

The Relationship between Playing Sports in Youth and Maintaining Good Health in Old Age

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Abstract

Original Research Article

Engaging in sports during youth has been linked to long-term health benefits in old age. This article explores the relationship between early-life physical activity and overall well-being later in life, considering factors such as physiological benefits, cardiovascular health, mobility, cognitive function, and disease prevention. Drawing from scientific studies and real-world examples, the analysis highlights how lifelong physical activity contributes to a healthier aging process. The findings suggest that early sports participation fosters habits that promote physical and mental resilience, emphasizing the importance of encouraging youth sports for long-term public health benefits.

Keywords: Sport, Youth, Aging, Health Benefits, Physical Activity

INTRODUCTION

The benefits of physical activity are widely acknowledged, yet the long-term advantages of participating in sports during youth are often underestimated. Numerous studies reveal a strong connection between engaging in sports at a young age and maintaining physical and mental health well into old age. This relationship is shaped by a combination of physiological, psychological, and social factors that collectively enhance an individual's quality of life. Moreover, early sports participation lays the groundwork for habits and skills that carry over into other aspects of life, creating a positive feedback loop that benefits both individuals and society as a whole. By fostering a love for physical activity early in life, individuals set the stage for a lifetime of health benefits that span decades.

Physiological Benefits of Early Sports Participation

Youth participation in sports promotes the development of strong bones, muscles, and cardiovascular systems. Physical activities such as running, jumping, and swimming during the

formative years enhance bone density, reducing the risk of osteoporosis later in life. A 2018 study published in the *Journal of Bone and Mineral Research* showed that individuals who participated in high-impact sports during their youth had higher bone density in old age compared to their less active peers. This enhanced bone density is especially critical as aging populations face increasing risks of fractures and mobility issues. By engaging in structured sports activities, young athletes create a reserve of physical resilience that can mitigate the impact of aging.

Similarly, engaging in sports improves cardiovascular fitness and establishes habits that often persist throughout life. Regular physical activity enhances blood flow, reduces inflammation, and strengthens the heart, contributing to a lower risk of chronic illnesses such as heart disease, diabetes, and obesity. Youth sports programs not only teach the importance of physical activity but also instill discipline and routine, which often translate into a lifelong commitment to health. The cumulative protective effect of these habits is undeniable; the earlier and more consistently they are

formed, the greater the long-term benefits. Furthermore, participation in endurance-based activities, such as soccer or long-distance running, builds a foundation of aerobic fitness that supports vitality in later years.

Another critical physiological benefit is the improvement in motor skills and coordination. Participation in sports during youth hones balance, reflexes, and overall physical literacy, which are essential for maintaining independence in later years. Studies suggest that older adults who engaged in sports during their youth are less prone to falls and other mobility-related challenges, further highlighting the enduring advantages of early physical activity. Additionally, these skills contribute to better performance in everyday tasks, enhancing overall quality of life [1,2,3].

Cardiovascular Health and Musculoskeletal Development

Early sports participation promotes cardiovascular fitness by enhancing heart and lung function. Regular physical activity strengthens the heart muscle, improves stroke volume, and increases cardiac output. Studies have shown that children involved in sports have lower resting heart rates and better blood pressure profiles compared to their inactive peers. Furthermore, early adoption of physical activity reduces the risk of developing cardiovascular diseases later in life by promoting healthy arterial function and lipid profiles.

Childhood and adolescence are critical periods for bone and muscle development. Weight-bearing sports, such as soccer, basketball, and gymnastics, stimulate bone mineralization, leading to increased bone density and reduced risk of osteoporosis in adulthood. Simultaneously, sports encourage muscle growth, strength, and endurance. Participation in structured athletic activities also improves motor skills, coordination, and proprioception, which are essential for overall physical competence.

Engaging in sports helps regulate metabolic processes, including glucose and lipid metabolism. Active children demonstrate better insulin sensitivity and are less likely to develop metabolic disorders such as type 2 diabetes.

