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Sport Motivation and Health: Relationship Between Health and Sport Motivation Among Key Junior High Schools' Students in China

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ABSTRACT

The existing research has focused on physical and mental health, yet exploring the relationship between sports motivation and overall health remains indispensable. This study investigates sports motivation and health levels of students in key junior high schools, examining correlations between these variables and their sub-items. Data were collected using the Sport Motivation Scale and the Self-rated Health Measurement Scale, followed by descriptive analysis, multi-way ANOVA and correlation analysis. Results revealed that intrinsic motivation emerged as the most prevalent type of motivation. Students' health conditions were suboptimal, with the moderate sub-health group accounting for 60% of the whole sample. Intrinsic and extrinsic motivation shared a similar development trend with overall health. Intrinsic motivation, extrinsic motivation and their sub-items were found to have positive correlations with overall health (p<0.001). Notably, social health demonstrated a positive correlation with intrinsic motivation, extrinsic motivation, sub-items, and overall health (p<0.001). The findings suggest that there are positive significant correlations among intrinsic motivation, extrinsic motivation, social adaptation and overall health. Junior high school students' sports motivation and wellness are dynamic and complicated, sharing analogous developmental trajectories. It would be practical to pay more attention to Grade 8 students, as they

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are more likely to exhibit the worst situation regarding sports motivation and health. Meanwhile, intervention measures, such as internalization of sports values and external rewards, are suggested to enhance students' wellness.

Keywords: Health, key junior high school student, SDT, sport motivation, Three-Dimensional Health

INTRODUCTION

As indicated in the Global Strategy for Women's, Children's, and Adolescents' Health and the Countdown to 2030 (Boerma et al., 2018; Temmerman et al., 2015), teenagers are an important research target, as their state of health is becoming a universal concern. Scholars have reported a variety of teenagers' health problems, such as physical illnesses (Lebek et al., 2024), mental diseases (Bevilacqua et al., 2023), behavioral issues (Morishima et al., 2024), and interpersonal violence (Chainé et al., 2023). Reviewing health-related problems reveals that teenagers' health issues are never a one-sided physiological or mental theme but a manifold research topic that needs to be explored from multiple dimensions.

Sports motivation is not only a basis for individuals to engage in sports but also the driving force to maintain sports behavior. The Self-Determination Theory (SDT; Deci & Ryan, 1991) posits that behavior can be intrinsically motivated, extrinsically motivated, or demotivated. The relationship between sports motivation and health is mainly reflected in physical and mental health, indicating that sports motivation can deliver a positive impact on physical and mental conditions (Conde-Pipó et al., 2022; Trigueros et al., 2020). Individuals with higher sports motivation are less likely to suffer from physical diseases (e.g., chronic disease) and mental disorders (e.g., anxiety). Nevertheless, the connection between sports motivation and overall human wellness has not been thoroughly investigated, and the connection in the adolescent group is even unclear. This represents a research-lacking area that spans the fields of sports motivation and health. Exploring the correlation between sports motivation and multi-dimensional health would provide comprehensive health promotion suggestions from the origin of sports behavior, making it of great significance for enhancing adolescents' health. In the face of the declining health situation of adolescents, this study is purposed to explore how to provide ideas for health improvement in terms of the relationship between adolescents' overall health and sports motivation. Against this backdrop, the objectives of this study include: (1) to investigate the status quo of junior high school students' sports motivation and health and examine the differences that exist in sports motivation and health based upon gender and grade; and (2) to analyze the correlation among sport motivation, health, and their sub-items, thereby elucidating the possible linkages between these two important variables

for adolescents' sustainable development. Generally, it is assumed that intrinsic motivation (IM) and extrinsic motivation (EM) are positively correlated with health, and boys have a higher level of IM and EM than girls.

LITERATURE REVIEW

Sport Motivation and Health

The effects of sports motivation have been widely studied by scholars for years on such aspects as sports participation (Deelen et al., 2018), the sense of contentment and happiness (Batista et al., 2019; Duan et al., 2020), self-concept (Melguizo-Ibáñez et al., 2022), and mental disorders (Trigueros et al., 2020). Apart from these frequently discussed topics, exploration on such less focused themes as sports settings has delivered some interesting results. Deelen et al. (2018) found that people with IM and extrinsic-oriented goals are more likely to go to sports clubs, a place known for people to keep high sports frequencies and spend more time in. Studies have found positive correlations between sports-related motivation and other factors, such as sports participation motivation and perceived value (Zhao & Li, 2021). In a cross-sectional study of ninth-grade adolescents, health and fitness-related motivation was found to strengthen control competence in physical training and foster participation in sports (Haible et al., 2019). Researchers have also reviewed physical activity motives and barriers across social backgrounds, like socioeconomic status and ethnic minority (Pedersen et al., 2021). The above research revealed positive relationships between sports motivation and other factors. However, some studies suggested negative relationships between sports motivation and other factors. Take, for example, negative behaviors: Sports anomie behavior was found to be negatively related to sports motivation (S. P. Chen et al., 2023). As shown in the review of sport motivation-related literature, the research population included the old (Conde-Pipó et al., 2022), urban residents (Yu & Song, 2022), university students (Zhou, 2023), adolescents (Molcho et al., 2021), athletes (Wu et al., 2021), and women (Yen et al., 2012). In terms of sports items, summer sports were the main research focus, such as marathons (Duan et al., 2020), swimming (Anderson & William, 2018), soccer (Bai, 2020), and basketball (Jung et al., 2021). Winter sports have been attracting attention in recent years, such as ice sports (Liu et al., 2023) and alpine skiing (Conde-Pipó et al., 2022).

