

Exploring the Relationship between Physical Activity and Social Interaction in School-Aged Children

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DOI: <https://doi.org/10.63163/jpehss.v3i4.710>

Abstract

Physical activity plays a vital role in children's social development. This study demonstrates by examining its impact on teamwork, communication, and peer relationships. Using a quantitative research design, data were collected from 100 teachers across four schools to assess the influence of a structured physical activity programs. The participants' responses were recorded using structured questionnaire. The data were analyzed using descriptive and inferential statistics, including ANOVA, Correlation, and t-test to assess the variation of responses. The results show a statistically significant relationship between physical activity and social skills ($r=0.65$, $p=0.001$), and a moderate association with behavioral outcomes ($r=0.52$, $p=0.004$). ANOVA results show significant differences between age groups ($F=3.67$, $p=0.02$) and activity levels ($F=4.52$, $P=0.01$), while no significant gender differences was found. The study advocates for integrating structured physical activity programs into school curricula to promote holistic development. This will be very helpful for schools, parents, teachers, and policymakers in developing physical activity programs for school-aged children.

Keywords: Physical activity, relationships, school-aged children, social interaction

Introduction

Physical activity is an essential part of child development, contributing to physical, mental, and social well-being. Research consistently shows that participation in sport and structured exercise programs positively influences children's social skills, enhances peer interactions, and reduces negative behaviors. The benefits are observable in school-aged children where physical activity plays a vital role in promoting social capabilities (Wang, 2022). Engagement in physical activities developing moral development, teamwork, and sense of educated society. Children are facing many social challenges such as learning disabilities, sports provide opportunities to develop essential life skills and build peer relationships Holt, et al., (2011). Organized physical activity programs, including school physical education and recreational sport, create environment for children to learn respect, cooperation through social connections (Jadwiszczak et al, 2025). This study explores how sport impacts the social development of school-aged children with

particular concentration on communication, teamwork and peer relationships. By analyzing the recent research, this study emphasized the need of planned sport into school programs and intervention to support children's overall moral and social development.

Background of the study

Physical activity positively influences children's social interaction, driven significantly by peer presence. An experimental study involving preschool-aged children found that activity levels increased by 54%, when children played with a friend compared to solo play; notably, all children chose to extend activity time when accompanied by a peer, underscoring the motivational role of friendship (Salvy et al., 2012). Kamal (2024) proposed an emotional-intelligence-based-primary-education system striking balance among intellectual, moral and physical development of a child. This system is based on 50% time spent on sport and the rest on academics. 3 sport activities are offered, first one individual performance, second one working in pairs and the third one team work, offering maximum social interaction. Kamal & Khan (2014) emphasize that social-cum-professional acceptability of a person, not only, depends on the academic, the intellectual and the communicational capabilities, but also, on the body image and the body language of an individual. Kamal & Khan (2015) suggested appropriate hairstyle, footwear and clothing for gymnastic activities in the primary-school setting. Team gymnastics provides ample opportunities for social interaction among members. In addition, graces performed at the end of a routine render social-interaction occasions with the spectators. Kamal & Khan (2018) emphasize free play and observation during which gymnast is observed unaware for 10 minutes for social interaction with parents and other players. Kamal & Khan (2020a) discuss association of balanced diet and physical activity with fitness of young children. It is proposed that under-7 boys and girls remain stripped-to-waist in gender-segregated classrooms and sport as well as small-area-game activities to promote emotional balance and social interaction. This paper, also, unveils for the first time prohibited, intermittent and safe sun-exposure periods for the city of Karachi, Pakistan. Kamal & Khan (2020b) discussed challenges of maintaining social interaction during corona pandemic. Kamal & Khan (2021) propose summer camps, who can promote harmony and understanding among players belonging to different nations by promoting empathy, inclusiveness and respect. Kamal et al. (2020) propose a model football academy, which should groom the footballers to have physical, mental, social and spiritual maturities by regular monitoring of their chronological, developmental, phenotypic (biological) and skeletal ages. Beyond younger kids, a quasi-experimental study focusing on children with autism spectrum disorder demonstrated that a 12-week group sport intervention significantly increased moderate-to-vigorous physical activity and reduced loneliness, while enhancing group play and social engagement behaviors Xing et al., (2025). Expanding from individual cases to broader school environments, recess and structured activity interventions have been shown to boost both physical activity and social development across diverse groups of children. A systematic review and meta-analysis found that interventions during school recess, such as increased structure, more equipment, and longer or more frequent breaks significantly raise levels of moderate-to-vigorous physical activity among children and adolescents, which in turn provides opportunities for social interaction (Zhu et al., 2025). Shang et al. (2023) studied in Sichuan, China over 1000 middle school students. This study revealed that higher levels of physical exercise were associated with better peer relationships and reducing social anxiety. The interplay was, partially, mediated by improved peer support and suggested that physical activity, indirectly, nurtures social interaction through emotional and relational pathways. Collectively, the literature underscores a strong positive correlation between physical activity and social interaction in school-aged children. Peer presence enhances motivation and sustained engagement in activity from early childhood, while structured and group-based physical programs, further, amplify social skills and peer bonding. School-based interventions, particularly, during transitions like recess, offer fertile settings for facilitating physical activity with social benefits.

