

## **Parental Support and Concerns About Physical Activities of Their Children with Autism Spectrum Disorder During COVID-19**

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### **Abstract**

Parental support is one of the intertwining factors that affect physical activity (PA) in children with autism spectrum disorder (ASD). With multiple COVID-19 regulations that have posed many challenges for people participating in their usual social activities, including PA, there is a need to examine parent concerns and support behaviors for PA of children with ASD. Thus, the purpose of this study was to investigate how the PA support behaviors of parents of children with ASD and COVID-19 concerns about their children's PA participation changed during the pandemic and how these variables are correlated with other variables, such as their children's demographic and PA related variables. Parents ( $n = 253$ ) of children with ASD aged 10-17 years old completed an online survey that queried their children's demographic information, parent PA support behaviors, parent and child PA, COVID-19 concerns about their children's PA participation, and the perceived importance of their children's PA. The results showed that parents' COVID-19 concerns for their children participating in PA significantly correlated to the severity of their children's ASD. Parents who identified as more physically active and perceived their children's PA participation as more important tended to show higher COVID-19-related concerns. In addition, higher COVID-19 concerns among parents negatively correlated with their children's PA variables. Parent PA support behaviors showed a significant reduction during the pandemic compared to before the pandemic. Overall, the findings suggest that it is important to provide parents with information on safe PA participation and resources to promote their children's PA.

Keywords: parental support behaviors, physical activity, autism, children, COVID-19 pandemic

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## **Introduction**

Physical activity (PA) provides numerous health, social, and academic benefits to children and adults with and without disabilities. In particular for children with autism spectrum disorder (ASD), PA is often a means to engage in more socialization opportunities while developing fitness, movement skills, and communication skills (Kwon, 2020; Lee & Vargo, 2017; Lee et al., 2021). These benefits of PA participation for this population are significant, as ASD is a neurodevelopmental condition that affects one's communication, social activity, and behaviors (American Psychiatric Association [APA], 2013) as well as movement skills (Kaur et al., 2018; Wilson et al., 2018). These individual-level characteristics of ASD are delineated in the diagnostic manual (i.e., APA, 2013) and research has identified many unique challenges for children with ASD participating in PA due to these characteristics (Must et al., 2015). For example, children with ASD whose social skills and movement skills are delayed may have difficulties in participating in sport programs (Lee et al., 2021). However, other factors beyond individual-level characteristics, such as interpersonal, physical, and social environments interacting with each other, also affect PA participation (Sallis et al., 2006). Studies on PA among children with ASD identified various factors relating to PA levels including age (MacDonald et al., 2011; Pan & Frey, 2005, 2006) social support from peers, teachers, and parents (Obrusnikova & Cavalier, 2011; Pan et al., 2011), PA in school and afterschool programs (Obrusnikova & Cavalier, 2011; Pan & Frey, 2005, 2006; Pan et al., 2011), and community-based settings (MacDonald et al., 2011; Obrusnikova & Cavalier, 2011).

Parent support as a positive factor for PA in children with ASD may require special attention, as parents are powerful agents who can promote PA for these children, whose opportunities and social support are often limited (Taheri et al., 2016). In fact, parent support often has positive associations with PA among children in general (Trost & Loprinzi, 2011). Parent support for children's PA can take various forms, but it may include encouraging or praising the child's physically active behavior, watching the child participate in PA, providing transportation for PA, and monitoring the child's PA (Yao & Rhodes, 2015). There is limited research on parent support and its role in PA among children with ASD. A recent study found a correlation between parent support and PA behaviors of their children with ASD (Brown et al., 2020). In addition to common interfering factors for parent support for PA, such as busy schedules (Mailey et al., 2014), the literature about parents of children with ASD identified additional challenges such as insufficient PA resources outside the family (Blagrove & Colombo-Dougovito, 2019; Gregor et al., 2018). In particular, Arnell et al. (2020) reported that parents felt difficulties in motivating their children to do PA as they get older and to find meaningful and safe PA opportunities that provide predictability and fulfill individualized needs. Thus, although many parents of children with ASD would recognize the importance of PA behavior, promoting it

for their children may be an extremely challenging task (Arnell et al., 2020).

Restrictions due to the COVID-19 pandemic have created many public health challenges, including reduced PA participation opportunities for all (Kim et al., 2021; Park, 2021). Access has been restricted for public places and services that were primary resources for PA, such as schools, parks, and youth sport programs. Thus, it is not surprising that recent studies have reported that the COVID-19 pandemic has negatively affected PA among children and youth (Dunton et al., 2020). Parents can still support their children to be physically active at home; however, increased family burden from working at home, online schooling, and limited social interactions may have acted as barriers to parents actively promoting their children's PA. Only a few studies explored PA among children with ASD during COVID-19. A study reported that parents' limited time to do PA with their children and the mental and physical exhaustion resulting from working from home were major challenges for parents when it comes to promoting their children's PA (Esentürk, 2020). In addition, Esentürk (2020) addressed parents' increased safety concerns when children with ASD engage in PA at home such as injuries. Another study showed that most children with ASD participating in the study during the COVID-19 pandemic (78%) had a reduced number of days of daily PA participation for 60 minutes or more (Garcia et al., 2020). While these studies provided valuable insights on PA in children with ASD during COVID, the sample size was relatively small.

