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## The mental health benefits of sports: A critical review

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### Abstract

The relationship between physical activity and mental health is a well-documented area of study, with substantial evidence supporting the positive effects of physical activity on various aspects of mental well-being across different age groups. Regular physical activity has been associated with reduced levels of anxiety, stress, and depression, while also improving mood, self-esteem, and cognitive function. However, the underlying mechanisms of these associations remain complex and require further exploration. Moreover, it is essential to investigate whether these benefits of physical activity are consistent across diverse socio-economic and cultural contexts. Additionally, understanding the role of different types and characteristics of exercise in promoting mental health is crucial for developing effective interventions. Studies on mental health in students highlight the prevalence of stress and mental disorders, particularly among university students, underscoring the need for targeted interventions to support their well-being. Various psychological hypotheses, including distraction, self-efficacy, and social interaction, offer insights into the mechanisms through which physical activity positively impacts mental health. Furthermore, research suggests that physical exercise not only alleviates symptoms of depression but also enhances social interaction and functional autonomy, thereby improving overall quality of life. Mental health, conceptualized as a comprehensive set of outcomes encompassing self-related constructs, well-being, ill-being, and cognition, plays a critical role in individual and social functioning across the lifespan. Given the significant global burden of mental disorders, understanding and promoting mental health through strategies such as physical activity interventions are essential for improving public health and reducing the societal impact of mental illness. In summary, fostering a better understanding of the bidirectional relationship between physical activity and mental health, along with addressing the complex interplay of biological, psychological, and social factors, is vital for developing effective interventions and policies to promote mental well-being and prevent mental disorders.

**Keywords:** WHO, benefits of sports, mental health, physical activity

### Introduction

#### Physical Activity

Connections between physical activity (i.e., any bodily movement produced by skeletal muscles that requires energy expenditure, thus including any modality of movement at any intensity) and mental health have been well documented (Biddle *et al.*, 2019; Cortis *et al.*, 2017; World Health Organisation [WHO], 2022) <sup>[7, 12, 45]</sup> with clear inter-links between physical and mental health and quality of life (Biddle *et al.*, 2021; Ciaccioni *et al.*, 2022) <sup>[7, 11]</sup>. Compared to inactive people, individuals who perform greater amounts of moderate-to-vigorous physical activity are likely to experience improvements in anxiety, stress, depression, self-esteem, mood, and cognition (Biddle *et al.*, 2021) <sup>[7]</sup>, and to have lower risks of developing cognitive impairment and dementia (US Department of Health and Human Services, 2018) <sup>[39]</sup>. Whilst in youth strong evidence for a causal association between physical activity and mental health emerges for cognitive functioning, in older adults exercise is particularly effective in reducing depressive symptoms (Biddle *et al.*, 2019; Catalan-Matamoros *et al.*, 2016) <sup>[7, 10]</sup>. Still the complicated and interconnected mechanisms underlying the relationships between physical activity and mental health remain unclear (Rose & Soundy, 2020; Taylor & Faulkner, 2008) <sup>[34, 37]</sup>. Second, there is a need to investigate whether these associations are consistent across dissimilar socio-economic and cultural contexts (Pesce *et al.*, 2021; White *et al.*, 2017) <sup>[27, 42]</sup>. Third, more research is needed to explore the role of different types and characteristics of exercise (e.g., sport vs leisure, low vs high intensity, multicomponent vs single-component,

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supervised versus self-initiated) in promoting mental health (Rebar & Taylor, 2017; Fessel *et al.*, 2017; Vella *et al.*, 2023) [31, 15, 40].

### **Mental Health**

Studies on mental health in students deal with various aspects, especially with stress, well-being, and risk for depression. In terms of stress levels, university students experience high amounts of stress during their study programs (Bayram & Bilgel, 2008) [5]. These stress levels can have negative effects on students' academic performance (Bennett, 2007; Janse van Rensburg *et al.*, 2011) [6, 20] but are also often associated with mental disorders (e.g., depression). Recent studies indicate prevalence rates for mental disorders in students between 20% and 30% (Beiter *et al.*, 2015; Grobe *et al.*, 2018; Gusy *et al.*, 2016; Meier *et al.*, 2010) [47, 18, 19, 23]. Within the group of students, sports students represent a special target group when considering stress at university (i.e., study-related stress). They are confronted with study-related stressors that are not only caused by typical academic demands (i.e., examinations) but also by physical and sporting demands (i.e., physical performance, training). This combination of academic and physical demands may have a special impact on study-related stress processes in sports students. Whether study-related stress affects the overall well-being of students and their general risk for depression is largely unknown. Therefore, the main objective of this study is to focus on the specific target group of sports students and to examine study-related stress and its relationships to general well-being and risk for depression at different points of time during their studies. The results of this study should be discussed with the perspective of developing specific health prevention programs for sports person.

