



The Transformative Power of Sports as a Catalyst for Positive Lifestyle Changes

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Article Info

Received: 23.09.2024
Accepted: 18.12.2024
Published: 30.12.2024

Keywords

Sports Participation
Lifestyle Changes
Socio-demographic
Health benefits
Public Policy

ABSTRACT

Abstract Sports participation has emerged as a powerful catalyst for positive lifestyle changes, conferring profound improvements in physical health, mental well-being, and social cohesion. However, sports also possess risks that must be prudently managed. This review explores the multifaceted impacts of sports on holistic health through a sociodemographic, psychological, and physiological lens. Sports serve as a socio-demographic equalizer, promoting cultural exchange, social mobility, inclusion, and female empowerment. Psychologically, routine sports participation alleviates anxiety and depression, enhances cognition and self-esteem, and induces an antidepressant effect via numerous biological mechanisms. However, excessive training at elite levels risks physical and psychological harm. Physiologically, our species is inherently adapted for high physical activity, though sedentary modern lifestyles create an energy surplus driving obesity and poor health outcomes. Sports participants tend to have better physical fitness, mental acuity, and lower disease risk. The health benefits extend from individual to societal levels via reduced healthcare costs. Multidisciplinary collaborations among policymakers, educators, healthcare professionals and sports administrators can optimize inclusive participation and engender positive lifestyle shifts via sports. Further research should explore longitudinal impacts, demographic variations, and technological innovations for engagement.

1. INTRODUCTION

The realm of sports, a ubiquitous part of human culture, presents itself as a paradoxical entity with far-reaching implications for the promotion of health and wellbeing. It serves as a powerful catalyst that can effectuate positive lifestyle modifications, providing an array of benefits that range from physical fitness to cognitive development. At the same time, it possesses the potential for adverse impacts, contingent upon factors such as the intensity of participation, the nature of the sport, and individual predispositions [1]. The duality inherent in sports and its transformative potential constitutes the focus of our research, as we delve into the role sports play in instigating beneficial lifestyle shifts.

Sports, predominantly characterized by physical activity, offer a potent means of improving

health outcomes. Regular participation in sports not only fosters a healthier physical lifestyle but also facilitates holistic development by enhancing mental health, cultivating personal growth, and promoting positive societal values. The potential for sports to engender these benefits is seen across all age groups, from youth to the elderly. Interestingly, participation in sports has been associated with a delayed onset and diminished consumption of deleterious substances such as alcohol. Furthermore, it has been found to instill knowledge and awareness of nutrition, exercise, and overall health, thereby empowering individuals to make more informed decisions regarding their wellbeing. For example, a study found that youth athletes had higher nutrition knowledge scores than non-athletes [2]. Another study revealed that just a single season of sports participation led to improvements in nutrient intake among youth [3].

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How to cite this article

Latif, R.A., Tumijan, W., Hidayat, Y., Carsiwan, C., and Nawi, N.F. (2024) The Transformative Power of Sports as a Catalyst for Positive Lifestyle Changes. *Int. J. Act. Health Aging*, 2(2)45-52.

It is crucial to acknowledge that the realm of sports is not devoid of potential pitfalls. While sports can usher in a multitude of health benefits, they also carry risks, particularly when engaged in at an elite level, where the fine line between peak performance and negative health impacts is often blurred. Detrimental effects can range from the risk of injury to the development of eating disorders, from psychological burnout to exercise-induced discomforts [4]. Furthermore, the competitive nature of sports may inadvertently foster an environment conducive to physical and psychological abuse. One study found the injury rate among college athletes to be 2 to 3 times higher than non-athletes [5]. An intriguing aspect of sports participation is that those engaged in structured training often exhibit lower physical activity levels compared to individuals who exercise without adhering to a fixed regimen. This phenomenon may be attributed to a decrease in spontaneous physical activity among the latter group, emphasizing the complexity of sports and physical activity's impacts on health and lifestyle. For instance, a study discovered that college athletes did 10% to 20% less physical activity than non-athletes outside of their sport [6].

The transformational power of sports in society has gained increasing significance over time, given the escalating trend towards organized physical activity. The role of sports extends beyond the individual, impacting public health at large and necessitating a comprehensive understanding of its multifaceted effects. Our research aims to elucidate this complex interplay between sports, health, and lifestyle changes, adopting a physiological and psychological perspective to provide a holistic view of the issue at hand.