As researchers have been foreseeing a considerable negative impact of the pandemic on the well-being of youth with ASD, including reduced PA (Esentürk, 2020), there is an urgent need for additional studies to evaluate parent concerns and support for their children's PA during the COVID-19 pandemic. Therefore, the aim of this study was to explore parent concerns about and support behaviors for PA of their children with ASD during the pandemic. The current study addressed the following research questions:

- RQ1. How do parents' concerns about PA participation of their children with ASD during COVID-19 correlate with their children's PA and demographic variables?
- RQ2. Do children's PA variables show any difference between parents who have low and high levels of COVID-19 concern about their children's PA participation?
- RQ3. Are there any differences between parents' support behaviors for their children's PA before and during COVID-19?

## **Method**

### ***Recruitment and Sample***

The research team collected cross-sectional data from a purposive sample of parents or caregivers of children with ASD aged 10–17 years old in South Korea between October 2020 and December 2020. This was part of a larger international project on guidelines for physical activity, screen time, and sleep duration in youth with ASD and the study is currently under review. An online survey platform (Google Forms) distributed the survey, and a link to the survey went to organizations and parent groups in South Korea that provide various programs and resources for families of children with ASD. Participants who completed the survey automatically received a 3000 Korean Won gift voucher (approximately US\$2.5). The ethical committee of the primary researcher's university approved the study protocol and materials.

### ***Measurements***

The survey included several sets of questions that asked about (a) demographic information on children with ASD, (b) parental support for PA, (c) PA of parents/caregivers and their children with ASD, and (d) concerns about their children's PA participation during COVID-19 and the perceived importance of their children's PA participation. In total, the online survey consisted of 21 items.

#### ***1. Demographic Variables (8 items)***

The demographic questions included level of ASD symptom severity (mild, moderate, severe), age, gender (male, female, other), living situation (lives with both parents, one parent, non-parent caretakers/guardians), number of children with and without ASD living in the household, and the additional disabilities of the child (open-ended).

#### ***2. Parent Support Variables (6 items)***

Three questions from Tandon et al. (2014), each asked twice (six items total), explored parents' support for their children's PA. They asked how many days the parent or a household adult engaged in behaviors that support their children's PA: watching the child's participation in sports or PA (Watching), encouraging the child to do sports or PA (Encouraging), or transporting to a place where the child can do sports or PA (Transporting). These questions were asked twice in the survey to compare these behaviors before and during COVID-19.

#### ***3. PA Variables (4 items)***

Two measures, totaling four items, assessed the estimated PA of the parents/caregivers and their children with ASD. One PA recall question adopted from the National Survey of Children's Health was used to measure how many days the adult/child had exercised, played a sport, or participated in PA for at least 60 minutes during the past week (Days PA 60 min). In addition, a three-item PA



measure used a modified version of the Godin Leisure Time Questionnaire (Godin & Shephard, 1985; Shephard, 1997). This questionnaire asked the number of times on the average the adult/child has participated in PA for least 15 minutes over a 7-day period based on particular intensities: strenuous (e.g., running, football), moderate (e.g., easy bicycling, easy swimming), and mild (e.g., yoga, easy walking). Then, weekly leisure activity scores were calculated using the following formula: Leisure Score =  $(9 \times \text{Strenuous}) + (5 \times \text{Moderate}) + (3 \times \text{Light})$ .

#### ***4. Concerns About Children's PA and the Importance of PA (3 items)***

The researchers created questions to identify parents' perceptions of their children's PA. One question asked about parents' COVID-related concerns about their children's PA participation, another question asked about their general concerns about their children's safety when they participate in PA, and a third question asked how important they feel PA is for their children. The parents rated these questions using a Likert-type scale ranging from 1, "not at all," to 5, "totally."

#### ***Analysis***

All data were downloaded as an Excel spreadsheet and transferred to SPSS (version 28.0. Armonk, NY: IBM Corp.). Pearson correlation analysis was conducted to test for correlations between the variables. To identify whether different support behaviors for their children's PA depended on the level of COVID-related concerns, two groups were used, with one group reporting no or little concern ( $n = 76$ ) and the other group reporting moderate to total concern ( $n = 177$ ). Independent samples t tests assessed whether these two groups manifested significant differences in children's and parents' PA variables and parents' support behaviors. To determine whether parents' PA support behaviors were different before and during the COVID-19 pandemic, a paired t test examined the mean difference between the number of days parents reported that they engaged in PA support behaviors for their children with ASD. The level of significance was  $p < .05$  for all analyses.

