise referral interventions for this population an effective way to use public funds. Members noted that, in practice, only a few schemes appear to accept referrals on this basis alone.
- Sedentary or inactive but with an existing health condition, or other factors that put them at increased risk of ill health (for example, being obese or overweight). PHAC considered that this population should be the main focus of the guideline. Members noted the majority of referrals in practice fall into this group.
- Ongoing management of, and rehabilitation following, certain health conditions (for example coronary heart disease, stroke and chronic obstructive pulmonary disease). This population is outside the scope of this guideline. PHAC highlighted that NICE clinical guidelines (see box 1) already make recommendations for referring this population to structured exercise programmes.

4.3 The PHAC acknowledged that a number of different types of exercise referral schemes have been set up in the UK since the publication of four commonly used methods to increase physical activity. There was insufficient evidence to assess the relative cost effectiveness of the different types of schemes. Overall, the new evidence identified does not support exercise referral schemes as a cost effective means of improving health by increasing levels of physical activity. (See 4.8 for other benefits of such schemes.)

4.4 The PHAC noted that a number of factors may influence effectiveness. These include: the intensity, length and frequency of the exercise referral scheme; and the experience, skills and knowledge of people who provide or deliver it. However, the evidence on the specific impact of these factors was very limited.

4.5 The PHAC noted that the overall aim of exercise referral schemes is to improve health and that an increase in physical activity is not always the primary outcome. Other outcomes, including an increased sense of belonging and social interaction ('social capital') may be important, but these have not been measured in most studies and were not specifically considered here. Members agreed that these outcomes were potentially important in their own right. But they also agreed that it should be made explicit if they are the primary goal for such a scheme.

Evidence of effectiveness

4.6 The PHAC was disappointed at the relatively small number of studies identified for this update. Members discussed the details of each study including: participants referred; reasons for referral and exclusion – including their risk factors for ill health and existing diseases or other health conditions; and types of exercise referral intervention (see the evidence).

4.7 The PHAC noted that exercise referral schemes, compared with brief advice, resulted in a 1.08 relative risk of participants meeting the Chief Medical Officers' (CMOs') recommended level of physical activity. So, if 36 people participate in an exercise referral scheme only one of them will achieve the recommended levels of physical activity.

4.8 Members noted that getting people who are sedentary or inactive to be more physically active will lead to health benefits, even if they do not meet the CMOs'

recommended levels. They also noted that this is not always captured in the evidence base.

4.9 Members noted that the evidence on the medium- or long-term health benefits associated with exercise referral schemes was very limited.

4.10 Members noted that data collected via self-reporting methods may overestimate how physically active each participant has been compared with more objective measures of physical activity.

Economic modelling

4.11 The PHAC noted that exercise referral schemes are only marginally more effective than brief advice and lead to a very small additional gain in quality-adjusted life years (QALYs). However, there were considerable uncertainties about the correct parameters to use for the economic modelling and members noted that the model does not capture all the potential benefits.

4.12 Using the base case assumptions, the incremental intervention cost of £217 led to an incremental cost-effectiveness ratio (ICER) between £72,748 and £113,931 per QALY gained. Even in the best case scenario, the estimated incremental cost effectiveness ratio was £31,009 per QALY gained. NICE normally considers that any interventions over a threshold of £20,000–£30,000 per QALY are not cost effective. However, because current evidence to inform the assumptions in the model was insufficient, members did not feel they could recommend disinvestment in such schemes. Further, some schemes may be cost effective, or may only be cost effective for some subgroups. Again, however, there was insufficient evidence to make recommendations on this, hence data collection has been made a condition for any exercise referral scheme that is commissioned.

4.13 The PHAC noted that if exercise referral schemes collected more detailed data commissioners would be able to make a more informed decision on future investment. Such a decision would take into account the prevailing local priorities, the nature of the schemes, evidence of effectiveness and the primary aim of the scheme (such as social engagement).

4.14 The PHAC noted that set up costs have not been considered in the economic

model and that their inclusion would increase the incremental cost-effectiveness ratio.

