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Review paper *Pregledni rad*

Exercise and Emotional Well-being: What Does Physical Activity Bring to Our Happiness?

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Abstract: *This review paper was created with the intention of critically examining the findings of contemporary scientific research studies that explore the relationship between physical activity and the perception and experience of positive emotions and emotional states. The method used is bibliographic-speculative. The results indicate that physical activity contributes to the perception and experience of positive emotional states (colloquially: happiness), as assessed through some of the most commonly measured parameters (higher levels of subjective and psychological wellbeing, positive affect, quality of life, and lower levels of depression, anxiety, and stress) across all stages of life.*
Keywords: *physical activity, wellbeing, happiness, satisfaction with life*

Introduction

As in everyday life, physical exercise is most commonly linked to mental health in science through understanding the impact of physical activity on mood (Popov & Jakovljev, 2017). Besides professional sports, people engage in physical activity for recreation and to maintain physical and mental health. Numerous studies confirm the connection between recreational exercise and psychological well-being (Hassmen et al., 2000). Physical activity in this context is defined as any bodily movement produced by skeletal muscles and results in energy expenditure. In contrast, physical exercise refers to a specific form of physical activity that is planned, structured, and repeated to improve or maintain physical fitness (Caspersen et al., 1985). On the other hand, pursuing happiness is a universal human aspiration, as research shows that people in nearly all cultures most often cite achieving happiness as their primary life goal (Diener & Oishi, 2000). Furthermore, most people consider happiness the most important life value (Diener & Oishi, 2004). These studies suggest that quality of life and mental health are not characterized by a neutral state or the absence of negative experiences but by pleasant emotions and satisfaction with various aspects of life[1]. Moreover, subjective well-being is significant at the individual level – happiness and life satisfaction, along with economic and social indicators- and represents key indicators of quality of life in society (Diener & Suh, 1998). Subjective well-being (SWB) refers to an individual's assessment of their own life in terms of satisfaction, positive emotions, and the absence of negative emotions (Diener, 1984). It is a multidimensional construct that encompasses a cognitive component (life satisfaction) and an affective component (the frequency and intensity of positive and negative emotions) (Diener et al., 1999). High subjective well-being is associated with better mental and physical health, better interpersonal relationships, and greater productivity (Lyubomirsky et al, 2005).

This paper aims to review research on the relationship between physical activity and subjective well-being to answer the question: Is it worth "sweating" for happiness, or does physical activity help in experiencing pleasant emotions and happiness? Additionally, this paper seeks to answer in which age groups and at what intensity physical activity contributes to life satisfaction. Since happiness is a highly individual feeling that cannot be generalized, the research is based on the connection between measurable parameters used in science to describe the feeling of happiness and physical activity. The paper primarily relies on recent research, although several foundational older studies are referenced. The impact of physical activity on these parameters has been explored across life stages from adolescence to late adulthood.

1 **Positive psychology** is a scientific discipline that focuses on the importance of positive emotions for mental health, as well as overall psychological functioning, and serves as a complement to the previously pathology-centered approach to the science of mental health (Seligman & Csikszentmihalyi, 2000).

What is the Measure of Happiness in a Psychological Sense?

Pursuing happiness is likely a key determinant of human existence (Ellis, 2001). The need and ambition to achieve the ideal of happiness is common to everyone across all eras and social systems (Seligman, 2002; Csikszentmihalyi, 1990). What distinguishes people in this regard is the way they attain happiness. Some find happiness in the company of others, while others find it in solitude. Listening to music brings one person immense joy, leaving another completely unmoved. There are individuals whose sense of happiness is directly tied to physical appearance and presence; others pay little attention to such things. The victory of a favorite football team in a major competition may be a lasting source of joy for one person, while another may hardly be aware that the sport exists. From a material perspective, some find great happiness in acquiring wealth, while others are pleased living a life oriented toward spiritual values, owning very little (Diener & Seligman, 2004). Empirical findings indicate that the intensity of happiness experienced remains moderately expressed by most people. High-intensity feelings of happiness are typically short-lived episodes, after which most individuals return to a stable state of mild positive emotions (Diener & Diener, 1996).

Although the experience of happiness is nearly universal, the conceptualization of this phenomenon remains a challenge due to its multidimensional nature. It has been shown that pleasant sensory stimuli—such as optimal temperature, harmonious sounds, pleasant scents, tastes, and aesthetic scenes—significantly contribute to the immediate feeling of pleasure. However, a lasting and deeper experience of happiness requires the integration of higher psychological processes, including a sense of life meaning, inner harmony, and spiritual fulfillment (Ng, 2022). Is the psychological experience of happiness primarily a matter of perception?