With respect to intervention measures to enhance sports motivation, Abdoshahi and Shemshaki (2021) found that a self-determination-based teaching strategy can boost high school students' motivation, engagement and satisfaction with sports; however, their research lacked information on the sub-dimension of sports motivation. Reducing irrational beliefs also has a similar implication. Studies demonstrated that with reduced irrational beliefs, increased autonomous motivation could be found in triathletes (Turner & Davis, 2019), American football players (Chrysidis et al., 2020), and an archer (Wood et al., 2020). Apart from the above-mentioned intervention strategies, it was found that the HERizon Project (a

physical activity program founded on the basis of SDT) could enhance identified regulation and IM (Cowley et al., 2024). These studies provided application insights into sports motivation promotion and suggested intervention methods for the targeted proposals of the current study.

The measurement of multi-dimensional health has been valued since the World Health Organization (WHO) put forward the Three-Dimensional Health view. Similar to the current study in terms of research subjects, recent research investigated the multi-dimensional health-related characteristics of 217 children aged 9 to 14 years old, finding that male students outperformed girls on most physical indicators, with greater self-determined motivation (Burton et al., 2024). Multi-dimensional health was measured by individuals' emotional, psychological and social well-being in Vella and her coauthors' (2021) study, which found that higher rates of self-determined motivation were associated with lower psychological distress and higher well-being at the team level. In terms of the connectivity between health and sports, most studies have focused on external indicators, such as physical activity, while paying less attention to intrinsic ones, such as motivation. A positive correlation is proven between sports motivation and health, but the concept of health is focused mostly on physical health, showing a weakness of incomprehensiveness (Zhou, 2023). Compared to physical and mental health, social health has been understudied. Social environments that fulfill people's basic psychological needs and facilitate self-determined behavior can promote well-being (Hortop et al., 2013) and prevent negative psychological outcomes (Britton et al., 2014). In this context, sports programs are in the range of social environments. Given this idea, multi-dimensional health, which includes social well-being, might have a correlation with sports motivation. Generally, the relationship between sports motivation and overall health, which combines physical, mental and social health, still needs to be explored.

Self-Determination Theory

The Self-Determination Theory (SDT), proposed by Deci and Ryan, has shown remarkable persistence as a theory to explain motivation in the context of sports and physical activities (Hagger & Chatzisarantis, 2007). It is accepted as an appropriate conceptual framework for exploring sports motivation. SDT posits that people's motivations lie along a continuum from the most to least self-determination, namely, from IM to EM, to motivation (Deci & Ryan, 2000). The level of self-determination can be divided into autonomous motivation and controlled motivation, with behaviors generated by different motivation types lying on different points of the continuum (Figure 1). A higher level of self-determination would lead to more positive and persistent behavior. Sun and Zhang (2012) and Wang (2014) found that a high level of autonomous support could deliver a positive effect on athletes' mental fatigue, training satisfaction and EM internalization. However, research on non-athletic groups still needs to be further conducted.