4.15 If the relative risk of exercise referral schemes (compared with usual practice) is 1.08, even in the best case scenario schemes costing over £150 per participant would not be cost-effective at a threshold of £20,000 per QALY. However, there was no evidence on how a reduction in costs would affect effectiveness so it was not possible to recommend a cap on the cost of such schemes.

4.16 The PHAC noted that the full cost to participants (including travel and childcare costs) was not considered in the economic model.

4.17 The PHAC noted that any increase in physical activity is associated with positive health benefits. But unless people achieved the CMOs' recommended levels of activity, these benefits were not captured in the economic modelling. This means that the true gains from exercise referral schemes are likely to be underestimated by the model. However, the economic model used is comparable to that used to assess the cost effectiveness of brief advice to increase physical activity. The latter is often used as the comparator in many of the included studies. So the finding that exercise referral schemes cost considerably more per QALYs than brief advice is likely to be valid.

4.18 The PHAC discussed the importance of additional, health-related quality of life gains and the 'feel good' factor (process utility) gained from being physically active. Both feature as inputs of the model. However, there was uncertainty around the magnitude of the process utility and how long it would last. This meant that the PHAC was unable to agree or disagree on this key assumption in the cost effectiveness model. This added to the uncertainty about estimates of cost effectiveness.

4.19 The PHAC was aware that the economic modelling to determine the long-term health benefits of exercise referral schemes was based on cohort studies limited to coronary heart disease, stroke and type 2 diabetes. The PHAC noted that the other benefits of physical activity are not captured by the model (for example, alleviation of mental health problems, musculoskeletal conditions and some cancers). Taking these into account could lower the ICER, but the magnitude of this effect was unclear.

4.20 The PHAC noted that the economic model over-simplifies the clinical situation. That is because it does not allow for someone having more than 1 of the 3 health conditions (coronary heart disease, stroke or type 2 diabetes). Members also noted that the model does not consider that having one 'comorbidity' may affect the likelihood of experiencing another. These limitations mean that the cost effectiveness of exercise referral schemes may be underestimated. But the comparison with brief physical activity advice (usual care) is still valid as the same limitations apply.

Scenarios of effectiveness

4.21 The PHAC noted that some exercise referral schemes may or may not be more effective and cost effective than others. Some approaches may be cheaper to deliver (see 4.22). Others may be more effective for specific subgroups (see 4.23). Some are better at helping to maintain physical activity levels after the scheme ends (see 4.24).

4.22 The PHAC noted that cost effectiveness and effectiveness varied according to the type of exercise referral scheme. There was a feeling that self-directed and less resource-intensive activities (such as walking and cycling) may be more acceptable than gym-based activities. Therefore, they may be more effective and more cost effective for certain subgroups. However, no review evidence was identified to verify this assumption.

4.23 The PHAC felt that exercise referral schemes may be cost effective in encouraging physical activity among specific groups. For example, it may help people with multiple disease risk factors such as hypertension, obesity or poor mental health, or those who would not otherwise have access to supervised exercise programmes. Members also noted that the people who appear to benefit most from these programmes may gain similar benefits from brief physical activity advice. However, because of a lack of evidence the PHAC was unable to make specific recommendations on the best ways to increase physical activity among specific groups.

4.24 The PHAC discussed the importance of increasing adherence throughout the duration of an exercise referral scheme and participating in physical activity beyond the end of the programme. For example, it agreed that helping participants to develop the skills they need to be physically active on their own,

or providing social support during the intervention, might encourage adherence to the scheme. In turn, this might increase the chances of participants being physically active in the longer term.

Barriers to success

4.25 The PHAC noted that poor referral practices affect the overall effectiveness of schemes. This could be due to the initial assessment or the type of activity someone has been referred to. Because the participant may not be interested in a particular type of activity, or may not be able to complete it because of their current fitness level. Or schemes may be less effective because they do not fully take participants' motivation and ability into account. Members noted that better use of triage or a 'stepped approach' that includes brief physical activity advice (NICE public health guidance 44) may overcome these problems. However, no evidence was identified to substantiate this assumption.

