

Correlations between Physical Activity and Social Health, Moral Development and Physical Fitness among Middle School Students

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Abstract

Background: Sports and physical activity (PA) are recognized not only as beneficial activities but also as complex phenomena with a variety of functions. The present study aimed to examine the association between children's PA and their social health, moral development, and physical fitness.

Methods: This was a descriptive-correlational study. The study included 384 middle school students who were selected through convenience sampling method (average age of 14.12 years) from Tehran, Iran, in 2023. We used Physical Activity Questionnaire for Adolescents, Keyes's Social Well-being Questionnaire and Moral Development Questionnaire for measuring PA, social health and moral development, respectively. Physical fitness was measured using two tests including "Shuttle Run 4*9" and "Stork Balance Stand". The data were analyzed using both the independent t-test and Pearson correlation test.

Results: There were no gender differences among boys and girls regarding age and BMI (both $P > 0.05$). Children had a medium level of PA (2.65 out of 5); PA showed direct and significant correlations with social health ($r = 0.539$, $P < 0.001$), moral development ($r = 0.427$, $P < 0.001$) and physical fitness ($r = 0.630$ and $r = 0.408$, both $P < 0.001$). Moreover, boys had significantly higher PA ($P < 0.001$), social health ($P < 0.001$), moral development ($P < 0.001$), and physical fitness ($P < 0.001$) than girls.

Conclusions: These results suggested the necessity to enhance the level of physical activity (PA) among middle school students. Furthermore, it is advised that physical education teachers and sports coaches incorporate physical education programs to promote PA in middle school students.

Keywords: Exercise, Social health, Moral development, Physical fitness, School

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1. Introduction

The global change and development of modern life have made physical activity and sports an essential part of daily routines. It is now seen as an unavoidable requirement in today's world (1). Nowadays, improving people's health and keeping them active is a serious concern (2). Also, due to the increasing growth of industries and mechanization of life, people do less PA and, in this way, they go through a downward trend in terms of health and physical fitness (3, 4). Even though understanding the importance of regular physical activity is crucial for maintaining overall health, both physically and mentally, it can also have positive social impacts. (5-9). Among social components, one of the most important concepts that evaluates the way a person functions in society and seems to be affected by physical and sports activities is social health. Social health is the evaluation of a person's conditions

and his efficiency in society, which is a reflection of "positive social health" (10, 11). Therefore, social health is a reflection of understanding people from their experiences in the social environment. In fact, it is the assessment of one's conditions and work in the society. The components of social well-being include social unity, social inclusion, social engagement, social welfare, and social adjustment (12, 13). Consequently, an individual who is socially well-adjusted excels by viewing the community as a significant, understandable entity with opportunities for advancement and success, experiencing a sense of belonging within social circles, and actively engaging in the progress of the community. Sports and physical activity serve to foster overall well-being within society by promoting social health (14). In an era that is moving towards industrialization and domination of the capitalist system, the increasing reduction of social ties, lack of identity, isolation, passivity

and alienation, sociologists and social reformers are concerned with finding opportunities to bring back disconnected social bonds resulting from social transformations (15). PA and sports play a crucial role in fostering mutual understanding and unity among people, thereby contributing to social cohesion. They serve as effective tools for deciphering and analyzing societal norms and structures. In this light, PA and sports are recognized as influential factors in enhancing our comprehension of different societies. (10, 13, 15). However, the association between PA and sports and social health among children is less understood. Therefore, the present study primarily aimed to examine the relationship between PA and sports with social health among children.