Additionally, sports participation helps maintain a healthy body composition by balancing energy expenditure with caloric intake, reducing the risk of obesity. The long-term benefits of a healthy metabolism extend into adulthood, contributing to lower rates of chronic diseases [4,5].

Neurophysiological Benefits

Physical activity during early life has profound effects on brain development and function. Exercise increases blood flow to the brain, supporting cognitive function and neurogenesis. Sports that involve strategy, coordination, and teamwork further enhance neural pathways associated with decision-making, memory, and spatial awareness. Research indicates that children who participate in sports often perform better academically and exhibit higher levels of focus and discipline.

The physiological benefits of early sports participation are closely linked to mental health. Regular exercise triggers the release of endorphins, dopamine, and serotonin—neurochemicals that boost mood and reduce stress. Participation in team sports fosters a sense of belonging and builds resilience, which are critical for emotional development. Moreover, learning to cope with challenges and setbacks in sports translates into improved stress management skills in other areas of life.

The habits formed through early sports participation often persist into adulthood, promoting lifelong physical activity. Regular exercise reduces the risk of developing numerous chronic conditions, including hypertension, coronary artery disease, and certain cancers. Additionally, the physiological adaptations gained through sports during childhood provide a robust foundation for maintaining mobility and independence in later years [6,7].

Cognitive and Psychological Benefits

The advantages of playing sports extend beyond physical health, influencing mental well-being and cognitive function. Physical activity has been linked to the release of endorphins and other neurochemicals that reduce stress and enhance mood. Furthermore, children and adolescents who engage in sports are more likely

to develop resilience, discipline, and teamwork skills, all of which contribute to mental fortitude in later years. The structured environment of sports fosters goal setting, time management, and problem-solving skills, traits that are invaluable throughout life. Engaging in sports also encourages creativity and adaptability, particularly in fast-paced games where strategic thinking is required.

Longitudinal studies have demonstrated that individuals who played sports in their youth exhibit a lower incidence of cognitive decline and dementia in old age. Researchers hypothesize that the combination of physical activity and strategic thinking required in many sports contributes to lifelong brain health. A 2020 review in *Frontiers in Aging Neuroscience* highlighted how sports-related activities improve neuroplasticity and delay age-related cognitive deterioration. This protective effect is further amplified by the social interactions inherent in team sports, which stimulate the brain and reduce the risks associated with cognitive isolation. Furthermore, sports that involve hand-eye coordination and complex movements, such as tennis or basketball, have been shown to enhance neural connectivity, promoting sharper cognitive abilities well into old age.

Additionally, sports participation during youth provides a foundation for stress management and emotional regulation. These psychological tools are particularly valuable as individuals face the challenges of aging. A strong connection has been observed between early sports engagement and lower rates of depression and anxiety in old age, underscoring the mental health benefits that span decades. The discipline and resilience cultivated through sports often translate into a greater ability to cope with the adversities of aging, including health setbacks and changes in lifestyle [8,9,10].

Cognitive Benefits of Youth Sports in Later Life

Youth sports promote neuroplasticity—the brain's ability to reorganize itself by forming new neural connections. Physical activity increases blood flow to the brain, enhancing the delivery of oxygen and nutrients critical for brain health. These changes lay a foundation for

cognitive resilience, which can help delay or prevent cognitive decline in later life.

Research indicates that youth sports participation is associated with enhanced executive function—skills such as planning, decision-making, and problem-solving. These benefits persist into older age, as individuals with a history of regular sports activity often demonstrate better memory retention and cognitive flexibility compared to non-athletes.

The concept of cognitive reserve explains why some individuals maintain cognitive function despite brain aging or pathology. Regular sports participation in youth contributes to higher cognitive reserve, offering a protective buffer against diseases such as Alzheimer's and other forms of dementia [11].

Psychological Benefits of Youth Sports in Older Age

Sports teach young individuals how to handle stress, setbacks, and competition—skills that become invaluable in later life. This early conditioning fosters emotional resilience, helping older adults navigate the challenges of aging, such as loss or declining physical health, with greater ease.

