

# Health behavior: an overview of effects & issues

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EuropeActive's

# Essentials of motivation and behaviour change

For fitness, health and sport professionals

CHAPTER 2

## Health behaviour: An overview of effects and issues



Authors **Alfonso Jiménez, Chris Beedie and Gary Liguori**

## 2. Health behaviour: An overview of effects and issues

Alfonso Jiménez, Chris Beedie and Gary Liguori

### 2.1 INTRODUCTION

Our modern way of living has largely eliminated physical activity as one of the fundamental parts of our lives. The growth of non-communicable lifestyle diseases and the epidemic in obesity provide clear evidence of the imbalance between our lifestyles and our physical requirements. Physical inactivity is a state of relative physical rest, which does not provide sufficient stimulus for human organs to maintain their normal structures, functions and regulations. Physical inactivity has become a major risk factor for chronic non-communicable diseases. Epidemiological research has proven that 15–20% of the overall risk for coronary heart disease, type 2 diabetes, colon cancer, breast cancer and fractured hips in the elderly is attributable to physical inactivity. The overall disease burden in Europe caused by physical inactivity is estimated to be 3.5% <sup>(1)</sup>.

Participation in physical activity and exercise can result in desirable health outcomes in terms of both acute and chronic adaptations in the physiological and psychological domains <sup>(2)</sup>. Physical activity, exercise, health and the quality of life are closely interconnected. The human body was designed to move and therefore needs regular physical activity in order to function optimally and avoid illness. It has been proven that a sedentary lifestyle is a risk factor for the development of many chronic illnesses, including cardiovascular diseases, a main cause of death in the Western world.

Furthermore, living an active life brings many other social and psychological benefits with a direct link between physical activity and life expectancy, so that physically active populations tend to live longer than inactive ones. Sedentary people who become more physically active report feeling better from both a physical and a mental point of view, and enjoy a better quality of life. As a result, the interest in the potential effect of physical activity and exercise on different aspects of mental health and general wellbeing is increasing. There is strong and consistent evidence, both from surveys and experimental studies, showing that physical activity and exercise make people feel better. These effects are seen in populations of all ages and are independent of

socioeconomic or health status. Further, people who are aware of such benefits may be encouraged to increase commitment to regular exercise <sup>(3)</sup>.

The current climate in global health is one of increasing concern about the sedentary habits and weight problems of the general population. In fact, physical inactivity has been considered as the biggest public health problem in the 21st century <sup>(4)</sup>. Embedded within this are serious concerns about epidemic rates of diabetes and obesity. In the general population a combination of these concerns and some key messages coming from Governments, the healthcare sector and international bodies, have resulted in an increased awareness of the need to monitor health behaviour. Research shows that most people at some point in time have indicated an intention to change something about their eating habits or physical activity levels. Given this increased community focus on health behaviour, it is important for health and fitness professionals to have an understanding of how individuals work to change their health behaviour and the challenges they face <sup>(5)</sup>.

This book addresses key concepts, elements, factors and theories regarding motivation and behavioural change, trying to offer an evidence-based and practical approach to exercise professionals dealing with a significant challenge, to help people to change their lives by being more active and especially more often (as frequency of activity will be the real and critical key factor to improve health status in and inactive population). In this chapter there is information on the types of behaviour affecting health in both positive and negative ways.

## 2.2 OVERVIEW OF MOST RELEVANT KINDS OF HEALTH BEHAVIOUR

This section gives an overview and brief discussion of the kinds of health behaviour most relevant for fitness, health and sport professionals.

### 2.2.1 Physical activity

It is important to differentiate two critical terms that are often used interchangeably, but which do not involve the same specific health behaviours, and therefore do not produce the same effects in terms of health improvements or diseases prevention. These terms are *physical activity* and *exercise*: see also table 1.1 in chapter 1.