4.26 Stakeholder and fieldwork feedback highlighted that there is a lack of consistent and appropriately delivered brief advice on physical activity in primary care. Members were concerned that removing exercise referral schemes for specific populations and in certain locations, combined with these problems, may reduce the priority given to physical activity in primary care. The impact of this guideline on the wider physical activity agenda was also discussed.

4.27 The PHAC noted that a lack of focus on relapse prevention and sustainability negatively impacts on effectiveness. Alongside improving referral practices (see 4.25), members discussed the need for improved follow-up to identify why people drop out and how this might inform development of future schemes. Members also discussed the importance of following up participants who have completed a scheme and supporting them to continue to increase or maintain their activity.

4.28 The PHAC considered how staff training affects the effectiveness of exercise referral schemes. Members noted the training outlined in the Department of Health's National Quality Assurance Framework and British Heart Foundation exercise referral tool kit. Members also noted that this training could help alleviate concerns about possible litigation issues. The latter was highlighted as a significant barrier to referral in review 2 undertaken for this guideline.

4.29 The PHAC noted that the range of physical activities provided is a key factor in whether or not someone adheres to a scheme. Those offering alternatives to gym-based activities, that are less expensive and give a degree of personal choice, seem to improve adherence.

5 Recommendations for research

The Public Health Advisory Committee (PHAC) recommends that the following research questions should be addressed. It notes that 'effectiveness' in this context relates not only to the size of the effect, but also to the duration of effect and cost effectiveness. It also takes into account any harmful or negative side effects.

All the recommended research should aim to identify differences in effectiveness among groups, based on characteristics such as socioeconomic status, age, gender and ethnicity. It should also focus on exercise referral schemes that seek to improve the health of sedentary or inactive adults with an existing health condition – or other factors that put them at increased risk of developing a health condition.

The research recommendations do not cover people for whom exercise referral schemes are not recommended (see recommendations 1 and 2).

They assume that exercise referral schemes benefit health by helping people to be more physically active. Changes in physical activity levels should, therefore, be the primary outcome measured, ideally at 1 year and beyond. The potential health benefit of someone doing some physical activity, albeit below current UK physical activity guidelines rather than none at all, should be taken into account. (See the Department of Health's Start active, stay active.)

If other outcomes or determinants of health – such as reducing social isolation or improving community engagement – are seen as key benefits, then they should be clearly set out and measured against a suitable control intervention. This is not, however, the focus of these research recommendations.

5.1 How effective and cost effective are different types of exercise referral scheme? Compare the relative effects of different models in controlled studies. Include health-related quality of life as an outcome. Compare exercise referral schemes that vary by:

- setting – for example, home-based, gym-based, community-based or outdoors
- intensity and duration – for example, a 12-week scheme involving 1 session a week, or a 6-week scheme involving 4 1-hour sessions per week

- the techniques used, for example, some use additional 'supportive' techniques such as 'motivational interviewing' and education sessions
- the target group, for example, people who are overweight and obese, people with raised blood pressure or cholesterol levels or those experiencing mild depression, anxiety or stress; or by age, gender, race or socioeconomic status
- other scheme characteristics including: design, content and delivery; referral mechanisms; choice of activity; cost and qualifications of instructors; and whether it is commissioned and delivered by an NHS, non-NHS or community-based organisation.

5.2 What factors encourage uptake of, and adherence to, an exercise referral scheme? Factors to consider include: design, content and delivery; referral mechanisms; choice of activity; qualifications and cost of instructors. Also identify any barriers preventing participation and factors that encourage it.

5.3 What factors encourage under-represented groups to participate in and complete an exercise referral scheme? What factors prevent these groups from participating? Under-represented groups include: people from black and minority ethnic groups, people with disabilities and those from lower socioeconomic groups.