Given the high degree of subjectivity in the experience of happiness, psychological science resorts to operationalizing related constructs, such as Quality of Life (QOL). The World Health Organization defines quality of life as "an individual's perception of their position in life in the context of the culture and value systems in which they live, and about their goals, expectations, standards, and concerns." The WHOQOL-100 instrument was developed for empirical research, encompassing six domains: physical health, psychological health, level of independence, social relationships, environment, spirituality, religion, or personal beliefs (Pavićević & Minić, 2018). A key advantage of quality of life as a parameter defined by the WHO is its relatively good measurability, which serves its purpose as a statistical indicator. However, although it is a predictor, quality of life cannot be equated with happiness. Is a quality life also a good life?

In the search for an answer to the question of what truly constitutes a good life in the context of mental health, two major lines of thought have emerged. The first is the *hedonistic* approach, which defines a good life as one filled with pleasures, happiness, and comfort (Diener et al., 2006). The hedonistic perspective has been supported by many thinkers throughout history, from Aristippus of Cyrene to more modern philosophers like Thomas Hobbes and Jeremy Bentham. Hedonism defines life satisfaction along a continuum—from a relatively narrow understanding of "a life filled with physical pleasures" to a broader definition of hedonism as "the idea of what makes life pleasant or unpleasant."

The second line of thought is the *eudaimonistic* approach, which sees a good life as one directed toward the fulfillment of human potential. Aristotle regarded hedonism as a vulgar ideal that reduces people to slaves of their own pleasures. Erich Fromm warned of the difference between subjective needs and objectively valid needs, considering the former harmful and the latter essential for human potential development (Ryan & Deci, 2001). Simplified, the hedonistic approach can be defined as the pursuit of pleasure, while the eudaimonistic approach is the pursuit of overall personal growth. These approaches are strictly distinguished only at the philosophical level, while on the personal level, they may overlap.

In the continued search for a clearer definition and measurement of happiness, it has been linked to *psychological well-being***,** defined through six variables: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (Ryff, 1989). Still eluding precise definition, the concepts of happiness, the good life, quality of life, and psychological well-being are often inconsistently used and interchangeably applied in the literature.

Methodology

This paper is based on a narrative, bibliographic-speculative review of empirical and theoretical studies examining the relationship between physical activity and indicators of happiness and emotional well-being across the lifespan. Electronic searches were conducted in major scientific databases, including Web of Science, Scopus, PubMed, and Google Scholar. The search strategy combined keywords such as *physical activity*, *exercise*, *subjective well-being*, *psychological well-being*, *happiness*, *life satisfaction*, *quality of life*, *mental health*, and *aging*. Reference lists from relevant articles, books, and review papers were also screened to identify additional sources.

The inclusion criteria for the empirical studies discussed in this review were:

1. peer-reviewed publications,
2. studies that operationalized physical activity or exercise as an independent or predictor variable,
3. studies that included at least one indicator of subjective well-being, psychological well-being, life satisfaction, quality of life, or related positive and negative affective states (e.g., depression, anxiety, stress),
4. studies conducted on non-clinical populations, from adolescence to old age.

Both cross-sectional and longitudinal designs, as well as randomized controlled trials and meta-analyses, were considered. Foundational theoretical and conceptual contributions on happiness and well-being were also included in order to contextualize and interpret empirical findings. Given the narrative character of this review, studies were not formally coded, and no quantitative meta-analysis was performed. Instead, the emphasis was on integrating findings, identifying recurring patterns, and highlighting open questions relevant for future research.

Results

The Connection Between Physical Activity and Positive Indicators of Mental Health

Caspersen defined physical activity as "any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen et al., 1985). Numerous studies have observed a positive relationship between physical activity and improvements in various parameters associated with happiness. One of the earlier large-scale randomized cluster studies (Ferron et al., 1999), conducted in Switzerland, included 9,268 individuals aged 15–20. The study aimed to determine the association between the frequency of sports activities and somatic (cardiovascular) and mental health. The findings showed a link between low levels of physical activity and health problems such as headaches, insomnia, stomach pain, and general physical weakness. Conversely, students who regularly engaged in physical activity reported higher levels of energy, optimism, and confidence in their health and lower levels of anxiety, stress, and suicidal ideation.

More recent studies have yielded similar results. A comprehensive study by Malagodi and colleagues (Malagodi et al., 2024) focused on the student population and the conditions available for engaging in sports at British universities. The study addressed growing concerns over the worsening mental health indicators observed among students over the past 15 years. Promoting physical activity was identified as a key strategy in preserving and improving mental health. The research found that out of 143 universities, only 45 (36%) had appropriate facilities for engaging in physical activities, and only 54 interventions had been implemented to increase participation in and improve conditions for physical activity.