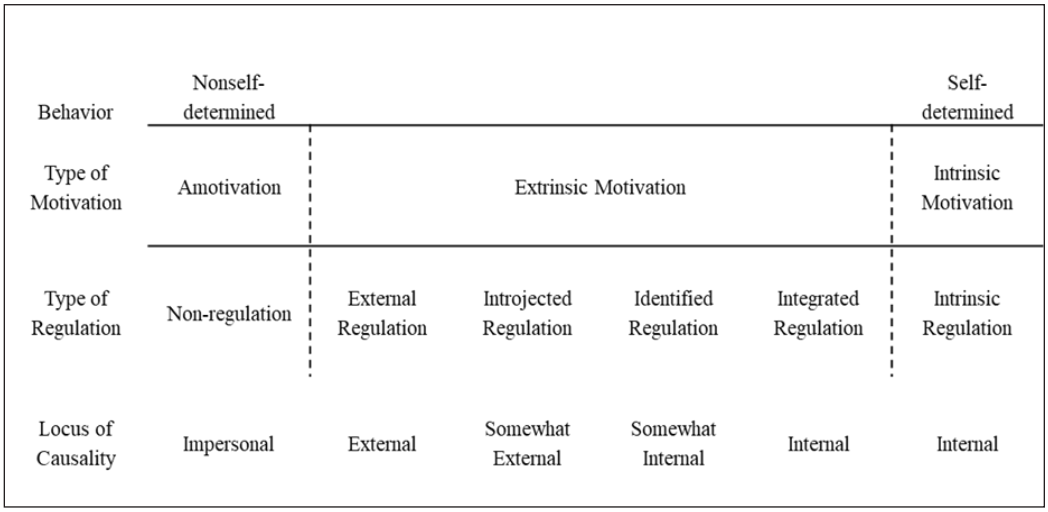

Figure 1. The self-determination continuum (Source: Deci & Ryan, 2000)

IM relates to performing an activity for the sake of enjoyment and satisfaction. It is the most self-determined form of motivation, consisting of intrinsic motivation to know (IM-to know), intrinsic motivation toward accomplishment (IM-accomplishment), and intrinsic motivation to experience stimulation (IM-stimulation). IM-to-know can be defined as engaging in an activity for pleasure and satisfaction while learning something new. IM-accomplishment happens when one does an activity for pleasure and satisfaction by accomplishing or creating something. This type of motivation is related to athletes' pursuit of breaking records. IM stimulation occurs when one is involved in an activity that leads to the experience of stimulating sensations, such as sensory pleasure or aesthetics (Pelletier et al., 1995). EM includes identified regulation, introjection regulation and external regulation. Identified regulation reflects the conscious valuing of a behavioral goal or regulation, such that an action is accepted or owned as personally important (Ryan & Deci, 2000). Its internalization would be fuller than with introjection regulation, which entails adopting external regulations as one's requirements and maintaining them in a form that is relatively isomorphic with the external regulations (Ryan & Connell, 1989). Thus, it is described as swallowing regulations as a whole without digesting them first (Perls, 1973). External regulation is the case where people act in accordance with external contingencies so as to gain a desired outcome, such as rewards (Deci & Ryan, 1991). Amotivation lies at the least self-determined end of the continuum and is characterized by a lack of intention to act (Sheehan et al., 2018).

Three-Dimensional Health Model

The WHO holds a view that health is a triunity of states of physical, mental and social well-being rather than a mere lack of disease and weakness (World Health

Organization, 1946). This definition remains visionary and is worthwhile to pursue. Under this interpretation, physical health refers to being physically strong without pain or illness; mental health relates to having a good mental state, a positive attitude towards life, etc.; social health compasses individuals' ability to adapt to their social environment and play an active role in prompting the health of their families, communities and even the whole society. It also involves exploring and maximizing one's potential so that one's social value is manifested. The Human Population Laboratory of Alameda County, California, has been trying to apply this health view in measuring health and in ascertaining how to promote it. The Laboratory regards health as a spectrum with three axes (physical, mental and social well-being). Each person has his/her position on each axis of the spectrum (Breslow, 1972). The three dimensions offer a comprehensive view of modern human health. Given that the Three-Dimensional Health Theory is well-established and widely employed, this study would take it as the theoretical basis and select a health survey instrument that can measure the triumvirate nature of health.

METHODS

Participants and Procedures

The inclusion criterion for participants is students coming from key junior high schools. In China, key secondary schools concentrate on top-level students with high-quality educational resources to cultivate elite talents urgently needed by the country (Xia, 2008). It is well known that students in junior high schools have to undertake a more severe academic burden, for they are expected to gain higher academic scores. As a result, they may stay in a specific and unoptimistic health status. Furthermore, key schools have become the mainland for Chinese parents to seek higher-quality education and cultivate the next generation. Accordingly, education topics related to key schools are representative and valuable for exploration. Meanwhile, students in this studying phase have to face the Physical Exam of the Entrance Examination for Senior High School (PEEESHS), giving researchers a chance to study students' possible dynamic sports motivation and health changes. Three key junior high schools were selected from both old and new urban districts in Xi'an, China. Four hundred questionnaires were randomly distributed in these schools, and all were retrieved, including 355 valid ones. Eventually, 355 students (43.10% male, 56.90% female) participated in this study, and they came from both public and private high schools. Thus, these participants are representative of key junior high school students to a great extent. The sample size is proper under the calculation using G-Power 3.1 software (Input parameters: H1 corr ρ_cd=0.2, α error prob=0.05, power=0.8. Output parameters: sample size=213, actual power=0.801). The Academic Committee of Shaanxi Normal University approved the protocol. Informed consent with signatures was obtained from the participants. To ease the participants' concerns, they were told before filling out

the questionnaires that the investigation was anonymous and would not affect any of their academic records. The investigators then administered the surveys to ensure students finished the paper-and-pencil tests (estimated 15–20 minutes) during one of their regularly scheduled classes. This timing guaranteed a quiet and stable environment, avoiding severe interference. The whole investigation process was carried out in the absence of school teachers so as to minimize their potential influence on the validity of the survey. The Excel and SPSS 24.0 statistical software were employed to process the data. Statistical methods, such as descriptive analysis, independent-samples t-test, one-way ANOVA, multi-way ANOVA, and correlation analysis, were utilized to identify the participants' sports motivation and health condition, as well as the correlation between the two.

