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ORIGINAL ARTICLE

Associations between Physical Activity with Health-Related Quality of Life and Wellbeing among Children with and without Autism

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ABSTRACT

Purpose: Evidence revealed that physical activity has positive effects on quality of life and mental health. Nevertheless, this topic has received little attention among special groups such as autism. Thus, this study was designed to examine the associations between physical activity with health-related quality of life and wellbeing among children with autism.

Method: 65 children with autism (aged 9 to 13 years old) from special school and 70 typically developing children from regular primary schools (aged 9 to 12 years old) participated in this study. Physical activity, health-related quality of life, and wellbeing were measured by using standard questionnaires. Pearson correlation, regression analysis, and independent t test were used for data analysis.

Results: Both children with and without autism had low physical activity. Children without autism had significantly higher levels of physical activity, health-related quality of life, and wellbeing compared with children with autism. Physical activity was positively associated with health-related quality of life and wellbeing among both children with and without autism.

Conclusion: These findings, together, indicate that physical activity is a critical concern for children with autism. Accordingly, it is necessary to adopt appropriate strategies to increase the level of physical activity among children with autism.

Keywords: Autism, Physical Activity, Quality of Life, Wellbeing, Children

INTRODUCTION

It is known that exercise is among the most important factors affecting the quality of life of individuals among healthy living parameters[1,2]. In addition, depending on the exercise models and recovery protocols applied, the increase in the participation of disabled individuals in sports positively affects the attitudes of healthy individuals towards the disabled[3-5]. Evidence showed that children with developmental disabilities are more likely to engage less in sports activities compared to typically developing children (TDC)[6,7]. A common disability in children is autism spectrum disorder (ASD). Individuals with ASD suffers from deficits in peer relationships social skills, as well as stereotyped behaviors. It is also associated with a high rate of psychiatric problems such as mood and anxiety disorders, and cigarette and substance use disorders[8]. Furthermore, they have problems with performing the motor skills[9]. Regarding physical activity (PA), several studies have shown that individuals with ASD do not meet WHO recommendation of 60 minutes of MVPA per day[10-12]. A recent review found that only 42% of the children with ASD aged 6-17 years met the PA guidelines of at least 60 min of daily moderate-to-vigorous PA (MVPA)[13]. Rostami Haji Abadi et al. (2021) conducted a meta-analysis and showed that children with ASD engage 30 min lower in daily MVPA than TDC[14]. Inactivity among children with ASD is largely because of their personal and physical limitations. In fact, inactivity of individuals with ASD predisposes them for its negative consequences. Several studies showed that inactivity and having a sedentary lifestyle will lead to immediate and long-term health disadvantages such as enhancing the risk of chronic diseases such as type 2 diabetes, cancer and cardiovascular disease[15-25]. Thus, physical activity is an important topic in the field of children and adolescents with ADHD and it is necessary to constantly measure engagement of children with ASD in PA. Thus, the first aim of this study was to measure the level of PA among children with ASD and compare them with that of TDC.

Moreover, some studies have shown that PA can improve the quality of life and wellbeing of children[15,26,27]. However, this issue has not been well understood in individuals with ASD. Health-related quality of life is a broad multi-dimensional concept including physical, mental, and social functions. In children, enhancing HRQoL is essential for their present and future wellbeing and widely considered a priority area for health interventions. Specifically, health-related quality of life focuses on the children's subjective self-perception about their current health status and ability to perform daily activities in different life domains[15,26,28]. In addition, wellbeing is a person's ability to recognize their own capacities, manage regular stresses of life, work productively, and contribute to their community. Wellbeing is not just the absence of disease or illness. It's a complex combination of a person's physical, mental, emotional and social health factors. Wellbeing is strongly linked to happiness and life satisfaction. In short, wellbeing could be described as how person feels about himself and his life[29]. Thus, wellbeing can be considered as a vital factor in life, especially among people with physical and mental disabilities. Thus, the second aim of this study was to examine the associations between PA with HRQoL and wellbeing among children with ASD. Altogether, this study aimed: 1) to compare the level PA, HRQoL and wellbeing of children with ASD with those of TDC; and 2) to examine the associations between PA with HRQoL and wellbeing among children with ASD and TDC.

MATERIAL AND METHODS

Physical Activity: Physical Activity Behavior in Leisure-Time Scale[30] was employed to assess the level of PA of children with and without ASD. This questionnaire has 3 questions scored based on an eight-point Likert scale from zero days (0) to seven days (7). We measured its validity with a Cronbach's alpha coefficient of 0.93.

Health-Related Quality of Life: Health-related quality of life was measured by using The Pediatric Quality of Life Inventory Version 4.0 Generic Core Scales (PedsQL)[31]. It has 23 items scored based on a 5-point Likert scale from 0 (never) to 4 (almost always). Items are reversed scored and linearly transformed to a 0-100 scale as follows: 0=100, 1=75, 2=50, 3=25, 4=0. Maximum score is 100, and minimum score is 0. The Cronbach's alpha of the PedsQL in this study was α=0.91.

Wellbeing: Well-being was measured using the 7-day recall Kidscreen-27 questionnaire[32], which is regarding the perceptions of children of their physical and mental wellbeing. It includes 12 items, rated on a 5-point Likert scale ranging from 1 = never, 2 = seldom, 3 = quite often, 4 = very often, and 5 = always, or 1 = not at all, 2 = slightly, 3 = moderately, 4 = very, 5 = extremely. In this study, Cronbach's alpha coefficient was 0.84.