Studies show a clear link between physical activity and reduced rates of depression and anxiety. Youth sports instill a habit of exercise that often continues into adulthood, providing a natural and effective way to combat mood disorders across the lifespan.

Participation in team sports cultivates social skills and a sense of belonging. These early experiences often translate into better social engagement and a larger support network in older age, reducing the risk of loneliness—a significant factor in mental and physical decline.

Youth sports foster a positive association with physical activity, making individuals more likely to remain active throughout life. Regular physical activity in older age is closely tied to better cognitive function and psychological well-being.

The discipline and goal-setting habits developed through sports carry over into other areas of life, contributing to a sense of purpose and achievement. These traits can be particularly beneficial for older adults, who may face identity shifts following retirement or other major life changes [12].

The Role of Specific Sports

Team sports like soccer or basketball emphasize communication, cooperation, and leadership. These social and cognitive skills remain relevant in later life, enhancing interpersonal relationships and mental agility. Sports such as swimming, running, or tennis promote self-reliance and focus. These activities often build mental toughness and persistence, traits that support emotional health and cognitive endurance in older adults.

Participation in team sports promotes regular physical activity, which is crucial for maintaining a healthy body. Activities like soccer, basketball, or volleyball involve aerobic and anaerobic exercises that improve cardiovascular health, muscular strength, and endurance. Regular involvement in such sports helps reduce the risk of chronic diseases such as obesity, diabetes, and heart disease. Moreover, the dynamic nature of team sports often requires agility, flexibility, and coordination, further enhancing physical fitness [13].

Children and adolescents who engage in team sports develop healthier habits early on, leading to lifelong benefits. For adults and seniors, team sports provide an enjoyable way to stay active, counteract the natural decline in physical abilities, and maintain mobility.

The mental health benefits of team sports are equally significant. Regular participation in sports has been shown to reduce symptoms of anxiety and depression by triggering the release of endorphins, the body's natural mood elevators. Team sports also provide a structured environment where participants can set and achieve goals, boosting self-esteem and fostering a sense of accomplishment.

Moreover, the inherent challenges in team sports, such as competition and the need to adapt

to changing situations, build resilience. Players learn to manage stress, cope with setbacks, and develop problem-solving skills—attributes that translate to other areas of life [14,15].

One of the unique aspects of team sports is their ability to create a sense of community. Players form bonds through shared experiences, mutual support, and collective goals. These relationships often extend beyond the playing field, providing emotional support and a sense of belonging.

Team sports also teach valuable social skills, including communication, cooperation, and conflict resolution. Learning to work with others toward a common objective fosters empathy and understanding, which are essential for personal and professional relationships.

For young people, team sports are a powerful tool for personal development. They instill discipline, time management, and a strong work ethic. Participation in sports can also improve academic performance, as the skills learned on the field—such as focus and determination—are applicable in educational settings.

Additionally, team sports provide a safe environment for young athletes to explore their identity, build confidence, and develop leadership abilities. Coaches and teammates often serve as role models, guiding young players toward positive behaviors and attitudes [16].

Encouraging Early Participation

Parents, educators, and policymakers should prioritize opportunities for youth sports participation, emphasizing inclusion and accessibility for all children. Youth sports programs should promote enjoyment and skill development to foster a lifelong love of physical activity. Sports that require strategic thinking and problem-solving, such as chess boxing or martial arts, can offer dual cognitive and physical benefits, amplifying their impact on long-term mental health.

Regular physical activity has profound effects on brain health, promoting neurogenesis and enhancing cognitive functions such as memory, attention, and problem-solving. Aerobic

exercise, in particular, increases hippocampal volume—a critical area for memory and learning—and boosts the release of brain-derived neurotrophic factor (BDNF), a protein that supports neuronal growth and connectivity. Research highlights that even moderate physical activity can improve executive functions and delay cognitive decline in older adults [17].