Moreover, physical exercise supports peer-relationship development and emotional well-being, reinforcing its value as a dual-purpose intervention for children's social and physical development.

Statement of the Problem

Despite strong evidence that physical activity supports children's social, emotional and physical development, many school-aged children today are experiencing declining levels of active participation in both structured and unstructured activities. Increased academic pressure, growing screen time and limited access to safe play spaces have, significantly, reduced opportunities for regular physical engagement. This decline, not only, threatens physical health, but also, limits valuable opportunities for children to interact with peers, develop friendships and strengthen social skills.

Many studies highlight that sport can enhance peer support, social interaction, cooperation much of these evidences are either context-specific or concentrated on particular groups, such as children or adolescents (Salvy et al., 2012; Xing et al., 2025). There is lack of understanding of how sports participation and fair play in various planned sport, contribute to social development of school-aged children in their general education.

This gap shows the need of further research regarding the relationship between sport and social development. Without research, schools and policymakers may overlook sports as a tool, not only, for well-being, but also, promoting essential social skills such as cooperation and teamwork.

Therefore, this study tried to find the relationship between sport and social development among school-aged children, providing evidence that may enhance educational practices, curriculum-development practices, and overall development of children.

Objectives of the Study

1. To analyze the influence of physical activity on peer relationships, cooperation and communication skills among school-aged children
2. To examine the level of participation of school-aged children in physical activities such as creative movement, free play, physical education and sport.
3. To investigate the relationships between physical activity and social interaction of school-aged children

Hypotheses of the Study

H1: There is a statistically-significant difference in the level of social interaction of school-aged children between whom regularly participate in physical activity and who those participate less.

H2: Participation in physical activities, significantly, enhances peer relationships.

H3: Engagement in physical activities is a statistically-significant effect on fostering cooperation and communication skills among school-aged children.

Significance of the Study

This study is important because it underscores the need of physical-activity programs in promoting, not only, physical fitness, but also, developing social connections of school-aged children.

By underscoring how does the physical activity effect the communication, cooperation and communication, the research provides worthwhile understanding into broader benefits of regular participation. Interpretation of this relationship can helpful for educators, parents and policymakers to acknowledge the physical activity as a compulsory tool for social development of children.

The findings of this study provide confirmation to strengthen the implementation of organized physical activities into school curriculum for school and educators. This can help to plan physical-education programs that, not only, enhance the physical health of the children, but also, build teamwork, social connections and interpersonal skills. The study should be very helpful for

students, coaches and sportpolicymakers to promote physical-activity programs for social and community development.

Moreover, the study should contribute to the existing body of knowledge by providing empirical evidence of relationships between physical activity and social interaction that provide the foundation for further studies in the fields of physical education and children's social development.

Delimitations of the Study

This study is limited to children in the age range 10–15 years, enrolled in selected schools. It focuses only on the relationship between physical activity (creative movement, free play, PE and sport) and social interaction. The research is confined to a specific geographic area and may not represent all populations. Other aspects, such as academic achievement and emotional growth, are not included in this study.

Literature Review

Physical Activity

Physical activity is, widely, acknowledged as vital for children's holistic growth, extending beyond physical fitness to social and psychological well-being. Studies emphasize its role in improving peer relationships, communication and coöperation in school-aged children (Yi, et al., 2025).

Concept of Physical Activity in Childhood

Childhood physical activity includes creative movement, free play, physical education and structured sport, all of which contribute to growth and development. WHO (2020) highlights that children aged 5–17 years should engage in at least 60 minutes of moderate-to-vigorous activity daily to foster health and social outcomes (Bull, et al., 2020).