Moral development is viewed as a change in how children reason in moral matters, their attitude towards breaking the law, and their behavior when faced with moral issues (16). Also, moral development focuses on the emergence, evolution and understanding of ethics from childhood to adulthood. In this context, ethics acts as a determinant of instructions, including how people should treat others with justice, helping each other, and correctness (17, 18). Achieving moral growth, which results in the praise of the society, will cause a person to be respected and admired by others in life, and when an individual emerges to be great and respected among their peers, they are bound to gain numerous advantages and privileges including being favored, having dignity, and not being blamed. Studies have indicated that several factors significantly influence the growth of moral discernment and shape children's character including: parental viewpoints and convictions, parents' instructional approaches, emotional atmosphere prevailing the household, and resources and cultural circumstances of the family (19-21). However, the association between participating in sports and physical activities with moral development in children and adolescents needs further investigation. Therefore, this study also aimed to examine the association between participating in sports and physical activities and moral development in middle school children.

In addition to social and moral components, this study aimed to consider physical components such as physical fitness. Physical fitness is the ability of the body to perform physical, sports and work activities and is considered as an important

indicator of health (22). Improving physical fitness is a public health priority to reduce the significant and increasing prevalence of lifestyle-related diseases in developing and developed countries (23). PA plays a crucial role in managing body weight, prompting a significant interest to explore its connection with physical fitness in young individuals. Additionally, the study aimed to highlight the significance of PA in promoting overall health and well-being. Another objective of this study was to examine how PA influences the level of physical fitness in children which is essential for their daily activities. Finally, the study sought to uncover the association between PA, social health, moral development, and physical fitness in middle school students.

2. Methods

2.1. Design and Participants

This was a descriptive-correlational study; the statistical population consisted of students from second middle schools in Tehran, Iran. Participants were selected by approaching public schools and selecting students who were willing to participate in the study (eight schools). A total of 384 students (190 girls) were chosen as the study sample through convenience sampling. The average age of the participants was 14.12 years old.

2.2. Measures

The Physical Activity Questionnaire for Adolescents (PAQ-A) (24) was used to assess PA levels. This self-report tool consisted of nine questions, with each question being assigned a score between 1 and 5. A response indicating minimal activity would receive 1 point, while a response indicating the highest level of activity would receive 5 points. To calculate the final PA score, the values assigned to all nine questions would be summed and averaged. This final score would reflect the individual's PA level, ranging from 1 to 5. A score of 1 represents low PA, while a score of 5 represents high PA. PA scores falling between 1 and 2.33 indicate a low PA level, scores between 2.34 and 3.66 indicate a moderate PA level, and scores above 3.67 to 5 are classified as a high PA level. In this study, the validity of the Persian version of the scale was confirmed by eight experts (CVI=0.90, CVR=0.96). Additionally, the Cronbach's alpha coefficient was calculated to be 0.94.

Keyes's Social Well-being Questionnaire (KSWBQ) was used to assess social health in this study (25). Comprising of 15 questions, this questionnaire evaluates five dimensions: social cohesion, social acceptance, social participation, social flourishing, and social adaptation. Each question is scored between 1 to 5 points, with the lowest possible score for social health being 15 and the highest possible score being 75. These scores are categorized into three groups: low, medium, and high social health. The Persian version of the scale was validated by eight experts, with a Content Validity Index (CVI) of 0.88 and a Content Validity Ratio (CVR) of 0.92. Furthermore, the Cronbach's alpha coefficient was calculated to be 0.90.

In this study, the Moral Development Questionnaire (MDQ) (26) was used to assess moral development. The questionnaire consists of questions categorized into six moral categories, each with three fictional scenarios. Responses are measured on a Likert scale ranging from "I completely agree" (1) to "I completely disagree" (5). Scores on the questionnaire range from 18 (minimum) to 90 (maximum), with 90 indicating high moral development and 18 indicating a lack of moral development. The Persian version of the scale was validated by eight experts (CVI=0.88, CVR=0.92), and Cronbach's alpha coefficient was calculated to be 0.92.