Psychological resilience—the ability to adapt and recover from stress or adversity—is a key determinant of mental health. Practices such as mindfulness meditation and cognitive-behavioral techniques strengthen resilience by enhancing self-awareness and emotional regulation. Studies show that individuals with high resilience exhibit lower levels of anxiety and depression, better stress management, and improved overall well-being.

Human cognition thrives on social interaction. Engaging in meaningful social activities stimulates areas of the brain responsible for empathy, communication, and critical thinking. Social bonds reduce the risk of mental health disorders, including loneliness and depression, which are linked to cognitive decline. Group activities, such as team sports or collaborative projects, also foster a sense of belonging and collective problem-solving skills.

Education and intellectual engagement are vital for maintaining cognitive agility. Lifelong learning stimulates neuroplasticity—the brain’s ability to adapt and reorganize itself—which is essential for memory retention and adaptability. Activities like reading, puzzles, and learning new skills have been shown to enhance cognitive reserve, a protective factor against dementia and other neurodegenerative diseases [18].

Diet plays a pivotal role in cognitive and psychological health. Omega-3 fatty acids, antioxidants, and essential vitamins found in foods such as fish, nuts, and leafy greens support brain function by reducing inflammation and oxidative stress. Conversely, diets high in refined sugars and unhealthy fats are associated with cognitive impairment and mood disorders. Adequate hydration and balanced meals are fundamental for sustaining mental clarity and focus.

Creative activities, such as writing, painting, or playing music, have therapeutic effects on mental health. These activities activate the brain’s reward pathways, fostering feelings of accomplishment and reducing stress. Engaging in the arts also promotes divergent thinking—the ability to generate innovative ideas—and strengthens emotional intelligence by enabling individuals to process and express complex emotions.

Sleep is a cornerstone of cognitive and psychological health. During sleep, the brain consolidates memories, clears metabolic waste, and regulates emotional responses. Chronic sleep deprivation impairs attention, decision-making, and mood stability, increasing the risk of mental health disorders. Prioritizing healthy sleep hygiene, including consistent schedules and a conducive sleep environment, is crucial for optimal brain function [19].

Technological advancements have introduced cognitive training tools designed to enhance mental agility. Applications that challenge memory, reasoning, and problem-solving are effective in improving specific cognitive skills, particularly in older adults. While these tools are not a substitute for physical and social activities, they provide supplementary benefits when integrated into a balanced routine.

Sports offer a platform for developing social skills and creating meaningful relationships. These connections often persist into adulthood, forming a support network that contributes to emotional and social well-being. Social engagement is a well-documented factor in promoting longevity and reducing the risks associated with isolation, particularly in old age. Participating in team sports, for example, teaches individuals how to collaborate, communicate, and resolve conflicts—skills that are essential for building and maintaining relationships throughout life. These experiences foster empathy and an understanding of diverse perspectives, which are invaluable for creating lasting bonds.

Moreover, youth sports often instill a sense of community and belonging, values that participants carry forward. Older adults who

were involved in sports as children often continue to engage in community activities, volunteering, or recreational sports, which help sustain their social and emotional health. Recreational leagues for seniors and community exercise programs frequently attract individuals who maintain an active lifestyle cultivated in their youth. These activities not only enhance physical health but also provide opportunities for social interaction, which is crucial for combating the loneliness that can accompany aging. Intergenerational sports programs, where older adults participate alongside younger individuals, further strengthen community ties and promote mutual learning.

The benefits of social connections formed through sports are not limited to emotional well-being. Strong social ties have been linked to lower mortality rates and improved immune function. By fostering these connections early in life, sports play a pivotal role in ensuring long-term health and happiness. Furthermore, the camaraderie and shared experiences developed through sports create a sense of purpose and belonging that significantly contributes to overall life satisfaction [20,21].

Physical Health Benefits of Sports Participation

Regular involvement in sports supports cardiovascular health, strengthens muscles and bones, and enhances metabolic regulation. Engaging in moderate to vigorous physical activity reduces the risk of chronic diseases such as hypertension, diabetes, and obesity—key contributors to premature mortality. Studies have found that individuals who participate in sports live, on average, several years longer than their sedentary counterparts.