5.4 What is the comparative effectiveness and cost effectiveness of exercise referral schemes compared with other interventions that aim to help people to become more physically active? Relative effectiveness and cost effectiveness should be compared in controlled trials.

More detail identified during development of this guideline is provided in gaps in the evidence.

6 Glossary

Brief advice

'Brief advice' means verbal advice, discussion, negotiation or encouragement, with or without written or other support or follow-up. It can vary from basic advice to a more extended, individually focused discussion (see NICE public health guidance 44).

Inactive

'Inactive' is defined as not currently meeting the Chief Medical Officer's recommendation for physical activity as outlined in Start active, stay active: a report on physical activity from the four home countries' Chief Medical Officers (Department of Health 2011).

Level 4

Level 4 refers to the National Occupational Standards levels for exercise instructors. These are currently being reviewed. See The Register of Exercise Professionals for details.

Phase 3 and phase 4 rehabilitation activities

Phase 3 refers to the rehabilitation phase of a disease care pathway. This generally takes place after hospital discharge. It consists of structured exercise training, education and psychological support and advice on risk factors. Phase 4 refers to long term maintenance of physical activity following completion of Phase 3. It consists of exercise classes in leisure centres and community settings.

Process utility

People benefit psychologically from physical activity. This short-term 'feel good' factor is referred to in economic terms as 'process utility'.

Sedentary

Being sedentary is not just a lack of physical activity (see 'inactive'). Sedentary behaviour involves activities that do not increase energy expenditure much above resting levels, for example, sitting, lying down, sleeping, watching TV and reading. Sedentary behaviour is an independent risk factor

for chronic disease. People who achieve the recommended levels of physical activity can still be at risk if they spend too long being sedentary. (Evidence briefing: sedentary behaviours British Heart Foundation National Centre for Physical Activity and Health 2012).

7 References

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8 Summary of the methods used to develop this guideline

Introduction

The reviews include full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it.

The minutes of the Public Health Advisory Committee (PHAC) meetings provide further detail about the Committee's interpretation of the evidence and development of the recommendations.

Guideline development

The stages involved in developing public health guidelines are outlined in the box below.

1. Draft scope released for consultation
2. Stakeholder comments used to revise the scope
3. Final scope and responses to comments published on website
4. Evidence reviews and economic modelling undertaken and submitted to PHAC
5. PHAC produces draft recommendations
6. Draft guideline (and evidence) released for consultation (and for fieldwork)
7. PHAC amends recommendations
8. Final guideline published on website
9. Responses to comments published on website

Key questions

The key questions were established as part of the scope. They formed the starting point for the reviews of evidence and were used by the PHAC to help develop the recommendations. The overarching questions were:

Question 1: How effective and cost effective are exercise referral schemes? What are the most important factors that influence effectiveness and cost effectiveness?

Question 2: What factors influence referral to an exercise referral scheme?

Question 3: What factors influence attendance at, and successful completion of, an exercise referral scheme?

Question 4: What factors influence longer-term participation in physical activity following attendance on an exercise referral scheme?

The subsidiary questions included:

1. What factors influence the effectiveness of exercise referral schemes (for example, age, gender or socioeconomic status)?

2. How aware are health practitioners of exercise referral schemes?

3. Are there any adverse or unintended effects from exercise referral schemes (for example, unintentional injuries)?

4. Are exercise referral schemes available to, and accessible by, different populations?

5. How are initial assessments and medical records transferred from primary care to physical activity services for people attending exercise referral schemes?

6. What 'exit strategies' are in place for people once they have completed an exercise referral scheme?

These questions were made more specific for each review.

Reviewing the evidence

Review of effectiveness, uptake and adherence

An effectiveness, uptake and adherence review was commissioned by the National Institute for Health Research Health Technology Appraisal programme (NIHR HTA).

This review is an update of a systematic review commissioned by NIHR HTA and carried out by Pavey et al. in 2011. It was specifically commissioned to inform NICE's guidance. NICE set out the parameters and protocols for the review but it is based on the NIHR's methods (summarised

below). The review also includes an economic model. For more details see review 1 A systematic review and economic evaluation of exercise referral schemes in primary care: a short report.