Measures

The Sport Motivation Scale

The Sports Motivation Scale (SMS) is a 28-item questionnaire based on the tenets of SDT theory, designed to measure IM, EM, and amotivation. In this study, a Chinese version of SMS was employed, which was exploited by Peng (2012). This version of SMS was applied to Chinese junior high school students in previous research (N. Chen, 2023; Zhang, 2024), demonstrating a generalizability in this age group. This questionnaire provides a 7-point Likert scale for each response, with seven indicating "very consistent" and one indicating "very inconsistent ."The higher the score on one dimension, the stronger the influence on one's sport behavior. In particular, Questions 2, 4, 23 and 27 of the scale refer to IM-to know; Questions 8, 12, 15 and 20 refer to IM-accomplishment; Questions 1, 13, 18 and 25 refer to IM-stimulation; Questions 7, 11, 17 and 24 refer to identified regulation; Questions 9, 14, 21 and 26 refer to introjected regulation; Questions 6, 10, 16 and 22 refer to external regulation; and Questions 3, 5, 19 and 28 refer to amotivation (Pelletier et al., 1995). SMS has high internal consistency, with Cronbach's alpha values higher than 0.6 for each subscale, and each item has a factor loading above 0.7 (Peng, 2012).

The Self-rated Health Measurement Scale

The Self-rated Health Measurement Scale (SRHMS) was developed by Xu et al. (2003). First designed and measured in Chinese, this scale was tested as suitable for subjects aged about 14 years in previous studies (Xu et al., 2006). The scale comprises 48 items and three subscales. Questions 1 to 18 test physical health; Questions 19 to 34 test mental health; and Questions 35 to 47 test social health. SRHMS is translated into 100 points: A score of 45 points or less represents the existence of diseases; a score of 46 to 55 is classified as severe sub-health; a score of 56 to 75 is classified as moderate sub-health; a score of 76 to 85 is considered as mild sub-health; and a score above 86 is calculated as healthy. SRHMS has Cronbach's alpha values ranging from 0.63 to 0.91 for the three subscales (Xu et al., 2002).

Ethics Statement

The studies involving human participants were reviewed and approved by the Academic Committees of Shaanxi Normal University. The patients/participants provided their written informed consent to participate in this study.

RESULTS

Reliability of the Scales

The reliability of SMS in this study is consistent with previous research (F. F. Chen, 2021; Peng, 2012). SMS reported excellent internal consistency, with a Cronbach's alpha of 0.92. Cronbach's alpha coefficients for IM, EM and amotivation were 0.92, 0.86 and 0.71, respectively. SMS also had good structural validity, as evidenced by the Kaiser-Meyer-Olkin (KMO) coefficient, which was greater than 0.70 (0.93). The SRHMS's reliability is compatible with relevant studies (Gao et al., 2021; Xu et al., 2002). It demonstrated good internal consistency, with a Cronbach's alpha of 0.84. Cronbach's alpha coefficients were 0.73-0.90 for the SRHMS subscales, with values for physical health (α=0.73), mental health (α=0.76) and social health (α=0.90) all standing in an acceptable range for Cronbach's alpha. The KMO value for SRHMS was also indicative of good structural validity (0.90). Thus, this questionnaire can be used as a reliable and valid measure of health.

Demographic Characteristics of the Participants

The participants' demographic information is listed in Table 1. As can be seen, the average age of all the participants is 14.67 years (± SD 1.58); the number of male and female participants is nearly equal; and the participants were distributed evenly across grades in the junior high schools.

Table 1
Characteristics of the study samples

Demographic information	n	% or mean
Socio-demographics		
Male	153	43.10
Female	202	56.90
Mean age (all participants)	355	14.67
Mean age (grade 7)	118	13.26
Mean age (grade 8)	121	14.87
Mean age (grade 9)	116	15.89
Grades		
7	118	33.24
8	121	34.08
9	116	32.68

Overall Description of Sport, Motivation, and Health

Sport Motivation of Chinese Key Junior High Schools' Students

In terms of sports motivation structure, IM accounted for the largest proportion (48%), followed by EM (41%) and amotivation (11%). The proportion of IM indicators showed that these students' IM appeared to be balanced, with IM-accomplishment accounting for 34.27%, IM-stimulation accounting for 33.49%, and IM-to-know accounting for 32.24%. The results of IM and EM in different genders were in line with the assumption. The average level of the boys' IM was higher than that of the girls' (63.88±15.62 v.s. 59.40±14.74). It can be found that the boys outperformed the girls on IM-to-know (p=0.01) and IM-stimulation (p=0.002; Figure 2a). There was

