

THE INCREASING RELEVANCE OF PHYSICAL ACTIVITY AND EXERCISE TO INDIVIDUAL MENTAL HEALTH

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Abstract

There are substantial evidences from longitudinal studies that physical activity and exercise offer protection from depression in adolescents, adults and older adults. This evidence has been gathered from different countries and with different populations. Exercise provides some health and psychological benefits as an adjunct to treatment in complex mental health problems such as alcohol and drug rehabilitation, mild and moderate depression, provision of valuable social support etc. The evidence to support the benefits of exercise as an intervention in the treatment of mental illness is growing. This paper therefore critically looks into the increasing relevance of physical activity and exercise to individual mental health.

Keywords: Physical activity, exercise, mental health

Introduction

While the physical benefits of physical activity have long been known and promoted, there is growing evidence that being physically active is strongly associated with mental health and that being inactive can contribute to poor mental health. The past 15 years has seen the development of a considerable literature in this area. Biddle, Fox and Boutcher, (2008) broadly suggested that physical activity has the potential to contribute to the enhancements in mood, self-perception and self esteem; the prevention of the development of mental health problems such as depression; and alleviation of the symptoms of mental health problems. Physical activity has been found to be of immense benefits in the mental health service delivery because of the vital role it plays in the psycho-physiological functioning of the human body (Jaiyesimi & Babalola 2012).

The concept of mental health

Defining mental health is complex. The terminology is viewed negatively in the context of mental illness and positively in the context of mental well-being. Mental health is therefore defined by World Health Organisation as a state of wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to his or her community (WHO, 2007). According to Tudor, (1996) mental health refers to both mental wellbeing and mental health problems. Mental wellbeing is considered to comprise of three main dimensions – emotional, social and psychological and includes aspects of emotional wellbeing, life satisfaction, optimism and hope, self-esteem, mastery and a sense of control, having a purpose in life, a sense of belonging and personal support. The alternative terms, positive mental health or mental health, are often used synonymously. Mental health problems refer to symptoms which meet the criteria for clinical diagnosis of mental illness (such as depression, anxiety and schizophrenia) which interfere with an individual's cognitive, emotional or social abilities. Ajayi, Abayomi and Ojo, (2012) submitted that mental well-being is a fundamental factor for maintaining good quality of life and a multidimensional facet of our overall state of

health. Mental health is hereby viewed as the adjustment of man to other men and to his environment with a maximum of effectiveness, happiness and satisfaction. The breakdown includes maintaining an even temper, an alert intelligence, a happy disposition and a socially considerate behaviour. The quality of an individual's life is enhanced by good mental health (Sadiq&Lawal, 2012). Good mental health is therefore seen as more than the absence of mental illness. The dimensions of mental wellbeing and mental health problems are understood as operating on a model of interacting 'dual continua' shown in Figure 1 below. This model demonstrates the possibility of having optimal mental wellbeing, while experiencing diagnosable mental health problems and having minimal mental wellbeing while having no diagnosable mental health problems.

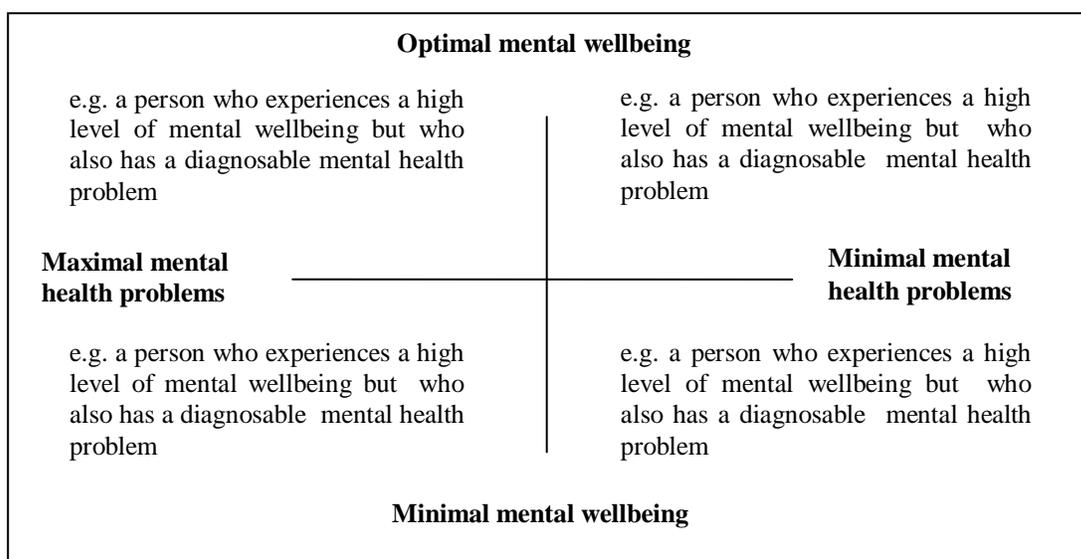


Figure 1: Concepts of mental health: a dual continua model

Adapted from Tudor K. (1996) *Mental Health Promotion Paradigms and Practice* Routledge, London.