Social Interaction and Child Development

Social interaction is very important for the development of children, shaping teamwork, peer bonding and emotional regulation. Research illustrates that children, who participate regularly in physical activities tend to have stronger social connections and lower social anxiety (Zhang, et al., 2023).

Role of Physical Activity in Enhancing Social Skills

Participation in physical activities fosters teamwork, coöperation, empathy, leadership and problem-solving techniques. Evidence suggests that group sport and PE programs improve children's communication and peer acceptance (Li, et al., 2022).

Impact of Structured Physical Activities

Structured activities such as sport and PE classes provide opportunities for teamwork, goal-setting and responsibility. A 2025 systematic review found that school-based-PE programs enhance both physical competence and social development (Lhendup, et al., 2025).

Influence of Unstructured Play on Social Interaction

Unstructured play, such as recess and outdoor games, supports creativity and peer coöperation. Research confirms that free-play environments help children negotiate rules, build friendships and strengthen social skills (Donner, et al., 2024).

Demographic Factors Affecting Physical Activity and Social Interaction

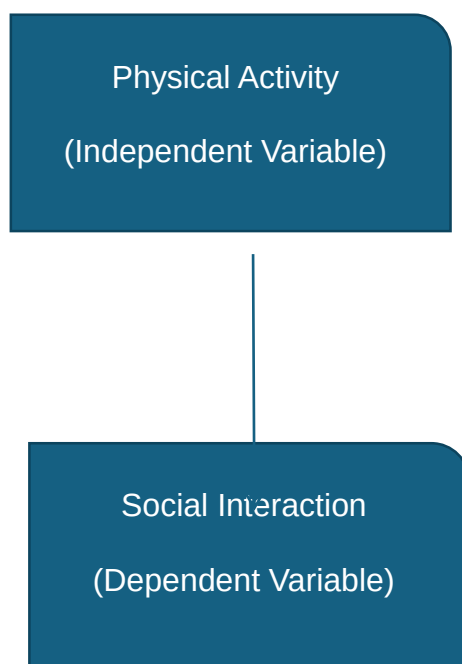
Age, gender and socioeconomic background influence children's activity levels and social outcomes. For example, boys are generally more active, while girls may gain more social benefits from participation in group activities (Aubert, et al., 2023).

Physical education and social interaction

School-wide-physical-activity programs increase engagement and support wellness (Hodges et al., 2012). Physical-fitness concepts promote self-management skills (Corbin, et al., 2014). Conceptual- physical-education programs enhance social interaction among school-aged children (Corbin, et al., 2020). Vigorous physical activities provide sustainable health benefits for theyouth (Corbin, 2025).

Theoretical Framework

Vygotsky (1978) conducted a study that draws on Social-Development Theory, which posits that interaction with peers fosters learning and development. The **Health-through-Sport Model**, also, supports the idea that sport participation promotes psychosocial health (Eime et al., 2013).



Research Methodology

Research Design

The study adopted a **quantitative-research design** using a **survey method** to examine the impact of physical activity on children’s social development. Quantitative methods were chosen as they allow for objective measurement and statistical analysis of variables such as social skills, peer relationships and behavioral outcomes. The cross-sectional design enabled the collection of data from participants at one point in time to identify relationships between physical activity and social outcomes.

Population of the Study

The population consisted of **teachers**in4 schools—2 public and 2 private. Children aged **10-15 years**were asked to participate, as this age range represents a crucial developmental stage in which social skills, cooperation and peer interaction become increasingly important.

Sampling Technique and Sample Size

A **stratified-random sampling technique** was employed to ensure representation across gender, school type (public/private) and setting (urban/rural). From the overall population, a sample of **100 teachers** was selected from 4 schools. Stratification helped in minimizing sampling bias and

ensured that different demographic factors were adequately represented. The data were collected from 25 teachers from each school because school-aged children could not fill the questionnaire.

Research Instrument

Data were collected using a structured questionnaire designed on a 5-point-Likert scale. The instrument consisted of 4 sections—(i) demographic information, which included age, gender, school type and residential area; (ii) physical activity participation, focusing on the frequency, type (structured/ unstructured) and duration of activities; (iii) social-skill development, covering aspects such as communication, teamwork, cooperation and peer relationships; (iv) behavioral outcomes, which measured inclusivity, moral values, reduction of antisocial behaviors and respect. The questionnaire items were developed after reviewing the relevant literature (Qi et al., 2024) and validated by a panel of experts in physical education and psychology.

