

HEALTH-ENHANCING PHYSICAL ACTIVITY: EVIDENCE, POTENTIAL AND POPULATION STRATEGIES FOR PUBLIC HEALTH

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Introduction

Sport, exercise and physical activity have been promoted on health grounds for many decades. However, only in the 1990's the scientific evidence on the health benefits of physical activity became convincing enough to be considered as a significant health-promoting life-style. Together with the knowledge of the high prevalence of inactivity in Western countries the new understanding of the health-enhancing potential of physical activity has led to initiatives to include physical activity in the health promotion agenda in many countries.

In the following an overview of the available evidence of the health benefits of physical activity, the characteristics of health-enhancing physical activity (HEPA) and the activity patterns in European countries is presented. In addition the issues of the public health potential of physical activity and the population strategies for its promotion are addressed.

Evidence on health benefits of physical activity

Recently a critical assessment of the scientific evidence on the health benefits of physical activity was conducted by the US department of Health and Human Services (1996). The findings were:

Physiological responses and long-term adaptations to exercise

1. Physical activity has numerous beneficial physiologic effects. Most widely appreciated are its effects on the cardiovascular and musculoskeletal systems, but benefits on the functioning of the metabolic, endocrine, and immune systems are also considerable.

2. Many of the beneficial effects of exercise training – from both endurance and resistance activities – diminish within 2 weeks if physical activity is substantially reduced, and the effects disappear within 2 to 8 months if physical activity is not resumed.
3. People of all ages, both male and female, undergo beneficial physiological adaptations to physical activity.

The effects of physical activity on health and disease

Overall mortality

1. Higher levels of regular physical activity are associated with lower mortality rates for both older and younger adults.
2. Even those who are moderately active on a regular basis have lower mortality rates than those who are least active.

Cardiovascular diseases

1. Regular physical activity or cardiorespiratory fitness decreases the risk of cardiovascular disease mortality in general and of coronary heart disease mortality in particular. Existing data are not conclusive regarding a relationship between physical activity and a stroke.
2. The level of decreased risk of coronary heart disease attributable to regular physical activity is similar to that of other lifestyle factors, such as keeping free from smoking cigarettes.
3. Regular physical activity prevents or delays the development of high blood pressure, and exercise reduces blood pressure in people with hypertension.

Cancer

1. Regular physical activity is associated with a decreased risk of colon cancer.
2. There is no association between physical

activity and rectal cancer. Data are too sparse to draw conclusions regarding a relationship between physical activity and endometrial, ovarian, or testicular cancers.

3. Despite numerous studies on the subject, existing data are inconsistent regarding an association between physical activity and breast or prostate cancers.

Non-insulin-dependent diabetes mellitus

Regular physical activity lowers the risk of developing non-insulin-dependent diabetes mellitus.

Osteoarthritis

1. Regular physical activity is necessary for maintaining normal muscle strength, joint structure, and joint function. In the range recommended for health, physical activity is not associated with joint damage or the development of osteoarthritis and may be beneficial for many people with arthritis.
2. Competitive athletics may be associated with the development of osteoarthritis later in life, but sports-related injuries are the likely cause.

Osteoporosis

1. Weight-bearing physical activity is essential for normal skeletal development during childhood and adolescence and for achieving and maintaining peak bone mass in young adults.
2. It is unclear whether resistance- or endurance-type physical activity can reduce the accelerated rate of bone loss in postmenopausal women in the absence of estrogen replacement therapy.

Falling

There is promising evidence that strength training and other forms of exercise in older adults preserve the ability to maintain independent living status and reduce the risk of falling.

Obesity

1. Low levels of activity, resulting in fewer kilocalories used than consumed, contribute to the high prevalence of obesity in the United States.
2. Physical activity may favourably affect body fat distribution.

Mental health

1. Physical activity appears to relieve symptoms of depression and anxiety and improve mood.
2. Regular physical activity may reduce the risk of developing depression, although further research is needed on this topic.

