

Research Paper

Iranian Parents' Perceptions on Physical Activity for Their Children With Autism Spectrum Disorder During the COVID-19 Pandemic



Sarvin Salar¹ , Justin A. Haegele² , Hassan Daneshmandi¹

1. Department of Sport Injuries and Corrective Exercises, Faculty of Physical Education, University of Guilan, Rasht, Iran.

2. Department of Human Movement Sciences, Old Dominion University, Norfolk, Virginia, United States.



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ABSTRACT

Purpose: The COVID-19 pandemic is a remarkable health crisis that enforced most people to stay at home and quarantine for a period of time and seems to be having negative impacts on physical activity and mental health worldwide. Autism Spectrum Disorder (ASD), is a neurodevelopmental disorder with a deficit in social interaction characteristics, relationships, and stereotyped behaviors. This study examined Iranian parents' perceptions of physical activity for their children with ASD during the COVID-19 pandemic.

Methods: In this study, an explanatory qualitative methodology was used and data were collected via semi-structured phone interviews. The samples included 40 Iranian parents (aged 25-50 years) who had children with ASD according to the Diagnostic and Statistical Manual of Mental Disorders-5 Edition (DSM-5) criteria (aged 7-12 years).

Results: The results showed that the parents observed their children's physical activity to decrease greatly than before the pandemic. Parents experienced weight gain, increased anxiety, increased stereotypic behaviors, and decreased orderliness, communicative interactions, and social skills. The parents stated that, when their children were more active before the COVID-19 pandemic, they were more cheerful, more adaptable, and communicated more verbally. Parents believed that physical activities have positive effects on the development of their children's physical health and behavior. They also reported some barriers to their children's participation in physical activity.

Conclusion: Participating in daily physical activity and support from parents were consequential factors in the promotion of their physical and behavioral health and the development of their independent performance and quality of life during the COVID-19 pandemic.

* Corresponding Author:

Sarvin Salar

Address: Department of Sport Injuries and Corrective Exercises, Faculty of Physical Education, University of Guilan, Rasht, Iran.

Phone: +98 (911) 9142789

E-mail: sarvin_salar@yahoo.com

Highlights

- This research utilized qualitative methodologies through semi-structured phone interviews to understand the experiences, attitudes, and feelings of parents using open ended questions.
- The results of this study showed the physical activity levels in children with autism spectrum disorder has substantially decreased compared to before the COVID-19.
- Most of the parents reported weight gain, increased anxiety, decreased orderliness, effective communication, and social skill.

Plain Language Summary

Due to the outbreak of COVID-19 along with home quarantine which has created many challenges for children with ASD and their parents, the researchers decided to pursue research to explore the perception of Iranian parents about their child's physical activity during the COVID19 pandemic. Interviews are used to achieve insights into a person's experiences, attitudes, and desires among 40 parents who had children with autism spectrum disorder. Based on the findings of this study, following the COVID19 pandemic, the levels of physical activity in children with ASD have decreased. Parents also observed weight gain, increased anxiety, decreased orderliness and increase stereotypic movements in their children. Parents and educators can play an important role in this physical activity promotion. Iranian parents express a clear need for regular physical activity participation for their children with ASD to help cope with challenges associated with the COVID-19 pandemic and home quarantine orders.

1. Introduction

C OVID-19 is a disease caused by the SARS- CoV-2 that emerged at the end of 2019, with the first cases being diagnosed in China. That outbreak was declared a public health emergency by the World Health Organization (WHO) [1]. In an attempt to slow infection rates, particularly in groups predisposed to high risks of morbidity and mortality, comprehensive social distancing and isolation policies were implemented worldwide [2]. These policies aiming at limiting the spread of COVID-19, mean that most people have had to spend much of their time at home. Although restrictions and social distancing are effective to prevent the uncontrolled spreading of COVID-19, they may have deleterious effects on physical and mental health [3]. Self-isolation means far fewer opportunities to engage in physical activities and can cause negative effects on mental health and daily life [4]. In many countries, sports and recreational facilities and public gyms were closed and children were studying via the Internet and had social interactions virtually [5]. Most of the evidence identified during the COVID-19 outbreak asserts that stress, anxiety, and depression increased, and the levels of physical activity decreased [1]. More specifically, research suggests that following the outbreak of COVID-19, anxiety rates increased by 19%, depressive symptoms increased