### **Relationship between Physical Activity and Mental Health**

There is a strong relationship between physical activity and mental health. Cross-sectional studies show that regular physical activity is associated with better mental health and emotional well-being (Galper, 2006; Goodwin, 2003) [16, 17] and lower rates of mental disorders (Goodwin, 2003) [17]. Longitudinal studies also show an association between physical activity and reduced risk of developing a mental disorder (ten Have, de Graaf, & Monshouwer, 2011) [38]. For example, a population-based study of 7076 Dutch adults found that engaging in physical exercise reduced the risk of developing a mood or anxiety disorder over the 3-year follow-up period, even when controlling for sociodemographic characteristics and physical illnesses (ten Have *et al.*, 2011) [38].

### **Psychological Hypotheses Explaining the Benefits of Physical Activity**

Various psychological hypotheses have been proposed to explain the beneficial effects of physical activity on mental health, the main being 1) distraction, 2) self-efficacy, and 3) social interaction. The distraction hypothesis suggests that diversion from unfavorable stimuli leads to an improved mood during and after exercise (Morgan, 1985) [48]. The self-efficacy hypothesis proposes that, since physical exercise can be seen as a challenging activity, the ability to get involved in it in a regular manner might lead to

improved mood and self-confidence (North *et al.*, 1990) [25]. With respect to the social interaction hypothesis, the social relationships commonly inherent in physical activity, as well as the mutual support that occurs among individuals involved in exercise, play an important role in the effects of exercise on mental health (Ransford, 1982) [30].

### **The Impact of Physical Activity on Mental Health**

Decreased physical activity can contribute significantly to increased levels of depression (Moore *et al.*, 1999) [24]. On the other hand, regular physical exercise positively alters the symptoms of depression, thereby promoting mental health (Moore *et al.*, 1999; Brocardo *et al.*, 2012) [24, 9]. In addition, physical exercise facilitates and stimulates social interaction with positive consequences on quality of life (Moore *et al.*, 1999; Salmon, 2001) [24, 35]. Feasible and effective interventions that might provide benefits to both physical and mental health are needed for these disorders to optimize health outcomes in this vulnerable patient group (Moore *et al.*, 1999; De Matos *et al.*, 2017) [24, 13]. Recently, research in this area has been focused on mental health markers, which reflect common pathophysiological processes related to the loss of functional autonomy and increased oxidative stress that are thought to be involved in depression (Salmon, 2001; Kotan-VO *et al.*, 2011) [35, 21]. Psychosocial stressors, a sedentary lifestyle, and low functional autonomy may alter cellular functioning and have been proposed as worthwhile intervention targets for the treatment or prevention of depression (Brocardo *et al.*, 2012; Schuch *et al.*, 2016) [9, 49]. Although studies have shown significant improvement in the depressive symptoms of elderly individuals after the regular practice of physical exercises (Brocardo *et al.*, 2012; Aidar *et al.*, 2006) [9, 1], the relations between mental health, functional autonomy, and oxidative stress remain obscure. The aim of this study was to investigate the effects of aquatic exercise on mental health, functional autonomy, and oxidative stress parameters in depressed elderly individuals. Mental health plays an essential role in many individual and social aspects across the lifespan (Prince *et al.*, 2007; World Health Organisation [WHO], 2021) [44]. Framed within a wide variety of theories, mental health has been a contested concept for decades. Recently, 34 different models were identified and grouped into five broader and interconnected categories, with the biological and psychological approaches and the social, consumer, and cultural approaches representing the most and least diversified theories, respectively (Richter & Dixon, 2022) [33]. Therefore, incorporating both psychological and biological data, mental health will be operationalized as a set of comprehensive and integrated outcomes such as self-related constructs (e.g., self-esteem, body image), ill-being (i.e., negatively framed emotions and emotional-related behavioral disorders such as depression, anxiety), well-being (i.e., positively framed states and skills such as emotional intelligence, coping, life satisfaction), and cognition (with underlying brain health mechanisms) (American Psychiatric Association [APA], 2013; Lubans *et al.*, 2016; WHO, 2021) [4, 22, 45]. Whilst people with positive self-esteem and a healthy body image are generally more resilient to stress and may be better able to cope with life's challenges, individuals with cognitive impairments and those socially isolated may be at higher risk for developing mental health problems, negative thought patterns, and unhealthy behaviors (APA, 2013;

WHO, 2021) [4, 45]. Mental disorders affect millions of people worldwide and account for approximately 10% of the global burden of disease (WHO, 2018; 2021) [43-44]. Moreover, mental disorders frequently lead individuals and families into poverty and produce disproportionately higher rates of mortality (Allen *et al.*, 2014; Bratman *et al.*, 2019; WHO, 2021) [8].

