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A Community-Based Approach to Increasing Physical Activity Among University Students: A Narrative Review and Strategic Implications for Universities

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ABSTRACT

Physical activity plays a vital role in supporting the physical health, mental well-being, and cognitive function of university students. Several studies have demonstrated that physical activity positively contributes to executive brain function, working memory, and concentration. These cognitive functions are directly related to students' academic performance. Despite this, physical activity levels among university students tend to be low, especially in higher education environments dominated by sedentary behavior. In this context, a community-based approach is viewed as a potential strategy for sustainably increasing student participation in physical activity. This narrative review aims to explore the role of community-based approaches in facilitating active lifestyles among university students and to identify their implications for university policy development. Through an analysis of recent literature, social engagement and environmental support have been identified as key factors that make this approach relevant and applicable to campus settings. These findings provide a conceptual foundation for universities to consider community-based interventions as part of their strategic efforts to foster a campus culture that supports healthy lifestyles and optimal academic performance.

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INTRODUCTION

Physical activity is a key determinant of public health, playing a vital role in the prevention of chronic diseases and improvement of quality of life. Several studies have consistently shown that an active lifestyle reduces the risk of non-communicable diseases, including type 2 diabetes, hypertension, cardiovascular disease, obesity, and mental disorders (Gaetano, 2016; González et al., 2017). *World Health Organization Organization* (WHO) through *the Global Action Plan on Physical Activity 2018–2030* , targets a 15% reduction in the prevalence of physical inactivity globally by 2030, emphasizing the role of educational institutions in achieving this target (WHO, 2018). Therefore, the WHO recommends that adults perform at least 150 minutes of moderate-intensity or 75

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minutes of vigorous-intensity physical activity per week, in addition to muscle-strengthening exercises at least twice a week [4].

Despite ample evidence of the benefits of physical activity, global participation remains low, including that of university students. Cross-country studies show that over 40% of university students in Asia do not meet WHO recommendations (Pengpid & Peltzer, 2019), and the prevalence of sedentary behavior in the student population is reported to be approximately 11 hours time per day (Moulin et al., 2021). This condition makes university students a vulnerable group with long-term health risks due to inactivity. Frequently reported barriers include time constraints, lack of access to facilities, low motivation, and prioritization of academic demands over physical activity (Brown et al., 2024; Ferreira Silva et al., 2022). A systematic review also emphasized the importance of psychological, emotional, cognitive, environmental, and sociocultural factors in determining student engagement in physical activity (Ferreira Silva et al., 2022). On the other hand, physical activity has important implications for academic performance.

Several studies have shown that regular activity is associated with improved executive function, attention, working memory, concentration, and decision-making skills (Loprinzi et al., 2012; Redondo-Flórez et al., 2022). Exercise is associated with increased neuroplasticity and *brain-derived secretion neurotrophic factor* (BDNF), which strengthens executive function and learning capacity (Erickson et al., 2011). Physical activity has also been shown to be effective in improving mental well-being and academic performance. A systematic review and meta-analysis showed that physical activity-based interventions can reduce anxiety, depression, and stress symptoms in undergraduate students (Huang et al., 2024). Thus, physical activity is not only beneficial for health but also a strategic factor in supporting students' academic success in college.

Recent empirical evidence reinforces the crucial role of the community in supporting students' physical activity. Campus community-based interventions have been shown to increase moderate-to-vigorous activity levels. A systematic review based on the COM-B and TDF frameworks indicated that social influence, particularly exercising with friends or groups, is a key factor facilitating physical activity among university students (Brown et al., 2024). This community approach not only serves as a source of physical motivation, but also strengthens mental resilience through emotional support networks and conducive mountain facilities (Y. Zhang et al., 2022).

Therefore, this narrative review aims to explore the importance of physical activity among university students and examine community-based strategies that universities can implement to create an active and healthy campus environment for them. This approach is expected to not only support physical and mental health but also contribute to achieving the targets of the WHO Global Action Plan on Physical Activity 2018–2030.

METHODS

This article was compiled using a narrative review approach by searching the literature in PubMed and Google Scholar databases. The search was conducted using

keywords related to physical activity ("physical activity", "exercise"), student (" university students", "college students", "undergraduate", "higher education"), and community-based. Boolean operators (AND, OR) were used to combine the keywords.

Inclusion criteria included: (1) original research articles or reviews published in peer-reviewed journals , (2) primary population of university students or young adults, (3) articles written in English or Indonesian, and (4) published within the last 10 years. Articles that were irrelevant, not data-driven, or focused on non-student populations were excluded. Literature that met the criteria was then analyzed narratively by identifying key themes, comparing implementation contexts, and synthesizing to formulate strategic implications for universities.