Fitness was measured using two tests including "Shuttle Run 4*9 test" and "Stork Balance Stand test". Shuttle run 4*9 test was used to measure agility in children. In this test, the length of the test track is 9.15 meter, which the participants must walk four times during which, they carry sticks or legs to the other side of the track and place them on the ground. To start the test, the participant stands behind the starting line and with "go" sign, he/she starts running. Upon reaching the end of the track, the participant retrieves one of the sticks, returns to the starting line, and puts it on the ground behind the line. This process is repeated for the second time; however, there is no requirement to place the stick on the ground, and the individual crosses the line with the same pace. Moreover, Stork Balance Stand test was used to measure static balance in children. This test is a commonly used field tool to measure static balance. The participant stands on a foam surface with eyes open and lifts one leg and places the sole of the foot under the knee of the opposite leg, the test continues until the person places the sole of the foot on the ground and the

time is recorded by a stopwatch. This test evaluates the stability of the posture in the standing position by measuring the time (in seconds) that the person can maintain the position of standing on one leg.

2.3. Statistical Analysis

SPSS version 26 was used for data analysis. The data was described using mean and standard deviation (SD). Normality of the data for each variable and gender was assessed using Kolmogorov-Smirnov tests. Gender differences were calculated using independent t-tests. The association between the variables was determined using Pearson correlation tests. The significance level was set at $P < 0.05$.

3. Results

3.1. Demographic Data

The participants were 384 (190 girls) middle school students in Tehran, Iran. The average age of the participants was 14.12 years. The inclusion criteria were: 1) being a middle school student, 2) parental consent, 3) full participation in the study, 4) not having a history of any physical abnormalities which prevents the individual from participating in the study.

Table 1 shows the demographic characteristics of the participants, which include age, height, weight, and body mass index (BMI), categorized by boys and girls. The results of the Kolmogorov-Smirnov test indicated that the data for age ($Z=0.175$, $P=0.200$ and $Z=0.130$, $P=0.200$, for boys and girls, respectively), height ($Z=0.143$, $P=0.200$ and $Z=0.129$, $P=0.200$, for boys and girls, respectively), weight ($Z=0.179$, $P=0.200$ and $Z=0.158$, $P=0.200$, for boys and girls, respectively), and BMI ($Z=0.147$, $P=0.200$ and $Z=0.176$, $P=0.200$, for boys and girls, respectively) follow a normal distribution for both genders. Consequently, there were no significant gender disparities observed among boys and girls in terms of age and BMI (both $P > 0.05$).

3.2. Gender Differences

Table 2 shows the mean and SD of PA, social health, moral development and physical fitness among boys and girls. The results of Kolmogorov-Smirnov test showed that the data of PA ($Z=0.180$, $P=0.200$ and $Z=0.137$, $P=0.200$, for boys and girls,

Table 1: Demographic characteristics of the children

Variable	Total(n=384)	Boys(n=194)	Girls(n=190)	Gender differences
Age (years)	14.12±1.82	14.49±1.93	14.89±1.90	t=0.129 P=0.857
Height (m)	1.51±0.12	1.58±0.14	1.47±0.11	t=4.697 P<0.001
Weight (kg)	48.55±5.93	51.43±6.59	46.60±5.82	t=6.580 P<0.001
BMI	18.62±1.52	18.49±1.57	18.71±1.41	t=0.746 P=0.348

BMI: Body Mass Index

Table 2: Mean and standard deviation of studied variables across gender

Variables	Total (n=384)		Boys (n=194)		Girls (n=190)		Gender differences
	Mean	SD	Mean	SD	Mean	SD	
Physical activity	2.65	0.81	2.97	0.93	2.21	0.67	t=9.151 P<0.001
Social health	47.40	5.47	50.14	6.93	44.25	4.18	t=14.269 P<0.001
Moral development	52.19	7.76	57.23	9.37	48.73	7.50	t=7.395 P<0.001
Physical fitness							
Shuttle Run 4*9	12.74	1.29	11.13	1.93	13.08	2.93	t=15.971 P<0.001
Stork Balance Stand	26.37	6.43	30.93	6.82	21.37	5.28	t=-15.397 P<0.001