The available evidence from observational studies support the conclusion that physical activity and exercise, performed on a regular bases (as a behaviour), have protective benefits for several aspects of physical, mental health and general wellbeing. There is strong evidence for their protection against all the chronic pathologies, as well as for symptoms of the major mental disorders: depression and cognitive decline, anxiety and poor sleep, feelings of distress and fatigue. Thus, current evidence supports the conclusion that regular participation in moderate-to vigorous physical activity and/or exercise, consistent with current public health guidelines, confers physical and mental health benefits when compared to participation in low levels of activity or a sedentary lifestyle.

| <b>Children and adolescents</b>  |  |
|--|--|
| <p><b>Strong evidence</b></p> <ul style="list-style-type: none"> <li>Improved cardio respiratory &amp; muscular fitness</li> <li>Improved bone health</li> <li>Improved cardiovascular &amp; metabolic health biomarkers</li> <li>Favourable body composition</li> </ul>   | <p><b>Moderate evidence</b></p> <ul style="list-style-type: none"> <li>Reduced symptoms of depression</li> </ul>   |
| <b>Adults and older adults</b>   |  |
| <p><b>Strong evidence</b></p> <ul style="list-style-type: none"> <li>Lower risk of early death</li> <li>Lower risk of coronary heart disease</li> <li>Lower risk of stroke</li> <li>Lower risk of high blood pressure</li> <li>Lower risk of adverse blood lipid profile</li> <li>Lower risk of type 2 diabetes</li> <li>Lower risk of metabolic syndrome</li> <li>Lower risk of colon cancer</li> <li>Lower risk of breast cancer</li> <li>Prevention of weight gain</li> <li>Weight loss, particularly when combined with reduced calorie intake</li> <li>Improved cardio respiratory and muscular fitness</li> <li>Prevention of falls</li> <li>Reduced depression</li> <li>Better cognitive function (for older adults)</li> </ul> | <p><b>Moderate to strong evidence</b></p> <ul style="list-style-type: none"> <li>Better functional health (for older adults)</li> <li>Reduced abdominal obesity</li> </ul> <p><b>Moderate evidence</b></p> <ul style="list-style-type: none"> <li>Lower risk of hip fracture</li> <li>Lower risk of lung cancer</li> <li>Lower risk of endometrial cancer</li> <li>Weight maintenance after weight loss</li> <li>Increased bone density</li> <li>Improved sleep quality</li> </ul> |

Note: The advisory committee rated the evidence of health benefits of physical activity as strong, moderate, or weak. To do so, the committee considered the type, number, and quality of studies available, as well as consistency of findings across studies that addressed each outcome. The Committee also considered evidence for causality and dose response in assigning the strength-of-evidence rating. U.S. Department of Health and Human Services (HHS). *Physical Activity Guidelines Advisory Committee Report, 2008*, full report available at <http://www.health.gov/paguidelines/guidelines/#committee>

Table 2.1: Health benefits associated with regular physical activity <sup>(6)</sup>.



### 2.2.2 Exercise

When someone does planned, structured, and repetitive bodily movements that are performed to improve or maintain one or more components of physical fitness, that person is doing exercise. From a health promotion point of view, and considering the immense level of current evidence, exercise is a fantastic and proactive health behaviour. The best element linked into the health benefits is the fact that exercise means regular practice, a systematic, progressive and tailored stimulus that will improve health status of anyone as a result of frequency of practice. The most updated evidence-based guidelines for exercise from ACSM <sup>(7)</sup> employs the frequency (how often), intensity (how hard), time (duration or how long), and type (mode or what kind), with the addition of total volume (amount) and progression (advancement), formulated as the FITT-VP principle for exercise prescription. Fitness, health or sport professionals play a critical role in addressing specific needs of individuals to offer safe and effective exercise programmes.

In the past decades considerable knowledge has been accumulated about the significance of exercise in the treatment of a number of diseases, including those that do not primarily manifest as disorders of the locomotive apparatus. Today, exercise is indicated in the treatment of a large number of medical disorders, and the *American College of Sports Medicine* is leading a global advocacy and resources program called *exercise is medicine* (<http://exercisemedicine.org/>). In the medical world, it is traditional to prescribe evidence-based treatment that is known to be the most effective and entailing the fewest side effects or risks. Evidence suggests that in selected cases exercise therapy is just as effective as medical treatment, and in special situations can

be more effective, or adds to the effect. In this context, exercise therapy does not represent a paradigm change, it is rather that the accumulated knowledge is now so extensive that it has to be accepted <sup>(8)</sup>.

