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Mediating Role of Enjoyment in the Associations between Social Support and Participation in Physical Activity among Female Adolescents

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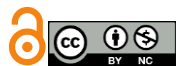
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Objective: This study focused on examining the connections between social support and physical activity participation, with enjoyment identified as a mediating variable.

Methods and Materials: This research employed a descriptive-correlational approach utilizing structural equation modeling. A sample of 384 adolescent girls was selected through convenience sampling. Standardized assessment tools were used to measure the research variables, and the data analysis was performed using Smart PLS statistical software version 4, with a significance threshold set at 0.05.

Findings: The path analysis results indicate a significant positive structural relationship between physical activity ($P=0.000$, $T=8.54$, $b=0.53$) and enjoyment ($P=0.000$, $T=10.23$, $b=0.45$) in relation to social support. Additionally, a significant positive structural relationship exists between the enjoyment and physical activity ($P=0.000$, $T=6.84$, $b=0.33$). In addition, enjoyment serves as a significant mediating factor in the relationship between the social support and physical activity, with a p -value of 0.000, a t -value of 4.58, and a b coefficient of 0.16.

Conclusion: The findings of this study highlight the profound influence of the home and family environment on the physical activity trajectories of children and adolescents, emphasizing that parental support plays a vital role in establishing an active lifestyle that can predict future levels of physical activity.

Keywords: Adolescent, Girl, Exercise, Social Support, Enjoyment

1. Introduction

The advancement of technology, mechanization, and shifts in lifestyle have contributed to a decline in physical activity levels (1, 2). Engaging in regular physical activity is crucial for enhancing various life aspects and

improving overall quality of life (3, 4). Numerous studies indicate that a sedentary lifestyle is a significant risk factor for non-communicable diseases, making it a pressing public health issue globally (5, 6). The World Health Organization emphasizes that an active lifestyle is vital for everyone, particularly for the healthy development and well-being of

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children and adolescents (7). This age group requires adequate physical activity to support their physical growth and mental development, as adolescence is a critical phase marked by significant physical, emotional, and cognitive changes that lay the groundwork for adulthood (8). The behaviors adopted during this period, especially those related to physical activity, can have lasting implications for future health. However, modern conveniences and urban lifestyles appear to diminish adolescents' enthusiasm for sports and physical activities (1, 2). Various factors influence their motivation to engage in such pursuits, and according to ecological systems theory, understanding individual behavior necessitates considering the broader context in which they exist.

While intrapersonal interventions have shown effectiveness, the sustainability of behavior change hinges on the coordinated influence of social, cultural, and physical factors that promote an active lifestyle. Recognizing the critical role of physical activity during childhood and adolescence, researchers have sought to identify variables that impact engagement, with social support emerging as a key factor. It has been highlighted that a positive social environment, grounded in self-determination theory, fosters a sense of independence and belonging, thereby enhancing intrinsic motivation for lifestyle changes (9, 10). Social support encompasses both the quantity and quality of interpersonal relationships, which are vital for improving health and overall life trajectories (11, 12). Longitudinal and cross-sectional studies consistently demonstrate a positive correlation between social support and physical activity levels among adolescents (13-15). Notably, parents are among the most influential figures in shaping children's physical activity habits and preferences, with family support being a crucial driver for participation in physical activities (16-18).

Ecological Systems Theory posits that understanding individual development or change necessitates an examination of the surrounding context (19). While interventions targeting personal behavior can yield positive results, sustained behavior change is more likely when the socio-cultural and physical environments promote active lifestyles (20). Davison and Birch applied Ecological Systems Theory to identify factors influencing childhood physical activity, highlighting that for children, their ecological niche encompasses family and school, which are situated within broader social frameworks such as the community and society (21, 22). Therefore, it is essential for

effective interventions to consider the contextual factors influencing the behaviors of individuals or groups.

For children and adolescents, family plays a crucial role in their initial socialization experiences. Research has identified various forms of parental influence, including instrumental support, such as organizing physical activities and providing transportation; emotional support, like encouraging participation; informational support, which involves giving guidance; companionship support, through engaging in play; and validation support, where parents act as role models (23-25). These diverse interactions shape children's perceptions of parental support in specific contexts. Furthermore, numerous studies have shown that children's beliefs about their parents' support can significantly influence their attitudes and values regarding physical activity, as well as their actual involvement in such activities (26, 27). Given the importance of social support in driving motivation and intention, investigating the social support has been a focal point in understanding the engagement of children and adolescents in physical activities.