Validity and Reliability of Instrument

To establish content validity, the questionnaire was reviewed by 3 **subject experts** in physical education and child development. Their feedback was incorporated to refine the instrument. Reliability was tested through a **pilot study** involving 30 students outside the main sample. **Cronbach's Alpha coefficient** was computed, yielding a value of **0.87**, which indicates high internal consistency of the instrument.

Data-Collection Procedure

Before conducting the survey, permission was obtained from the respective school administrations. The questionnaires were then distributed among teachers to get their responses in presence of the researcher, who provided clarification whenever needed. After completion, all questionnaires were collected, checked for accuracy and completeness and subsequently coded to prepare the data for analysis.

Data Analysis

Data were analyzed using **SPSS (Statistical Package for Social Sciences) version 27**. The following techniques were applied:

Descriptive Statistics (frequency, mean, percentage, standard deviation) to summarize demographic data and responses.

Inferential Statistics:

For data analysis, an Independent Samples t-test was applied to compare the responses of participants across gender and school type, while a One-Way ANOVA was employed to examine differences based on age groups and varying levels of physical activity. In addition, Correlation Analysis was conducted to identify and measure the strength of the relationship between physical activity and different aspects of social development, providing deeper insights into the associations among the study variables.

Cronbach's Alpha

Cronbach's Alpha is statistically used to evaluate the internal consistency of the items within the questionnaire. The coefficient runs from 0 to 1, with higher value indicating strong reliability. A commonly-used interpretation of Cronbach's Alpha is as under.

Table.1

Cronbach's Alpha Value	Reliability
$\alpha \geq 0.9$	Excellent (High reliability)
$0.8 \leq \alpha < 0.9$	Good (Reliable)
$0.7 \leq \alpha < 0.8$	Good and Acceptable
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor

Ethical Considerations

The study, strictly, adhered to ethical research principles, ensuring that participation was entirely voluntary and that all respondents retained the right to withdraw at any stage without any consequences. The consent form was signed by the parents for data collection. The data-collection team informed them about the purpose of the study. Furthermore, it was ensured that their information is confidential and used only for academic purposes.

Table.2: Data Analysis

Demographic Characteristics of Respondents

Category	Frequency (N)	Percentage (%)
Gender Male	52	52
Female	48	48
School Public	60	60
Private	40	40
Age (Y) 10–12	35	35
13–14	40	40
15	25	25
Residence Urban	55	55
Rural	45	45

A total of **100 students** participated in the study. The demographic data revealed an almost balanced representation of gender, with 52% male and 48% female respondents. In terms of school type, 60% of the participants were from public schools, while 40% from private schools. The age distribution indicated that 35% of respondents were aged 10–12 years, 40%, 13–14 years and 25% 15-year-old. Regarding setting, 55% were from urban areas and 45% from rural areas. These demographics ensured diverse representation across key variables, relevant to the study.

Table.3: Descriptive Statistics of the Study Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Physical-Activity Participation	3.85	0.65	2.10	4.90
Social-Skill Development	3.98	0.72	2.50	5.00
Behavioral Outcomes	4.02	0.68	2.60	5.00

The descriptive statistics provided an overview of participants' responses across the key variables. The mean scores indicated moderate to high levels of engagement in physical activity, with structured activities (*e.g.*, sport and PE) showing higher participation compared to unstructured play. Social skills development (communication, cooperation and teamwork) recorded a mean score of 3.98, suggesting that children perceived significant improvement in these areas through physical activity. Behavioral outcomes, including inclusivity, moral values and respect scored a mean of 4.02, reflecting strong positive effects of participation in physical activities.

Table.4: Cronbach's Alpha

Test of reliability	Sample size (N)	Cronbach's Alpha	Interpretation
Pilot study Questionnaire	30	0.87	High internal consistency

A pilot study was conducted with 30 students. The reliability analysis produced a Cronbach's Alpha value of 0.87, indicating that the questionnaire has high-internal consistency and is suitable for data collection.