Identifying the evidence

Several databases were searched in September 2013 for randomised control trials published since October 2009 (the date of the previous searches by Pavey et al. 2011).

Selection criteria

Studies were included in the review if they:

- were based on randomised controlled trials
- included adults (aged 18 or older) without a medical diagnosis and for whom an exercise referral scheme was deemed appropriate
- included counselling (face-to-face or by telephone), written materials or supervised exercise training
- included outcomes on: physical activity, physical fitness, health, adverse events, and uptake and adherence to the scheme.

Studies were excluded if:

- they focused exclusively on people with a medical diagnosis
- interventions were not part of an exercise referral scheme
- interventions did not include a clear assessment of physical activity levels and a clear referral process.

Details can be found in review 1

Quality appraisal

Included papers were assessed for methodological rigour and quality using the Cochrane risk of bias tool to assess study quality. Study quality was checked against the following factors:

- method of randomisation
- allocation concealment

- blinding
- numbers of participants randomised, excluded and lost to follow up.
- whether intent to treat analysis has been performed
- methods for handling missing data
- baseline comparability between groups.

Analysis and synthesis

Data from new studies published since 2009 were tabulated and discussed in a narrative review. These were integrated with data from the studies identified and analysed by Pavey et al. in 2011. Meta-analyses were used to estimate a summary measure of effect on relevant outcomes. These were based on intention-to-treat analyses.

Review Manager software was used for the meta-analysis to study fixed and random effects models. Heterogeneity was explored by considering: study populations, methods and interventions; visualisation of results; and, in statistical terms, by the $\chi 2$ test for homogeneity and the I2 statistic.

A qualitative thematic analysis of the discussion and conclusion sections of the included randomised controlled trials was undertaken (as per Pavey et al. 2011). The aim was to understand factors that predict uptake of, and adherence to, exercise referral schemes. The results are described in a narrative. A logic model explains the associations between multiple and varied barriers and facilitators to uptake and adherence.

NICE-commissioned review of context, barriers and facilitators

One review of context, barriers and facilitators was conducted using NICE methods and processes, review 2 The factors that influence referral to, attendance at and successful completion of exercise schemes and longer term participation in physical activity.

Identifying the evidence

Several databases and websites were searched in July 2013 for qualitative and grey literature from January 1995 to June 2013. See review 2 for details.

Selection criteria

Studies were included in the review if they:

- were qualitative and observational that is, they reported the views, perceptions and beliefs of those using and delivering exercise referral schemes
- mainly covered people aged 19 years and older who were potential or actual users of an exercise referral scheme
- included exercise referral schemes involving assessments and referrals by health professionals.

Systematic reviews were also identified and 'unpicked' for relevant studies meeting the inclusion criteria.

Studies were excluded if they:

- mainly focused on people under 19
- did not include an exercise referral scheme
- covered only physical activity rehabilitation programmes used to aid recovery from specific health conditions.

See review 2 for details of the inclusion and exclusion criteria.

Quality appraisal

Included papers were assessed for methodological rigour and quality using the NICE methodology checklist, as set out in Methods for the development of NICE public health guidance. Each study was graded (++, +, −) to reflect the risk of potential bias arising from its design and execution.

Study quality

++ All or most of the checklist criteria have been fulfilled. Where they have not been fulfilled, the conclusions are very unlikely to alter.

+ Some of the checklist criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are unlikely to alter the conclusions.

– Few or no checklist criteria have been fulfilled. The conclusions of the study are likely or very likely to alter.

The evidence was also assessed for its applicability to the areas (populations, settings, interventions) covered by the scope of the guidance. Each evidence statement concludes with a statement of applicability (directly applicable, partially applicable, not applicable).

Summarising the evidence and making evidence statements

The review data were summarised in evidence tables (see the review).