This review paper embarks on an exploration of sports as a medium of changes for positive lifestyle, integrating both the beneficial aspects associated with physical activity and the added value of sports per se. We begin by providing succinct definitions of various concepts central to the discourse on physical activity and health. Subsequently, we delve into an examination of the lifestyle-related sociological, psychological, and physiological impacts of sports participation.

2. Defining Physical Activity, Exercise, and Sports Training

Physical activity, as defined by the Ministry of Health (Malaysia), encapsulates all forms of movement, including those associated with work, transportation, recreational activities, and exercise routines, produced by skeletal muscles that result in energy expenditure [7]. This broad definition

covers activities ranging from spontaneous, everyday movements to organized, intensive training sessions. The importance of physical activity is underscored by its profound impact on health – both physical and mental. Echoing the WHO's definition of health as a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity [8], this paper adopts an encompassing view of health that extends beyond the mere absence of disease.

Differentiating between physical exercise and sports training is crucial for understanding their respective impacts on health and lifestyle changes. Physical exercise, as per our discussion, is primarily aimed at enhancing health and physical capacity. This might include activities such as brisk walking, recreational swimming, or casual cycling. On the other hand, sports training is targeted at augmenting an individual's maximal physical capacity and performance. This would include more structured and intensive activities, like weight training, interval running, or professional sports training. For example, a study showed that moderate-intensity aerobic exercise for 30-60 minutes 3-5 days per week provides substantial health benefits [9]. However, high-intensity aerobic training for over an hour per session elicits greater fitness improvements [10].

Physical inactivity, which stands in contrast to the afore mentioned concepts, is characterized by a lack of body movement resulting in energy expenditure that closely mirrors resting levels. Individuals who fail to meet the prescribed guidelines for physical activity are deemed physically inactive and are often referred to as "sedentary". The risks associated with a sedentary lifestyle have been well-documented, including an increased susceptibility to a range of chronic diseases. For instance, research indicates that physical inactivity contributes to 5.3 million deaths per year worldwide [11]. Sports, an integral component of our discussion, can be organized based on several parameters such as age, gender, weight, or level of ambition. It can also manifest in spontaneous forms, such as impromptu games or recreational activities.

3. Sports Participation as a Socio-Demographic Equalizer

Contrary to the prevailing belief that sports participation is on a steady decline, research indicates that since the 1980s, there has been a distinct trend towards increased participation in sports among both young people and adults across Asia and specifically in Malaysia [12]. Accordingly, several studies in Malaysia have shown that despite

a slight downturn in recent years, participation in sports is now more prevalent than at any other time in the past [13]. For instance, a national survey found that overall sports participation increased from 41% in 2011 to 43% in 2015 [14]. These studies highlight those social dynamics, such as gender, social class, and ethnicity, are significant determinants of sports participation.

The realm of sports, often overlooked as a mere pastime, has emerged as a potent socio-cultural force influencing a wide array of societal aspects. Sports participation, be it in an individual or team setting, has profound implications that extend beyond the confines of the physical and mental health benefits it imparts [15]. Sports participation plays a pivotal role in shaping cultural identities and fostering social cohesion. It serves as a common ground where individuals from diverse backgrounds can engage in shared experiences, thereby promoting mutual understanding and unity [16]. Indeed, the universal language of sports transcends cultural, racial, and linguistic barriers, facilitating intercultural exchanges and fostering a sense of global citizenship. For instance, a study on the sociocultural impacts of sports found that 89% of respondents believe playing sports helps people connect across cultures [17].

In addition to serving as a platform for cultural exchange, sports also play a significant role in preserving and perpetuating cultural heritage. Traditional sports and games form an integral part of a culture's historical narrative, offering a unique lens through which societal values, traditions, and norms can be examined and appreciated. Sports participation also has profound socio-demographic implications. It can act as a vehicle for social mobility, offering opportunities for individuals from disadvantaged backgrounds to overcome socio-economic barriers [18]. Scholarships awarded to talented athletes provide a pathway to education and a potential escape from the cycle of poverty.

Furthermore, sports participation fosters a sense of community and belonging. It promotes social inclusion by providing a platform for individuals of all ages, genders, and ethnicities to interact and collaborate. By fostering a sense of collective identity and common purpose, sports participation can aid in bridging societal divides and mitigating the negative impacts of social isolation. One study demonstrated that youth participating in sports reported higher levels of social inclusion compared to non-participants [19].

Sports can also serve as a powerful tool for empowerment. They provide an avenue for individuals to develop self-confidence, resilience, and leadership skills, equipping them with the tools necessary to navigate the challenges of life.