Health-related quality of life

Physical activity appears to improve the health-related quality of life by enhancing psychological well-being and by improving the physical functioning in persons compromised by poor health.

Adverse effects

1. Most musculoskeletal injuries related to physical activity are believed to be preventable by gradually working up to a desired level of activity and by avoiding excessive amounts of activity.
2. Serious cardiovascular events can occur with physical exertion, but the net effect of regular physical activity is a lower risk of mortality from cardiovascular disease.

Based on this evidence the Surgeon General's report concluded that for the purpose of health and well-being the promotion of physical activity is important in the whole population and in all ages because physical activity:

- benefits growth and development in children and the youth
- prevents many diseases in adults
- helps in maintaining functional capacity in elderly
- supports the independent life-style in ageing people

Published research (e.g. Haskell 1998, Vuori 1998) after the Surgeon General's Report which consistently supports these conclusions. A similar position have been adopted by authoritative international organisations (WHO/FIMS 1995, WHO 1997) and programmes (European Commission 1996).

How much exercise for health?

Simultaneously with the accumulating evidence of the health benefits of physical

activity the understanding of the specific characteristics of health-enhancing physical activity have evolved. The earlier, fitness-oriented recommendation (American College of Sport Medicine 1985, 1998) called for vigorous intensity ($>60\%$ VO_2^{max}), intermittent frequency (3-5 times per week), short to moderate duration (15-60 minutes), and an aerobic, continuous mode of activity. This prescriptive can be called a jogging type. The HEPA recommendation (US Department of Health and Human Services 1996) is as follows:

Significant health benefits can be obtained by including a moderate amount of physical activity (e.g. 30 minutes of brisk walking or raking leaves, 15 minutes of running, or 45 minutes of playing volleyball) on most, if not all, days of the week. Through a modest increase of daily activity, most individuals in industrialised countries can improve their health and quality of life. Additional health benefits can be gained through a greater amount of physical activity. People who can maintain a regular regimen of activity that is of long duration or of vigorous intensity are likely to derive greater benefits.

In comparison to the fitness-oriented prescriptive the HEPA recommendation can be identified as a walking type. It has three distinctively different characteristics. The moderate intensity, meaning 50-75 % of VO_2^{max} , is relatively low and includes brisk walking for most inactive individuals. It also has an upper ceiling thus aiming at preventing the injury and health risks associated with very intensive activity. This moderate-intensity concept provides the potential for most adult people to participate in HEPA effectively and safely – a very important characteristic from the population promotion perspective. In our own studies we have shown that most types of walking, from casual walking to work to fast exercise-type walking, improve aerobic fitness and yield metabolic health benefits among previously inactive middle-aged men and women (Oja et al. 1991, Oja & Paronen 1998, Kukkonen-Harjula et al. 1998).

Another distinctive characteristic of HEPA is the high frequency. While the fitness-oriented prescription includes rest days in between exercise days, to allow a proper recovery from the intensive exercise bout, the HEPA recommendation calls optimally for

daily activity. This of course is a demanding feature of HEPA but the other characteristics, especially the moderate intensity and the accumulation possibility, make it possible to build HEPA as part of a daily lifestyle.

The third special feature of HEPA is the accumulation, i.e. the daily total activity can be broken into several bouts. The evidence for this is still developing, but a few studies (Asikainen et al. 2000, DeBusk et al. 1990, Murphy & Hardman 1998) suggest that the half-an-hour daily activity can be divided into 2-3 shorter bouts. Naturally, this fact adds significantly to the practical applicability of HEPA as a regular life-style integrated daily activity.

In summary, based on the evidence the public health message for HEPA promotion is that adopting a lifestyle that exceeds complete sedentariness will produce health benefits. At very low levels, these benefits may not be due to for example improvements in the cardiovascular health per se, but due to a reduction in risk of cardiovascular disease through a better control of body weight and better management of psycho-social stress.