Parents play a crucial role in shaping their children's enjoyment of sports through their behaviors and choices. Research indicates that enjoyment is the primary motivator for children and adolescents to engage in sports, significantly influencing both the initiation and continuation of participation (28, 29). Parental support and encouragement are vital sources of enjoyment, enhancing adolescents' commitment to athletic activities. However, studies highlight that girls face specific limitations that can hinder their physical activity levels (30). Alarming, 90 percent of adolescent girls aged 13 to 15 globally do not meet the recommended physical activity guidelines, consistently showing lower activity levels than their male counterparts (31). Gender bias further exacerbates this issue, restricting girls' opportunities for participation in sports and physical activities across various settings, including home, school, and community (29). This disparity not only affects their current activity levels but also limits their chances to build self-confidence and physical skills. Identifying and addressing these gender differences through targeted research and program development could help promote greater physical activity among adolescent girls (30).

A deeper exploration of the factors influencing physical activity and sports participation among adolescent girls is essential for developing more effective interventions tailored to this demographic. Investigating the elements that contribute to sustainable behaviors during adolescence,

particularly in girls, is crucial. Given that physical activity significantly impacts adolescents' self-efficacy and that parental support plays a vital role, there is a notable gap in research examining how these factors collectively influence increased physical activity levels. This study aims to identify these factors and establish a predictive model for physical activity among adolescent girls. Furthermore, recognizing the importance of physical activity and the role of social support, this research will also explore the relationships between social support and physical activity participation in adolescent girls, with enjoyment serving as a mediating factor.

2. Methods and Materials

2.1 Study Design and Participants

This research employed a descriptive-correlational approach utilizing structural equation modeling. The target population consisted of female adolescents aged 14 to 17 years, with a sample size of 384 participants determined through appropriate calculations for correlational studies, using parameters of $\alpha=0.05$, $\beta=0.05$, and $r=0.20$. The mean age of the participants was 15.35 years, accompanied by a standard deviation of 0.42. Recruitment was conducted through convenience sampling, and prior to the study, both participants and their parents were thoroughly informed about the research objectives and methodologies. Eligibility criteria required participants to be female adolescents without any physical or mental health conditions and not on special medication. Those who did not fulfill these criteria or who did not complete the questionnaire were excluded from the study.

In the implementation phase, coordination with the Education Department was initiated to secure the necessary permissions. A subsequent visit to the school was conducted to outline the research objectives and highlight the importance of the findings, ensuring that both parents and students provided their consent. A convenience sampling method was then employed to select a sample of 384 female adolescents, who were given questionnaires to complete. Finally, the completed questionnaires were gathered for analysis.

2.2 Data Collection

This scale includes 13 items aimed at assessing the impact of family and friends on individuals' physical activity and

exercise habits, as well as their attitudes towards engaging in exercise (32). Respondents rate each item on a 5-point Likert scale, ranging from 1 (never) to 5 (always). The overall social support score is derived from the average of these responses, with higher scores reflecting a stronger level of social support for physical activity and exercise engagement. In this study, the Cronbach's alpha coefficient was found to be 0.95, demonstrating excellent internal consistency.

The Physical Activity Questionnaire for Adolescents (PAQ-A) was employed to evaluate the physical activity levels of participants (33). This self-administered instrument comprises nine questions, each rated on a scale from 1 to 5, where a score of 1 signifies minimal activity and 5 indicates the highest level of activity. The total physical activity score is derived by summing the scores of all nine questions and calculating the average, resulting in a final score that ranges from 1 to 5. Specifically, scores between 1 and 2.33 reflect low physical activity, scores from 2.34 to 3.66 represent moderate activity, and scores exceeding 3.67 are categorized as high activity levels. In this research, the Cronbach's alpha coefficient was determined to be 0.93, indicating excellent internal consistency.

The enjoyment was evaluated using a questionnaire consisting of three items rated on a Likert scale ranging from never (2) to always (5, 34). Additionally, the reliability of the questionnaire was confirmed with a Cronbach's alpha coefficient of 0.94.

2.3 Data Analysis

For the data analysis, descriptive statistics were utilized, focusing on measures of central tendency and variability such as mean, standard deviation, skewness, and kurtosis. In the inferential statistics phase, structural equation modeling was employed after verifying the necessary assumptions. The analysis was performed using Smart PLS statistical software version 4, with a significance threshold set at 0.05.

3. Results

Table 1 presents the features of social support, physical activity, and enjoyment among female adolescents. The skewness and kurtosis values for all variables fall within the range of -2 to +2, confirming that the data meets the criteria for normal distribution.