Data analysis: We analyzed the data by using SPSS software version 26. We used descriptive statistics consisted of means and

standard deviations to describe PA, HRQoL, and wellbeing. In order to evaluate the associations between PA, HRQoL, and wellbeing, we used Pearson correlation test. Regression analysis was also utilized to investigate whether PA predicts HRQoL and wellbeing. Independent t test was used to compare PA, HRQoL, and wellbeing between ASD and TDC. P-value was set at $P < 0.05$.

RESULTS

Descriptive data and the results of comparison between ASD and TDC are presented in Table 1. In general, the level of PA in both ASD and TDC groups were low, however, TDC group was significantly more active than ASD. HRQoL was higher than average for TDC and lower than average for ASD. Here, again, TDC group reported higher HRQoL scores than ASD. Similar results were observed for wellbeing, where TDC reported significantly higher scores of wellbeing compared with ASD.

Table 1: Descriptive data and comparative results

Variable	ASD		TDC		Comparison
	Mean	SD	Mean	SD	
Physical Activity	1.42	0.66	2.94	1.09	t=6.157 p=0.000
HRQoL	45.97	10.94	71.07	12.55	t=19.584 p=0.000
Wellbeing	1.33	0.84	2.67	1.12	t=9.374 p=0.000

Associations among variables: Table 2 shows bivariate associations between PA, HRQoL, and wellbeing. For ASD, results showed that PA was significantly associated with both HRQoL (p=0.000) and wellbeing (p=0.000). Moreover, HRQoL was significantly related to wellbeing (p=0.000). Moreover, for TDC, results showed that PA was significantly associated with both HRQoL (p=0.000) and wellbeing (p=0.000). Moreover, HRQoL was significantly related to wellbeing (p=0.000).

Table 2: Associations among PA, HRQoL, and wellbeing in ASD and TDC

		1	2	3
ASD	1. Physical Activity	-		
	2. HRQoL	r=0.749 P=0.000	-	
	3. Wellbeing	r=0.667 P=0.000	r=0.492 P=0.000	-
		1	2	3
TDC	1. Physical Activity	-		
	2. HRQoL	r=0.589 P=0.000	-	
	3. Wellbeing	r=0.394 P=0.000	r=0.740 P=0.000	-

Regression analysis: The results of regression analysis are shown in Table 3. Results for ASD group showed that PA directly predicted HRQoL (p=0.000 and wellbeing (p=0.000). Results for TDC group also showed that PA directly predicted HRQoL (p=0.000 and wellbeing (p=0.000).

Table 3: Results of regression analysis

		HRQoL	Wellbeing
ASD	Physical Activity	β = 0.749 t = 3.968 R^2 = 0.227 F = 9.985	β = 0.667 t = 4.515 R^2 = 0.227 F = 8.671
TDC	Physical Activity	β = 0.589 t = 2.631 R^2 = 0.348 F = 5.693	β = 0.394 t = 3.742 R^2 = 0.186 F = 4.929

DISCUSSION

Several studies have shown that PA positively influence HRQoL and wellbeing among children[17,26]. Nevertheless, associations between PA with HRQoL and wellbeing of special groups such as ASD have been rarely investigated. Hence, this study was designed to examine the associations between PA with HRQoL and wellbeing among children with ASD. The results showed that, although TDC had higher levels of PA than ASD, both groups showed low level of PA. These results are in accordance with previous findings[17,30,33]. The explanation for lower MVPA in ASD than TDC is not well understood, however, it may be related to social interaction impairment, motor skill difficulties, and physical barriers in individuals with ASD[14].

Concerning HRQoL, we found that HRQoL of children with ASD was relatively low. Also, TDC reported higher amount of HRQoL than ASD. The present findings are in accordance with previous studies[15,26,35,36], indicating low levels of HRQoL among children with ASD. This low level is quite understandable, because of their difficulties with motor and cognitive functions. Therefore, it is necessary to adopt appropriate strategies to improve the perception of quality of life among this population. The results of linear regression analysis showed that a greater frequency of PA may contribute to a higher HRQoL in both children with and without ASD. These findings are in accordance with previous studies indicating positive effects of PA on HRQoL in children with and without ASD[15,26,37]. Therefore, it can be stated that PA relates to improved quality of life in children with and without ADHD.

Concerning wellbeing, the results showed that PA was positively associated with wellbeing among both children with and without ASD. The present findings are in accordance with previous studies[15,21], indicating positive role of PA in improving wellbeing of children with and without ADHD. Among the possible explanations, increases in neurogenesis and reductions in inflammatory and oxidant markers as well as improvements in self-esteem can be mentioned[34]. Similar to HRQoL, TDC reported higher wellbeing than ASD.

As limitation of this study, it can be mentioned that we measured PA by using a questionnaire which may has self-reporting bias. Moreover, our sample size was relatively small. These two limitations should be addressed in future studies. In summary, this study found that children with ASD have low amount of PA which make it necessary to adopt appropriate strategies and intervention to increase the PA in this population. If PA increases in children with ASD, it can be assumed that HRQoL and wellbeing increase, as our results showed.

CONCLUSION

When the physical activity status of children with autism and non-autism is compared, it is seen that physical activity is important for children with autism. Accordingly, necessary studies should be carried out in order to increase the level of physical activity in children with autism.

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