Table.5: T-Test

Group Comparison	t-value	p-value	Significance
Gender (Male vs Female)	1.12	0.26	Not Significant
School Type (Public vs Private)	2.34	0.02	Significant

The Independent-Samples-t-test was conducted to compare responses across **gender** and **school type**. Results showed no significant gender differences in overall social-skill development ($p > 0.05$), suggesting that both boys and girls benefited equally from physical-activity participation. However, significant differences were found between school types, with students in private schools reporting slightly higher levels of cooperation and teamwork ($p < 0.05$) compared to their peers in public schools. This finding explores the need of planned-physical-activity programs to promote social interactions in school.

Table.6:One-Way ANOVA

Variable	F-value	p-value	Significance
Year-Wise-Age Groups (10–12, 13–14, 15)	3.67	0.02	Significant
Level of Physical Activity	4.52	0.01	Significant

The table indicates that all age groups and level of physical activity have statistically-significant effects on the studied outcomes. For the age group (10-12,13-14, and 15 years), the obtained F-value of 3.67, with the corresponding p-value of 0.02, suggest that differences exist among the age groups. These differences are statistically meaningful since the p-value is below the 0.05 threshold. Similarly the result for the level of physical activity shows an F-value of 4.52 and p-value of 0.01, which, also, falls below the 0.05 significance level. This indicates the variations in physical-activity levels have a significant influence on the outcomes being measured. Overall, these findings highlight that both age and physical- activity levels are important factors and contribute to significant results.

Table.7: Correlation

Variables	Correlation Coefficient (r)	p-value	Significance
Physical Activity & Social Skills	0.65	0.001	Significant

Variables	Correlation Coefficient (r)	p-value	Significance
Physical Activity & Behavioral Outcomes	0.52	0.004	Significant

Note. Correlation is significant at the 0.01 level (2-tailed)

The correlation analysis shows a positive as well as a significant relationship between physical activity and both social skills as well as behavior outcomes. For physical activity and social skills, the correlation coefficient is 0.65 with ap-value of 0.001. This indicates a strong-positive correlation, meaning that as children's physical activity increase, their social skills also tend to improve and the result is statistically significant. Similarly, the relationship between physical activity and behavior outcomes reveals a coefficient of 0.52 and p-value of 0.004. This reflects a moderate-positive correlation, showing that higher levels of physical activity are associated with better behavioral outcomes. Since the p-value is below the 0.05 threshold, this result is also statistically significant. Overall, the findings suggest that greater involvement in physical activity plays an important role in enhancing both social and behavioral development among children.

Findings, Discussion, Recommendations and Conclusion,

Findings

The findings of the study illustrate that physical activity plays an important role in improving children' social development by enhancing cooperation, communication skills, peer relationships and teamwork, while, also, fostering inclusivity, moral values and respect. The statistics indicating from t-test showed no significant gender differences, indicating that both boys and girls benefited equally. Furthermore, the students from the private schools reported slightly higher levels of teamwork and cooperation as compared to those from the public schools. Test statistics of ANOVA shows that younger children have batter communication skills, whereas older children showstronger leadership skills. Correlation analysis shows apositive relationship between physical activity and social skills ($r=0.65$, $p=0.01$). Physical activity and behavioral outcomes shows moderate positive relationship $r=0.52$, $p=0.01$. These results indicate that regular participation in physical activity is linked to improved social development and reduced negative behavior among school-aged children.

Discussion

Findings of this study shows the important role of physical activity in promoting children's overall well-being and, also, explores that participation in physical-activity programs is, definitely, connected with communication skills and positive behavioral outcomes such as moral values and respect. Similarly, studies of Qi et al. (2024) and Xing et al. (2025) claimed that organized physical-activity programs promote social development and collaboration among school-aged children. This study, also, shows that structured and unstructured physical-activity programs provide fruitful results in respect of child's social growth and moral development.

Gender analysis showed no significant differences, indicating that physical-activity benefits both boys and girls, equally, with the private-school students excelling in cooperation, and communication skills and teamwork compared with the public-school students. These findings align with Al-Qtaibi (2024), who claimed that resources and organized physical-activity programs have a role in developing social outcomes. The study, also, put a great stress on addressing the issues faced by children of public and private schools to use these facilities for participation in physical activities. The age- based analysis shows that younger students have better communication skills, while the older students show strong-leadership skills. These differences align with social skills and child-growth theories (Shafai et al., 2024). Correlation results, also, proposed that regular participation in physical activities lead to better social development and

reduce negative behaviors. Similarly, these results align with (Yang et al., 2024), indicating that physical activity, not only, develops the social interaction, but also, decrease negative vibessuch as aggression and anxiety. This study confirmed that physical activity plays a crucial role in the children's development. Similarly, studies of (Turkmen & Kaya 2024) as well as Liu & Shang (2024), claim that regular participation in physical activities, enhances social and communication skills of children with special needs. Moreover, previous studies show positive results for rural children. Li & Ren (2024) underscored the significance of recreational programs in fostering social interactions.