Table 3: Correlation matrix of studied variables with physical activity

	1	2	3	4	5
1. Physical activity	-				
2. Social health	r=0.539 P<0.001	-			
3. Moral development	r=0.427 P<0.001	r=0.386 P<0.001	-		
4. Shuttle Run 4*9	r=-0.630 P<0.001	r=-0.603 P<0.001	r=-0.358 P<0.001	-	
5. Stork Balance Stand	r=0.408 P<0.001	r=0.513 P<0.001	r=0.419 P<0.001	r=-0.397 P<0.001	-

respectively), social health ($Z=0.155$, $P=0.200$ and $Z=0.169$, $P=0.200$, for boys and girls, respectively), moral development ($Z=0.151$, $P=0.200$ and $Z=0.153$, $P=0.200$, for boys and girls, respectively), Shuttle Run 4*9 ($Z=0.162$, $P=0.200$ and $Z=0.138$, $P=0.200$, for boys and girls, respectively), and Stork Balance Stand ($Z=0.147$, $P=0.200$ and $Z=0.152$, $P=0.200$, for boys and girls, respectively) were normally distributed for both genders.

Our data showed that the participants in this study had a medium level of PA (mean=2.65). In addition, the data showed that boys had significantly higher PA than girls ($P<0.001$). We also found that the participants in this study had a medium level of social health (mean=47.40). In addition, the data showed that boys had significantly higher

social health than girls ($P<0.001$). Regarding moral development, data showed that the participants in this study had a medium level of moral development (mean=52.19). In addition, the data showed that boys had significantly higher moral development than girls ($P<0.001$). Regarding physical fitness, data showed that the participants in this study had a medium level of physical fitness. In addition, the data showed that boys had significantly higher physical fitness than girls ($P<0.001$).

3.3. Correlations between Physical Activity and Motor Proficiency

Table 3 shows the results of the correlation matrix of the studied variables (social health, moral development and physical fitness) with PA.

The results showed that PA was directly and significantly correlated with social health ($P<0.001$), moral development ($P<0.001$), and physical fitness ($P<0.001$). In addition, physical fitness was directly and significantly correlated with social health ($P<0.001$) and moral development ($P<0.001$). Finally, social health was directly and significantly correlated with moral development ($P<0.001$).

4. Discussion

Today, sports and PA, in addition to being considered as a beneficial activity, are considered as a multi-dimensional phenomenon with different functions. The present study aimed to explore the association between PA with social health, moral development and physical fitness among children. Results demonstrated a direct and significant correlation between PA and social health, so that social health increases with increased PA. Most of the study participants were in the middle level in terms of PA. A comparison of average PA and social health among boys and girls showed that average PA in boys was significantly higher than girls. Many studies have confirmed the difference in PA between men and women. For example, Lawler and colleagues (27) reported that men generally participate more in physical and leisure activities than women. Also, women participate more than men in sports such as yoga and swimming, and in other sports, men form the majority of participants. Moreover, according to the findings of Slater and Tiggemann (28), a notable distinction exists between males and females in terms of engaging in light and heavy PA at two different levels. The results of their research have shown that women are more inclined to participate in light activities, but the tendency towards vigorous physical activities is observed more among men. Another research by Cho and co-workers (29) showed that men and women have a significant difference in terms of motivation for sports participation. Accordingly, women are more influenced by internal motivations to perform and display their behaviors (such as participation in sports), but men are more influenced by external motivations. Additionally, the findings from this study indicated that men have a higher level of social health as compared with women. Consistent with these results, Dias Rodrigues and colleagues (30) and St Laurent and co-workers (31) showed that the size of the social network and the level

of trust are more among men than women. There is little knowledge about social relations and it is considered as a barrier for women to enter the society. In general, the results of this study confirmed the relationship between PA and social health among children. The findings aligned with those of other studies (30-32) that have examined the relationship between these two variables. The results of a study by Pels and Kleinert (32) indicated that physical activities increase the level of social health of people. To interpret these findings, it can be stated that participating in PA positively affects a person's self-confidence and ultimately increases a person's self-esteem. It is evident that enhancing one's self-esteem leads to favorable transformations in interpersonal connections and an individual's social circle, thereby enhancing their social well-being.

