

Associations between Physical Activity and Health-Related Quality of Life in Children with Intellectual Disability: Mediating Role of Parental Social Support

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ABSTRACT: Background and Aim: The connection between social support and physical activity in children has been extensively researched; however, its role as a mediating factor in the relationship between physical activity and quality of life for children with intellectual disabilities has received comparatively less attention. Hence, this study was designed to explore the associations between physical activity and health-related quality of life in children with intellectual disability with considering the mediating role of parental social support.

Methods: A descriptive-correlation methodology was utilized in this study, incorporating structural equation modeling. The research involved 125 children diagnosed with intellectual disabilities, including 42 females, who were recruited from various special education institutions. The ages of the participants varied from 7 to 12 years, with an average age of 9.53 ± 0.38 years. Participants were chosen using a convenience sampling technique. Standard questionnaires were used to collect data. Pearson correlation test and the structural equation modeling were used for data analysis.

Results: Results revealed that physical activity significantly affected quality of life ($T=6.394$). Furthermore, parental social support affected quality of life ($T=5.586$). Finally, parental social support has significantly mediated the relationship between physical activity and quality of life ($P<0.001$). Results of model fit indicated that the research model has good fit.

Conclusion: This study emphasizes the significant relationship between physical activity and parental social support in relation to the quality of life for children with intellectual disabilities. It highlights the urgent need for focused healthcare interventions.

Keywords: Physical activity, quality of life, parental social support, child, intellectual disabilities

INTRODUCTION

A disability is defined as any condition affecting the body or mind that encompasses impairments, limitations in activities, and restrictions in participation, as outlined by the International Classification of Functioning, Disability and Health for Children and Youth framework (Baniyadi et al. 2022; Longo et al. 2017; Ilkim et al 2021). It represents an interaction between individual and environmental factors that hinders full engagement in daily life activities. Globally, approximately 1.5 billion individuals are living with disabilities, with children and adolescents who have

physical disabilities and intellectual disabilities facing heightened risks of mental health issues and socioeconomic challenges (Feng et al. 2022; Ruckwongpatr et al. 2021). They also receive less adequate disease prevention and health promotion services compared to their typically developing peers. Research shows a positive correlation between physical activity and the psychosocial wellbeing of children and adolescents with disabilities; however, a significant number of these individuals do not engage in regular physical activity, which may adversely affect their mental health (Baniyadi, 2024; Lee, 2017).

Quality of life serves as a crucial measure of mental health, encompassing aspects of life satisfaction that include physical, emotional, social, and educational well-being (Omidvar et al. 2018; Seyedi Asl et al. 2016). Achieving quality of life involves fulfilling essential psychological needs, such as self-acceptance. Research indicates that children and adolescents with disabilities often report lower levels of quality of life (Khosravi et al. 2023; Marsack & Samuel, 2017; Ilkim et al 2018; Özdemir et al. 2018). Prior studies have shown that children and adolescents with intellectual disabilities exhibit lower quality of life compared to their peers without intellectual disabilities, and factors such as age, environment, and significant relationships have been found to significantly impact both quality of life in children with and without disabilities (Kim et al. 2021; Perez-Sousa et al. 2018).

There has been a growing body of research focused on physical activity and quality of life among children and adolescents with intellectual disabilities. For instance, studies have shown a positive relationship between physical activity and both physical and social quality of life in this demographic (Shafaei et al. 2024; Taghva et al. 2020). Additionally, the experiences of physical activity have been linked to improved quality of life in child and youth athletes with intellectual disabilities. Furthermore, children and adolescents with intellectual disabilities who engage in sports exhibit stronger connections between physical activity and quality of life compared to their non-participating peers (Najafzadeh et al. 2024; Stiller & Stiller, 2024, Ilkim & Yurtseven, 2021). Positive associations have also been identified between active leisure pursuits and athletic competence, as well as between skill-based leisure activities and physical appearance in adolescents with intellectual disabilities. Evidence suggests that engaging in physical activity enhances quality of life by fostering better physical self-perceptions related to esteem and appearance, which serve as key psychosocial mechanisms in youth. Nevertheless, the specific mechanisms at play in children and adolescents with intellectual disabilities remain inadequately understood. A possible mechanism that may play a role is parental social support (Abdoshahi & Ghorbani, 2022; Hsiao, 2016).