## **Results**

Two hundred fifty-three respondents provided usable data for analysis (a completion rate of 98.06%). Table 1 shows the demographic characteristics of children whose parents completed the survey. There were no significant differences in the responses based on demographic characteristics, except that parents of male children rated the importance of PA higher than parents with female children (4.16 vs. 3.89;  $p = .037$ ).

Table 1. Demographic Information on Youth with ASD

Variable	Numerical Value	Variable	Numerical Value
Total	N = 253	Severity	Mild = 116 (46%)
Age (years)*	11.51 (5.13)		Moderate = 108 (43%)
Sex	Male = 159 (63%)		Severe = 29 (11%)
	Female = 94 (37%)	Sibling	Without ASD = 96 (38%)
Height (cm)*	152.8 (13.7)		With ASD = 16 (6%)
Weight (kg)*	47.9 (13.3)		Only Child = 141 (56%)
General Schools	184 (73%)	Living with Parents	Both parents = 230 (92%)
	Special Ed = 101 (55%)		One parent = 16 (6%)
Special Schools	69 (27%)		Others = 3 (1%)

\*Mean (SD).

***Variables That Were Correlated with Parents’ Concerns About Child PA***

Pearson correlation analyses showed that parents’ COVID-related concerns about their children’s PA participation had a positive correlation with children’s ASD severity ( $r = .143, p < .023$ ). Parents with higher general safety concerns about their children’s PA participation tended to report greater COVID-related concerns for their children participating in PA ( $r = .447, p < .001$ ). Also, parents who rated their children’s PA as more important tended to report greater COVID-19 concerns about their children’s PA participation ( $r = .146; p < .020$ ). Parents’ COVID-19 related concerns about their children’s PA participation had a positive correlation with two of the parents’ general PA support behaviors (before COVID-19), namely watching PA ( $r = .150, p < .017$ ) and encouraging PA ( $r = .161, p < .010$ ). Last, parents’ COVID-related concerns about their children’s PA participation had a negative correlation with their children’s PA variables, including Days PA 60min ( $r = -.167, p < .008$ ) and Leisure Scores ( $r = -.134, p = .033$ ).

***Different Children’s PA Depended on the Levels of Parents’ COVID-19 Concerns***

Table 2 shows the results from an independent samples t test comparing two different levels of parental COVID-19 concerns (Group 1 = unconcerned to moderately concerned; Group 2 = mostly to totally concerned). Although differences were not statistically significant, the results demonstrated a trend toward parents with greater COVID-19 concerns to report lower levels of children’s PA and their PA support behaviors. Of the two children’s PA variables in the analysis, only Days of PA 60 min showed a significant difference between the two groups. There was a significantly lower mean for Days of PA 60 min (child) in the high concern group (i.e., mostly to totally concerned) than in the low concern group ( $p < .033$ ).

Table 2. Differences in t-Test Responses Between the Two Study Groups

Variable	Group	Mean (SD)	Std. Error	<i>p</i>
PA Leisure Scores	1	36.45 (25.64)	2.94	.101
	2	30.84 (22.61)	1.70	
Days of PA 60 min	1	2.22 (1.60)	0.18	.033*
	2	1.77 (1.34)	0.10	
Parent Support (days)				
Watching	1	1.51 (1.30)	0.15	.313
	2	1.34 (1.14)	0.09	
Encouraging	1	1.70 (1.29)	0.15	.093
	2	1.41 (1.17)	0.09	
Transporting	1	1.49 (1.30)	0.15	.162
	2	1.24 (1.17)	0.09	

\*  $p < .05$ , \*\*  $p < .01$ . Group 1 = unconcerned to moderately concerned; Group 2 = mostly to totally concerned. Note: the test was two tailed and did not assume equal variances.

***Parents’ PA Support Behaviors for Their Children Showed Differences Before and During COVID-19.***

A paired sample t test (2-tailed) tested whether parent PA support behaviors before COVID-19 differed from those during COVID-19. The results showed that parents’ self-reported PA support behaviors for their children significantly reduced during the pandemic (Table 3). Parents reported fewer days of watching, encouraging, and providing transportation for their children’s PA during COVID-19 compared to before COVID-19.

Table 3. Changes in Parent PA Support Behavior (Days)

Paired Variable	Mean Difference	Std. Deviation	Std. Error	<i>t</i>	<i>df</i>	<i>p</i>
Watching	-.57708	1.198125	0.075325	-7.661087	252	< .001**
Encouraging	-.95257	1.555113	0.097769	-9.743048	252	< .001**
Transporting	-.56522	1.394681	0.087683	- 6.446158	252	< .001**

\*  $p < .05$ , \*\*  $p < .01$ . Days of parent PA support behaviors during COVID-19 were subtracted from those before COVID-19. A negative value for the mean difference indicates a reduction during the pandemic relative to the pre-pandemic evaluation.