Table 1. Description of research variables

| | Skewness, | Kurtosis | Mean | SD | Maximum | Minimum |
|-------------------|-----------|----------|------|------|---------|---------|
| Social support | 0.266 | 0.527 | 2.05 | 0.09 | 5 | 1 |
| Physical activity | 1.25 | 0.128 | 1.39 | 0.10 | 4 | 1 |
| Enjoyment | - 1.02 | 0.117 | 1.69 | 0.13 | 5 | 1 |

Table 2 revealed that the Cronbach's alpha values for social support was 0.96, physical activity was 0.93, and enjoyment was 0.89. Additionally, the composite reliability for social support was 0.95, physical activity was 0.92, and enjoyment was 0.90. Finally, the average variance extracted

(AVE) for social support was 0.639, for physical activity was 0.586, and for enjoyment was 0.541. These values exceed acceptable thresholds, indicating that the questionnaires utilized demonstrated satisfactory reliability and validity.

Table 2. Validity and reliability

| | Cronbach's alpha | Composite reliability | AVE |
|-------------------|------------------|-----------------------|-------|
| Social support | 0.961 | 0.953 | 0.639 |
| Physical activity | 0.934 | 0.921 | 0.586 |
| Enjoyment | 0.922 | 0.903 | 0.541 |

The analysis using Pearson's correlation coefficient revealed a significant positive correlation between the social support and physical activity ($P < 0.001$, $r = 0.57$), as well as between enjoyment and physical activity ($P < 0.001$, $r = 0.62$). Additionally, a positive relationship was found between the social support and enjoyment ($P < 0.001$, $r = 0.39$). These findings support the validity of the assumption of a linear relationship among the variables. Furthermore, the variance inflation factor (VIF) values for the research

variables were all below the threshold of 10, indicating the absence of multicollinearity among them.

The path analysis results obtained through Smart PLS software, as presented in Table 3, indicate a significant positive structural relationship between physical activity ($P=0.000$, $T=8.54$, $b=0.53$) and enjoyment ($P=0.000$, $T=10.23$, $b=0.45$) in relation to social support. Additionally, a significant positive structural relationship exists between the enjoyment and physical activity ($P=0.000$, $T=6.84$, $b=0.33$).

Table 3. Structural model coefficients and values for the direct path

| Path | b | SE | T | P |
|-------------------------------------|-------|-------|-------|-------|
| Social support => Physical activity | 0.531 | 0.049 | 8.54 | 0.000 |
| Social support => Enjoyment | 0.452 | 0.050 | 10.23 | 0.000 |
| Enjoyment => Physical activity | 0.331 | 0.047 | 6.84 | 0.000 |

The results presented in Table 4 indicate that enjoyment serves as a significant mediating factor in the relationship

between the social support and physical activity, with a p-value of 0.000, a t-value of 4.58, and a b coefficient of 0.16.

Table 4. Structural model coefficients and values for the indirect path

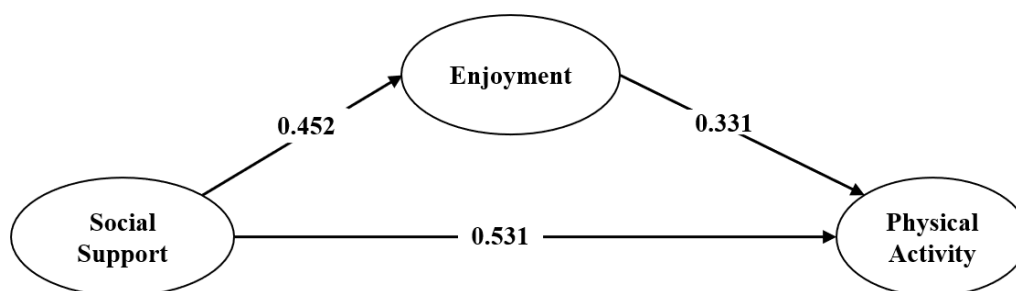
| Indirect path | b | SE | T | P |
|--|------|-------|------|-------|
| Social support => Enjoyment => Physical activity | 0.16 | 0.038 | 4.58 | 0.000 |

The Stone-Geisler Q2 index values presented in Table 5 are all positive, indicating that the structural model demonstrates good quality. The model exhibits strong predictive power for the endogenous latent variables, with an R2 value of 0.41 for social support, meaning it accounts for 41 percent of the variance in this variable. Additionally,

the SRMR value of 0.074 is below the acceptable threshold of 0.08, and the goodness of fit index (GOF) for the overall model assessment is 0.38, surpassing the minimum criterion of 0.36. These results collectively suggest that the model fits well.