RESULTS AND DISCUSSION

The Importance of Physical Activity For Students

Physical activity is a crucial determinant of health and optimal human function. Physiologically, regular exercise improves mitochondrial function, the primary organelle in skeletal muscle that regulates metabolism and adenosine production. triphosphate (ATP), two essential components of muscle contractility and plasticity (Distefano et al., 2018; Gan et al., 2018)). Longitudinal studies have shown that adults who maintain high-intensity physical activity have better mitochondrial capacity , comparable to physically active young adults, which further contributes to muscle quality, exercise efficiency, and optimal physical performance (Hood et al., 2019). In addition, physical activity increases blood circulation and oxygen supply to the brain while providing essential nutrients for nerve function. This mechanism not only supports the motor, cardiovascular, respiratory, hormonal, and immunological systems but also plays a crucial role in the maturation of motor areas in the brain, which correlates with motor development and accelerated nerve impulse conduction. Physical activity stimulates increased neurohormonal secretion by hypothalamic neurons, which influences the excitability of neurons that form synapses (Bidzan-Bluma & Lipowska, 2018). In addition, several studies have reported that physical activity can increase brain-derived neurotrophic factor levels. neurotrophic factor (BDNF), a neurotrophic protein that plays a role in synaptic plasticity, memory, and learning (Gomez-Pinilla & Hillman, 2013; Hopkins et al., 2012). The implications of these neurobiological mechanisms are evident in the improvement of students' cognitive function. Furthermore, physical activity is also associated with increased cerebrovascular reserve, which contributes to global cognitive function (Davenport et al., 2012). Thus, exercise not only supports physical health but also academic performance by improving attention, working memory, and executive function.

In addition to physiological and cognitive aspects, physical activity also plays a significant role in supporting students' mental health. A meta-analysis showed that exercise interventions have a moderate effect on reducing depression and anxiety among university students (H. Zhang et al., 2024). Furthermore, studies on the mechanisms suggest that physical activity improves psychological well-being through mediators such as self-esteem, self-efficacy and social support (White et al., 2024).

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In addition to individual benefits, physical activity also has social implications. Participation in team sports or community-based activities on campus has been shown to increase the sense of community, strengthen social support, and foster a sense of belonging to the university (Eime et al., 2013). Research among Chinese university students has shown that physical activity supports social support, subjective well-being, and self-esteem, all of which mediate the positive effects of exercise on students' subjective *well-being (Shang et al., 2021)*. This dimension aligns with a community-based approach, where physical activity is viewed not only as a means of improving individual health but also as a means of strengthening social cohesion, which supports the creation of a healthy and inclusive learning environment.

Consistent physical activity engagement among university students from an early age serves as a protective factor against chronic diseases such as obesity, hypertension, type 2 diabetes, and cardiovascular disease (WHO, 2020). College is a critical period for lifestyle formation; therefore, promoting physical activity in this population provides not only short-term benefits for academic performance and mental health but also a long-term investment in preventing the burden of chronic disease in adulthood.

Thus, scientific evidence consistently confirms that physical activity has multidimensional benefits for students, encompassing physiological, neurological, cognitive, mental, social, and preventive aspects. These findings provide a strong rationale for universities to integrate physical activity-enhancing strategies into campus health policies using a community-based approach.

Barriers To Student Physical Activity On Campus

Low physical activity in university students is influenced by a combination of academic, psychological, environmental, social, and economic factors. A heavy course load often leads to the sacrifice of exercise. This finding was also observed in a European study that highlighted the transition to college as a critical phase for decreased physical activity (Deforche et al., 2015). Furthermore, these time constraints are exacerbated by psychological factors, such as stress, anxiety, and low motivation, creating a gap between exercise intention and behavior.

A less supportive campus environment, such as limited access to facilities, distance, or additional costs, further reinforces the tendency toward sedentary behavior. Financial factors are also significant differentiators, with students with limited financial resources being less likely to participate in paid sports activities (Castro et al., 2020). Furthermore, social support has been shown to increase students' physical activity. A meta-analysis revealed a significant positive correlation between social support and physical activity, with peer support being more important than family support (Wang et al., 2024). The COM-B (Capability, Opportunity, Motivation, and Behavior) framework emphasizes the importance of a combination of individual factors, environmental opportunities, and social support. A recent systematic review confirmed that multilevel, community-based strategies are the most effective approach to increasing students' physical activity (Brown et al., 2024).

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Thus, low physical activity among university students cannot be viewed solely as an individual problem but rather as the result of a complex interaction between personal, social, and structural factors. Therefore, strategies to increase physical activity in higher education need to simultaneously integrate personal, social, and structural dimensions to achieve a more sustainable impact on physical activity.