**Discussion**

Recent studies on PA among children with ASD during the COVID-19 pandemic showed reduced PA opportunities and increased subsequent concerns of parents about their children’s health (Esentürk, 2020; Garcia et al., 2020). These studies provided important evidence that the pandemic negatively

affected PA participation and increased sedentary time (Garcia et al., 2020) and that parents faced multiple barriers to providing PA opportunities for their children (Esentürk, 2020). The current study added more insights into this line of research on parent concerns about PA participation by children with ASD during the pandemic based on data from a relatively large sample size. Additionally, this study was conducted in South Korea and provided insights for future comparative studies. Different types of PA infrastructure and culture can influence how parents support their children's PA across different countries. A comparative study reported that parents of children with developmental disabilities in Korea showed lower PA support behaviors than their US counterparts (Ku & Jin, 2022). Unfortunately, limited evidence is available to understand PA among children with ASD in South Korea. According to the 2018 South Korea Report Card on PA for children and youth (12-17 years old), an effort to identify indicators to promote PA among children, it was not even feasible to assess certain indicators, including "Active Play," "Family and Peers," "Community and Environment" (Oh et al., 2019).

It was interesting that parents with higher PA participation and interest in PA, such as those who reported more Days of PA 60 min (parents), higher Leisure Scores (parents), and higher perceived importance of their children's PA, tended to report higher COVID-19 concerns about their children's PA participation. This might imply that more concerns could occur when there are disparities between parents' knowledge of and interests in PA and information on safe PA participation during COVID-19. Like Esentürk (2020), who reported that parents felt their safety concerns were a factor limiting their children's participation in PA during the COVID-19 pandemic, this study also showed that parents with high COVID-19 concerns reported significantly lower child PA than parents with low COVID-19 concerns. The findings of this study imply that it is important to reduce parental concerns over COVID-19 to promote PA participation among children with ASD. Also, providing sufficient information on safe PA participation for children, particularly during the global pandemic, is imperative even for parents who see the importance of their children's PA and who may have knowledge of PA. Future studies should explore the nature of parents' concerns about COVID-19 and the association between these concerns and PA participation of their children with ASD.

This study also explored the PA support behaviors of parents of children with ASD during the COVID-19 pandemic, as such support behavior can positively influence the PA of children with ASD (Brown et al., 2020). An important finding about parents' PA support behaviors was that parents reported fewer days of PA support behaviors during the pandemic than before. This indicates that parents' COVID-19 concerns about their children's PA participation might have affected their PA support behaviors. This might be related to the interconnection between parents' PA support behaviors and children's PA. Reduced parents' PA support behavior could lead to fewer PA opportunities for

children with ASD.

Although the findings of this study came from a relatively large sample and may contribute to future studies, there are several limitations in interpreting the data. First, this study was correlational in nature; thus, one should not assume any causal relations between variables. In addition, the findings relied on a self-report survey of parents, and thus, the data were subjective. The utilization of self-report instruments tends to overestimate favorable variables, such as PA participation, due to social desirability (Adams et al., 2005). Last, the data came from only one country and PA environment, and COVID-19 situations vary greatly from one country to another. Thus, generalizing this study's findings would be difficult.

Given that many safety considerations already exist for children with ASD when they participate in PA, supporting parents of such children to promote their children's PA is particularly important during COVID-19 to maintain the mental and physical health of this population. Future research should focus on what interventions, such as technological tools and online protocols, would be effective in the engagement of parents or children with ASD in PA through their perceptions of PA during limiting circumstances like the COVID-19 pandemic.

## **Conclusion**

This study has explored the relationship between parental concerns about COVID-19 when considering their children's PA participation, parent PA support behaviors, the perceived importance of their children's PA, and parents' self-reported PA variables (Leisure Scores and Days of PA 60 min for parent and child). The findings from this study indicate that parental concerns about COVID-19 during their children's PA participation had a positive correlation with the severity of their children's ASD, high perceptions of the importance of their children's PA, and general PA support behaviors (i.e., pre COVID-19). This suggests that parents who were more exposed to PA contexts and perceived child PA as more important took the COVID-19 risks more seriously concerning their children's PA participation. Parents who reported more COVID-19 concerns reported fewer Days of PA 60 min (child). All three variables of parents' self-reported PA support behaviors showed a significant reduction during COVID-19 compared to before the pandemic. This study provides an indication of the importance of providing safety information, including procedures for children's safe PA participation, to parents of children with ASD based on the particular concerns they may have when it comes to their children's PA participation in general and COVID-19-related concerns in specific.

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