

The Effect of Sport on the Quality of Mental Health of Adolescents

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Abstract: Physical education is an important component and means of quality education, and the integration of physical education and mental health education represents an inevitable trend in modern educational reform and development. Based on this premise, this paper examines the relationship between sports and adolescent mental health quality as a starting point for analysis and research. It considers the quality education and people-oriented development concept as a backdrop, taking into account the physical and mental development characteristics of adolescents. Specifically, it explores the impact of sports on the quality of adolescent mental health from the perspectives of cognitive qualities, emotional qualities, personality qualities, and adaptive qualities of adolescents. The study aims to ascertain how sports can foster adolescents' mental health development, thereby offering reference and support for enhancing mental health quality within quality education practices.

Keywords: mental health qualities; adolescents; mental health; physical education and sports

1. Introduction

The change of time, the progress of society, and the requirements for the comprehensive development of human beings are also rising, and even more so, the diversified requirements for young people in terms of survival, choice, and adaptation, as well as the educational hopes for development, thinking, and creativity are being put forward. To fulfil this series of requirements in an era of fast pace of change and rapid progress of society, becoming a sound human being is the most basic condition. A sound human being is a person who is physically and mentally healthy, and whose physical and mental health are mutually reinforcing.

2. Overview of mental health qualities

Quality education is continuously evolving, with its content, methods, and objectives being fine-tuned to align with the needs of students and social progress. Through practical implementation and continuous adjustments, the significance of mental health and psychological resilience has become apparent in the pursuit of quality education. This development offers a fresh perspective on addressing adolescent mental health concerns.

Many scholars have studied the psychological qualities of thousands of things, and among them, research on mental health quality is particularly significant. Mental health quality essentially constitutes a critical component of psychological quality, representing its healthy and positive aspects. It contributes to forming a healthy mental state, which is an integral part of psychological quality. Nowadays, research on mental health remains controversial, and scholars have not yet reached a consensus on the definition of mental health standards and related issues. Therefore, in the process of exploring mental health and quality education, mental health quality has emerged as an important starting point for new research and attempts.

The research group of "Survey and Research on the Mental Health Quality of Chinese Adolescents" proposed the concept of mental health quality for the first time in China, and in order to objectively reveal the concept and structure of mental health quality, it is necessary to explore the relevant meanings of quality, mental quality and mental health. [1]

In the ancient Greek period, "quality" originally originated from philosophy, it is the point of view of sexuality or tendency, due to social changes and the development of modern psychology, resulting in

some of the "quality" theory began to leave the field of philosophy, "quality" began to be separated from the philosophical field, "quality" is the first time in China to propose the concept of mental health quality.

The concept of "quality" began to have a biological basis leaning towards psychopathological research, which aligns more with the current genetic theory's interpretation of "quality". However, as research progressed, it was discovered that the biological basis tended to move towards a different interpretation of "quality".

However, as research progressed, it became apparent that the interpretation of "quality" solely based on biological tendencies is somewhat incomplete. In other words, relying solely on a genetic determinism perspective lacks absolute persuasive power. One perspective suggests that "quality" is shaped by heredity and then further developed through the interaction of practical and spiritual activities, as well as environmental factors. This process ultimately leads to the internalization of relatively stable, fundamental, and implicit individual qualities." [2] In general psychology, for instance, "qualities" can be described as "anatomical or physiological hereditary characteristics inherited from birth, encompassing structural manifestations and functional characteristics of the nervous system, as well as sensory, motor-tactile, and developmental structural and physiological functions of the body." The formation of these characteristics is mainly influenced by heredity, but also associated with the internal and external environment during the foetal period (Lin Chongde, 2003). Therefore, the understanding of "quality" can vary across disciplines. In physiology, it is interpreted more as a psychological condition related to psychological development, whereas in psychology, it is seen as a general term for physical and mental tendencies that are shaped by both innate genetic factors and acquired experiences. The definition of the domain of qualities has gradually become clearer, with qualities no longer being solely biologically inherited, but also encompassing psychological or behavioural dispositions. (James, 2004; Zou Tao, 2006).

