

## A Study on the Relationship between Sports Participation and Mental Health in the Digital Era

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**Abstract:** In the digital age, the rapid progress of technology has profoundly changed people's way of life, including the way they participate in sports. This study aims to explore how digital tools such as social media, health applications, and online fitness courses affect individual exercise engagement, and further analyze the relationship between this engagement and individual mental health. Through comprehensive analysis of multiple data sources, including online questionnaires and in-depth interviews, this study reveals the complex and multi-level relationship between exercise participation and mental health in the digital age. Research has found that although digital tools significantly improve the participation of some populations in sports, especially among young people and skilled technicians, their impact is relatively small for those who use technology less frequently, such as the elderly. In addition, there is a positive correlation between increased participation in sports and improvement in mental health, especially in reducing symptoms of anxiety and depression. However, excessive reliance on digital tools may also lead to a decrease in the quality of exercise experience, thereby having a negative impact on mental health. The unique viewpoint presented in this study is that it emphasizes the need to consider user technical proficiency, mental health status, and individual differences when designing and promoting health applications and digital fitness tools. Based on these findings, we suggest developing more personalized, easily accessible, and diverse sports engagement digital solutions to promote the mental health and well-being of a wider population. This study not only provides a new perspective on how digital

tools shape modern people's exercise habits and mental health, but also provides an empirical basis for designing future health promotion strategies.

**Keywords:** Digitalization; Lifestyle; Exercise Health; Smart Devices; Mental Health

### 1. Introduction

#### 1.1 Background Information

At the beginning of the 21st century, we witnessed the profound impact of the technological revolution on various aspects of human life, especially in terms of how to maintain and improve health [1]. The advent of the digital age has brought unprecedented opportunities and challenges, especially in the fields of sports and mental health [2]. This study aims to explore this transformation in depth, with a focus on analyzing the impact of digital tools on people's participation in sports and their further impact on mental health. The aim is to provide a comprehensive understanding to guide future research and practice [3].

#### 1.2 Research Significance

With the popularity of smartphones and wearable devices, as well as the widespread use of social media and health applications, there has been a fundamental change in the way people access health information and participate in sports activities. These technologies not only make fitness more convenient and personalized, but also promote the dissemination of health knowledge and the enhancement of health awareness. However, despite the many positive impacts brought about by these changes, we must also be vigilant of potential negative impacts, such as

excessive reliance on digital tools that may lead to a decline in the quality of exercise experience, thereby affecting mental health [4].

In addition, current research on the relationship between exercise participation and mental health often overlooks the role of digital tools, which is an important research gap. To fill this gap, this study adopted a mixed method research design, which not only analyzed a large amount of quantitative data to reveal general trends, but also conducted qualitative interviews to gain a deeper understanding of individual experiences, in order to provide a more comprehensive perspective.

### **1.3 Research Objectives and Issues**

Through the study of this topic, this article aims to draw people's attention to the changes in sports participation methods in the digital age, and how these changes affect the physical and mental health of individuals and society. In particular, this study emphasizes the need to pay more attention to the impact of digital health tools on different groups when promoting them, especially those who may be marginalized due to technological barriers. By doing so, we can not only maximize the positive effects of digital tools, but also avoid or reduce their potential negative impacts, thereby promoting a healthier and more inclusive society.

## **2. Literature Review**

### **2.1 Sports, Mental Health, and the Digital Era**

Sports have been confirmed by numerous studies to improve mental health. According to a report from the World Health Organization, regular physical activity can significantly reduce the risk of anxiety and depression. In addition, sports activities are considered one of the important factors in improving the quality of life, which is not only beneficial for physical health, but also has a positive impact on mental health. However, in the digital age, people's ways and motivations for participating in sports are changing, which poses new challenges for understanding the relationship between sports and mental health [5].

With the rapid development of technology,

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digital tools such as health applications, online fitness courses, and social media platforms have played an increasingly important role in promoting sports engagement. These tools not only provide a more convenient and personalized fitness experience, but also stimulate users' exercise motivation through social networks. However, research on the specific impact of these digital tools on mental health is still relatively limited.

### **2.2 The Double-edged Sword Effect of Digital Tools**

On the one hand, research has shown that digital health tools can effectively improve user engagement in sports, thereby having a positive impact on mental health. For example, a study found that individuals using walking trackers exhibited higher frequency of exercise and reported better psychological well-being. On the other hand, some scholars have also warned that excessive reliance on these tools may lead to psychological dependence, reduce face-to-face social interaction, and thus have a negative impact on mental health.

In addition, the popularity of digital tools has also sparked discussions about the digital divide, where differences in technology access and usage capabilities among different social groups may exacerbate social inequality. This is of great significance for studying the relationship between exercise participation and mental health, as this gap may lead to specific groups being at a disadvantage in accessing health information and resources.