Hodges et al., (2012) indicate that administrators, students and teachers observed school-wide fitness- and-physical-activity program, positively. The program increases acceptance and participation, highlighting that organized physical activities can foster supportive environment for physical activity and social interaction in schools. Corbin (2025) emphasizes that vigorous physical activity offers greater health and fitness for theyouth.

Similarly, Corbin et al. (2020) emphasize that conceptual physical education promote lifelong-physical activity and equip students with self-managed skills, which can, also, encourage peer engagement and social interaction in school-aged children. Moreover, Corbin et al. (2014) highlight 10 key concepts of youth fitness, stressing the integration of knowledge, assessment and self-management to foster lifelong health. They claim that organized fitness program support physical activity, while, also, boosting peer interaction among school-aged children.

The findings of their study confirmed that physical activity is a tool for overall well-being of school-aged children. The results are very helpful for parents, policy makers and school administrators to develop structured-physical-activity programs for children. Regular physical-activity programs may be used as tools for social capabilities and positive social outcomes.

Implications of the Study

For schools, the regular integration of structured physical education and recreational activities can significantly enhance students' social and moral development. For teachers, physical activity should be adopted as a pedagogical tool to promote cooperation, discipline within classroom settings and teamwork. For parents, encouraging children to participate in regular physical activity at home or within the community helps build resilience, confidence and positive social behaviors. Finally, for policymakers, greater investments in school sport facilities and community-based recreational programs are essential to maximize the developmental benefits of physical activity and ensure inclusivity for all children.

Recommendations

The study offers several key recommendations. Based on the findings, it is recommended that schools should implement planned-physical-activity programs within the curriculum to provide students with consistent opportunities for social interaction and growth. Both organized sport and unorganized play must be promoted. Organized sport offers distinct advantages through structured activities, foster teamwork and discipline, while unstructured play encourages creativity, flexibility and peer bonding. In particular, special attention should be directed towards public schools and rural areas, where limited resources, often, restrict access to such opportunities, to ensure equity and inclusivity across all educational settings.

Future Research Suggestions

Future research should prioritize longitudinal studies to assess the long-term effects of physical activity on children's social development and behavioral outcomes. Tailored interventions are, also, necessary to address the needs of children with special needs, ensuring that programs are inclusive and effective in enhancing coöperation, communication and confidence. By adopting these measures, educators, policymakers and stakeholders can maximize the developmental

potential of physical activity and create supportive environments that enhance social skills across diverse populations.

Conclusion

This study underscores that physical activity has a positive role in enhancing children's social development. Participation in structured and unstructured activities fosters cooperation, communication, peer relationships and teamwork, while, simultaneously, promoting inclusivity, moral values and respect. These findings demonstrated that frequent engagement in physical activity is positively associated with stronger social competencies and reduced negative behaviors. Importantly, these benefits were consistent across gender and residence, though school type and activity levels influenced the degree of improvement. This study supposed that physical activity has a revolutionary role in increasing children's social development. Overall, physical activity is essential for social growth and holistic development of school-aged children.

Acknowledgement

The authors are indebted to **Meritorious Professor Dr. Syed Arif Kamal**, Ex-Dean, Faculty of Science and Ex-Chairman, Department of HPSS (Health, Physical Education and Sports Sciences), University of Karachi and Ex-Member, Subject Committee, Physical Education, Health and Sport Sciences, National Testing Service Pakistan, who thoroughly read the draft manuscript and provided reference to his conference presentation (Kamal, 2024).

In addition, the authors are also indebted to Dr Omar Ben Rakaa, Physical Education Teacher at Ministry of National Education, Preschool and Sports, Sport Science Assessment and Physical Activity Didactic. Multidisciplinary Laboratory In Education Sciences and Training Engineering (LMSEIF). Normal Higher School (ENS-C), Hassan II University of Casablanca, Morocco. He reviewed the paper and help us in restructuring the paper and provided invaluable guidance and feedback throughout this research paper.