Psychological quality, which falls under the umbrella concept of quality, is a crucial aspect of the three elements comprising the quality structure. It is also the cornerstone and key component of quality education. The concept of psychological quality emerged in the context of localised quality education. Compared to physiological quality, it refers to the continuous reinforcement of the psychological facets resulting from the interaction with the external environment, which ultimately becomes internalized as stable, fundamental, and derivative psychological characteristics. There are differences in the understanding of this concept depending on the direction of the research. There are views that summarise psychological quality as the unity of mental health qualities and intellectual qualities, and emphasise that psychological quality is the guarantee that individuals will maintain a state of psychological well-being in their life, study and work. There are also views that point to the dynamic organisational system formed in the interaction of three subsystems: intellectual factors, personality factors and physical and mental potential. [3]

In addition to explaining the concept and definition of psychological quality by the parallel force of related factors, there are also views from the perspective of positive psychology, that psychological quality is a positive and social development direction of the unity of the value of the orientation, [4] which includes a number of positive emotions, commitment, positive interpersonal relationships, positive significance and value of the achievement of a number of positive non-intelligent factors organically integrated complex whole. There are multiple perspectives and elements to analyse and study psychological quality, leading to vastly different definitions of the concept. One perspective is that psychological quality is a complex unity of multiple categories, qualities, and factors, aiming for a more comprehensive overview.

The above viewpoints are highly inspiring for exploring the meaning of psychological quality. Through understanding the essence of "quality", we can summarize the basic meaning of psychological quality as follows: psychological quality refers to a psychological attribute that is grounded in physiological conditions. It entails internalizing externally acquired traits into something stable, fundamental, and derivative, and it is intimately connected to one's socially adaptive and creative behaviors. (Zhang Dajun, 2000).

The study of mental health quality has not only become an expansion of the research trend of positive psychology abroad, but also a new breakthrough in the domestic study of adolescent mental health. Mental health quality and mental health are essentially describing psychological phenomena, is to psychological as the main body of the study of its two aspects, both concepts and standards are inseparable from the analysis of the basic psychological structure of people. [5] Mental health quality more specifically refers to the psychological resilience of the human body, emphasizing the aspect of "quality". Individuals with a high level of mental health quality possess more stable psychological

characteristics, making them less susceptible to disturbance by external factors and less prone to psychological issues. Therefore, the quality of mental health plays a significant supporting role in determining the level of one's mental health, whether high or low. Mental health is a state of soundness and well-being of the psyche, which is manifested by sound cognitive function, normal intelligence, stable and positive emotions, sound personality, perfect will quality and good social adaptation, and harmonious interpersonal relationships, focusing on the description of the "state". [6] There is a close connection between the level of mental health quality and the state of mental health. Mental health represents the ideal psychological function that mental health quality aims to achieve. It encompasses the fundamental indicators of mental health at a conceptual level and indirectly clarifies the relationship between mental health and mental health quality. Mental health serves as the external manifestation and extension of mental health quality, while mental health quality constitutes the internal foundation and provides directional guidance for the development of mental health. In essence, the quality of mental health lays the groundwork and steers the formation of overall mental health.

The distinction between the concepts of mental health qualities and mental health is a prerequisite. Mental health qualities are defined as certain inherent, relatively stable psychological qualities that contribute to the state of mental health of an individual, which are formed under the combined influence of inborn genetic and acquired environmental factors. Individuals' mental health quality is specifically manifested in the integration process of their cognition and adaptation to themselves, others and the external environment. The quality of mental health is expressed in the integration of the individual's perception and adaptation to himself, others and the external environment (Zhang Dajun, 2000).

3. Components of mental health quality

From the collection of domestic and foreign studies on the components of mental health qualities, it is found that the study of the components of mental health qualities can be started from the causes of mental qualities; it can also be analysed based on the realities of surveys and research on adolescents, or it can be more direct to study the structural elements of the quality of mental health of adolescents from the theoretical point of view.

However, when the structure of adolescent mental health quality was first constructed in China, it was analysed by combining the various psychological qualities directed to the self with the psychological qualities directed to other things, and in order to understand the components of adolescent mental health quality more objectively, the quality was divided into seven quality dimensions, i.e., cognitive style, attributional style, coping style, motivational system, ego, personality qualities, and interpersonal qualities. Qualities.