Strong social connections are as important to longevity as avoiding smoking or maintaining a healthy weight. Social bonds reduce stress, lower blood pressure, and boost immune function, all of which contribute to a longer lifespan. Sports, by their nature, create environments for forming and strengthening these connections, whether through teamwork, shared goals, or community involvement.

Sports participation offers significant psychological benefits, including stress reduction and increased self-esteem. These effects are amplified when paired with social support from teammates, coaches, and peers. The sense of belonging and camaraderie in team sports fosters resilience, enabling individuals to cope better with life's challenges, which is closely linked to overall health and longevity.

Sports create opportunities for intergenerational interactions, bridging age gaps and promoting mutual understanding. Community sports leagues, for example, bring together players, families, and supporters of different ages and backgrounds. These interactions foster social cohesion, reduce feelings of isolation, and build a supportive network that enhances both mental and physical health.

Research has consistently shown that team sports provide greater longevity benefits compared to solitary activities. A study published in *Mayo Clinic Proceedings* revealed that sports like tennis, soccer, and badminton, which involve social interaction, were associated with longer lifespans compared to individual pursuits like running or swimming. The combination of physical exertion and social engagement appears to create a synergistic effect on health outcomes.

Participation in sports is linked to reduced rates of depression and anxiety, key factors that can undermine health and longevity. For older adults, staying active through sports delays cognitive decline and enhances social integration, reducing the risk of loneliness—a significant predictor of mortality. Youth sports, on the other hand, help develop emotional resilience and teamwork skills that contribute to long-term well-being [22].

Building Social Capital through Sports

Sports function as a platform for building social capital—the networks of relationships that provide mutual support. Communities with strong sports cultures tend to have higher levels of trust, cooperation, and collective efficacy. These social benefits extend beyond the playing field, contributing to safer neighborhoods, better mental health services, and improved overall

quality of life for residents.

Recommendations for Promoting Sports and Social Connections

To maximize the longevity benefits of sports and social connections, public health initiatives should prioritize:

- **Accessible Sports Programs:** Ensuring that sports opportunities are available to people of all ages, abilities, and socioeconomic backgrounds.
- **Inclusive Environments:** Creating spaces where participants feel welcome and supported, regardless of skill level.
- **Community Engagement:** Encouraging local governments and organizations to invest in sports facilities and community leagues.
- **Education and Awareness:** Highlighting the combined benefits of physical activity and social interaction for long-term health.

Mitigating the Risks

While the benefits of youth sports are considerable, it is important to address the potential risks, such as injuries or overtraining, which can have long-term consequences. Structured programs with appropriate coaching and safety measures can minimize these risks, ensuring that young athletes reap the rewards of their activities without undue harm. For example, educating coaches and parents about proper training techniques, injury prevention, and the importance of rest can significantly reduce the incidence of sports-related injuries. Emphasizing skill development and body awareness can further enhance safety.

Additionally, it is vital to emphasize balance and inclusivity. A focus on enjoyment and personal growth over competition ensures that children of all abilities can benefit from participation in sports, creating lifelong positive associations with physical activity. Promoting access to diverse sports programs—including non-traditional or adaptive sports—can further expand the reach of these benefits to underrepresented groups, ensuring that no child is left behind. Tailored programs for children with disabilities or those from underserved

communities can create equitable opportunities for all to thrive through sports.

Finally, fostering an environment that prioritizes mental health alongside physical performance is essential. Pressures to excel in youth sports can sometimes lead to burnout, anxiety, or disinterest. By cultivating a supportive and nurturing atmosphere, programs can ensure that sports remain a source of joy and personal development rather than stress. Encouraging open communication and promoting mental health resources within sports organizations can further safeguard young athletes' well-being [23].

Physical Injuries

Injuries such as sprains, strains, fractures, and concussions are among the most common risks in sports. Contact sports like football and rugby, as well as high-impact activities like gymnastics, present a higher injury risk compared to low-impact activities.

