

## Mental health benefits of physical activity

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### Abstract

*Background:* Public health discussions of physical activity have tended to focus on physical health benefits rather than mental health benefits.

*Aim:* This article provides a commentary on the potential benefits of physical activity on mental health.

*Method:* This article reviews the documented association between mental disorders and lack of regular physical activity.

*Results and conclusion:* While highlighting the need to build a much stronger evidence basis, the article summarizes key literature that describes physical activity as an intervention that may be helpful for the promotion of mental health and wellbeing, the prevention and treatment of common mental disorders, and as a strategy in psychosocial rehabilitation for persons with severe mental disorders. The article discusses various interventions and settings for promoting physical activity and highlights that mental health professionals are an underused resource for the promotion of physical activity.

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### Mental health benefits of physical activity

The *World Health Report 2002* (World Health Organization [WHO], 2002) paid considerable attention to the potential of physical activity to reduce the burden of various diseases (e.g., coronary heart disease, ischemic stroke, diabetes, colon cancer, and breast cancer in women). According to the report, at least 60% of the global population fails to achieve the minimum recommendation of 30 minutes moderate intensity physical activity daily. Of those, 60% or about two thirds perform some, but insufficient activity to gain substantial health benefits. Lack of adequate physical activity is considered to cause almost 2 million avoidable deaths per year worldwide (WHO, 2002; Bull et al., 2004).

The Global Strategy for Diet and Physical Activity for Health (WHO, 2004a) – requested by WHO's member states in 2002 and adopted at the World Health Assembly in May 2004 – describes how community and individual strategies to increase participation in physical activity can help in the fight to reduce the burden of chronic disease. The strategy document suggests roles for WHO member states, United Nations agencies, civil society and the private sector, to help to reduce the occurrence of non-communicable diseases by increasing levels of physical activity and improving diets for both children and adults.

Most attention has focused on the physical health benefits of physical activity, and there are well-established guidelines on the type, frequency, and duration of physical activity to provide risk reduction for physical morbidities (e.g., United States Department of Health and Human Services, 1996). However, the evidence on the relationship between physical activity and mental health outcomes is less well established and, in part as a consequence, there are no guidelines on physical activity for mental health benefits. This brief commentary will focus on the broad issues around the links between physical activity and mental health benefits.

### **Physical activity and mental disorders**

Mental and behavioural disorders are estimated to account for 13.0% of the global burden of disease (WHO, 2004b), yet most countries spend less than 1% of their health budget on mental health (WHO, 2001a, b). If participation in physical activity impacts positively on mental health, then the promotion of physical activity may be a mental health strategy with potential, because such activity may be adopted by large segments of the population (Moore et al., 1999). Most recreational physical activity (e.g., walking, swimming, jogging) may be assumed to be relatively inexpensive and tends to be – at least in western culture – accepted and understood by people as an activity that will improve health (Armstrong, Bauman, & Davies 2000).

The relationship between lack of regular physical activity and mental disorders has been the subject of some documentation (Dunn, Trivedi, & O’Neal, 2001; Carless & Faulkner, 2003; Goodwin, 2003). In the largest representative study to date – involving diagnostic measures and a nationally representative sample of 8,098 adults aged 15–54 in the United States, respondents were asked the question “How often do you get physical exercise, either on your job or in a recreational activity?” and were given four response options: regular, occasional, rare and never (Goodwin, 2003). In total, 60% of respondents identified themselves as getting regular physical exercise. Regular physical exercise was significantly more common in men than in women and significantly less among those older than 44. Those who reported regular exercise were less likely to meet criteria in the previous year for diagnosis of DSM-III-R major depression (8% vs. 13%) and a range of anxiety disorders (agoraphobia: 3% vs. 5%; social phobia: 7% vs. 11%; specific phobia: 7% vs. 11%; generalized anxiety disorder: 2% vs. 4%; and panic attacks: 3% vs. 6%). These rates remained significant when adjusted for demographic variables and comorbid physical and mental disorders. No relationship was found between regular physical exercise and bipolar disorder, alcohol dependence, or (other) substance dependence (Goodwin, 2003). Despite its strengths in terms of sample size, national representation and broad diagnostic assessment, this study needs to be replicated in middle-income and low-income settings to test the generalizability of findings. Further, the physical activity measurement tool used in this study captured only limited information on physical activity participation. A more objective measure, or a measure that captures activities undertaken in all domains of life (i.e., at work, at home, for transport and for leisure) would provide more detailed information on physical activity and its relationship to mental disorders.

Although this study was cross sectional in nature, an association between physical activity and depression and anxiety is an important observation, justifying investment in epidemiological research to test the hypothesis that lack of physical activity is a causal risk factor of depression and anxiety (Hill, 1965). This leads us to the next question. What could an association between physical activity and depression and anxiety signify for prevention and treatment of mental disorder and promotion of mental health?