Social support is fundamentally associated with enhanced life satisfaction, diminished stress levels, reduced emotional fatigue, and an increase in positive feelings. It encompasses the perception of being cared for, loved, respected, and integrated within a network of reciprocal responsibilities (Kim et al. 2018; Savari et al. 2023, Yurtseven et al., 2024). In essence, social support represents the assistance and encouragement an individual receives through their relationships within the community. Research has established a favorable correlation between social support and mental health. Additionally, studies have shown that elements such as religious beliefs and social support can significantly improve mental well-being during challenging times. Children with intellectual disabilities often present various behavioral challenges, including difficulties with attention, hyperactivity, and externalizing behaviors, especially in their early years. Moreover, they are twice as likely to exhibit aggressive behavior compared to their non-disabled counterparts (Baniyadi et al. 2022; Grasaas et al. 2020).

Furthermore, parents play a crucial role as "gatekeepers" of physical activity, regulating access to community sports programs and outdoor spaces conducive to exercise. This is particularly significant during childhood, specifically between the ages of 5 and 12, when children have less autonomy over their behaviors (Huang et al. 2014). In this context, parents are key facilitators of both inhibitory and promotive opportunities that encourage physical activity. They affect their children's activity levels through various mechanisms, including their own engagement in physical activities, which can serve as a model for their children, as well as through the familial patterns of activity. Additionally, parental attitudes, beliefs, and values regarding physical activity, along with genetic factors and the provision of social support, play a vital role. Among these factors, social support—encompassing both verbal and nonverbal encouragement, as well as direct assistance—has a particularly positive influence on the activity levels of children and adolescents (Quaresma et al., 2014).

The connection between social support and physical activity in children has been extensively researched; however, its role as a mediating factor in the relationship between physical activity and quality of life for children with intellectual disabilities has received comparatively less attention. Hence, this study was designed to explore the associations between physical activity and health-related quality of life in children with intellectual disability with considering the mediating role of parental social support.

METHODS

A descriptive-correlation methodology was utilized in this study, incorporating structural equation modeling. The research involved 125 children diagnosed with intellectual disabilities, including 42 females, who were recruited from various special education institutions. The ages of the participants varied from 7 to 12 years, with an average age of 9.53 ± 0.38 years. Participants were chosen using a convenience sampling technique.

The assessment of physical activity was carried out using the Rapid Assessment of Physical Activity (RAPA) scale (Yang, 2022). This scale consists of seven items that require respondents to answer with either 'Yes' or 'No'. The total score on this scale ranges from 0 to 7. In the present study, the internal consistency reliability of the RAPA scale, as measured by Cronbach's alpha, was found to be 0.92. Furthermore, the validity of this tool has been affirmed by ten experts, resulting in a Content Validity Index (CVI) of 0.90 and a Content Validity Ratio (CVR) of 1.00.

The Pediatric Quality of Life Inventory™ (PedsQL™) 4.0 Generic Core Scales for Children (Yang et al. 2023), designed for ages 7 to 12 years, was utilized to assess health-related quality of life (HRQoL) among children with intellectual disabilities. This assessment tool comprises 23 items distributed across four domains: physical functioning (8 items), emotional functioning (5 items), social functioning (5 items), and school functioning (5 items). Each item is evaluated using a five-point Likert scale, with responses ranging from "never" (0) to "almost always" (4). The resulting scores are converted linearly to a scale from 0 (indicating the worst condition) to 100 (indicating the best condition). In this research, the PedsQL demonstrated a Cronbach's alpha of 0.96, and its validity was corroborated by nine experts (CVI=0.94, CVR=0.90).

Multidimensional Scale of Perceived Social Support (MSPSS): In 1988, researchers Dahlem, Zimet, and Walker created a self-administered questionnaire designed to evaluate perceived social support (Najafzadeh et al., 2024). This instrument comprises 12 items, each assessed using a seven-point Likert scale, where 1 signifies complete disagreement and 7 indicates complete agreement. It measures the support received from friends, family, and other individuals. The total scores provide an indication of the perceived level of social support, with higher scores reflecting a greater sense of support. The scoring range for this scale is from 12 to 84. Based on the scoring criteria, a total score between 12 and 36 is interpreted as low support, a score from 37 to 60 is viewed as moderate support, and a score ranging from 61 to 84 is classified as high perceived social support. In this research, the MSPSS demonstrated a Cronbach's alpha of 0.90, and its validity was corroborated by nine experts (CVI=0.90, CVR=0.92).