Moreover, for marginalized groups, sports participation can serve as a platform to voice their concerns, challenge stereotypes, and advocate for their rights. The growth of women's sports, for instance, has played a significant role in promoting gender equality and challenging traditional gender norms. Indeed, sports participation has multifaceted cultural and socio-demographic benefits. It not only serves as a platform for cultural exchange and preservation but also acts as a socio-demographic equalizer, fostering social inclusion and empowerment. Despite potential drawbacks, with the right policies and frameworks in place, the world of sports holds immense potential as a catalyst for societal growth and transformation. As such, further research and policy focus on harnessing the societal benefits of sports participation is warranted.

4. Deciphering Psychological Influences of Sports Participation

Mental health issues constitute a pervasive global challenge impacting millions of individuals across diverse socio-demographic segments [8]. Symptoms manifest in various forms such as stress, anxiety, fatigue, insomnia, and headaches, reflecting the multifaceted nature of mental ill health. The term "mental ill health" encompasses a broad spectrum of mental health disorders and symptoms, each with its own level of severity. Numerous studies have examined the potential benefits of regular physical activity in enhancing mental health, often comparing its effects to other interventions, such as medication. For instance, a meta-analysis of randomized controlled trials found exercise to be as effective as antidepressants and psychotherapy in reducing depressive symptoms [20].

Emerging evidence suggests that physical activity and exercise, whether used as primary or secondary treatment modalities, exert substantial positive impacts in preventing or alleviating depressive symptoms. Moreover, they have been associated with an antidepressant effect in individuals diagnosed with neurological conditions [21]. Regular exercise and training have also been shown to enhance quality of life, improve stress management, bolster self-esteem, and strengthen social skills [22]. For example, a systematic review revealed that physical activity reduces anxiety in healthy adults and those with chronic illnesses. Further, they have been found to mitigate anxiety in individuals diagnosed with anxiety- or stress-related disorders, and to enhance cognitive functions, such as vocabulary learning, memory, and creative thinking [23]. A meta-analysis showed

that aerobic exercise training has a moderate effect on improving cognition in adults over 50 years old [24].

Various physiological mechanisms have been proposed to explain the mental health improvements associated with physical activity and exercise. These include increased brain perfusion and brain volume, enlargement of the hippocampus [25], and the anti-inflammatory effects of physical activity, which reduce brain inflammation in neurological diseases. Additionally, physical exercise may mediate resilience to stress-induced depression via the activation of skeletal muscle peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1 α). This activation enhances the conversion of kynurenine to kynurenic acid, thereby shielding the brain and reducing the risk of stress-induced depression. Furthermore, physical exercise is associated with the increased release of growth factors, endorphins, and signalling molecules, all of which contribute to enhancing mental health [26].

To fully harness the transformative potential of sports as a catalyst for positive lifestyle changes, it is imperative to understand the intricate interactions between physical activity, mental health, and socio-demographic factors. Through a deeper comprehension of these relationships, we can better tailor interventions to promote mental well-being and overall health, leveraging sports as a powerful tool in this endeavour.

5. Sports Participation in Modern Health Paradigms

Sports and physical activity have always been a critical component of human physiology, contributing to optimal health and wellbeing. It is a fundamental need that is deeply embedded in our biological make-up, dating back to the early days of human evolution. Modern humans, though living in vastly different environments and leading remarkably different lifestyles compared to their predecessors, share a similar demand for physical activity with their ancestors from about 40,000 years ago [27]. This requirement translates into a substantial amount of exertion. For instance, an average individual weighing around 70 kg would need to walk approximately 19 km per day, complemented by other routine physical activities [28]. This underscores the magnitude of physical exertion that our bodies are naturally designed to undertake and adapt to, given our evolutionary history. It serves as a reminder that our biological systems are inherently geared towards a high level of physical activity, a condition that our modern, sedentary lifestyles often fail to meet.

However, contemporary society has seen a significant shift in lifestyle patterns. The technological and economic advancements of the modern age have, in many ways, reduced our need for physical exertion. We've transitioned from labor-intensive ways of life to ones characterized by prolonged periods of sedentary behavior. Daily physical activity, driven by the necessities of life such as hunting, gathering, or farming, has been steadily decreasing. In contrast, planned and deliberate exercise, which is often performed in designated settings such as gyms or sports clubs, has been on the rise [29]. This transition has not been without consequences. A disturbing trend has emerged alongside these lifestyle changes. As physical activity levels have fallen, daily energy intake has increased. This mismatch between energy intake and expenditure has created an energy surplus, a condition that is far from our evolutionary norm. According to the CDC, the prevalence of obesity in the U.S. was 42.4% in 2017-2018 [30]. This imbalance in energy dynamics is a significant factor behind the escalating prevalence of obesity, a condition that contributes to numerous health problems and is increasingly becoming a public health concern.