Furthermore, the findings of this study indicated a strong association between physical activity and increased moral development among middle school students. This finding aligned with previous research studies (16, 18), which highlighted the positive impact of participating in physical activities on moral development in children. To interpret these findings, it can be stated that participating in sports develops character and instills the moral ideals of a culture in children and teenagers. Due to various emotions and unpredictable situations, sports have a potential to develop moral behavior (19). Sports provides a suitable environment for learning the qualities of honesty, loyalty, self-love and fairness. The participants distinguish between social contractual aspects of sportsmanship and ethical aspects of sports. The social contractual aspects of sports mean maintaining the structure of the social organization such as shaking hands with an opponent after a competitive tennis match, not cursing or humiliating the opponent. The ethical aspects of sports are rooted in honesty, loyalty, teamwork, kinship and fair play (20, 21). Activities such as games and sports provide an appropriate context in which all levels of moral behavior can be observed. It is in such a context that real moral growth takes place. Sports and PA can build character, but the sportsman's character develops only when the environment and background of the activity is structured. The formation of sportsmanship is not a spontaneous result of participation in sports activities, and it is achieved through cognitive dissonance, with the presence of

an interested coach and appropriate developmental experiences. Therefore, children need teachers and coaches who are not only competent, confident and motivated, but also consistent in coaching and supporting the athlete, firstly as a human being, and secondly as an athlete (16, 18, 19).

Moreover, the results of the present study revealed that students who participated in higher levels of PA demonstrated superior physical fitness scores. This is consistent with previous studies (33, 34) that emphasized the positive influence of sports participation on overall physical fitness. The heightened levels of fitness can be attributed to regular involvement in PA, which promote increased joint mobility, muscle growth, and flexibility in ligaments and tendons. Furthermore, consistent PA leads to enhancements in respiratory function within the body. These improvements are characterized by stronger respiratory muscles, improved thoracic compliance, endurance of the upper respiratory system, and increased respiratory elasticity. Conversely, non-athletic students experienced stiffer joints and a decreased resistance in the respiratory system due to their lack of involvement in sports and games (22, 23, 33).

4.1. Limitations

One limitation of this study was the reliance on a questionnaire to measure PA, which may introduce self-reporting bias. To address this issue, it is suggested that future studies integrate device-based measurements such as accelerometers for a more accurate assessment of PA. Additionally, to build upon the results of this study, it is recommended that future studies use digital devices for PA evaluation. Furthermore, given the low levels of PA among participants, it is strongly recommended that practitioners introduce programs and interventions focused on boosting PA levels in middle school students, particularly girls.

5. Conclusions

To summarize, our findings indicated that children who participated in this study showed limited PA levels. This highlights the need for implementing effective strategies to promote children's involvement in sports and physical activities, especially for girls. Additionally, we found a medium level of social health, moral development and physical fitness, which calls

for increased control and support. Furthermore, we observed a significant correlation between increased PA and higher levels of social health, moral development and physical fitness among children. Finally, the role of physical education teachers is essential, given that their perspectives on student involvement in PA can significantly affect social and physical well-being of middle school students.

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Authors' Contribution

Hassan Shafaei: Substantial contributions to the conception and design of the work, acquisition, analysis, and interpretation of data for the work, reviewing the work critically for important intellectual content. Niloofer Rezaei: Contribution to the design of the work, drafting the work and reviewing it critically for important intellectual content. Sadie Mohammadi: Contribution to the design of the work, drafting the work and reviewing it critically for important intellectual content. Saeed Ghorbani: Acquisition, analysis, and interpretation of data for the work, reviewing the work critically for important intellectual content. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such as the questions related to the accuracy or integrity of any part of the work.

Ethical Approval

The University Ethics Review Board approved the present study with the code of IR.IAU.AK.REC.1398.001. Also, written informed consent were obtained from parents of children.

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