There are a number of factors that are considered to support mental wellbeing and prevent mental health problems (protective factors) and others that increase the risk of mental health problems and decrease mental wellbeing (risk factors). These factors can operate at individual, social and wider societal levels and are shown below in table 1.

Table 1: Mental Health Factors

Level	Protective Factors	Risk factors
Individual	positive sense of self good coping skills attachment to family social skills good physical health	low self-esteem low self-efficacy poor coping skills insecure attachment in childhood physical and intellectual disability
Social	positive experience of early attachment supportive caring parents/family good communication skills supportive social relationships sense of social belonging community participation	abuse and violence separation and loss peer rejection social isolation
Structural	safe and secure living environment economic security employment positive educational experience access to support services	neighbourhood violence and crime poverty unemployment/economic insecurity homelessness school failure social or cultural discrimination lack of support services

Adapted from Tudor K. (1996) *Mental Health Promotion Paradigms and Practice* Routledge, London.

The concept of physical activity and exercise

Physical activity is any movement of the body that results in energy expenditure rising above resting level and includes activities of daily living, domestic chores, gardening and walking (Casperson, Powell, & Christenson, 1985). Physical Activity is defined as “all bodily movement procedures by muscle action that increases energy expenditure” (McArdle, Katch, & Katch, 1996). A physically active lifestyle has been found to be an effective way of improving fitness and overall health (Haskell, I-Min Lee, Pate, Powell, Blair, & Franklin, 2007). Conversely, the absence of a physically active lifestyle can adversely affect health and well-being, increasing the risk of somatic health problems such as cardiovascular diseases, hypertension, diabetes mellitus, osteoporosis, and some types of cancer (US Department of Health, 1997).

Exercise is a subset of physical activity and is undertaken to improve health or for leisure-time activities including activities such as swimming, jogging, brisk walking, going to the gym and sports such as tennis and football. These various activities have the potential to bring about improvements in muscle strength & stamina, flexibility, power, speed, agility, co-ordination and balance and suggests that physical activity can vary in relation to: intensity (relatively high to relatively low) and quantity (duration and frequency). In turn, these qualities of physical activity can contribute to a range of wider health gains. Traditionally these features have been couched in physiological terms (for example, heart, respiratory & circulatory health, weight & body composition).

How does exercise help in preventing and alleviating mental health problems?

The association between exercise and positive mood can be explained by physiological and psychological explanations. The increased blood flow to the brain stimulates the release of naturally occurring mood enhancing chemicals known as endorphins. These natural opiates are similar to morphine and have been linked to the “runners high”. Studies have demonstrated their presence in blood samples of people following exercise (Mutrie, & Faulkner, 2003). This explanation, however, remains speculative, as it is not clear if endorphins can cross over the blood-brain barrier. Animal studies have found that chemicals known to be depleted during depression norepinephrine, dopamine and serotonin are released during exercise (Biddle, Fox & Boutcher, 2000). These neurotransmitters have been associated with elevating mood. Antidepressant medication such as Prozac works by boosting these chemicals. This may partially explain why exercise offers protection to depression and is effective as a treatment intervention. Exercise is known to increase levels of brain-derived neurotrophic factor (BDNF); this substance is associated with enhancing mood and helping the brain cells survive longer. This may also be linked to improved cognitive function (Biddle et al, 2000). It has also been suggested that increased levels of phenylethylamine, a known stimulant in the brain occurring during exercise, is linked to the release of dopamine and endorphins, acting as a natural antidepressant.

This has been evidenced by a rise in phenylacetic acid found in urine samples following exercise. Explanations from psychology suggest links between exercise and physical self-perceptions such as body image, physical self-worth and self-esteem (Biddle & Mutrie, 2001). The findings from the Mind survey support this explanation, with 50% stating that exercise boosted their self-esteem. Planning and undertaking exercise allows setting and achieving goals, skill development, building self-confidence and it may also provide a mechanism for social support if exercising with others. The anxiety reduction effects of exercise have been linked to improved cardiovascular fitness; reducing reactivity to and recovery from psychosocial stressors (Biddle et al, 2000).

It has recently been suggested that exercise can influence brain plasticity and bring about changes by facilitating neurogenerative, neuroadaptive and neuroprotective processes (Dishman, Berthoud, Booth, Cotman, & Edgerton, 2006). Currently the mechanism for this is not well understood but metabolic and chemical pathways among the brain, spinal cord and muscles offer plausible testable mechanisms. The human genome (the totality of body chromosomes) cannot account for the entire structure of the brain but it helps set the circuits in the older part of the brain (Damasio, 1994). This part of the brain, which includes the brain stem, hypothalamus, limbic system and amygdala, is pre-set for survival ensuring continue breathing, regulating heartbeat and balancing body metabolism. It has been argued that the benefits of exercise and mental health are likely to be best explained by an integrated theory that takes account of the biochemical physiological, psychological explanations (LaForge, 1995). In doing so, the importance of the brain circuitry involved in emotions and feelings should not be ignored. The mind-body link is important in all of these explanations.