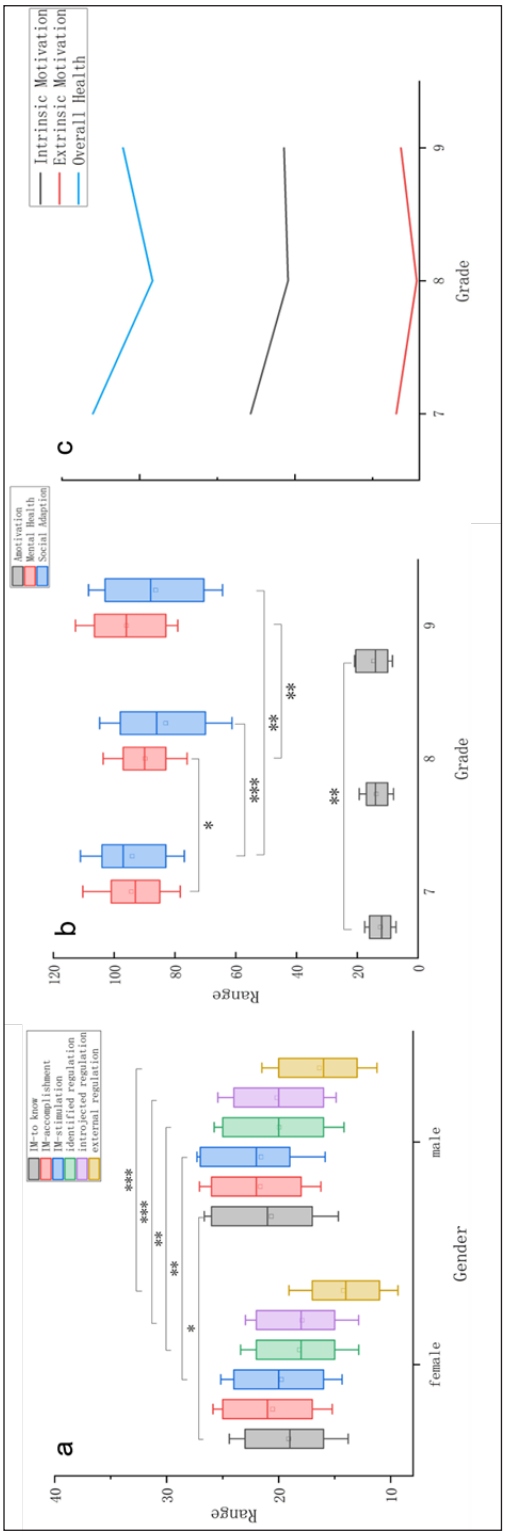

Figure 2. a. Gender differences for intrinsic motivation and extrinsic motivation. b. Grade differences for amotivation, mental health and social adaptation. c. Development of intrinsic motivation, extrinsic motivation and overall health over grades

Note. IM-to know=intrinsic motivation to know; IM-accomplishment=intrinsic motivation toward accomplishment; IM-stimulation=intrinsic motivation to experience stimulation; * p<0.05; ** p<0.01; *** p<0.001

no significant difference between grades. For EM, introjected regulation and identified regulation took up a similar proportion, around 35%, while external regulation was relatively low (28.60%). The whole level of the boys' EM was higher than that of the girls', with mean values of 56.47±14.42 and 50.26±12.93, respectively. Then, it was proved that there were significant gender differences in all indices: boys outperformed girls on identified regulation (p=0.002), introjected regulation (p<0.001), and external regulation (p<0.001; Figure 2a). No significant grade difference was found. In terms of amotivation, boys and girls demonstrated similar levels, with no significant gender difference observed. However, a significant grade difference was revealed in Grades 7 and 9 (p=0.002), with Grade-7 students' amotivation (12.38±5.16) significantly lower than Grade-9 students' (14.66±6.25; Figure 2b).

Health Status of Chinese Key Junior High Schools' Students

On average, mental health (62.20±10.50), social adaptation (73.14±17.40) and physical health (77.41±8.36) stayed in ascending order. The mean values of the three indices of the boys and girls were approximately equal. No significant gender difference was observed in these indicators. It was found that there were significant differences in mental health and social adaptation based on grade levels (Figure 2b). Specifically, mental health in Grade 7 was significantly higher than that of students in Grade 8 (p=0.027), which was significantly lower than that of students in Grade 9 (p=0.003). Similarly, social adaptation in Grade 7 was significantly higher than that of students in Grade 8 (p < 0.001) and Grade 9 (p = 0.005). In terms of overall health, the moderate sub-health group (60%) was the most common, followed by the mild sub-health group (32%), the severe sub-health group (5%), the healthy group (2%), and the disease group (1%).