Younger individuals were also the target group in a study by Asquith and colleagues (Asquith et al., 2022). Three cohort studies were conducted among individuals aged 14–15, 16–17, and 18–20, examining, among other factors, the influence of leisure-time physical activity on their well-being. The study focused on five well-being factors: life satisfaction, positive affect, negative affect, mental health, and so-called "flourishing mental health."[2] The findings showed that physical activity benefits younger populations, highlighting the detrimental impact of screen time. Time spent in front of electronic devices often replaces time dedicated to physical activity, socialization, and sleep.

The Danish cohort study by Ibanez Roman and colleagues (Ibanez Roman et al., 2023) is a very current contribution to the field. This research aimed to investigate the relationship between physical activity and positive mental health, specifically mental well-being. The study design is both interesting and innovative, as it analyzes physical activity levels in 2020 and correlates them with mental well-being measured in 2019. In a representative sample of 5,000 individuals aged 15 and older, it was found that mental well-being in 2019 could predict the likelihood of engaging in ≥150 minutes of physical activity per week in 2020, suggesting a reciprocal relationship: happier individuals tend to exercise more, and individuals who exercise more tend to be happier.

The benefits of physical activity for life satisfaction in younger populations were the subject of a study involving 1,002 high school students in Macau, Taipei, and Qujing. The study proposed that physical activity positively impacts reductions in depression, anxiety, and psychological/emotional distress in adolescents. A positive correlation was confirmed: as physical activity increased, so did life satisfaction. The results suggest that high schools should implement strategies to increase students' physical activity levels. Two strategies were proposed: systematic education through the curriculum and a wide range of extracurricular and elective sports activities (Chen et al., 2020).

2 **Flourishing mental health** refers to a state where individuals experience high levels of emotional well-being, psychological functioning, and social functioning. It is more than simply the absence of mental illness; flourishing describes optimal human functioning characterized by positive emotions, life satisfaction, a sense of meaning and purpose, strong relationships, and effective coping with life's challenges (Keyes,2002)

The link between physical activity and variables related to happiness in younger individuals has also been recognized and confirmed. A Croatian research team explored which intensity and domain of physical activity are most closely related to life satisfaction. They used WHO's standard recommendation that physical activity can be categorized into light, moderate, and vigorous intensity and that recommended levels can be achieved in various life domains — at work, at home, during commuting, or in leisure time. Their study suggested that although the domain of physical activity may not be critical for somatic health, it does influence life satisfaction. In a sample of 1,750 students from the University of Zagreb, a weak but present correlation was found between vigorous physical activity during leisure time and life satisfaction (Pedišić et al., 2015).

The relationship between the type and intensity of physical activity and indicators of positive (positive affect, subjective well-being, and unconditional self-acceptance) and negative (depression, anxiety, stress, negative affect, and conditional self-acceptance) mental health was the focus of a study by Popov and colleagues. Conducted in Serbia on a sample of 939 participants from the general population aged 18 to 75, the study found that physically active individuals exhibit higher levels of positive mental health indicators and lower levels of negative ones. However, there was no significant difference between recreational exercisers and highly dedicated fitness practitioners (Popov et al., 2023).

The correlation between intensity and volume of physical activity and subjective well-being was explored in a randomized study involving 22,971 individuals from 28 European Union countries (Wicker & Frick, 2015). The findings suggest that for adults, an increase in moderate-intensity physical activity (as defined by the WHO) leads to improved subjective well-being. However, increasing the volume of high-intensity physical activity is associated with a decrease in subjective well-being. These findings challenge the WHO's guidelines, which equate moderate and vigorous physical activity in terms of their positive health effects, including their effects on subjective well-being.

In later life, depression often accompanies degenerative aging processes and the loss of social roles. Research by Ekkakis and Murri suggests that physical activity is equally as effective as medication or psychotherapy in cases of moderate depression (Ekkakis & Murri, 2017). Much earlier, a longitudinal study by Morgan and Bath (1998) monitored the psychological well-being associated with physical activity among 1,042 individuals over the age of 65 over an eight-year period. Three types of physical activity were assessed: walking, housework and yard work, and leisure-time physical activities. Following the initial measurement, follow-ups were conducted after four and eight years. A weak positive correlation was observed between physical activity levels and psychological well-being. However, the authors raised concerns about the mechanism underlying this effect, suggesting that socialization and the sense of accomplishment associated with physical activity may have contributed to the observed outcomes.