Exercise and Cognitive Functioning

A wealth of research has shown that improvements in cardiovascular fitness are associated with improvements in cognitive functioning, including motor function, memory, cognitive speed and attention (Kramer & 1999; Colcombe and Kramer 2003; Angevaren, Aufdemkampe, 2008). Weuve and Kang (2004)

found that higher levels of regular, long-term physical activity were associated with better cognitive performance among older women. Cognition was tested for 18,766 women between the ages of 70-81 (1995-2001) and then reevaluated two years later through telephone assessments (1997-2003). Physical activity was measured by reported levels of exercise from a 1986 questionnaire. The results showed a strong association between baseline reports of physical activity and better cognitive functioning and less cognitive decline among the women 11-17 years later. The effect of physical activity on cognitive functions has been less studied among other age groups. A recent study examining the memory capacities of middle-aged adults found that leisure-time physical activity and exercise was associated with better memory performance (Richards, Hardy, 2003).

Evidence for prevention

The findings of one of the foremost prospective study by Farmer, Locke, Moscicki, Dannenberg, Larson, and Radloff, (1988) suggested that women who had engaged in little or no recreational activity were twice as likely to develop depression when compared with women who had engaged in moderate or high levels of activity. The same protective effect for men was not evident. However, for men who were depressed at baseline, inactivity was a predictor of depression at follow-up. The protective factor of physical activity in mental health for both men and women was demonstrated in a study reported three years later (Camacho, Roberts, Lazarus, Kaplan, & Cohen, 1991).

One of the largest longitudinal studies reported by Paffenbarger, Lee, and Leung, (1994) confirmed that the protective effects of physical activity involve the risk reduction of developing depression for men. The evidence for prevention has also been demonstrated in studies of older people. Adults over the age of 65 were followed up for three years providing evidence that daily walking reduced risk of depression (Mobily, Rubenstein, Lemke, O'Hara, & Wallace, 1996). A further study in the USA with middle-aged and older adults found similar protective factors (Strawbridge, Deleger, Roberts, & Kaplan, 2002). This is further supported by the work of researchers in the Netherlands (Van Gool, Kempen, Penninx, Deeg, Beekman, & Van Eijk, 2003), who found that study participants who became depressed from baseline to follow-up had changed from an active to a sedentary lifestyle, and research undertaken in Finland (Lampinen, Hiekkinen, Kauppinen, & Heikkinen, 2006) with evidence that mental well-being in later life is associated with activity, better health and mobility.

In a study conducted by Agbaraji, Esan and Adewumi (2012), involving forty housewives in a 12-week intervention programme on the effectiveness of aerobic exercise on the management of mental health, found out that those that participated in the aerobic exercises had better scores based on the norm of life hassle and stress questionnaire than those that do not participate in the aerobic exercises. Therefore, they recommended that aerobic exercises can be effectively utilized to improve mental health of women.

What we need to do

There is a need to heighten awareness of General practitioners (GPs), physiotherapists, occupational therapists and exercise specialists on the benefits of exercise for people with mental health problems. We need to consider the training needs of those who deliver exercise programmes in the community at outpatients clinics and exercise-referral schemes. Till now, there are ongoing research works on the exercise design to engage people with depression or addiction problems into exercise. Research from exercise

psychology with other populations (Biddle, & Mutrie, 2001) indicated that incorporating cognitive behavioural techniques such as motivational interviewing, identification of barriers to exercise, goal setting, self-monitoring, contracting, social support and reinforcement are all likely to be beneficial if included into programmes. It is important to evaluate these factors with people with mental health problems to see whether it does increase adherence and maintenance to exercise and physical activity. Likewise, we do not know yet whether involving spouse or family in exercise will increase motivation and participation. The dose response relationship is still not clearly defined. Therefore any type of exercise or physical activity undertaken regularly that seems to be beneficial, using the public health dose as a guide and following the American College of Sports Medicine recommendations should be encouraged.

Conclusion

Exercise improves mental health and well-being, reduces depression and anxiety and enhances cognitive functioning. Although exercise seems to improve the quality of life of those living with mental health problems, its value is seldom recognized by mainstream mental health services. The evidence suggests that exercise may be a neglected intervention in mental health care. The 17th-century Cartesian view that the mind and body are separate entities may still pervade medicine today (Damasio, 1994), resulting in the psychological consequences of disease being disregarded. There is a need to consider how exercise and the associated changes in the body relating to fitness and strength influence our emotions and feelings the somatopsychic response. By considering this response alongside the psychosomatic response, knowledge of how exercise can seriously impact on mental health may become evident.

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