The findings from the review were synthesised and used as the basis for a number of evidence statements relating to each key question. The evidence statements were prepared by the external contractors (see supporting evidence). The statements reflect their judgement of the strength (quality, quantity and consistency) of evidence and its applicability to the populations and settings in the scope.

Cost effectiveness

No formal review of economic studies was conducted because a preliminary search retrieved no additional economic evidence directly related to exercise referral schemes.

Economic modelling

An existing economic model, used for NICE's guidance on physical activity brief advice in primary care, NICE public health guidance 44 (2013), was updated. This model is a direct update of the models conducted for four commonly used methods to increase physical activity, NICE public health guidance 2 (2006) and Pavey et al. 2011. See review 1.

The economic model updated 3 groups of parameters:

- estimates of the relative clinical effectiveness of exercise referral schemes versus not using them
- costs – these were inflated to 2013 values using Personal Social Services Research Unit inflation indices
- starting age – this has been changed to 50 (the mean age used in the studies to collect effectiveness data).

Additional analyses conducted before the first committee meeting

The original base case assumption that physical activity offers a 10-year protective effect related to coronary heart disease, stroke and diabetes was based on cohort studies. These studies had follow-up periods of 19 years (for coronary heart disease and stroke) and 12 years (for diabetes). Additional analyses were undertaken to test the model using these different time periods. See appendix 7 of review 1.

The model is particularly sensitive to the feel good factor ('process utility' gain) attributable to physical activity. In the base case analysis it is assumed that this lasted for only 1 year. However, it is likely that some people who continue to be physically active at 1 year will carry on being physically active in the longer term (and so continue to benefit from the feel-good factor).

To explore the effect of a gradual fall-off in the number remaining physically active, this 'process utility' has been applied for 10 years. But the model assumes there will be a linear decrease in the number who are physically active over those 10 years and that no-one will benefit from the feel good factor after 10 years.

The additional analysis also explored the effect on the incremental cost-effectiveness ratios (ICER) of combining these 2 less conservative assumptions about the longer-term benefits.

Additional analyses conducted before the second committee meeting

Following the first Public Health Advisory Committee (PHAC) meeting, further additional analyses were undertaken to inform the Committee's discussion at its second meeting. See appendix 8 of review 1.

Incremental cost-effectiveness ratios (ICERs) were conducted for a 'combined scenario analysis' incorporating:

- costs for providing brief advice in the comparator arm
- efficacy estimates from the intention-to-treat analysis
- a 10-year linear fall-off in the 'feel good' factor (process utility) associated with being physically active, applied with the original base-case assumption that the protective effects of exercise are limited to 10 years.

In addition, several sensitivity analyses were undertaken. These:

- Explored the effect of using EQ-5D data from a study by Murphy et al (2012) as an alternative to the process utility gain estimated by Pavey et al. (2011). The latter was applied in the model used to inform NICE public health guidance 44.
- Explored the cost-effectiveness of less intensive exercise referral schemes.

Finally a threshold analysis was undertaken on the intervention cost for exercise referral schemes.

Fieldwork

Fieldwork was carried out to evaluate how relevant and useful NICE's recommendations are for practitioners and how feasible it would be to put them into practice.

It was conducted with those responsible for commissioning, referring to, managing and delivering exercise referral schemes – and 'exit' strategies from those schemes. This included commissioners and practitioners working in primary care and local authorities, and private companies, social enterprises and independent contractors commissioned to deliver the schemes.

The fieldwork comprised:

- Six group discussions involving 9 to12 participants each, carried out in Birmingham, Leeds and London by Word of Mouth.
- 10 indepth one-to-one interviews carried out in Birmingham, Leeds and London by Word of Mouth.

The fieldwork was commissioned to ensure there was ample geographical coverage. The main issues arising from the fieldwork is set out in section 10 under fieldwork findings. Or see field testing NICE guideline on exercise referral schemes to promote physical activity.