Moreover, we also like to thanks Professor Sabir Hussain, Principal, Government Degree Boys College, Korangi 2 1/2, College Education Department, Government of Sindh, Karachi 74900, Pakistan, for inspiration, impulse, gratitude, backing, and insightful discussion regarding this research.

References

- Aubert S., Barnes, J. D., Abdeta, C., Nader, P. A., Adeniyi, A. F., Aguilar-Farias, N., & Tremblay, M. S. (2023). Global prevalence of physical activity in children and adolescents: Demographic influences on activity and social outcomes. *International Journal of Behavioral Nutrition and Physical Activity*, 20 (1), 65–78
- Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G. & Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, 54 (24), 1451-1462
- Corbin, C. B., Welk, G. J., Richardson, C., Vowell, C., Lambdin, D. & Wikgren, S. (2014). Youth physical fitness: Ten key concepts. *Journal of Physical Education, Recreation and Dance*, 85 (2), 24-31
- Corbin, C. B., Kulinna, P. H. & Sibley, B. A. (2020). A dozen reasons for including conceptual physical education in quality secondary school programs. *Journal of Physical Education, Recreation and Dance*, 91 (3), 40-49
- Corbin, C. B. (2025). A response to “Why should the next generation of youth guidelines prioritize vigorous physical activity?” *Sports Medicine-Open*, 11 (1), 70
- Donner, P., Lundström, S. & Heikkilä, M. (2024). A case study of young children's plays negotiations in free play. *Early Years*, 44 (3&4), 889-902

- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J. & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10 (98), 1–21
- Hodges, M., Kulinna, P. H., Corbin, C. B., & Kloeppel, T. A. (2012). A school-wide wellness and physical activity model: Stakeholders' perceptions. *Research Quarterly for Exercise and Sport*, 83(1), A-xiv
- Holt, N. L. & Neely, K. C. (2011). Positive youth development through sport: A review. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 6 (2), 299-316
- Jadwiszczak, M., Wawrzyniak, S., & Pezdek, K. (2025). More than movement: a systematic review of moral and social development in adolescents physical education. *BMC Public Health*, 25(1), 2076.
- Kamal, S. A. (2024, March 12, 13). An emotional-intelligence-based-primary-education system striking balance among intellectual, moral and physical development of a child, in *Proceedings of the Fourth International Conference on Innovative Academic Studies (ICIAS 2024)*, paper#Y-201, All Sciences Academy, Eds., Konya, Türkiye, pp. 1457-1470, abstract#744: p. 267; full text: <https://www.ngds-ku.org/Papers/C146.pdf>
- Kamal, S. A. & Khan, S. A. (2014). Primary-physical-education practices in Pakistan and England: health and safety perspectives. *International Journal of Biology and Biotechnology*, 11(2&3), 401-419; full text: <https://www.ngds-ku.org/Papers/J33.pdf>
- Kamal, S. A. & Khan, S. A. (2015). Hairstyle, footwear and clothing for gymnastic activities in the primary-school setting. *Pamukkale Journal of Sport Sciences*, 6(3), 29-45; full text: <https://www.ngds-ku.org/Papers/J37.pdf>
- Kamal, S. A. & Khan, S. A. (2018). Overcoming vitamin-D deficiency in male gymnasts during preteen years. *The Sky (International Journal of Physical Education, Health, Sports and Applied Sciences)*, 2, 60-75; full text: <https://www.ngds-ku.org/Papers/J50.pdf>
- Kamal, S. A. & Khan, S. A. (2020a). Association of balanced diet and physical activity with fitness of young children and their parents. *The Shield (Research Journal of Physical Education and Sports Science)*, 15, 119-147; full text: <https://www.ngds-ku.org/Papers/J58.pdf>
- Kamal, S. A. & Khan, S. A. (2020b). Operation of sport academies during and after corona pandemic. *Uluslararası Beden Eğitimi Spor ve Teknolojileri Dergisi (International Journal of Physical Education, Sport and Technologies)*, 1 (2), 12-29; full text: <https://www.ngds-ku.org/Papers/J56.pdf>
- Kamal, S. A., Khan, S. A. & Aslam (2020). A model football academy for residents of Lyari Town, Karachi, Sindh, Pakistan. *The Sky (International Journal of Physical Education, Health, Sports and Applied Sciences)*, 15, 119-147; full text: <https://www.ngds-ku.org/Papers/J57.pdf>
- Kamal, S. A. & Khan, S. A. (2021). Establishing peace through sport activities: changing mindset of youngsters belonging to countries having conflicts. *The Sky (International Journal of Physical Education, Health, Sports and Applied Sciences)*, 2 (1), 1-26; full text: <https://www.ngds-ku.org/Papers/J62.pdf>
- Li, J. & Ren, X. (2024). Community-based recreational programs and social development of rural children. *Journal of Child and Adolescent Development*, 17 (3), 214–229
- Li, J. & Shao, W. (2022). Influence of sports activities on pro-social behavior of children and adolescents: A systematic literature review. *International Journal of Environmental Research and Public Health*, 19 (11), 6484.
- Liu, H. & Shang, Y. (2024). Sports participation and social communication in children with learning disabilities. *Disability & Health Journal*, 17 (2), 201–210