The study of adolescents' ego and other psychological qualities found that social factors also need to be considered in the composition of their mental health qualities. Since adolescents are members of society, they must show good adaptive ability in order to be able to complete their socialisation and to survive and develop healthily in society. [7] Therefore, the adaptive dimension within the structure of mental health quality has also garnered the attention of numerous scholars. However, many scholars contend that during the construction of the mental health quality framework, self and social factors must be taken into account. Additionally, some beliefs stemming from personal experiences and the environment can also be incorporated. In defining the concept of mental health quality, it is also proposed that an individual's mental health quality is specifically manifested in the process of integrating their cognition and adaptation towards themselves, others, and the external environment. The more systematically distributed components of mental health qualities include: cognitive style, attributional style, coping style, motivational system, ego, personality traits, emotionality, adaptation, health beliefs, and life beliefs. Among these, health beliefs and life beliefs, as mentioned earlier, have rarely been included by scholars.

The comprehensive implementation of quality education and the active trend of positive psychology have inspired the academic community to re-conceptualise mental health. In this process, the theory of mental health quality has gradually become independent from the large system of psychological quality (Jia-Yuan Zhang, Shi-Da Qin, Yu-Qiu Zhou, 2022). In this process the theory of mental health qualities gradually became independent from the large system of psychological qualities. In the preliminary studies, the structure of mental health qualities components showed that more attention was paid to the understanding of the process of socialisation of the person, and the exploration of the inner structure of the concept itself was minimal. The fact that in traditional psychological research more attention was paid to psychological qualities without over-analysing the logic of the inner structure of

the mental health quality components made later researchers puzzled about the origin of the components of the concept of mental health quality when it was proposed. In fact the focus of early research on mental health qualities was on how to abstract from the understanding of psychological qualities. As the academic community continued to understand the laws and manifestations of mental health qualities, in the "Survey on the Mental Health Qualities of Chinese High School Students" (Jiang Guangrong, 2009), it was proposed that the components of mental health qualities include cognitive style, attributional style, coping style, motivational system, self-personality qualities, and interpersonal qualities.

Successive scholars have also proposed the components and structure of the mental health quality of Chinese adults (Liang Baoyong, 2012), and proposed eight psychological traits and trait-like qualities and two "sub-traits" that can be used to reflect the mental health quality of Chinese adults. This method of constructing components tends to distinguish between the natural and social attributes of mental health qualities, aiming to reflect the dualistic characteristics of adult mental health. It is crucial to emphasize that mental health quality is a relative measure, representing a trait that persists over an extended period and cannot be readily dismissed as unhealthy solely due to momentary mood and behavioral fluctuations. [8] Furthermore, mental health quality exists on a continuum, exhibiting both quantitative and qualitative differences ranging from healthy to unhealthy, abnormal, deviant, and mentally ill. An individual can only be considered psychologically unhealthy if they encounter serious problems in more than one area. Additionally, the transition from unhealthy to healthy can be mutually transformative; therefore, in practice, it is also crucial to adopt a developmental perspective regarding the mental health quality of adolescents.

To sum up, the mental health quality of adolescents not only covers the basic contents of cognitive quality, coping quality, personality quality, will quality, motivational quality, interpersonal quality and adaptation, but also its constituent components have a certain logical relationship, which is consistent with the essential requirements of psychological training in quality education. So its components should include: cognitive quality (cognitive ability, metacognition, cognitive style, cognitive strategies, etc.), emotional quality (emotional adaptation, emotional expression and emotional perception), personality quality (ideological and moral quality, will quality, personality quality, self and psychological power system), adaptive qualities (interpersonal qualities, school adaptation, family adaptation and social adaptation), a total of four parts of the content.

4. Impact of sport on the quality of mental health

The relationship between sport and mental health has been the focus of attention in the field of sport and mental health and has produced fruitful results in various areas.

4.1 Long-term psychological benefits of sport

Although the ability of sport to reduce stress, regulate emotions, improve mental health and prevent and treat mental illness has been confirmed by many studies, the factors influencing it are not yet clear.