Data analysis was performed utilizing SPSS-26 and Lisrel software. Descriptive statistics, such as means and standard deviations, were applied to characterize the variables. A Pearson correlation test was conducted to assess the relationships among the variables. Furthermore, the structural equation modeling technique was used to investigate the structural relationships between the research variables. A significance threshold of $P < 0.05$ was set.

RESULTS

The research included a cohort of 125 children with intellectual disabilities, consisting of both male and female individuals. The participants' ages varied from 7 to 12 years, with a mean age of 9.53 ± 0.38 years. The average age for male participants was recorded at 9.51 ± 0.34 years, whereas female participants had a mean age of 9.55 ± 0.30 years ($P=0.869$). Nonetheless, no statistically significant differences were observed between the genders concerning height, weight and BMI (refer to Table 1).

Table 1. Demographic data of the participants

	Boys	Girls	Gender differences
Age (years)	9.51 ± 0.34	9.55 ± 0.30	$t=0.102$ $P=0.869$
Height (m)	1.33 ± 0.05	1.33 ± 0.04	$t=0.031$ $P=0.983$
Weight (kg)	28.58 ± 3.54	28.52 ± 2.25	$t=0.010$ $P=0.993$
BMI	19.00 ± 0.35	19.08 ± 0.30	$t=0.017$ $P=0.989$

Descriptive data are presented in Table 2. Descriptive results show that in general the level of physical activity is lower than the average. Also, quality of life and parental social support were at medium level. The results of Kolmogorov-Smirnov tests revealed that all variables were normally distributed (all $P > 0.05$).

Table 2. Descriptive data

	Physical activity	Quality of life	Parental social support
Mean	2.23	51.39	42.78
SD	0.17	3.38	4.54

Bivariate relationships between physical activity with quality of life and parental social support are demonstrated in Table 3. Results revealed significant direct relationship between physical activity and quality of life ($P<0.001$). Moreover, parental social support was directly and significantly associated with quality of life ($P<0.001$).

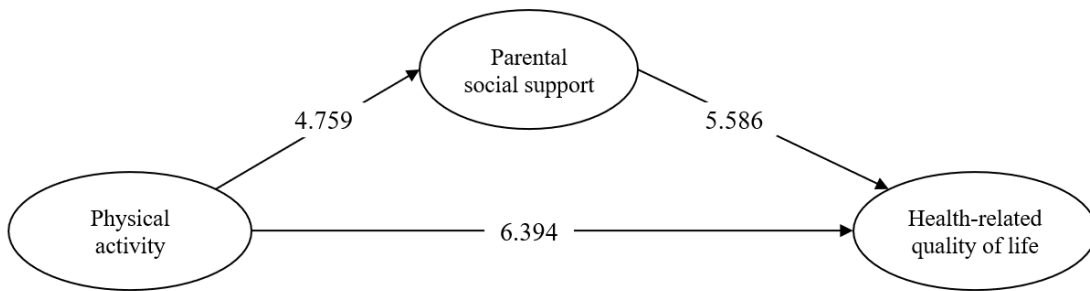
Table 3. Results of bivariate relationships between variables

	1	2	3
1. Physical activity	-		
2. Quality of life	$r=0.639$ $P<0.001$	-	
3. Parental social support	$r=0.475$ $P<0.001$	$r=0.558$ $P<0.001$	-

Table 4 and Figure 1 show the results of structural equation modelling. Results revealed that physical activity significantly affected quality of life ($T=6.394$). Furthermore, parental social support affected quality of life ($T=5.586$). Finally, parental social support has significantly mediated the relationship between physical activity and quality of life ($P<0.001$). Results of model fit are presented in Table 5 and indicated that the research model has good fit.

Table 4. Results of structural equation modelling

Path	β	T-value
1 Physical activity => Quality of life	0.639	6.394
2 Parental social support => Quality of life	0.558	5.586
	Z	P-value
3 Physical activity => Parental social support => Quality of life	7.547	$P<0.001$

**Figure 1. Structural equation modelling in the form of T-values****Table 5. Results of model fit**

Index	Optimal Range	Obtained Value	Conclusion
RMSEA	< 0.08	0.06	Good fit
X^2 / df	< 3	2.97	Good fit
RMR	Closer to 0	0.02	Good fit
NFI	> 0.9	0.97	Good fit
CFI	> 0.9	0.96	Good fit