by 21%, and sleep quality decreased by 16% [3]. In addition, based on a study on 1143 parents, over 80% of parents showed a negative change in their children's emotional and behavioral levels, difficulties in concentrating (76.6%), boredom (52%), irritability, restlessness, nervousness, or loneliness [2]. During the COVID-19 Pandemic, the physical activity levels in adolescents significantly decreased [5]. While children are not intrinsically exposed to an increased risk of getting COVID-19 [5], children and adolescents with special needs may be the most affected populations by restrictions and social distancing associated with this pandemic. For example, the demands of quarantine can disrupt routine and trigger behavioral difficulties, affecting the mental health of individuals with Autism Spectrum Disorder (ASD). In addition, self-isolation and physical distancing can increase the level of stress because of changes in habits [6].

ASD is a neurodevelopmental disorder identified by a deficit in social interaction and communication and stereotyped behaviors. Evidence has shown significant motor deficits in individuals with ASD. Furthermore, motor deficits are generally associated with behavioral limitations, social communication dysfunction, and the severity of autistic symptoms [7]. Therefore, in children with ASD, other factors or circumstances associated with their characteristics may affect their physical and mental health. Considering the mentioned consequences

of the prevalence of COVID-19 in the world and in Iran, it seems that children and adolescents with ASD are increasingly moving towards a sedentary lifestyle, which can pose health risks, obesity, diabetes, and a variety of other physical and behavioral difficulties [8]. Therefore, due to the outbreak of COVID-19 along with home quarantine and the closure of educational, sports, and rehabilitation and recreation centers, which has created many challenges for children with ASD and their parents, the researchers decided to pursue research to explore the perception of Iranian parents about their child's physical activity during the COVID19 pandemic.

2. Materials and Methods

This research utilized qualitative methodologies and semi-structured phone interviews acted as data. Qualitative research includes collecting and analyzing non-numerical data (for example text or audio) to understand concepts, opinions, or experiences. Qualitative research is characterized by flexibility, openness, and responsiveness to context. The most common qualitative method is the interview. Interviews are used to achieve insights into a person's experiences, attitudes, and desires. Semi-structured interviews are qualitative interviews as "exchanges with an unofficial character are characterized by open-ended questions, which include the broad areas of interest, sometimes sub-questions [9]. This research was conducted in October 2020 in Iran. In this study, purposeful and accessible sampling was performed. The sample in this study included 40 parents who were 25-50 years of age (the average age of mothers was 38 ± 3.36 years) that had sons aged 7-12 years (Mean \pm SD age of sons was 11 ± 2.24 years). All their sons had a diagnosis of ASD according to the DSM-5 criteria. Participants were selected based on the following criteria: (a) voluntary admission to the study, (b) having a child with ASD according to the DSM-5 criteria, and (c) consciously acceptance to complete one-to-one interviews by the phone. They were largely employed full-time (55%) and had college/university educational certification (51%). The research process and how to participate were explained to all participants, and subsequently, they completed consent forms. Then, the lead author contacted parents who were selected to participate in the one-to-one semi-structured phone interview.

Procedures

Qualitative interviews were used to understand the experiences, attitudes, and feelings of parents using open-ended questions. In this study, data were collected in October 2020 in Iran, children experienced at least five

months of lockdown, and children and parents were together during the time of the lockdown. The children did not go to school, did not receive any other educational or rehabilitation activity, and did not attend any sports or recreational program. In this study, children's behavior was recorded according to parents' reports. The effort was made to help participants feel comfortable, such as asking introductory questions about their children. In addition, the audio was recorded for all participations, and information was saved anonymously and confidentially. Interview data were transcribed verbatim following interviews [10]. The lead author collected data through a demographic data sheet and semi-structured interviews. Semi-structured interview questions were reviewed based on a panel of three expert professors who investigated the themes to be sure they followed the purpose of the study and corresponded with the research questions. Additional follow-up questions were asked based on participants' responses. At the end of the designed questions, we asked parents to express more details about any thoughts they felt missed or incompletely addressed during the interview. Each interview was implemented for almost 30-40 min and audio-recorded to ensure precision and validity. After data transcription, the lead author independently read the transcripts several times and then researchers analyzed the contents [8]. After the interviews were completed, the analyst read and reread each parent's transcript [11]. After the completion of the interviews, transcripts were read to the participants via phone, to check for accuracy and relevancy, as a mechanism to improve the trustworthiness of the information [10]. Each participant responded that the transcripts were an exact reflection of their opinions.