Chinese researchers designed a study aiming to determine which intensity of physical exercise best supports the concept of healthy aging, defined through a model encompassing the following components: (1) absence of significant diseases, (2) absence of disability, (3) preserved cognitive function, (4) independence, (5) active social interactions, and (6) high life satisfaction. The study included 9,026 individuals aged 60 and older. Physical activity intensities were categorized into three levels: vigorous, moderate, and light. Considering the participants' age, vigorous activity was defined as any that leads to shortness of breath, such as cycling, digging, or carrying heavy loads. Moderate intensity refers to activities that increase breathing rate, such as carrying light loads, brisk walking, or practicing Tai Chi. Light-intensity activities were defined as those that do not affect breathing patterns. Moderate intensity was identified as the most significant predictor of successful aging, and it also showed a positive impact on life satisfaction (Chen et al., 2021).

Finally, a meta-analysis by Morgan and colleagues (Morgan et al., 2019) synthesized findings from 39 studies on the effects of physical activity on quality of life. The summarized conclusions suggest that maintaining a habit of physical activity in older age supports the often challenging transition to a life with fewer responsibilities, reduced social roles, and diminished societal relevance. On a daily level, physical activity can alter monotonous routines and enhance one's sense of purpose, meaning, and direction. Group-based physical activities can increase feelings of connection, belonging, support (both given and received), and self-confidence. Such group activities typically foster socialization, laughter, and positive mood—elements that are particularly valuable to older adults.

Discussion

A review of available studies shows a fairly consistent pattern: physical activity across ages is most often associated with higher levels of life satisfaction and subjective well-being, as well as lower levels of depression, anxiety,

and stress. Among younger respondents, the frequency and intensity of leisure-time exercise stand out. More active adolescents and students report higher levels of positive emotions and lower levels of emotional distress (Ferron et al., 1999; Chen et al., 2020; Pedišić et al., 2015).

Data from larger European and Asian samples provide a somewhat more nuanced picture. Moderate-intensity physical activity is generally associated with more favorable psychological outcomes in adults, whereas very intense or prolonged exercise is not necessarily associated with higher subjective well-being; in some cases, it even goes in the opposite direction (Wicker & Frick, 2015). In older adults, activities that are not excessively demanding – such as brisk walking or low-intensity exercise – are the most reliable predictors of life satisfaction and overall aging success (Chen et al., 2021; Morgan & Bath, 1998).

Several studies also indicate that the relationship between physical activity and well-being is likely not unidirectional. People who feel psychologically better often find it easier to establish a routine of regular physical activity, and this routine can then help maintain or improve their emotional state (Ibanez Roman et al., 2023). In studies looking at depressive symptoms in older age, physical activity has occasionally been shown to be as beneficial as standard therapeutic approaches for mild forms of depression, although it is clear that other factors, such as social contact and a sense of accomplishment, also influence the outcome (Ekkekakis & Murri, 2017; Morgan et al., 2019).

Although the results are generally consistent, there are limitations. Many studies rely on self-reports of physical activity and well-being, which may bias the accuracy of the findings. Cross-sectional designs are still standard, making it difficult to draw firm conclusions about causality. Studies also vary considerably in how they measure activity (volume, domain, intensity) and in the instruments they use to assess subjective well-being, making direct comparisons difficult. In addition, qualitative aspects of activity – for example, whether it is recreational, work-related, or group-based – likely play a role in how a person feels after exercise, but these factors remain under-examined in many studies (Pedišić et al., 2015; Morgan et al., 2019).

Overall, the available evidence suggests that physical activity is an important, but not the only, element of emotional well-being. Its contribution depends on age, activity intensity, personal preferences, social environment, and broader lifestyle. Further research could clarify how different types of movement – and the contexts in which they occur – shape the subjective experience of the "good life".

Conclusion

A clear definition of happiness continues to elude scientists. If it is any consolation, philosophers, writers, and poets have not had much more success. Still, happiness can be indirectly measured through various auxiliary and quantifiable variables, the most commonly represented in the literature being life satisfaction, psychological well-being, and subjective well-being. Can physical activity contribute to the subjective experience of happiness? Numerous studies have confirmed the positive impact of physical activity on these measurable variables across all stages of life. In children and adolescents, the greatest effect has been observed with high-intensity exercise; in middle age, with moderate intensity; and in older adulthood, it is important to maintain the habit of physical exercise. The influence of socializing, companionship, and well-structured leisure time increases, particularly through group-based physical activities. The results of the analyzed studies provide an unequivocal answer to the question posed in the title. In pursuit of happiness and life satisfaction, it is worth engaging in physical activity—intensively in youth, moderately in middle age, and in groups during old age.

Future research in this field still faces unanswered questions: How does gender influence the relationship between physical activity intensity and healthy aging components, including subjective life satisfaction? Additionally, how do specific types of physical activity (organized, group-based, recreational, or particular sports) contribute to the experience of positive emotions and individual well-being?

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