DISCUSSION

The connection between social support and physical activity in children has been extensively researched; however, its role as a mediating factor in the relationship between physical activity and quality of life for children with

intellectual disabilities has received comparatively less attention. Hence, this study was designed to explore the associations between physical activity and health-related quality of life in children with intellectual disability with considering the mediating role of parental social support. The initial findings indicated that the children participating in this study exhibited markedly lower levels of health-related physical activity compared to the recommended standards. These results align with earlier research (Seyedi Asl et al. 2020; Chaharbaghi et al. 2022), underscoring the insufficient time children allocate to health-related physical activity. Considering the numerous advantages linked to regular health-related physical activity for children, it is imperative that health practitioners pay particular attention to the physical activity habits of children, especially those with intellectual disabilities. Therefore, it is crucial to identify effective interventions and strategies aimed at enhancing physical activity levels among children with intellectual disabilities.

Moreover, the results revealed that physical activity significantly affected quality of life. Furthermore, parental social support affected quality of life. Finally, parental social support has significantly mediated the relationship between physical activity and quality of life. Engagement in physical activity significantly enhances emotional well-being among participants in various ways. Numerous remarks highlighted the role of physical activity in fostering self-confidence, self-discipline, and self-acceptance, with statements such as "It encouraged me to be comfortable with myself" and "We acquire a great deal of dignity." Additionally, the theme of improved mood and stress relief emerged consistently within the emotional context (Ghorbani et al. 2020; Lei & Kantor, 2022). Participants noted that physical activity positively affected their emotional state, as evidenced by comments like, "When I feel stressed, I head to the gym... I can work through it," and "Morning runs set a positive tone for my entire day." Social contributions were frequently mentioned by participants, who noted that physical activity facilitates interactions with diverse individuals, fosters camaraderie, and enhances familial relationships. Additionally, benefits to cognitive and spiritual aspects were highlighted. For instance, one participant expressed, "I feel closer to God...when I'm physically active," while another remarked, "If I'd been inside on the couch, I wouldn't have paid any attention to the clouds and the sun and the trees and the nice breeze." Numerous responses reiterated the importance of balance or the integration of various aspects of quality of life in connection with physical activity (Baniasadi et al. 2022). When participants were directly questioned about the relative contributions of these domains, many indicated that they found it challenging to rank or distinguish between them. One participant remarked, "I believe that exercise influences every facet of your life," while another noted, "...all elements are interconnected and mutually influence one another, forming a cohesive whole." (Wu et al. 2018).

Social support is widely recognized as a complex concept that encompasses the establishment of secure relationships with others. Perceived social support refers to an individual's evaluation of the social resources available to them, particularly in the context of managing stress and fostering mental health (Trudeau, 2019). This support can be categorized into emotional support, which includes expressions of love, empathy, and trust, and instrumental support, which pertains to practical assistance provided by others (Isa et al. 2016). The influence of social support on stress levels, mental health, and overall quality of life is significant, as it equips individuals with essential resources for emotional regulation and stress management, thereby influencing their reactions to challenging situations. In essence, the extent and quality of social support can greatly alleviate the adverse effects of stress on an individual's well-being and overall life satisfaction (Shafaei et al. 2024; Sur, 2022). Gaining insight into how family, friends, and other significant figures offer social support, along with the associated psychological advantages, can inform the development of strategies aimed at enhancing well-being and quality of life. Social support can be assessed through the perception of available resources or the actual assistance received, with the former often exerting a more profound impact on well-being and quality of life. Additionally, the perception of social support is strongly associated with increased happiness, reduced academic stress, lower emotional exhaustion, and heightened positive emotions (Hamm & Yun, 2019).

CONCLUSION

This study emphasizes the significant relationship between physical activity and parental social support in relation to the quality of life for children with intellectual disabilities. It highlights the urgent need for focused healthcare interventions. The prevalent sedentary behavior in this population negatively affects their overall well-being, pointing to an immediate requirement for initiatives that promote physical activity. It is essential for healthcare professionals and educators to prioritize awareness initiatives and create customized programs that encourage active lifestyles, especially within educational environments. Furthermore, incorporating physical activity and parental support into the daily lives of students could greatly improve their quality of life, mental health, and academic success. This research contributes to the expanding evidence base that underscores the advantages of physical activity and advocates for a unified approach from educational institutions, healthcare providers, and policymakers to combat the

issue of physical inactivity among children with intellectual disabilities, ultimately leading to a healthier and more active future generation.

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