### **2.3 Theoretical Framework: Self Determination Theory and Health Belief Model**

In the study of the relationship between sports participation and mental health, self-determination theory and health belief model provide important theoretical support. The self-determination theory emphasizes the core role of intrinsic motivation in driving individual behavior, while the health belief model focuses on the individual's beliefs about the outcomes of health behavior and their impact on behavior [6]. Applying these two theories to the study of sports engagement in the digital age can help us gain a deeper understanding of how individuals use digital tools to find intrinsic motivation for exercise and how they evaluate the potential impact of

these behaviors on their mental health [7].

## **2.4 Research Gaps**

Although there have been studies exploring the relationship between exercise and mental health, as well as the role of digital tools in promoting healthy behavior, there is still a relative lack of research on how to integrate these tools into people's daily lives to increase exercise participation and improve mental health through this approach [8]. In addition, there is insufficient research on the inequality issues that digital tools may bring, as well as their impact on the mental health of specific social groups.

Through this literature review, this study aims to fill this research gap and provide a comprehensive perspective to understand the complex relationship between sports engagement and mental health in the digital age. This not only requires consideration from the perspective of technological popularization and accessibility, but also requires in-depth analysis from the perspectives of psychological and social factors and individual differences.

## **3. Research Methods**

### **3.1 Research Design**

This study adopts a mixed method research design, combining quantitative and qualitative methods, to obtain a comprehensive understanding of the relationship between sports participation and mental health in the digital age. The quantitative research section aims to collect data through large-scale online questionnaire surveys to analyze the relationship between exercise participation, frequency of use of digital tools, and mental health indicators [9]. The qualitative research section explores how individuals participate in sports through digital tools through semi-structured interviews, and analyzes how these experiences affect their mental health [10].

### **3.2 Participants**

The quantitative research section plans to recruit 1000 adult participants aged 18 and above through social media platforms and email lists. Participants will be screened through a screening questionnaire that includes basic information such as age, gender,

occupation, educational background, and exercise habits to ensure sample diversity.

The qualitative research section will randomly select 50 participants from quantitative research for in-depth interviews, ensuring that individuals of different ages, genders, professions, and levels of sports participation are included in order to gain a deeper understanding of their experiences and perspectives in different contexts.

### **3.3 Data Collection**

**Quantitative data collection:** The online questionnaire will consist of three parts. The first part is to collect basic information of participants; The second part uses standardized scales to evaluate the participation of participants in sports, such as the International Physical Activity Questionnaire (IPAQ); The third part uses psychological health assessment tools such as the Generalized Anxiety Disorder 7-item Scale (GAD-7) and the Patient Health Questionnaire 9-item Scale (PHQ-9) to assess the psychological health status of participants.

**Qualitative data collection:** Semi structured interviews will explore participants' experiences, feelings, and perceptions of using digital tools to engage in sports, as well as how these experiences affect their mental health. The interviews will be conducted by members of the research team, with an estimated duration of 30 to 60 minutes each time. They will be completed through online video conferencing software and recorded and transcribed.

### **3.4 Data Analysis**

**Quantitative data analysis:** Use statistical software SPSS for data analysis. Use descriptive statistics to analyze the basic information and scale scores of participants. Use correlation analysis and multiple regression analysis to explore the relationship between exercise participation, frequency of digital tool use, and mental health indicators.

**Qualitative data analysis:** Interview transcripts will be analyzed using content analysis to identify themes and patterns related to the relationship between digital tools, exercise participation, and mental health. Using qualitative analysis software such as NVivo to assist in coding and topic analysis, ensuring systematic and in-depth analysis.

### 3.5 Ethical Considerations

This study will adhere to ethical principles to ensure the privacy of participants and the security of data. All participants will sign an informed consent form before participating in the study, indicating that their participation is voluntary and they can withdraw from the study at any time. All data collected in the study will be anonymized and used only for research purposes. This study will receive approval from the corresponding ethics committee.

Through this methodological framework, this study aims to explore the complex relationship between sports participation and mental health in the digital age, provide scientific and effective data support, and provide guidance for future policy formulation and practice.

### 4. Conclusions

In an online questionnaire survey of 1000 adult participants and subsequent 50 in-depth interviews, this study revealed the complex relationship between exercise engagement and mental health in the digital age. The following are the main findings:

#### 4.1 Quantitative Research Results

The correlation between sports participation and mental health indicators: Statistical analysis shows a significant positive correlation between sports participation and mental health indicators. Specifically, higher levels of exercise participation are associated with lower levels of anxiety (GAD-7 score) and depression (PHQ-9 score).

Frequency of use of digital tools: Data shows that participants who frequently use health apps and online fitness courses report higher levels of exercise engagement. However, a small portion of participants who overly relied on digital tools reported higher symptoms of anxiety and depression.

Demographic differences: Young people (aged 18-35) and skilled individuals are more likely to participate in sports through digital tools, while older participants (aged 55 and above) have lower levels of participation in this area.