How the PHAC formulated the recommendations

At its meetings in December 2013 and January 2014, the Public Health Advisory Committee (PHAC) considered the evidence reviews and cost effectiveness to determine:

- whether there was sufficient evidence (in terms of strength and applicability) to form a judgement
- where relevant, whether (on balance) the evidence demonstrates that the intervention or programme/activity can be effective or is inconclusive

- where relevant, the typical size of effect
- whether the evidence is applicable to the target groups and context covered by the guideline.

The PHAC developed draft recommendations through informal consensus, based on the following criteria:

- Strength (type, quality, quantity and consistency) of the evidence.
- The applicability of the evidence to the populations/settings referred to in the scope.
- Effect size and potential impact on the target population's health.
- Impact on inequalities in health between different groups of the population.
- Equality and diversity legislation.
- Ethical issues and social value judgements.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of harms and benefits.
- Ease of implementation and any anticipated changes in practice.

Where evidence was lacking, the PHAC also considered whether a recommendation should only be implemented as part of a research programme.

9 The evidence

Findings of the evidence reviews and economic modelling

For details of the evidence that the PHAC considered, see what evidence is the guideline based on?

Fieldwork findings

Fieldwork aimed to test the relevance, usefulness and feasibility of putting the recommendations into practice. The PHAC considered the findings when developing the final recommendations. For details, go to fieldwork and field testing NICE guideline on exercise referral schemes to promote physical activity.

Fieldwork participants who have responsibility for commissioning, referring to and developing, managing and delivering exercise referral schemes found the draft guideline unclear and unhelpful. They believed that it would be used to justify existing practice (whether that meant continuing to commission or continuing not to commission exercise referral schemes).

Participants were also concerned that the draft recommendations could undermine physical activity promotion, as they seemed to imply that all exercise referral schemes are ineffective and that any advice on physical activity is not valued by NICE.

In addition, participants felt that the draft recommendations may increase inequalities in health, as many schemes focus on overcoming social isolation and improving people's general participation in the local community, rather than on physical activity alone.

They did not think brief advice to promote physical activity in primary care could replace exercise referrals. This was because primary care professionals do not feel they have the capacity or capability to deliver this advice. In addition, participants said they lack the incentive and belief in the value of promoting physical activity.

Participants were also concerned about the evidence base used to inform the recommendations. It was felt that the NICE process meant that evidence generated by their own schemes was excluded.

Finally, they did not feel that the guideline reflected the ways in which exercise referral schemes

are currently commissioned and delivered: exercise referral schemes, they said, are part of a 'physical activity pathway' and, as such, should not be considered a standalone intervention.

10 Gaps in the evidence

The Public Health Advisory Committee (PHAC) identified a number of gaps in the evidence related to the programmes under examination based on an assessment of the evidence, stakeholder process and fieldwork. These gaps are set out below.

1. High quality controlled and randomised controlled studies on exercise referral schemes.

2. Effectiveness and cost effectiveness evidence on the effect of exercise referral schemes on people with multiple health conditions.

3. Effectiveness and cost effectiveness evidence on the effect of exercise referral schemes on mental health.

4. Effectiveness and cost effectiveness evidence on whether physical activity levels are maintained in the long term after attendance at an exercise referral scheme.

5. Information about the different types or models of exercise referral scheme and for whom each type may be most effective.

6. Information about how practitioners identify whether or not someone should be referred for a physical activity intervention, including exercise referral.

7. Information on factors that:

a) encourage participation in physical activity during and after an exercise referral scheme

b) prevent or reduce the risk of drop out by those referred to such schemes.

8. Information about levels of participation by under-represented groups, such as people from black and minority ethnic groups and people with disabilities.

9. Information about all the short- and long-term benefits of exercise referral schemes. This includes the 'feel good' factor (process utility).

10. Information about measures and outputs to use to establish the effectiveness of exercise referral schemes.

The Committee made 5 recommendations for research into areas that it believes will be a priority for developing future guidelines. These are listed in recommendations for research.