Community-Based Approach: Concept And Relevance

A community-based approach emphasizes the active involvement of community members in the design, implementation, and evaluation of health programs. This principle is based on empowerment, participation, and contextual relevance, making it more adaptive than top-down intervention models that do not fully address the real needs (Jagosh et al., 2012; Wallerstein et al., 2017). In the context of higher education, students are positioned not only as beneficiaries but also as facilitators, peers, and mentors educators as well as the main drivers of the activities. This kind of involvement not only fosters a sense of ownership but also strengthens social solidarity, which is key to the program's sustainability (Jagosh et al., 2012; Olfert et al., 2018)

This approach is relevant for application in a highly heterogeneous campus environment. Community-Based Participatory Research (CBPR) shows that collaboration between students and stakeholders results in programs that are more contextual, responsive, and aligned with the dynamics of academic life (Wallerstein et al., 2017). This approach is also consistent with social-ecological theory, which emphasizes the interaction between individual factors, social support, cultural norms, and institutional policies in shaping health behavior. Therefore, community-based interventions not only increase sports participation but also create a more conducive campus ecosystem, for example, through the provision of activity spaces, strengthening peer groups, and integrating sports into academic and non-academic activities (Olfert et al., 2018; Sallis & Owen, 2015). Thus, this strategy can be seen as a holistic, inclusive, and sustainable approach to fostering a culture of healthy living in the university environment.

Findings From The Literature

A recent literature review showed that community-based approaches are consistently effective in increasing physical activity among university students. Interventions based on social and peer support have been shown to increase sports participation while reinforcing positive social norms related to active lifestyles through social networks within the student community (Sallis et al., 2016; Wang et al., 2024; Zhou et al., 2025). In addition to social aspects, digital innovation also contributes significantly to the effectiveness of interventions. Recent studies have shown that digital health student participation-based interventions can increase motivation and consistency of active behavior while reducing sedentary behavior (Bi et al., 2024; Peng et al., 2022). Technologies such as mobile applications and online platforms play a role in expanding the reach of interventions, strengthening social interactions, and maintaining the sustainability of community-based programs.

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From the perspective of active student participation, community-based participatory research (CBPR) emphasizes the importance of direct student involvement in the program's planning and evaluation stages. This approach not only fosters ownership but also ensures the program's relevance to students' real needs (Jagosh et al., 2012; Wallerstein et al., 2017). Furthermore, physical environmental factors and structural support play a crucial role. The availability of accessible sports facilities and supportive institutional policies has been shown to positively correlate with increased student participation in physical activity (Sallis et al., 2016). A supportive campus environment in terms of spatial design and health promotion policies is crucial for the long-term success of interventions.

Overall, this literature synthesis confirms that the most effective interventions are those that combine multiple dimensions in an integrative manner: social aspects through peer support, digital aspects through interactive technology, participatory aspects through direct student engagement, and structural aspects through creating a supportive campus environment.

Implications For Universities

The review findings indicate that universities play a strategic role in integrating community-based approaches into campus wellness policies. Physical activity can no longer be viewed as an add-on activity but rather as a vital part of the campus ecosystem that directly impacts student health, mental well-being, and academic success.

First, institutions must facilitate student involvement as program co-creators through activity units, student health centers, and cross-faculty forums. This active participation not only increases the relevance of interventions but also strengthens student leadership capacity and ownership of the program. Empowering student communities is crucial. Students should not only be positioned as beneficiaries but also as drivers through peer groups, sports clubs, and community initiatives that they form themselves. In this way, physical activity can develop into a campus culture based on unity and solidarity. Second, digital technology can be optimized to expand the program's reach. Participatory online applications or platforms have proven effective in maintaining motivation, strengthening social interaction, and fostering a sense of community among students. Third, support from the physical environment and institutional policies should be strengthened. Providing easily accessible sports facilities, activity-friendly open spaces, and regulations that incentivize participation will magnify the program's impact. Previous studies have shown that a combination of an adequate physical environment and supportive campus policies is key to fostering an active lifestyle.

Overall, these implications emphasize that universities have a dual role: as facilitators providing resources and as catalysts empowering students to become agents of change. The combination of social, digital, participatory, and structural dimensions will create a holistic strategy capable of sustainably cultivating a culture of physical activity in the university environment.

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CONCLUSION

Physical activity provides multidimensional benefits for students, ranging from physical health and mental well-being to improved cognitive function and academic performance. However, participation rates remain low because of personal, social, and structural barriers. The literature shows that a community-based approach is an effective and sustainable strategy for increasing physical activity through peer support, digital technology utilization, student engagement, environmental support, and institutional policies. Universities play a strategic role not only as providers of facilities but also as catalysts that empower students to become agents of change in their communities. By implementing a holistic strategy encompassing social, digital, participatory, and structural dimensions, universities can build a sustainable culture of physical activity that, in turn, supports optimal student health, mental well-being, and academic performance.

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