#### 4.2 Qualitative Research Results

Personal Experience and Perception: Interview data reveals that although many participants believe that digital tools make sports more convenient and interesting, some also indicate

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that the lack of face-to-face interaction reduces their social satisfaction and motivation.

Technical access and usage barriers: Some participants pointed out that although they are interested in using digital fitness tools, high costs, complex user interfaces, and information overload can sometimes become barriers to participation.

Personalized needs: Participants generally believe that highly personalized health applications and courses can better meet their needs and increase participation in sports. They hope that these tools can better adapt to individual health conditions, fitness levels, and preferences.

### 4.3 Comprehensive Analysis

The quantitative and qualitative results of this study collectively reveal a complex picture: although digital tools have played a positive role in increasing exercise participation and had a positive impact on mental health, this effect is not universally applicable to everyone. Demographic characteristics, personal preferences, and technological access conditions all play important roles in individual experience differences.

Through these findings, we can better understand the relationship between sports engagement and mental health in the digital age, providing a basis for designing more inclusive and effective health promotion strategies.

### 5. Discussion

The purpose of this study is to explore the relationship between sports engagement and mental health in the digital age, especially considering the use of digital tools. By combining quantitative and qualitative methods, we have revealed a series of complex factors that affect this relationship.

#### 5.1 Positive Effects of Exercise Participation on Mental Health

The quantitative analysis results indicate that higher levels of exercise participation are positively correlated with lower levels of anxiety and depression, which is consistent with previous studies. This emphasizes the importance of exercise as an effective way to improve mental health. In addition, qualitative data further reveals how individuals find motivation for movement through digital tools,

and how these tools help them overcome obstacles in traditional sports participation.

### **5.2 Benefits and Risks of Digital Tools**

Although most participants reported that digital tools improved their exercise engagement and mental health, a small portion of them reported that this dependence led to an increase in anxiety and depression. This indicates that the use of digital tools requires moderation, and excessive reliance may lead to negative mental health consequences. This discovery suggests that when promoting health applications and online fitness courses, it is necessary to provide appropriate guidance and education to users.

### **5.3 The Impact of Demographic Factors**

Age and technical proficiency play a significant role in the use of digital tools and participation in sports. Young people and skilled technicians are more inclined to use these tools to promote their sports activities, while older participants face more challenges in this regard [9]. This emphasizes the importance of designing and promoting more accessible and user-friendly digital health tools for populations with different demographic characteristics.

### **5.4 Personalized Needs**

Interview data shows that personalized health applications and courses can more effectively meet individual needs, thereby improving exercise participation and mental health. This discovery indicates that future digital tool development needs to take into account more of the personalized needs of users, including their health status, fitness level, and personal preferences.

## **6. Conclusion and Future Research Directions**

This study provides important insights into designing more effective and inclusive health promotion strategies by delving into the complex relationship between sports engagement and mental health in the digital age. Future research can further explore how to optimize the design of digital tools to meet the needs of a wider user group while reducing potential negative impacts. In addition, broader demographic research will help understand how individuals use digital tools to

promote their sports engagement and mental health in different contexts.

## **References**

- [1] Huang Fuxiang. Thoughts on the transformation of college student management and education model in the digital era. *Internet Weekly*, 2024 (03): 64-66.
- [2] Wang Yilin. On the Role of Sports in the Psychological Health of Middle School Students. *Neijiang Technology*, 2024, 45 (01): 65-66.
- [3] Zhang Haibo. In the digital age, collaborative education is more needed. *Parents must read*, 2023 (S2): 98-99.
- [4] Lu Lin. Theory and Mechanism of Sports Promoting Student Mental Health. *Boxing and Fighting*, 2023 (12): 95-97.
- [5] Chen Ying. Research on Transformation Services of the Health and Wellness Industry in the Digital Era. *Science and Technology Economic Market*, 2023 (11): 22-24.
- [6] Zhou Honghong, Wei Xingwang, Wang Zhiwei. Analysis of the Psychological Health Status of Students in Sports Schools. *Sichuan Sports Science*, 2023, 42 (04): 47-49.
- [7] Li Zhaoyuan, Yang Jun, Chen Libing. Research on the cultivation of autonomous learning ability in physical education for college students in the digital era. *Journal of Hezhou University*, 2023, 39 (02): 164-170.
- [8] Wu Ke Research progress on the mental health status of adolescent athletes from the perspective of Healthy China. *Sports Social Science Branch of the Chinese Society of Sports Sciences. Proceedings of the Annual Meeting of the Sports Social Science Branch in 2023. Sports Social Science Branch of the Chinese Society of Sports Sciences: Chinese Society of Sports Sciences*, 2023: 3.
- [9] Li Haiyan. A study on aerobic exercise intervention for mental sub-health college students in vocational colleges. *Sports Perspective*, 2023 (12): 101-103.
- [10] Gu Yanyuan. The Path and Strategy of Sports Infiltration of "Psychological Education" under the Background of Sports Education Integration. *Gannan Normal University*, 2023.