### **2.2.3 Nutrition**

Obesity among EU citizens, including children, is rising at an alarming rate. This phenomenon is linked with potentially fatal health problems, including cardiovascular diseases and certain cancers. The European Union (EU) has launched a series of initiatives designed to meet the problem head-on, helping consumers to make informed nutritional choices, encouraging an active lifestyle and improving the health of young people.

In the EU, it is estimated that over 200 million adults may be overweight or obese, which represents over half of the adult population. The link between excess weight and health problems is clear, as over a third of the EU citizens who suffer from a long-term disease are currently overweight. Obesity causes a range of very serious physical and mental health problems, ranging from diabetes to cancers, heart diseases, infertility, to psychological disorders.

According to the World Health Organisation (WHO), poor nutrition, physical inactivity and obesity account for nearly 10% of disability adjusted life years lost (one DALY represents the loss of one year of life in good health), which is greater than the loss resulting from smoking <sup>(9)</sup>.

Nutrition plays an important role in the prevention of many diseases and health conditions including heart disease, stroke, cancer, obesity, diabetes, and osteoporosis. In fact, some experts estimate that dietary changes could prevent as many as 35% of cancer deaths in many Western countries each year. Healthy eating is also essential in treating diseases such as diabetes, heart disease or cancer. Of course, as identified in this chapter, other factors such as exercising, not smoking, managing stress, and taking medications as prescribed also affect overall health. Whether for prevention or treatment, eating a healthy diet is good medicine <sup>(10)</sup>.

Poor nutritional habits can be a behavioural health issue, because nutrition and diet affect how people feel, look, think and act. A bad diet results in higher risk of development of obesity and metabolic disorders, lower core strength, slower problem

solving ability and muscle response time, and less alertness. Poor nutrition creates many other negative health effects as well. Evidence supports moderate-intensity physical activity (PA) between 150 and 250 minutes per week to be effective to prevent weight gain. Moderate-intensity PA between 150 and 250 minutes per week will provide only modest weight loss. Greater amounts of PA (>250 min-wk-1) have been associated with clinically significant weight loss. Cross-sectional and prospective studies indicate that after weight loss, weight maintenance is improved with PA >250 min-wk-1 <sup>(11)</sup>.

#### **2.2.4 Sleeping**

It is commonly believed that human beings need approximately 7-8 hours of sleep every night and that sleep serves as a restorative function. Some people think that missing this period of restoration of mind and body may present an immediate threat to health, or that chronic sleep deprivation may shorten life span or increase morbidity. Staying awake all night means missing the surge of reputedly restorative human growth hormone (hGH) that occurs during nocturnal sleep and, at the same time, gives an overabundance of stress substances, such as norepinephrine and corticosteroids.

However, most people experience going without sleep at one time or another, either totally for one or two nights, or for a few hours nightly over a period of time. Many ordinary life events, such as working to meet deadlines, earning a living as a night, or shift worker, or managing family and business emergencies, can lead to temporary total or partial sleep deprivation. Direct detrimental health consequences of sleep loss are probably minimal. The reports of healthy insomniacs who need little or no sleep seem to support this view. Nonetheless, it is possible that sleep loss interacts with stressful environments or biological weaknesses to the detriment of health. This might explain the cases of 'sleep loss psychosis' reported in early literature <sup>(12)</sup>.

Preliminary research reports that on the whole, the health consequences of total, partial, or selective sleep deprivation appeared to be much smaller than might have been anticipated from the overwhelming sense of sleepiness, tiredness, and sluggishness it can cause. An extensive report concluded that the only substantial and potentially serious effect of sleep deprivation was a reduction in the quality of life as defined by a person's feeling of well-being, willingness to work hard, and feeling of being efficient, wide awake, fresh, and in control <sup>(12)</sup>.