Table 5. Model fit indices

| | Q^2 | R^2 | SRMR | GOF |
|-------------------|-------------|-------|-------|-------|
| Social support | 0.252 | 0.411 | 0.074 | 0.38 |
| Physical activity | 0.303 | 0.071 | | |
| Enjoyment | - | | | |
| Acceptable value | Be positive | | <0.8 | >0.36 |

**Figure 1.** Standardized coefficients of paths

4. Discussion and Conclusion

A comprehensive investigation into the factors that affect physical activity and sports engagement among adolescent girls is crucial for creating targeted interventions for this group. This study focused on examining the connections between social support and physical activity participation, with enjoyment identified as a mediating variable. The findings revealed a significant positive relationship between social support and enjoyment, as well as between enjoyment and physical activity. Furthermore, enjoyment was found to play a critical role as a mediator in the relationship between social support and physical activity levels.

Social support plays a crucial role in various theoretical frameworks, such as environmental theory, social cognitive theory, social environmental theory, and ecological systems theory, which collectively suggest that a range of factors, including both physical and social environments, can interact to shape the health behaviors of children and adolescents (11, 35). Social cognitive theory highlights the influence of parental behaviors, attitudes, and values on the physical activity of young individuals, emphasizing the significance of social learning through the relationship between parental habits and children's engagement in physical activities. Meanwhile, self-determination theory and family systems theory underscore the critical role of parenting in determining behavioral outcomes (14, 24). Cognitive theory further elucidates the key parental factors

that affect the physical activity levels of children and adolescents, establishing a clear connection between parental attitudes towards physical activity and the support they provide, which in turn influences their children's activity levels. Additionally, the motor development model posits that advancements in motor competence are shaped not only by individual characteristics but also by social influences. Ecological systems theory reinforces the idea that understanding individual development requires consideration of the broader context in which individuals exist (19). While interventions targeting individual behavior can be effective, sustainable behavior change is more likely when various social, cultural, and physical factors align to promote an active lifestyle.

Social support plays a crucial role in enhancing adolescents' physical self-esteem and motivation to exercise by fostering confidence and creating opportunities for participation in physical activities (36). Studies indicate that social support not only boosts motivation for engaging in sports but also contributes positively to emotional well-being and psychological resilience among adolescents (37-39). To further enhance these benefits, initiatives such as family-centered sports activities, peer mentoring, and the development of social support networks are essential. These strategies significantly increase adolescents' willingness to participate in physical activities, thereby profoundly influencing their psychological growth.

According to Ecological Systems Theory, the findings of this study indicate that various levels of factors can

collaboratively influence children's health behaviors, encompassing both physical and social environments (22). Engagement from families and communities, as key interpersonal elements, is crucial for the effectiveness of comprehensive physical activity programs in schools. By recognizing the role of parents and actively involving them in decision-making processes, schools can potentially improve their physical activity initiatives.

We initially posited, in line with cognitive theories of motivation, that there would be a positive correlation between social support and enjoyment of physical activity. Our analyses confirmed this hypothesis. Specifically, adolescent girls who perceive less social support tend to derive less enjoyment from physical activity compared to those with higher social support perceptions. While previous research has established significant links between perceived social support and enjoyment of physical activity (29, 34), this study is among the few to explore this relationship among adolescent girls. The results reinforce the importance of focusing on social support in interventions designed to enhance physical activity enjoyment among adolescent girls.

The decline in physical activity across all age groups can be attributed to technological advancements and evolving lifestyles. This trend is particularly concerning among children and adolescents, as their engagement in physical and sports activities diminishes over time, with girls experiencing a more significant drop than boys. It is essential to explore and implement interventions that encourage higher participation rates in physical activities among adolescents, as this can help prevent various health issues and promote an active lifestyle. The perception of physical activity as a chore rather than a source of enjoyment may contribute to this decline. Therefore, addressing physical, social, and environmental factors is crucial, especially for adolescent girls. The findings of this study highlight the profound influence of the home and family environment on the physical activity trajectories of children and adolescents, emphasizing that parental support plays a vital role in establishing an active lifestyle that can predict future levels of physical activity.

Given the critical role of social support in enhancing physical activity levels, it is recommended that research be conducted to explore the impact of various social support dimensions. These dimensions include instrumental support, which encompasses tangible assistance like providing sports equipment or facilitating transportation to exercise venues; psychological or emotional support, which involves fostering motivation and encouragement for physical

engagement; and educational support, which focuses on counseling and discussing the significance and methods of participating in physical activities. Furthermore, to gain a comprehensive understanding of physical activity among adolescents, it is advisable to undertake an objective study that examines the environments of children and adolescents. This study should consider both the perspectives of the children and their parents, allowing for a comparison of their views and the differing conditions of their living environments.

Authors' Contributions

All authors equally contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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