### **Physical activity as a prevention strategy for mental disorders**

We will discuss prevention and promotion separately. Though promotion and prevention are overlapping and complementary activities, they may be distinguished by their focus. Prevention aims at reducing the incidence of mental disorders, while promotion attempts to maximize mental health and wellbeing – going beyond the absence of disorder (WHO, 2004c, d).

Physical activity as a population-level mental disorder prevention strategy has not yet been studied in a robust manner. Several longitudinal observational studies suggest that those who are physically active are less likely to develop mental disorders (Farmer et al., 1988; Camacho, Roberts, Lazarus, Kaplan, & Cohen, 1991; Mutrie, 2000), but the observed relation could be confounded by unmeasured factors (e.g., personality and social factors that determine whether a person initiates and continues to be physically active). Moreover, it is not known whether community-level *promotion* of physical activity translates in reduced incidence rates of mental disorder in the general population. Research on physical activity promotion activities involving either large-scale community trials (or time-series analyses of longitudinal data in the context of a community intervention) is necessary to understand to what extent population-level incidence rates of mental disorder may feasibly be changed. This could involve: (a) studies specifically designed to assess the impact of physical activity promotion programmes in reducing the incidence of mental disorders; and (b) routine inclusion of psychopathology measures in studies assessing the impact of community-level physical activity promotion on the prevention of physical disease.

### **Physical activity as mental health promotion**

The promotion of physical activity may be a feasible mental health promotion strategy (Carless & Faulkner, 2003). Lee and Russell (2003) reported on the longitudinal effects of physical activity and emotional well-being among older Australian women. Overall, persons who had become physically active over a 3 year interval had positive changes in emotional well-being (assessed by the SF-36 [Ware & Sherbourne, 1992]), while the opposite was true for those who had become less active. A study on a non-western population – Turkish immigrants in the Netherlands – showed that participation in physical exercises among those older than 55 related to increased mental well-being (assessed by the SF-12 [Ware, Kosinski, & Keller, 1995]) (Reijneveld, Westhoff, & Hopman-Rock, 2003). Physical activity can make children feel good and enhance their sense of self-esteem (Calfas, Sallis, & Nader, 1991). Experiential and prospective observational studies are needed to study the long-term positive mental health effects of interventions to increase physical activity in the general population.

### **Physical activity as treatment of depression and anxiety**

A growing body of research suggests that physical activity is a moderately effective treatment for anxiety and especially depression with an effect size of 0.72 (Mutrie, 2000) but much less than the most powerful medications and psychotherapies. Studies on the management of disorder through physical activity, however, have been criticized for involving non-clinical volunteers, brief follow-ups, inadequate experimenter blinding, and lack of proper intention-to-treat statistical analyses, all of which may all have led to an overestimation of the effectiveness of physical activity (Lawlor & Hopker, 2001). Nevertheless, a few recent studies provide strong data, making the case that physical activity is potentially an effective

strategy for the management of depression (Blumenthal et al., 1999; Babyak et al., 2000; Mather et al., 2002). Mather et al. (2002) conducted a randomized controlled trial among older adults who had responded poorly to antidepressant psychotropic therapy. The study compared patients receiving group exercise therapy (1 hour of predominantly weight-bearing exercise, twice weekly for 10 weeks) with patients receiving group health education (1 hour of lecture with questions and answers, twice weekly for 10 weeks). Patients receiving group exercise therapy were more likely to experience a substantial drop in depressive symptoms. Blumenthal et al. (1999) in a large randomized controlled trial of older patients with DSM-IV major depression compared four months of exercise training with sertraline, an effective antidepressant (Edwards & Anderson, 1999). The training involved thrice weekly aerobic exercise at 70–85% of heart rate reserve for 16 weeks. The two treatments were found equally effective. However, patients receiving sertraline treatment recovered more quickly. At 6-month follow-up of the Blumenthal et al. (1999) study (i.e., 10 months after the start the therapy), patients in the exercise group who had remitted after the 4-month treatment period were less likely to relapse than those who had received sertraline (Babyak et al., 2000), therefore providing evidence for the value of physical exercise as treatment for depression.

A limitation of most studies on the management of mental illness through physical activity is that they involve volunteers, i.e., persons who were solicited for research involving potential allocation to a physical activity treatment condition. It is likely that volunteers in these studies tend to be positively inclined towards physical activity, because otherwise they would not choose to participate (Babyak et al., 2000). It is not clear to what extent the results of these studies generalize to settings and populations where patients may be less motivated to participate in exercise programmes to address their mental health problems. Effectiveness studies in community settings and, of course, in resource-poor countries are needed to understand the extent to which the results of these trials have external validity and global applicability.