- Lhendup, G. & Tiaotrakul, A. (2025). *The Effects of Physical Activity Program on Health-Related Fitness for Seventh-Grade Students in Bhutan* (Doctoral dissertation, Naresuan University, Thailand)
- Otaibi, S. (2024). School resources and structured programs in promoting children's social development. *Journal of Educational Development*, 45 (2), 112–125
- Pellegrini, A. D. & Gustafson, K. (2022). Boys' and girls' uses of objects and play behaviors during recess. *Early Childhood Research Quarterly*, 59, 75–86
- Qi, L., Wang, J. & Chen, Y. (2024). Physical activity and inclusivity: Effects on peer cooperation and social interaction among school-aged children. *Frontiers in Psychology*, 15, 1245
- Sabri, S., Zhang, M. Y., Guo, L., Dang, J., & Mao, Z. X. (2024). Effectiveness of school-based physical activity programs in enhancing attention, academic performance, and social relationships among children with intellectual disabilities: evidence from Pakistani schools. *Frontiers in Psychology*, 15, 1431890.
- Salvy, S. J., Roemmich, J. N., Bowker, J. C., Romero, N. D., Stadler, P. J. & Epstein, L. H. (2012). Effect of peers and friends on youth physical activity and motivation to be active. *Journal of Pediatric Psychology*, 37 (2), 222–230
- Shafi, S., Asif, R., & Akram, R. (2024). Gender Differences in Cognitive Learning Strategies in Pakistani Schools: Implications for Educational Practices. *Pakistan Languages and Humanities Review*, 8(3), 113-126.
- Shafaei, M., Rahmani, A. & Noor, N. M. (2024). Social skill development through structured physical activity: Evidence from school-based interventions. *Asian Journal of Physical Education and Sport Science*, 13 (1), 56–72
- Shang, Y., Chen, S. P. & Liu, L. P. (2023). The role of peer relationships and flow experience in the relationship between physical exercise and social anxiety in middle school students. *BMC Psychology*, 11 (1), 428
- Türkmen, M. & Kaya, A. (2024). The role of sports in enhancing communication skills among children with intellectual disabilities. *International Journal of Inclusive Education*, 28 (4), 405–421
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, Massachusetts, United States: Harvard University Press
- Wang, C. (2022). The role of physical activity promoting thinking skills and emotional behavior of preschool children. *Psicologia: Reflexão e Crítica*, 35, 24
- World Health Organization (2020). *Guidelines on Physical Activity and Sedentary Behaviour*. Geneva, Switzerland: WHO
- Xing, Y., Zhang, J. & Huang, L. (2025). Group sports intervention and social development of children with autism spectrum disorder: A quasi-experimental study. *Journal of Autism and Developmental Disorders*, 55 (6), 2150–2165
- Yang, Z., Liu, Q. & Sun, H. (2024). Physical activity and behavioral outcomes: mitigating aggression and isolation in adolescents. *Journal of Adolescent Health*, 74 (5), 987–995
- , Z., Wei, L., Xu, L., Pang, W. & Liu, Y. (2025). Chain-mediation effect of cognitive flexibility and depression on the relationship between physical activity and insomnia in adolescents. *BMC Psychology*, 13 (1), 587
- Zhang, H., Li, F. & Zhao, W. (2023). Physical activity, peer relationships, and social anxiety among school-aged children. *Journal of Child Psychology and Psychiatry*, 64 (9), 1135–1145

Zhu, K., Yin, X., Liu, Y., Qin, G., Jia, J., Xie, Z. & Liu, Y. (2025). Correlates of physical activity and sedentary behavior in children and adolescents during school recess: a systematic review and meta-analysis. *BMC Public Health*, 25(1), 2662