Many researchers believe that the reason for this can be explained from the physiological point of view, but also from the psychological point of view to analyse, that is, sports can produce good mental health effect has its psychological mechanism. To this end, researchers have put forward a number of theories and hypotheses about the production and effects of the psychological effects of sport. The use of sport as a means of influencing an individual's mental health can be categorised as either long-term or short-term. [9] The short-term psychological effect of sport refers to the unstable impact of a single sport session on an individual's psychological state over a relatively short period of time. A single sport session is generally defined as an activity that lasts 30 minutes or slightly longer. At present, research on the short-term psychological effects of sport has made considerable progress and has developed some more mature theories. As for the long-term psychological effects of physical activity, more research has been done on the improvement of some psychological abilities by physical activity. It mainly includes: the effects of long-term, systematic sports on certain stable psychological traits of individuals. Long-term, systematic physical activity generally refers to physical exercise that takes place 2-4 times per week for about 30 minutes each time, and the exercise cycle lasts for 8-10 weeks or longer. In the case of this study, for example, where sport is used as a means to influence mental health qualities as an end in itself, more attention should be paid to the long-term, continuous and stable effects on mental health.

4.2 The effect of sport on the cognitive qualities of adolescents

"Cognition" is a concept that has both a broad and a narrow meaning. Cognition in the broad sense is considered to be synonymous with awareness, which is the cognitive process by which people know things through sensation, perception, representation, imagination, memory and thinking. [10] Cognition in the narrow sense is considered synonymous with memory, which is the conversion of stimuli obtained by the individual's sense organs, and their processing, storage and extraction. Cognition is the most basic mental ability of human beings and is the evidence of the existence of objective consciousness and thinking activities. There is a close connection between cognition and emotions, attitudes and behaviours, and it is the basis and prerequisite for them. Physical exercise leads to changes in the material basis of memory. The physiological activity of memory requires a strong material basis, regular and continuous engagement in physical activity can not only play a facilitating role in the nervous system, in adjusting the body organs to increase control, and can act on the brain to increase ribonucleic acid. Some studies have shown that people who regularly participate in physical exercise are 10 per cent more active than those who do not. The increase in ribonucleic acid leads to an increase in the activity of ethylphthalide choline, and changes in all of these substances have a great impact on memory (Wen Xu, 2015). Regular physical activity strengthens the heart, resulting in increased output per beat, increased lung capacity, and more oxygen to the brain. The brain needs the blood to deliver large amounts of oxygen and glucose when it works. And to enhance memory, there needs to be enough blood sugar in the blood. Studies have shown that a person's memory is strongest when blood sugar rises to 20 mg/ml. The mastery of the techniques of each sport requires not only logical thinking skills, but also action thinking skills (Wei Gaoxia, 2012). At the same time, it also has a role in the development and improvement of open-mindedness. In competitive sports with others, sportspeople need to make quick judgements based on what they observe on the field, and select the best strategies and skills that will help them win. The choice of these strategies and skills often occurs in an instant and must be made on the spot. In this choice, the fluency and adaptability of divergent thinking are honed (Welling, 2002). For example, in some ball games, in order to search for the opponent's weaknesses and discover strategies to win, both sides of the game will choose a variety of different strategies and tactics based on their judgement, to magnify the opponent's deficiencies and play to their own strengths. These tactics and thinking to win the game are in themselves characterised by flexibility, agility, speed and open-mindedness. Long-term practice of this type of sport has a certain effect on the development of divergent thinking.

4.3 The effect of sports on the emotional quality of adolescents

Emotional state is one of the important indicators of mental health, and some experts have categorised the effect of sports on emotions into short-term emotional effects and long-term emotional effects, and have achieved rich research results.