Hypokinesia is a real health threat in Europe

During the past several decades there has been a progressive decline of physical activity in normal daily living in industrialised countries. For the majority of people, little physical effort is involved any more in their work, domestic chores or means of transport. The ever increasing time that people spend watching TV and video, playing TV games, sitting in the car and more recently "surfing" and taking care of daily chores on the internet means less physical activity. This trend is not offset by the apparent increase in leisure-time physical activity in some countries as demonstrated by the world-wide increase in obesity. For example, in Finland reliable data shows that leisure time exercise has increased steadily from the mid 1970's to the end of the 1990's when about 60 % of the adult population reported to have exercised at least twice a week to a slight sweat at least half-an-hour each time (National Public Health Institute, 1999). At the same time walking and cycling for transport was reduced roughly by

one half. An extreme development likely to be linked to the declining physical activity is that found in the US; the design of seats in public places like sport and art arenas, public transport vehicles etc. need to be increased to fit the bigger dimensions of the overweight and obese customers.

Estimates of the current levels of physical activity in the EU countries suggest that the majority of adults are physically active for less than 3 hours per week (European Commission, 1999). Almost two thirds, ranging from one third in the Scandinavian countries to over eighty per cent in Portugal, do less than the recommended 30 minutes a day. Giving the fact that physical inactivity is now considered a major risk for developing coronary heart disease and that it is considered an established risk factor for diabetes II, obesity and hypertension, and one of the main causes of cerebro-vascular disease and a stroke, the health burden caused by it is enormous. On the other hand, since physical activity can significantly improve the functional independence of the ageing populations in Europe, an increase in the population's levels of physical activity is emerging as a major measure to improve the health and well-being of the Europeans.

Strategies for HEPA promotion

Most efforts to promote physical activity for health have thus far focussed on individual or small group behaviour. Different health behavioural theories and models have been used as the bases to understand the process of physical activity behaviour, particularly that of making an inactive one into an active one. While the individual approach has many strengths such as personal tailoring, application of a number of motivational strategies and direct assessment of change, it is not sufficient to make a real behaviour shift on the population level. In addition, community level interventions are needed. Community oriented approaches focus on widespread community behaviour change in combination with changes in the social network, environmental milieu, community norms, as well as policies and legislation that can sustain a long-term maintenance of change. While community approaches often include personal (e.g. individual counselling)

and interpersonal (e.g. supervised classes) interventions, they focus especially on organisational, environmental, institutional and societal levels of change (King 1998).

Experience on a community-level physical activity promotion comes mainly from the wider health promotion programs or projects in which physical activity has been only one of the intervention foci, often a minor one. Consequently the knowledge specific to physical activity promotion is limited. Recently two types of community-level approaches exclusively on HEPA promotion have been analysed and recommendations thereof proposed. These are the HEPA promotion programs and promotion of transport by walking and cycling as in HEPA.

HEPA promotion programmes

The European Network for the Promotion of Health-Enhancing Physical Activity, one of seven European Commission's health promotion networks, have developed guidelines of good practices for the HEPA promotion programmes (Foster 2000). These guidelines were designed to assist practitioners in creating successful programmes. The guidelines were developed through a comprehensive analysis of four major national programmes: The Netherlands on the Move, Allez Hop (Switzerland), Fit for Life (Finland) and Active for Life (England). They identify good practices for programme preparation, development, design, implementation and evaluation. The key elements in each step are:

Preparing for a HEPA programme

- identify the potential stakeholders in HEPA
- use a variety of sources of evidence to present a broad justification of the benefits of HEPA promotion to key stakeholders
- use the evidence to develop political justification, support and funding
- place the contribution of HEPA within the existing national and local strategy and policy documents

Developing a HEPA programme

- explore and resolve the potential relationship, role and function between

HEPA promotion and two key groups; the sport sector and the health sector

- cultivate and recruit other potential HEPA organisations and professional groups at the national and local levels
- identify and create and use any pilot project work
- conduct a good practice audit and ask others involved in HEPA promotion about their experience
- have a clear programme name and identity