The Trend of Sport Motivation and Health over Grades

To determine how sports motivation and health have developed over time, their trends were analyzed from the perspective of grades. It can be observed from Figure 2c that IM, EM, and overall health share the same developmental pattern, namely, a decrease from Grade 7 to Grade 8 and then a relative increase between Grades 8 and 9. Therefore, Grade 8 could be viewed as a turning point for both IM and EM, as well as for the health development of these students. According to this pattern, it was believed that there might be correlations between these indices.

Correlation Between Sport Motivation and Health

The bivariate correlation matrices (Figure 3 and Table 2) indicated that there were moderate, significant positive correlations between IM and overall health (r=0.293, p<0.001), as well as between EM and overall health (r=0.297, p<0.001). These results confirmed the hypothesis of this study. Additionally, each indicator of IM and EM was found to have a medium, significant correlation with overall health

Table 2
Cross-correlation matrix coefficients (top) and Pearson correlation tests P-Values (bottom) of SMS and SRHMS

	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) IM-to know	1												
(2) IM-accomplishment	0.723***	1											
	0.000												
(3) IM-stimulation	0.785***	0.769***	1										
	0.000	0.000											
(4) IM	0.915***	0.904***	0.930***	1									
	0.000	0.000	0.000										
(5) identified regulation	0.751***	0.719***	0.719***	0.797***	1								
	0.000	0.000	0.000	0.000									
(6) introjected regulation	0.712***	0.660***	0.724***	0.763***	0.728***	1							
	0.000	0.000	0.000	0.000	0.000								
(7) external regulation	0.498***	0.471***	0.479***	0.527***	0.644***	0.557***	1						
	0.000	0.000	0.000	0.000	0.000	0.000							
(8) EM	0.752***	0.710***	0.737***	0.800***	0.911***	0.873***	0.834***	1					
	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
(9) Amotivation	-0.002	0.031	-0.032	-0.002	0.114*	0.075	0.333***	0.196***	1				
	0.965	0.564	0.544	0.971	0.032	0.156	0.000	0.000					
(10) physical health	0.141**	0.154**	0.129*	0.154**	0.132*	0.076	0.120*	0.126*	-0.138**	1			
	0.008	0.004	0.015	0.004	0.013	0.155	0.023	0.018	0.009				
(11) mental health	0.166**	0.092	0.139**	0.145**	0.116*	0.180***	0.155**	0.171**	0.110*	0.100	1		
	0.002	0.084	0.009	0.006	0.029	0.001	0.003	0.001	0.038	0.059			
(12) social adaption	0.304***	0.196***	0.324***	0.301***	0.278***	0.302***	0.221***	0.306***	-0.090	0.323***	0.339***	1	
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.000	0.000		
(13) Overall Health	0.299***	0.211***	0.294***	0.293***	0.259***	0.279***	0.239***	0.297***	-0.058	0.614***	0.661***	0.840***	1
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.279	0.000	0.000	0.000	

Note. * $p<=0.05$; ** $p<=0.01$; *** $p<=0.001$ (two-tailed)