11 Membership of the Public Health Advisory Committee and the NICE project team

Public Health Advisory Committee A

NICE has set up several Public Health Advisory Committees (PHACs). These standing committees consider the evidence and develop public health guidance. Membership is multidisciplinary, comprising academics, public health practitioners, topic experts and members of the public. They may come from the NHS, education, social care, environmental health, local government or the voluntary sector. The following are members of PHAC A:

Chair

Susan Jebb
Professor of Diet and Population Health, Department of Primary Care Health Sciences, University of Oxford

Core members

Alison Lloyd
Community Member; Pastoral Manager, Specialist School

Amanda Sowden
Deputy Director, National Institute for Health Research Centre for Reviews and Dissemination, University of York

Chris Packham
Associate Medical Director, Nottinghamshire Healthcare NHS Trust

Joyce Rothschild JP
Independent Education Consultant

Lucy Yardley
Professor of Health Psychology, University of Southampton

Mireia Jofre Bonet

Professor of Health Economics, City University London

Toby Prevost
Professor of Medical Statistics, King's College London

Topic members

Andy Pringle
Reader in Physical Activity, Exercise and Health, Research Institute of Sport, Physical Activity and Leisure, Leeds Metropolitan University

Elaine McNish
Director of the British Heart Foundation National Centre for Physical Activity and Health

Malcolm Ward
Principal Health Promotion Specialist, Public Health Wales

Ruth Jepson
Senior Scientific Advisor, Scottish Collaboration for Public Health Research and Policy

Stephen Sutton
Professor of Behavioural Science, University of Cambridge

Jennifer Bostock
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Emma Doohan
Project Manager (until August 2013 and from July 2014)

Rukshana Begum
Coordinator

Sue Jelley
Senior Editor

Susie Burlace
Editor

About this guideline

What does this guideline cover?

This guideline is a partial update of four commonly used methods to increase physical activity, NICE public health guideline 2 (2006). It seeks to clarify the factors that influence referral to, attendance at and successful completion of an exercise referral scheme and longer term participation in physical activity.

The recommendations in the guideline replace recommendation 5 in 'Four commonly used methods to increase physical activity'.

This guideline does not provide detail on pedometers and community-based exercise programmes for walking and cycling.

The absence of any recommendations on interventions that fall within the scope of this guideline is a result of lack of evidence. It should not be taken as a judgement on whether they are cost effective.

How was this guideline developed?

The recommendations are based on the best available evidence. They were developed by the Public Health Advisory Committee (PHAC).

Members of the PHAC are listed in membership of the Public Health Advisory Committee and the NICE project team.

For information on how NICE public health guidelines are developed, see the NICE public health guideline process and methods guides.

What evidence is the guideline based on?

The evidence that the PHAC considered included:

- Evidence reviews:
  - Review 1: 'A systematic review and economic evaluation of exercise referral schemes in primary care: a short report' was commissioned by the National Institute for Health Research Health Technology Appraisal programme (NIHR HTA). It was carried out by The University of Sheffield, School of Health and Related Research (ScHARR). The principal authors were: Fiona Campbell, Mike Holmes, Emma Everson-Hock E, Sarah Davis, Helen Buckley Woods, Nana Anokye, Paul Tappenden and Eva Kaltenthaler.
  - Review 2: 'The factors that influence referral to, attendance at and successful completion of exercise schemes and longer term participation in physical activity' was carried out by the Support Unit for Research Evidence (SURE), Cardiff University. The principal authors were: Fiona Morgan, Ruth Turley, Helen Morgan, Lydia Searchfield, Alison Weightman, Eva Elliot and Simon Murphy.
- Economic modelling: review 1 contains the economic modelling.
- Fieldwork report: Field testing NICE guideline on exercise referral schemes to promote physical activity was carried out by Word of Mouth.

In some cases the evidence was insufficient and the PHAC has made recommendations for future research. For the research recommendations and gaps in research, see recommendations for research and gaps in the evidence.

Update information

Minor changes since publication

August 2018: Links to guidelines in box 1 and 2 have been updated where the linked guidance has been replaced since original publication. Recommendation 3 has been stood down after a review, as it repeated advice already covered by recommendation 2.

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