The following discussion focuses on the effects of sports on long-term emotional quality. Since stress factors have been discussed in the previous section, the effects on depression and anxiety are mainly discussed here. Depression refers to a state of mind dominated by low mood. If a person's mood is persistently low for more than two weeks, regardless of whether there is a reason or not, the medical suspicion is that he or she is pathologically depressed; if it is more than one month, he or she can be judged to be suffering from melancholia.[11] Its realistic clinical features are demonstrated as pessimism, sadness, feeling of helplessness, low self-esteem and despair (Sun Yanlin, 2014); mild fatigue, irritability, indecisiveness, relationship avoidance and anhedonia, and so on. Some scholars studied male depressed patients and divided the participants into two groups, one group performed various fitness exercises, such as jogging, swimming, circuit training, cycling, etc., and the other group arranged a seated lifestyle, and after six weeks, the results of the comparison found that the group engaging in fitness exercises had a good physical condition but the seated lifestyle group did not, and there was no change in the investigation of the level of depression in both groups (Morgan, 1970). However, 11 participants noted that they were depressed at the beginning of their participation in the study, but this was reduced after physical activity. This result supports the efficacy of physical activity in improving depression. A study of prenatal depression in pregnant women found that regular, systematic intervention with physical activity significantly reduced depressive symptoms in pregnant women (Griffin, 1994). The manifestation of depression is characterised by repression and in turn acts on mood states; sport enhances physiological features such as arousal, blood circulation and endorphins. Thus, physical activity is considered the most effective treatment against depression and presents significant results in all age groups. Anxiety is a state of nervousness and persistent panic in response to an unknown outcome or adverse situation, often accompanied by a loss of control of the individual's autonomic functioning and symptoms of fear (dry mouth, tightness in the chest, palpitations, cold sweats, tremors in the hands,

anorexia, constipation, etc.). The preventive effect of physical exercise on anxiety and depression is very clear. A foreign research study on 1750 psychologists showed that physical activity is the most common method for the prevention, regulation and treatment of depression, in which more than 60% of psychologists believe that physical activity and sports are effective means of treating anxiety disorders, and 80% of doctors believe that physical activity also has a good therapeutic effect on antidepressants (Robert, 2013). Although the underlying mechanism of the relationship between physical activity and the alleviation and treatment of psychological and psychiatric disorders has not yet been determined, the function and effect of physical activity on antidepressant and anxiety disorders have been widely recognised.

4.4 The effect of sport on the adaptive qualities of adolescents

The social characteristics of sport itself contribute to the development of social adaptability and the improvement of the quality of young people. Firstly, sport itself reflects its special characteristics, such as competition and cooperation, success and failure, desire for success and helplessness, etc., which will surely make sport motivate sports people to continuously adapt to society. Secondly, sport improves the survival skills of individuals and enhances one's self-knowledge and interpersonal skills. Kreutter et al.'s study also found that students' self-concept and initiative were significantly improved through sport. The acquisition of life skills promotes the healthy development of children and adolescents and gives them the ability to adapt to the ever-changing social environment.[12] Thirdly sport improves the ability to adapt to life. This is because in sport, people become familiar with motor skills, which helps to improve the flexibility, co-ordination, and suppleness of their movements, which in turn helps in the performance of everyday life movements. In addition, people experience physiological loads, thrilling and challenging events in sports, which to a certain extent develops resilience to setbacks and challenges among the sports population. Scott also believes that school sports have seven psychological effects on students: A Attitude changes and influences changes in undesirable behaviours. B Improvement of social adaptability. C Improvement of perceptual sensitivity and response accuracy. D Improvement of a feeling of self-goodness. E Promotion of mental relaxation. f Unwinding of physical and mental health. g Acquisition of motor skills.

The subjects of this study are adolescents, most of them are students, and sports are carried out in the interactions between teachers and students or between students, and people are in a state of interaction at times, including the environment of co-operation, competition, conflict, and communication, and these environments provide good conditions for students to improve their social interaction skills, and the environment and conditions of such interactions are non-utilitarian, egalitarian, and friendly. [13] In addition, people often play different roles in sports, such as different positions and division of labour in different tasks, and these make the people who play sports experience different roles. Perhaps because of the experience of different roles, students are more able to stand in each other's point of view to analyse and understand each other's feelings, which helps to understand and communicate with each other, cultivate the awareness and ability to live in harmony among people, and help to cultivate young people's social interaction skills.