The implications of a sedentary lifestyle, characterized by a failure to meet the recommended levels of physical activity, combined with excessive energy intake, are far-reaching and multi-faceted. Sedentary behaviors and poor dietary habits interact in a way that has detrimental effects on our health, impairing both physical and mental capabilities, and increasing the risk of disease. The effects of sedentary living extend beyond the individual, impacting public health and healthcare systems. However, it's worth noting that there are variations within and between populations. For example, despite the general trend towards sedentary living and increased energy intake, populations in certain regions like Sweden reported improved general health in 2015 compared to 2004. This improvement was noted despite similar levels of physical activity and stress [31]. This observation indicates that other factors, such as healthcare access, dietary habits, socioeconomic conditions, or genetic factors, might also be playing significant roles in shaping health outcomes.

In the sphere of health and wellbeing, participation in sports has been associated with better health outcomes. This association is not surprising given that sports activities typically involve high levels of physical exertion and often require mental agility and resilience. Individuals engaged in sports activities are often in better physical shape and have sharper mental acuity, which in turn translates into better health

According to one study, physically active individuals had a 30-35% lower risk of cardiovascular disease and mortality compared to inactive individuals [32]. These individuals are generally better prepared to handle the physical and mental challenges of sports, skills that can be transferred to other aspects of life. Conversely, those who are ill or injured may be precluded from participating in sports. Therefore, the observed association between sports participation and better health might, in part, be due to a selection bias. The health benefits of physical activity extend beyond the individual to society as a whole. Societies with higher levels of physical activity and sports participation tend to have lower morbidity rates and healthier aging populations. Furthermore, they also tend to incur lower healthcare costs [33, 34]. This societal perspective is crucial for understanding the full impact of physical activity on health. It underscores the importance of promoting physical activity and sports participation at a societal level and highlights the potential economic benefits of doing so. One analysis found that increasing physical activity by just 10% could save \$5.6 billion in healthcare costs in the U.S. [33]. Clearly, public health initiatives aimed at increasing physical activity levels can have far-reaching effects, not just improving individual health but also contributing to healthier communities and societies.

Numerous scientific studies have demonstrated a strong correlation between physical exercise/training and good physical and mental health. One meta-analysis found that exercising 3-5 times per week was associated with a 29% lower risk of developing dementia [35]. Accordingly, physical activity can lead to reductions in musculoskeletal disorders and disability due to chronic diseases, improved mental health, and decreased rates of anxiety, insomnia, depression, stress, and other psychological disorders [36]. Physical and mental health issues are associated with an elevated risk of major public health diseases and may contribute to premature mortality.

The impact of physical activity and exercise is not only immediate but also enduring. The long-term effects of regular physical activity can have profound implications for health. For instance, while the activity of certain muscle enzymes can be quickly increased by physical exercise/training and lost when sedentary, other changes, such as the increased number and size of muscle fibers and blood vessels, can persist for months or even years after training has ceased [34]. One study found that formerly active individuals had a higher aerobic capacity compared to lifelong sedentary individuals even after 30 years of inactivity [37]. The level of

physical activity required for maintaining good health needs to be performed with progression and continuity. When discussing health status, indicators such as life expectancy, disease incidence (number), and prevalence (frequency) are commonly used. In analyzing the relationship between physical activity and the risk of disease, considerations include the dose-response relationship, the effect size (the risk reduction demonstrated in studies), and the recommended type and dose of physical activity [38].

From the modern health paradigm perspective, active lifestyles characterized by routine physical exertion are an innate human trait. Despite radical lifestyle changes over the past century, our inherent physiological demands remain unaltered. Fulfilling these demands through regular physical activity can aid in preventing chronic diseases, improving mental health, and promoting healthy ageing.