## Discussion

The impact of sports on mental health is a multifaceted topic, encompassing various aspects of well-being among athletes across different levels of competition. Five research papers shed light on different dimensions of this relationship, providing valuable insights into the mental health challenges and benefits associated with sports participation.

Eather *et al.* (2023) [14] highlights the positive effects of sport participation on mental health and social outcomes in adults. The systematic review suggests that engaging in sports, whether at the community or elite level, is associated with improved psychological well-being and reduced levels of depression, anxiety, and stress. Notably, team sports appear to offer additional benefits compared to individual sports, emphasizing the importance of social interaction and teamwork in promoting mental health among adults.

In contrast, Rice *et al.* (2016) [32] focuses on elite athletes and their susceptibility to mental health problems. Despite the physical demands of elite sport being well-documented, there is a lack of comprehensive research on the mental health and psychological well-being of elite athletes. While some studies suggest that elite athletes experience a comparable risk of mental disorders to the general population, the evidence base is limited by methodological weaknesses and the absence of intervention-based research.

Wang *et al.* (2023) [41] explores the potential of mindfulness-based interventions (MBIs) in improving athletic performance and mental health among athletes. The meta-analysis indicates that MBIs can enhance athletes' mindfulness levels and related psychological components, although the effects on mental health outcomes remain inconclusive. This underscores the need for further high-quality research to validate the effectiveness of MBIs in sports settings.

Addressing mental health concerns among student-athletes is the focus of Yoon *et al.* (2023) [46]. Despite efforts to reduce stigma surrounding mental health in collegiate sports, barriers persist, preventing student-athletes from seeking help. Internal barriers, such as beliefs and attitudes about mental health, as well as external factors like coach attitudes, influence help-seeking behavior. The importance of shared identities between student-athletes and sport psychologists emerges as a potential facilitator of seeking mental health care.

Lastly, Shukla *et al.* (2023) [36] examines the impact of the COVID-19 pandemic on the mental health of athletes. The unprecedented challenges posed by lockdown restrictions and social isolation have exacerbated mental health issues among athletes worldwide. Disruptions to training, competition, and team dynamics have contributed to increased anxiety, stress, and depression among athletes, highlighting the need for targeted interventions to support their mental well-being during and after the pandemic.

In conclusion, the relationship between sports and mental health is complex and multifaceted, influenced by various

individual, social, and environmental factors. While sports participation can promote psychological well-being and social connection, athletes, particularly at the elite level, face unique challenges that require tailored interventions and support mechanisms. Further research is needed to better understand the mechanisms underlying the impact of sports on mental health and to develop effective strategies for promoting athlete well-being across all levels of competition.

## Conclusion

In conclusion, the intricate relationship between physical activity and mental health is well-documented, with substantial evidence suggesting positive effects on various aspects of mental well-being across different age groups. Regular physical activity has been linked to reduced levels of anxiety, stress, and depression, while also improving mood, self-esteem, and cognitive function. However, the underlying mechanisms of these associations remain complex and require further exploration. Moreover, it's essential to investigate whether these benefits of physical activity are consistent across diverse socio-economic and cultural contexts. Additionally, understanding the role of different types and characteristics of exercise in promoting mental health is crucial for developing effective interventions. Studies on mental health in students underscore the prevalence of stress and mental disorders, particularly among university students, highlighting the need for targeted interventions to support their well-being. Various psychological hypotheses, including distraction, self-efficacy, and social interaction, offer insights into the mechanisms through which physical activity positively impacts mental health. Furthermore, research suggests that physical exercise not only alleviates symptoms of depression but also enhances social interaction and functional autonomy, thereby improving overall quality of life. Mental health, conceptualized as a comprehensive set of outcomes encompassing self-related constructs, well-being, ill-being, and cognition, plays a critical role in individual and social functioning across the lifespan. Given the significant global burden of mental disorders, understanding and promoting mental health through strategies such as physical activity interventions is essential for improving public health and reducing the societal impact of mental illness. In summary, fostering a better understanding of the bidirectional relationship between physical activity and mental health, along with addressing the complex interplay of biological, psychological, and social factors, is vital for developing effective interventions and policies to promote mental well-being and prevent mental disorders.

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