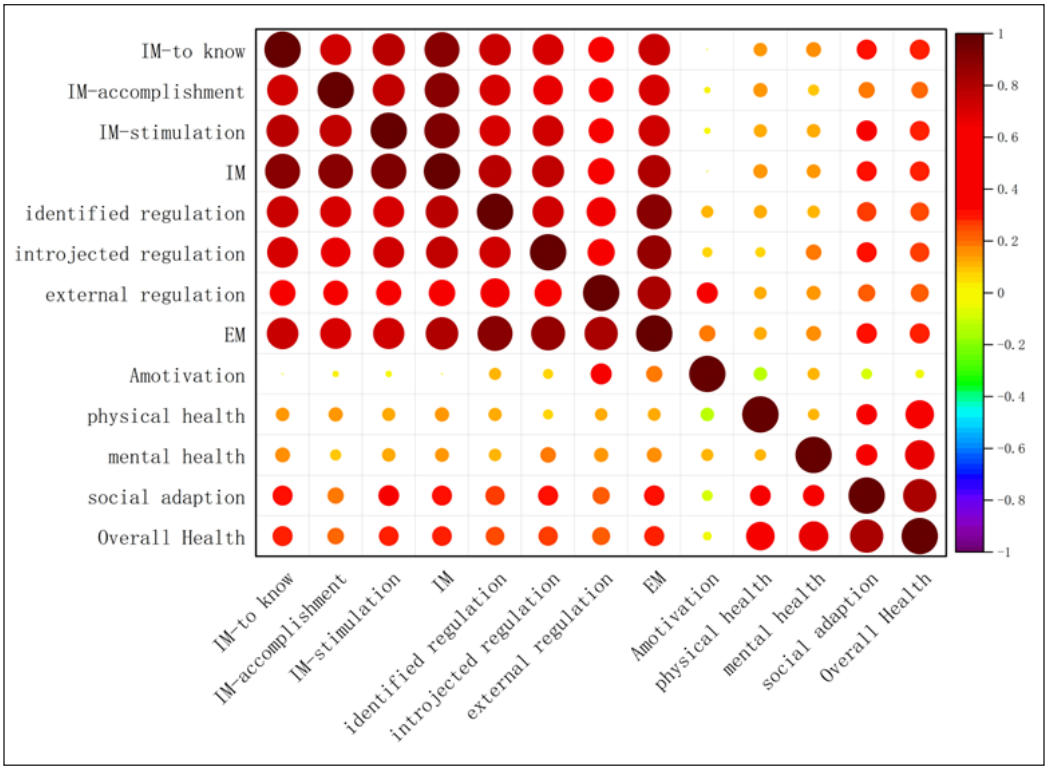

Figure 3. Cross-correlation matrix of SMS and SRHMS. IM-to know = intrinsic motivation to know; IM-accomplishment = intrinsic motivation toward accomplishment; IM-stimulation = intrinsic motivation to experience stimulation; IM = intrinsic motivation; EM = extrinsic motivation

($0.211 \leq r \leq 0.299$, $p<0.001$). Different from physical health and mental health, social adaptation was generally positively correlated with both IM and EM, as well as with their subitems ($0.196 \leq r \leq 0.324$, $p<0.001$). With regard to health, there were moderate to strong positive correlations between different dimensions of health and overall health ($0.614 \leq r \leq 0.840$, $p<0.001$), with social health having the most prominent performance.

DISCUSSION

As evidenced, sports motivation is closely related to mental health, which in turn raises a question: Is there a relationship between sports motivation and overall health? However, no research has been found that takes health as a whole and explores its relationship with sports motivation. Based on the current research status, this study has the following aims: firstly, to investigate the status quo of the sports motivation and health of Chinese key junior high school students while examining the differences that may exist in sports motivation and health based upon gender and grade; and secondly, to analyze the correlation between sport motivation and health, as well as between their sub-items,

to elucidate the possible linkages between these two important variables for teenagers' sustainable development. It is hypothesized that IM and EM are positively related to health. The results are in accord with our expectations. The current results and relevant research support the supposition. Descriptive statistics show that, unlike amotivation, IM and EM share a similar development pattern to overall health across grade levels. This is probably a result of their positive correlations with each other. Besides, IM and EM are found to have positive correlations with overall health, and this finding is compatible with previous evidence which demonstrates that sport motivation is positively related to psychological well-being (Stenling et al., 2015) and social health (Anderson & William, 2018). This relationship between sports motivation and health has also been testified in Turner's study: individuals reported that low self-determined motives would report worse physical and mental health (Turner et al., 2022). Sports behaviors induced by IM and EM can enhance students' overall health in the process of their physical and mental involvement and peer social interactions.

Overall, the boys appear to deliver a higher degree of IM and EM than the girls, a finding that aligns with previous research (Cao, 2021; Portela-Pino, 2019). This might indirectly explain the phenomenon that boys have higher participation in both moderate-to-vigorous and vigorous physical activities (Molcho et al., 2021). The indices also seem to be relatively balanced in terms of sub-item proportion, with a very close succession, indicating that a single motivation does not generate sports behavior; instead, it is a complex result of multiple types of motivation. There are significant differences between genders in all indicators, except for IM-accomplishment and amotivation, which may be due to physiological, psychological, and socio-environmental factors (S. P. Chen & Zhang, 2008), as multiple factors influence motivation. In terms of grade, IM and EM first decrease from Grade 7 to 8 and then increase from Grade 8 to 9 in a sequential manner. Apart from IM and EM, amotivation increases through the grades. This finding is greatly concerned with the educational factors. The first factor is the controversial examination system: PEEESHS. It aims to guide students in forming good exercise habits while encouraging school principals, parents, students, and the entire society to place considerable value on physical education. The examination is used as a means to "force" Grade 9 students and all junior high school students to exercise (Mao et al., 2021). However, for students, PEEESHS might be a stepping stone or an obstacle to high school since the PEEESHS score is a component of the total score for the Entrance Examination for Senior High School. As elementary school pupils enter junior high school, the academic burden becomes weighty. This may explain the phenomenon that IM and EM decrease from Grade 7 to Grade 8 students. Noticeably, the increase after Grade 8 is possibly connected with PEEESHS. With the aggravating PEEESHS pressure, students are urged to

take part in sports, either voluntarily or unwillingly, so as to attain better scores. The second educational factor may be the academic pressure, which becomes heavier in Grade 8 than in Grade 7 to a great extent. There are more subjects in Grade 8 than in Grade 7: for example, physics, a difficult discipline for most beginners, is a newly added subject in Grade 8.