6. Policy Implications: Fostering Sports Participation via Inclusive Strategies

This paper has delved into the transformative power of sports as a catalyst for positive lifestyle changes, and it is clear that the implications of these findings reverberate across several arenas, including policy development, intervention design, and future research. The first implication relates to policy interventions. Policymakers have a significant role to play in promoting sports participation across diverse demographic sectors [39]. This paper has demonstrated that sports participation can elicit substantial positive lifestyle changes, impacting physical health, mental well-being, and social cohesion. Therefore, strategies aimed at creating an environment that encourages sports participation should be prioritized. Such strategies could encompass infrastructure development, resource allocation, and initiatives aimed at raising awareness of the manifold benefits of sports. Crucially, these policies should address the observed disparities in sports participation across various socio-demographic strata. It is essential to develop interventions that are tailored to meet the unique needs of these disparate groups, thus ensuring inclusivity in sports participation [40].

Education, particularly at the school and university levels, has a substantial influence on the promotion of sports participation. Our research underscores the profound role of educational institutions in cultivating an ethos of physical activity among young people. Comprehensive physical education programs that expose students to a wide range of sports can foster a culture of

physical activity from a young age. Such programs do not merely provide an avenue for students to engage in physical activity; they also equip students with the knowledge and skills necessary to maintain an active lifestyle beyond their schooling years. Therefore, educational institutions should consider integrating diverse and engaging sports programs into their curriculum, thereby sowing the seeds for lifelong habits of regular physical activity.

From a healthcare perspective, the findings of our study have significant implications. Given the holistic benefits of sports participation, healthcare professionals should consider incorporating sports as part of preventive and therapeutic strategies. This approach necessitates a multidisciplinary collaboration involving healthcare providers, sports professionals, and patients to design interventions that are safe, enjoyable, and beneficial for different patient populations [39]. Such collaborations can also serve as a platform for knowledge exchange, enabling healthcare professionals to gain a deeper understanding of the benefits of sports and sports professionals to appreciate the health needs of different patient groups.

In terms of future research directions, there is a pressing need for longitudinal studies that investigate the long-term effects of sports participation on lifestyle changes. While our research has shed light on the transformative power of sports, it primarily relies on cross-sectional data. Longitudinal studies, by contrast, can provide a more nuanced understanding of the temporal relationships between sports participation and lifestyle changes. This type of study can help us understand how sports participation patterns evolve over time and how these changes impact various dimensions of health and well-being.

Further research is also needed to understand the factors that influence sports participation among different demographic groups. Our study has highlighted disparities in sports participation across gender, social class, and ethnicity. However, these findings raise further questions about the complex interplay of factors contributing to these disparities. More in-depth research can unravel these complexities, providing insights that can inform the design of targeted interventions to promote sports participation among underrepresented groups.

Furthermore, future research should explore the mechanisms through which sports participation affects various dimensions of health. Our study outlined several physiological and psychological mechanisms, but these warrant further exploration. Rigorous empirical research can elucidate the

complex pathways through which sports participation translates into health benefits, providing a more comprehensive understanding of the transformative power of sports. Lastly, in the age of digital technology, the potential of innovative approaches to promoting sports participation should be explored. Technologies such as mobile apps and virtual reality offer novel ways to engage individuals in sports activities. Research in this area could provide valuable insights into the effectiveness of these technologies in promoting sports participation and inducing positive lifestyle changes.

7. Conclusions

This review has explored the multifaceted role of sports as a powerful catalyst for positive lifestyle changes. Our research highlights the immense socio-cultural value of sports as a platform for empowerment, social inclusion, and cultural exchange. Sports participation has also demonstrated notable positive impacts on mental health, mitigating conditions like anxiety, depression, and psychological stress. Additionally, sports participation can elicit profound improvements across various dimensions of health and well-being. At the physiological level, routine participation in sports and physical activity confers extensive benefits ranging from enhanced cardiovascular health to better weight management. This review represents a towards comprehensively elucidating the relationship between sports and holistic lifestyle changes. As society continues to evolve, so must our understanding of how sports participation fits

Acknowledgement

The author extends heartfelt gratitude to the experts who contributed their insightful and constructive suggestions, which significantly enhanced the quality of this manuscript.

Conflict of Interest

No conflict of interest is declared by the authors. In addition, no financial support was received.

Ethics Committee

The study did not follow protocol as per the guidelines of the Ethics Committee because it is a conceptual paper.

Author Contributions

Study Design, AK, BÇ; Data Collection, AK, OB; Statistical Analysis, AK, NK; Data Interpretation, AK; Manuscript Preparation, AK, BÇ, NK; Literature

Search, AK, KU, OB. All authors have read and agreed to the published version of the manuscript.

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