### **Physical activity in the rehabilitation of persons with severe and chronic mental disorders**

Faulkner and Biddle (1999) report the potential existence of positive effects of physical activity on the psychosocial (and physical) well-being of people with schizophrenia. Even though physical activity would not be expected to change the diagnostic status of persons with severe chronic mental disorders, physical activity may be a component of rehabilitation to prevent or reduce long-term hospitalization. Among persons with such disorders, group physical activity may enhance social participation and thus contribute to the maintenance of social skills and access to social support. A sample of British psychiatric nurses perceived value in exercise during inpatient care in terms of both provision of structure to the day and distraction from boredom of inpatient care (Faulkner & Biddle, 2002).

### **Increasing physical activity in populations**

#### *Community interventions to reach the general population*

Physical activity can be effectively promoted at individual, community and environmental levels. A recent review suggests the following strategies: encouragement at “points of decision” (e.g., posters near elevators to encourage people to use stairs), community-wide, highly visible, multiple intervention approaches (e.g., combining mass media campaigns,

self-help groups, and policy changes), school-based physical education, social support in community settings (e.g., setting-up walking groups or a “buddy” system to encourage social reinforcement for participation), individually-tailored health behaviour change, and improving access to places for physical activity combined with informational outreach activities (Kahn et al., 2002). There is insufficient evidence to conclude that media campaigns (when used alone), classroom-based health education, and family-based social support are effective interventions to increase physical activity levels among populations (Kahn et al., 2002). However, a recent review of two systematic reviews investigating the effectiveness of interventions in community settings found that interventions targeting individuals in community settings are effective in producing positive changes in physical activity patterns. Interventions that promote moderate intensity activity (e.g., walking) and which are not facility dependent are associated with longer-term behaviour changes (Hillsdon et al., 2005).

#### *Primary care settings*

Promoting physical activity through primary care is a challenge (Estabrooks, Glasgow, & Dzewaltowski, 2003). Health-related lifestyles are deeply rooted in societies and not easily changed. Advising doctors to instruct patients on undertaking more physical activity may not necessarily change behaviour (Hillsdon et al., 2003). A recent review of eight reviews which examined the effectiveness of physical activity interventions in primary healthcare settings found that brief advice from a health professional, supported by written materials is likely to be effective in producing modest effects on physical activity for up to three months (Hillsdon et al., 2005). Further, referral to an exercise specialist can lead to longer term (> 8 months) changes in physical activity. Puska (2002) has argued the importance of ensuring that physicians provide carefully individualized advice and intervention to the patient with agreed follow-up concurrently with an overall multi-faceted approach in order to change health behaviours. One of the reasons that primary care setting-based counselling may not always be effective is that primary care workers tend to give direct advice rather than allocating time to identify patients who are ready to begin an exercise programme and to negotiate an appropriate individually-adapted exercise programme (cf. Hillsdon et al., 2002).

#### *Opportunities in specialized mental health care settings*

Mental health professionals as a group are an underused, highly valuable resource for the promotion of physical activities. It has been shown to be helpful for primary care physicians to engage in 20–30 minutes of negotiation on physical activity using the skill of motivational interviewing (Hillsdon et al., 2002). Motivational interviewing is a skill that many mental health providers can easily learn, and it is widely used in the treatment of addictive behaviours (Rollnick, Heather, & Bell, 1992). Engaging in negotiation is not new to mental health professionals who treat depression. Indeed, one strategy of cognitive-behaviour therapy of depression is to encourage the patient to become more active by giving negotiated homework assignments involving activities that are either pleasurable or involve gaining some form of mastery (Beck, Rush, Shaw, & Emery, 1979). Consultations with mental health professionals are typically longer than those with many other types of physicians, making it likely that mental health professionals have time to properly negotiate and develop personal action plans with strategies to overcome potential barriers and monitoring of progress. Thus, mental health professionals are particularly well-placed to negotiate individually-tailored physical activity programmes with depressed and anxious patients.

## Conclusion

This brief commentary has highlighted a potential role of physical activity in the field of mental health. A relationship between physical activity and anxiety disorders, mood disorders and mental well-being has been well-documented. While much more needs to be known about the potential psychosocial and physical benefits of physical exercise among people with schizophrenia, there is increasing evidence that participation in an exercise programme may be an effective treatment for depression. The type, intensity, and minimal duration of activity required to substantially reduce symptoms of depression still need to be quantified to facilitate the generation of clinical guidelines. Mental health professionals may be well placed to negotiate physical activity programmes with their patients and to transfer such negotiation skills to general health care workers. Presently it is not known to what extent physical activity promotion programmes can help prevent mental disorder or promote mental health in the community. A variety of community interventions exist that are able to increase physical activity in the general population. The effectiveness of such interventions needs to be evaluated in terms of preventing mental disorder and promoting mental health in communities. The fact that the promotion of physical activity is already a well-established public health intervention to reduce risk of physical disease, provides an opportunity for collaboration between public health specialists and researchers in the fields of mental health and physical health. Routine inclusion of mental disorder and well-being measures in physical activity research would be a first step towards providing a stronger evidence base to assess potential mental health benefits.

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