This does not mean that sleep deprivation has failed to cause small changes in human biochemistry and physiology. In fact, the importance of sleep to hormones and glucose metabolism was first documented more than four decades ago. Since then, sleep curtailment has become an endemic behaviour in modern society. In addition, the prevalence of sleep disorders, particularly obstructive sleep apnea (OSA), has increased. OSA is very common in endocrine and metabolic disorders, but often remains undiagnosed. Laboratory and epidemiologic evidence suggests that sleep loss, either behavioural or disease-related, and poor quality of sleep might promote the development of obesity and diabetes mellitus, and can exacerbate existing endocrine conditions. On the opposite, treatment of sleep disorders has the potential to improve glucose metabolism and an energy balance. Screening for habitual sleep patterns and OSA might be critically important for patients with endocrine and metabolic disorders<sup>(13)</sup>.

### **2.2.5 Sitting**

Sitting for long periods increases the risk of diabetes, heart disease and death, researchers suggest. According to a poll of nearly 6,300 people by the Institute for Medicine and Public Health in the US, people spend a stunning 56 hours a week sitting in front of a computer screen, behind a steering wheel, or watching TV. Interestingly, it seems that women may be more sedentary than men, since they tend to play fewer sports and hold less active jobs.

Researchers have linked sitting for long periods of time with a number of health concerns, including obesity and metabolic syndrome (a cluster of conditions that includes increased blood pressure, high blood sugar, excess body fat around the waist and abnormal cholesterol levels). Too much sitting also seems to increase the risk of death from cardiovascular disease and cancer. Scientists recognise that harm is done even if people are also exercising.

One recent study compared adults who spent less than two hours a day in front of the TV or other screen-based entertainment with those who logged more than four hours a day of recreational screen time. Those with greater screen time had nearly a 50% increased risk of death from any cause, and about a 125% increased risk of events associated with cardiovascular disease, such as chest pain (angina) or heart attack. The increased risk was separate from other traditional risk factors for cardiovascular disease, such as smoking or high blood pressure.

## Sit less, move more



The average adult spends **more than half** of their day sitting.  
Here's how the time can add up:



Figure 2.1: Example of information materials developed by a Heart Foundation.

Sitting in front of the TV isn't the only concern. Any extended sitting can be harmful. What's more, spending a few hours a week at the gym or otherwise engaged in moderate or vigorous activity doesn't seem to significantly offset the risk. Rather, the solution seems to be less sitting and more moving overall.

The prevalence of adults working in jobs that require mostly sitting is high, and occupations have become more sedentary and less physically active over the past few decades. Working adults spend an estimated one third to three quarters of their work time sitting. Thus, reducing sitting time may have good potential for chronic disease prevention in working populations, with the workplace as an appropriate intervention setting <sup>(14)</sup>.

As referred to previously, basic information for people is a key element to promote a healthy behaviour regarding their sitting time. See figure 2.1 as an example of information materials developed by a Heart Foundation regarding the negative impact of extended sitting time needed to inform people and promote awareness.

### **2.2.6 Stress**

The brain is the central organ of the stress response and determines what is stressful, as well as the behavioural and physiological responses to potential and actual stress factors. The brain is also a target of stress and it changes structurally and chemically in response to both acute and chronic stress. Glucocorticoids play a role in these changes, but there are other mediators as well. Although glucocorticoids and catecholamines are the two defining hormones of the fight or flight stress response, there are many other mediators, such as pro- and anti-inflammatory cytokines and the parasympathetic nervous system, that are also involved in the adaptation to stressors, as well as in the negative impact of chronic stress, known in everyday language as being stressed out. Stress is an ambiguous term and has connotations that make it less than useful in understanding how the body can adapt or fail to adapt efficiently to experiences in daily life, including both daily hassles as well as major life events and abuse or trauma <sup>(15)</sup>.

In prehistoric times, the physical changes in response to stress were an essential adaptation for meeting natural threats. Even in the modern world, the stress response can be an asset for raising levels of performance during critical events such as a sports activity, an important meeting, or in situations of actual danger or crisis. If stress becomes persistent and low-level, however, all organs and systems of the body (the brain, heart, lungs, vessels, and muscles) become chronically over- or under-activated. This may produce physical or psychological damage over time. Acute stress can also be harmful in certain situations.