Overuse Injuries

Repetitive motions in sports such as running, swimming, or tennis can lead to overuse injuries, including tendinitis and stress fractures. Young athletes specializing in a single sport are particularly vulnerable.

Psychological Stress

High levels of competition can result in performance anxiety, burnout, and other mental health challenges. The pressure to excel may be especially pronounced in youth and elite athletes [24].

Mitigation Strategies

Injury Prevention through Training

- **Proper Technique:** Emphasizing correct form during training and competition minimizes the risk of acute and overuse injuries.
- **Strength and Conditioning:** Incorporating strength training and flexibility exercises helps build resilience against injuries by improving muscle and joint stability.
- **Warm-Up and Cool-Down:** Dynamic warm-ups and static stretching during cool-downs prepare the body for activity

and aid recovery, reducing the likelihood of injuries.

Protective Equipment

- **Helmets and Padding:** Sports like cycling, hockey, and football require helmets and padding to protect against head and body injuries.
- **Appropriate Footwear:** Using sport-specific shoes with proper support can prevent foot and ankle injuries.
- **Regular Equipment Checks:** Ensuring that gear is in good condition and fits correctly is crucial for safety.

Managing Overtraining and Fatigue

- **Rest and Recovery:** Scheduled rest days and adequate sleep are essential for preventing overtraining syndrome, which can lead to chronic fatigue and injury.
- **Cross-Training:** Engaging in a variety of activities reduces the risk of overuse injuries and promotes balanced muscle development.
- **Monitoring Workload:** Coaches and athletes should track training intensity and volume to avoid pushing beyond safe limits.

Addressing Psychological Challenges

Building Mental Resilience

- **Stress Management Techniques:** Practices such as mindfulness meditation and breathing exercises can help athletes manage competition-related stress.
- **Positive Coaching:** Supportive coaching that emphasizes effort and growth rather than outcomes reduces the risk of burnout and anxiety.
- **Open Communication:** Encouraging athletes to discuss their mental health promotes early intervention for psychological issues.

Balancing Competition and Enjoyment

- **Youth Sports:** Prioritizing fun and skill development over competition in youth sports helps maintain long-term interest and reduces pressure.
- **Realistic Expectations:** Setting achievable goals prevents unnecessary

stress and fosters a positive sporting experience.

Special Considerations for Youth and Older Athletes

Youth Athletes

- **Growth Considerations:** Coaches should account for growth spurts and avoid excessive training that could impact skeletal development.
- **Parental Involvement:** Parents play a key role in ensuring a balanced approach to sports participation.

Older Adults

- **Age-Appropriate Activities:** Low-impact sports like swimming, cycling, or yoga are ideal for maintaining fitness while reducing injury risk.
- **Health Assessments:** Regular check-ups ensure that underlying health conditions are managed appropriately.

Policy and Community Recommendations

- **Comprehensive Safety Programs:** Sports organizations should implement guidelines for injury prevention, including concussion protocols and training for coaches.
- **Education and Awareness:** Athletes, parents, and coaches must be educated about the risks of sports and strategies for safe participation.
- **Access to Healthcare:** Providing access to sports medicine specialists ensures timely treatment and rehabilitation of injuries [25,26].

CONCLUSION

The evidence is clear: playing sports during youth has a profound and enduring impact on health and well-being in old age. From building a robust physiological foundation to fostering psychological resilience and social connections, the advantages are multi-faceted and long-lasting. By encouraging young people to participate in sports, we invest not only in their immediate health but also in their future quality of life.

To maximize these benefits, policymakers,

educators, and parents should prioritize accessible, safe, and enjoyable sports opportunities for all children. Such efforts will pay dividends for generations, contributing to healthier, happier societies. Furthermore, ongoing research and advocacy are needed to address barriers to participation, ensuring that the benefits of youth sports are available to all. In doing so, we can create a legacy of health and vitality that bridges generations, proving that the playing fields of youth can indeed shape the landscapes of old age. Expanding resources for sports programs and ensuring equitable access for all communities will be crucial in achieving this vision.

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