Among the sub-items of sports motivation and health, the sub-items of health are found to have the strongest significant correlation with overall health, and social adaption becomes the most noteworthy index for its strong positive correlation with overall health (r=0.840, p<0.001), as well as moderate positive correlation with IM, EM and their sub-items. With regard to social health, this result gives it a prior position, and the SDT theory, along with some related studies, supports it. Health is believed to be one of the ways for social factors to affect a person's subjective well-being (Helliwell & Putnam, 2004). Social wellness behaviors are associated with overall health (Anderson & William, 2018). The SDT theory contends that humans need competence, autonomy, and feeling related to others (Deci & Ryan, 2000). The relatedness mentioned in the theory is connected to social adaptation to a great extent. Conducive to the fulfillment of these three basic psychological needs, social contexts would support people's inherent activity, promote more optimal motivation, and produce the most positive psychological, developmental and behavioral outcomes (Deci & Ryan, 2000). Thus, comprehensively, social adaptation contributes more to the relationship between overall health and sports motivation than other factors. This result is parallel with Anderson's viewpoint: social wellness-related behaviors deliver a positive influence on overall health (Anderson & William, 2018). In terms of the correlation between sports motivation and health, all indicators reveal a moderate positive correlation with overall health, except for amotivation. Therefore, it can be learned that by enhancing students' social adaptation, IM and EM can become an effective way to maintain a state of good health.

Overall, controlled motivation (introjected and external regulation) is found to have a weak correlation with overall health in comparison to autonomous motivation (identified regulation and IM). Indeed, it has been shown that autonomous motivation can promote healthier lifestyles and behaviors (Pelletier et al., 2004), so it is beneficial for health development (Deci & Ryan, 2008). Based on these ideas, measures that could enhance autonomous motivation will be taken, such as providing positive feedback (Boggiano & Ruble, 1979), events that foster an internal perceived locus of causality (Deci & Ryan, 2000), and autonomy support (Deci et al., 1989). Education policymakers shall make sports infrastructure adequate and available since the satisfaction of infrastructure has a significant positive impact on IM (Kovács et al., 2022). For school administrators, remote PA programs, such as HERizon, are recommended to be implemented

throughout the campus. It is convenient and economical for schools to deploy such online projects, for this group-based intervention is as beneficial as one-to-one behavior change coaching in promoting autonomous motivation (Cowley et al., 2024). PE teachers are suggested to adopt the SDT teaching strategies, which are certain instructional teaching approaches based on SDT, such as goal setting and autonomy support. The deployment of SDT teaching strategies can boost autonomy (by using informational language and providing sports rationale), competence (by balancing students' skills with the difficulties of class tasks), and relatedness (by getting intimate with students; Abdoshahi & Shemshaki, 2021). Moreover, students are encouraged to get involved in more activities, and parents shall be accountable for supervision. In terms of specific recommendations for interventions, such factors as fitness infusion and game-like elements following the principles of SDT are worthwhile, for evidence has shown that they are conducive to enhancing sports motivation (Ha et al., 2020).

CONCLUSION

This study examined the current state of sports motivation and health among students from certain key junior high schools and explored the relationship between these two themes. It identified some worrying health conditions of the participants: over half of the students surveyed had a sub-health condition or worse. Then, a similar developmental pattern of IM, EM and overall health over grades was highlighted. Last but not least, this study finds a positive and significant correlation among IM, EM, social adaptation and overall health. This study suggests paying more attention to Grade 8 students, as they are more likely to fall into the worst situation of sports motivation and health. Meanwhile, intervention measures such as sports values internalization and external rewards are recommended for enhancing students' wellness.

The theoretical underpinnings of this study are SDT (Self-Determination Theory) and Three-Dimensional Health. The theoretical contributions are as follows: First, this study provides empirical evidence supporting the applicability of SDT in understanding health outcomes related to sports participation among adolescents. Second, this research contributes to a more holistic understanding of health within the context of sports motivation. Third, the finding that social health correlates positively with both types of motivation and overall health adds a new dimension to the understanding of the role of social health factors. The integration of social health into the sport motivation-health relationship is a significant theoretical contribution.

Firstly, this study was limited by the lack of data on the motivation for sports and the health of high school and college students. There is a heated discussion about the downtrend in students' health after their junior high school years. Thus, it would be consequential to investigate students' sport motivation and health

after PEEESHS. Secondly, this study only included key school students for their competitive situation, thus leading to a lack of data on students in common schools. This study is restricted by the absence of ordinary school students' data and a comparison between different types of school students. Future studies should attempt to include comparisons between students from ordinary urban schools and rural schools, as well as between students from different stages of study. Thirdly, self-reported physical health data were employed in this study instead of making objective physical assessments, such as fitness indicators. This may result in underreporting of health problems due to stigmas associated with health issues. Future studies should try to involve objective health indicators. Fourthly, the static representation of potential dynamic indices is inevitable when using the cross-sectional approach. Besides, this design might limit the ability to infer causality. It would be wise for future studies to design longitudinal research that can capture information over grades.

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