In conclusion, sports can improve the sense of psychological superiority, psychological energy, psychological resilience and interpersonal adaptability, which ultimately leads to the improvement of the adaptive qualities of adolescents. Moreover, this acquired competence is transferred to everyday life. The mechanism of this transfer is explained by the "general theory of transfer" in the field of cognitive psychology. Therefore, since sports, as a social enrichment programme, has its own context similar to that of social life, the adaptive skills developed in sports will also be transferred to social life according to the "general migration theory".[14]

4.5 Influence of sports on the personality qualities of adolescents

Our psychological community considers personality to be the unity of an individual's inner motivational organisation and his or her corresponding behavioural patterns.[15] This definition contains the three most basic characteristics of personality: first, personality usually refers to the individual's outward behavioural tendencies; second, personality is a person's internal motivational organisation, including stable motivation, habitual emotional experience and way of thinking, stable attitudes, beliefs and values; finally, personality is a unity consisting of certain traits embedded in the body and manifested in the outside. In the 1970s, the exploration of the athlete's special personality as a perspective was focused on by sport psychology, and some researchers studied the personality related to competition and exercise, but there were not many representative conclusions. Some studies (Qiu Yijun, 1986) pointed

out that sports have a positive effect on the formation of a stable and good personality; individuals who regularly participate in sports have a significant advantage in extroversion, independence and willpower, etc. However, there are some shortcomings in these studies, and one of the biggest problems is that the multidimensional cross-sectional studies of the effects of sports on personality, which usually can not determine the causal relationship, can only prove the correlation between related concepts, and can only prove the correlation between related concepts. These studies usually cannot determine the causal relationship, but can only prove the correlation between related concepts. In the study of adolescent personality development and physical education and sports, most of the relevant studies in China focus on the impact of school physical education on various reasonable states of personality psychological characteristics.[16]

Some scholars (Mao Zhixiong and Zhang Liwei, 1994) found that college students who actively participated in sports showed positive changes in their personality, mainly in optimism, cheerfulness, emotional stability and other aspects, which in turn further acted on the content of interpersonal relationships and social adaptation, and thus improved their mental health. From the above findings, it is clear that the impact of sports on personality is reflected in and positively affects many aspects of a person's appreciation of the collective spirit, rational understanding of conflict, good adaptation to setbacks, formation of self-concept, development of emotional identity, degree of socialisation, and improvement of social adaptability.

5. Summarization and prospect

The impact of physical education and sports on the mental health quality of adolescents is far-reaching and multidimensional, which not only helps to promote the physical and mental development of adolescents, but also improves their psychological quality in several aspects.

First of all, sports have a significant impact on adolescents' emotional regulation. In the process of participating in sports activities, adolescents can release pressure, transfer negative emotions and increase positive emotional experience through sports. At the same time, sports can also promote the secretion of dopamine, serotonin and other neurotransmitters in the body, thus reducing negative emotions such as depression and anxiety. This emotional regulation mechanism helps adolescents to better cope with the challenges of learning and life.

Secondly, sports have a positive effect on the personality molding of adolescents. By participating in competitive sports activities, young people can learn to accept failure and frustration, and develop a positive mindset and the quality of facing difficulties bravely. At the same time, sports can also cultivate teamwork and leadership among adolescents, and enhance their social interaction and interpersonal relationship development.

In addition, physical education and sports have a positive effect on the intellectual development of adolescents. Moderate physical exercise can promote adolescents' blood circulation and metabolism and improve the efficiency of the brain. At the same time, the thinking activities and strategic decision-making in sports can also exercise adolescents' thinking ability and innovation.

However, the current mental health problems of adolescents are still prominent and need the joint attention of educators and the community. In the future, we can further strengthen the popularization and promotion of sports and improve the enthusiasm and initiative of young people to participate in sports. At the same time, we can also design more diversified and personalized sports programs to better meet the psychological needs of adolescents, taking into account their age characteristics and psychological needs.

To summarize, the influence of sports on the quality of adolescents' mental health is multifaceted and positive. In the future, we should continue to deepen the research on the relationship between sports and adolescents' mental health, and explore more effective ways and methods to better promote the development of adolescents' mental health.

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