The common experience of being stressed-out has, as its core, the elevation of some of the key systems that lead to what is called allostatic overload, e.g., cortisol, sympathetic activity and proinflammatory cytokines, with a decline in parasympathetic activity. Nowhere is this better illustrated than for sleep deprivation, which can be a result of being stressed out. Sleep deprivation produces an allostatic overload that can have deleterious consequences. The effects include elevated evening cortisol, insulin and blood glucose, elevated blood pressure, reduced parasympathetic activity and elevated levels of proinflammatory cytokines, as well as the gut hormone, ghrelin, which increases appetite. Hunger for comfort foods and increased caloric intake are one result, along with depressed mood and cognitive impairment <sup>(15)</sup>.

### 2.3 RESEARCH ON HEALTH BEHAVIOUR

Throughout our life span the health effects of social and behavioural factors such as smoking, drinking, physical activity, and diet have been dramatically demonstrated. These behaviours have implications for a wide array of health outcomes for both women and men, including: cancer, infectious and allergic diseases, osteoporosis, diabetes, heart disease, arthritis, depression, periodontal diseases, obesity, and kidney diseases, as well as related outcomes, such as mood, functional impairment and disability, quality of life, and health care utilization.

Behaviour change, therefore, is critical to the prevention, management, and treatment of many important health conditions. However, the initiation and maintenance of behaviour change can be very difficult, and even those interventions that succeed in controlled clinical trials do not always scale well. It is not enough for behavioural and social scientists to do rigorous research and develop effective interventions; there must also be delivery channels and systems in place to disseminate these interventions to the public, policymakers, and other decision makers to ensure that they are implemented, adopted, and maintained.

Two possible approaches have been suggested in addressing the difficulties raised by the multitude of existing theories on health behaviour change. One approach is to attempt to identify variables common to these theories. This has been undertaken

for 33 health behaviour change theories <sup>(16)</sup> in order to make psychological theories more accessible and easier to select. A second approach is to attempt to integrate the theories.

Whilst there is a need for such theoretical integration, researchers and theorists should be cautious when picking and choosing parts of other theories to develop further theories, the so-called 'cafeteria-style theorising' as the resulting theories may include redundant variables. Because some theories share overlapping variables describing using different names, and most differences are due to an emphasis of one variable over another, it would serve the development of this field to conduct studies to identify particular variables that perform best in predicting behaviour change. Similarly, comparative studies between theories could be used to identify effective components. The field of health behaviour theory remains dynamic, and it is important to continue developing existing theories and approaches as new evidence emerges <sup>(17)</sup>.

#### *Current issues*

The main current issue regarding the promotion of healthy behaviour is the need for stronger evidence, and more specifically the translation of laboratory findings into practice. This has been described as one of the greatest challenges facing health promotion and disease prevention. No matter how efficacious an intervention during preliminary research based on clinical trials, if patients don't take it, or it doesn't demonstrate its effectiveness among those who do, it will not be supported (nor commissioned), especially in the face of potentially more effective alternatives. To healthcare commissioners faced with increasing professional and public scrutiny, an abundance of evidence for efficacy and even behavioural effectiveness is of little consequence <sup>(18)</sup>.

If the health and fitness sector, and the scientific community around, fail to provide evidence of effectiveness and thereby fail to secure a significant and substantial role in public health, subsequent generations are condemned to increasingly complex and expensive biomedical interventions, with the associated likelihoods of poorer public health and greater inequalities <sup>(18)</sup>.

## 2.4 CONCLUSION AND PRACTICAL IMPLICATIONS

From a behavioural change perspective, it is easier and more rewarding for an individual to incorporate new behaviour instead of removing existing ones. This is one of the key positive messages to work on with inactive people, adding exercise as a positive behaviour will provide always positive outcomes (if the dose is appropriate to the capacity level of the person and the program allows a progressive increase of the challenge).

Fitness, health or sport professionals you have a relevant role to play, and should be ready to meet people's expectations. Understanding the implications of health behaviours in the overall exercise intervention will be a key asset to effectively produce significant and sustainable health changes in inactive populations. Specific, tailored, and very simple and applied approaches to modify behaviours should be integrated in health behaviour programmes, for example in exercise interventions.

A positive combination of physical activity (i.e. as a mean of transportation) and individualised exercise doses, addressing specific needs and limitations of the individuals, will provide the kind of engaging and positive stimulus to help inactive population to change behaviour. The challenge is there: Who is joining us in our journey?

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