Designing a HEPA programme

- use experts', stakeholders' and users' input to help design the HEPA programme
- develop a strategy to drive and sustain the HEPA programme
- design the theoretical framework of the HEPA programme
- design the programme aims, objectives and indicators
- design the HEPA message

Implementing a HEPA programme

- develop the organisational structure of the programme
- establish programme ownership with all participants
- cultivate and tend the network
- co-ordinate national and local activity
- monitor low responsiveness to the national programme within different geographical and cultural groups

Evaluating a HEPA programme

- commit to evaluating the programme
- create an evaluation design for the programme
- use existing surveillance methods in the programme
- set up an independent evaluation mechanism for the programme
- support others in the evaluation of their activities
- learn from programme weaknesses
- plan for the dissemination of the results of the programme evaluation

The guidelines also include documentation

of the main lessons learned in the four national programmes. They are:

- set clear and measurable aims
- support local HEPA promoters and professionals
- cultivate and use the media as part of HEPA promotion
- disseminate information on HEPA campaign strategy from the outset to traditional allies and new allies
- be patient in observing any impact of the programme
- be creative and radical
- remember that current good practices may be based on experience rather than evidence

These guidelines offer the principles of good practice for the HEPA promotion based on very recent experiences gained in four national programmes selected from 20 member states of the European HEPA promotion network. For the first time these guidelines bring together examples of HEPA promotion in particular. Thus the guidelines should be helpful for those local, regional and national parties who consider launching a HEPA promotion programme. As more is learnt about HEPA promotion in different cultures, countries and settings, new examples of good practice will undoubtedly emerge.

Transport walking and cycling

The European HEPA Promotion Network has also developed strategy directions for the national promotion of transport walking and cycling (Oja & Vuori 2000). The document is a follow-up of the European Charter on Transport, Environment and Health (WHO 1999) adopted by WHO Euro and the European Commission. The starting point for the strategy directions is the statement in the Charter that, based on scientific evidence (Vuori & Oja 1999), physically active transport such as walking and cycling offer significant health gains through the reduction of the ill effects of motorised transport, on one hand, and the utilisation of the health benefits of increased physical activity, on the other.

The nature of transport walking and cycling in terms of frequency, duration and intensity

suggests that such activity can contribute significantly to people's health-enhancing physical activity. On the other hand, current practices of transport walking and cycling in European countries indicate that only in a few countries this potential for daily activity is being used to any significant extent, and moreover the available trends show a decline in development. Thus there is much room to improve and indeed many local, regional and even some national experiences suggest that physically active transport can be substantially increased by appropriate policies, strategies and actions.

The document provides suggestions for the key elements of national strategies in terms of objectives, targets, lines of action and the necessary conditions for a successful strategy. This kind of HEPA promotion is a good example of community-level interventions. By creating a pro-walking and cycling culture and providing a safe and widely available physical environment for it in terms of walking and cycling friendly transport infrastructure, a significant health promoting community-wide behaviour change can be achieved.

Concluding remark

Raising physical activity amongst the general population has been described as "today's best buy in public health" (Morris 1994). This statement is based on the significant health benefits of increased physical activity, on one hand, and the high prevalence of inactivity in many populations, on the other. In addition the nature of health-enhancing physical activity - low-to-moderate intensity, high frequency, the accumulation of a daily activity dose and a wide variety of applicable simple activities - make it feasible for large segments of populations and potentially cost-effective for the community.

The key HEPA message - a modest increase in daily physical activity is beneficial for public health - has significant policy implications. Physical activity needs to be promoted as part of the normal daily life rather than as a special effort requiring sport equipment and clothing and often travelling to the facilities. Policies need to foster both individual and environmental support for people to engage in physical activity as part of day-to-day living. This strategy offers the best way for the largest possible segment of the population to adopt a health-enhancing lifestyle in an economical, ecological and non-discriminate way.

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