Semi-structured interview

Questions were as follows:

1. a. What do you think about the importance and the necessity of physical activity in your child's life?
 - b. How has this changed during the time of quarantine?
2. a. How satisfied were you with your child's physical activity prior to quarantine?
 - b. What is his/her current level of physical activity and exercise?
3. a. How does your child spend most of the day during this time?
 - b. What are your thoughts or feelings about this?

4. Has the time of quarantine placed any additional stress on you as a parent to support or encourage your child's physical activity?

5. What are the main barriers to your child's participation in physical activity during the COVID-19 pandemic?

6. What kind of support do you think is important and required for the promotion of physical activity participation during the COVID-19 pandemic?

3. Results

The results of this study showed the low participation in physical activity in children with ASD, while, they were more active before the COVID-19 pandemic and they participated in physical activities several times a week. After the COVID-19 outbreak, these interventions had been canceled or postponed and the education process for children with ASD was disrupted. Most of the parents participating in this project expressed concern about their children's inactivity and lack of involvement in physical activities. In addition, they reported that the amount of their children's physical activity has substantially decreased compared to before the COVID-19 pandemic. They also reported weight gain, increased anxiety, decreased orderliness, effective communication, and social skill. Their child had difficulty maintaining and controlling their weight during quarantine, eating more than ever before, and families reported laziness and impatience in their children. Parents also observed a relative increase in stereotypic movements in their children. This can be due to reduced regular exercise activities as well as changes in daily lifestyle routine due to quarantine and stress and limited communication. According to their parents, the children were also dissatisfied that they did not engage in sports activities during this period. Thirty-seven parents had positive opinions about physical activity for their children and wanted their children to be as active as before. However, they reported that their child's physical activity has decreased drastically compared to before the COVID-19 pandemic. In contrast, children were spending most of their hours of the day sitting and being inactive. Nearly half of the parents said that they tried to keep their child active by walking in the yard or a private environment. Seven parents stated that their child did not like to participate in physical activities and exercise programs and resisted sports participation.

With the COVID-19, children spent long hours sitting with their mobile phones for online learning classes, playing computer games, and watching TV and social media. According to parent reports, the total of these

screen activities was on average over 5 hours per day, and children showed an increase in their sleep duration during the COVID-19. Also, 32 parents stated that they did not have any time to spend with their children due to their busy schedules. Eight parents stated that they are familiar with their child's disorder and try to devote time to the day for their child. They stated that during the quarantine period, they planned to teach the child puzzles, painting, and storytelling, in a planned manner on average one hour a day. All of these parents were interested in and familiar with the positive effects of exercise and physical activity. But, despite their inner desire, they avoided encouraging their children to attend in physical activity programs. Parental perceived capability emerged as an important factor for the lack of activity because they had no knowledge of how to train and practice physical activity, most parents stated that they had no purposeful plan to fill their child's leisure time. The reasons for this were lack of time, knowledge, and information to practice with the child and the lack of support from physical education educators. Also, parents reported that they were particularly afraid of the occurrence of sports injuries and teaching incorrect movements. Parents suggested that if the communication between physical educators and teachers with families with children with ASD will be available, it would be much more effective. In addition, physical activity should be available virtually under mentoring physical education teachers that could educate parents on basic training on how to train their children. Parents reported more child emotional and behavioral difficulties during the prolonged social distancing.

4. Discussion

The UNESCO estimates that 89% of children are out of school due to the COVID-19 and social distancing was imposed through measures that included closing clubs and gyms, which imposes a barrier for children to either remain or become physically active [12]. In the study to evaluate the level of changes in physical activity among adolescents from southern Croatia, the result showed that 48.9% of participants reported a decrease in physical activity participation after the COVID-19 pandemic and also, and adverse effects in physical activity were associated with anthropometric variables. Participants who reported low levels of participation in physical activity were more likely to have higher levels of depression [13]. In another study among children and adolescents from Italy and Spain, during the COVID-19 pandemic, the most common diagnoses reported were acute stress disorder, adjustment disorder, grief,

and post-traumatic stress disorder. Also, children experienced fear, restlessness, uncertainty, and physical and social isolation alongside a high level of parental stress [14]. Most parents reported a change in the emotional and behavioral states of their children. Approximately 12% of the Italian and Spanish parents reported the use of screen time in these countries increased and physical activity levels decreased [2]. These results were corroborated by a study among children, which reported changes in physical activity behavior and eating behaviors during the COVID-19 pandemic. This pandemic confinement has had a negative effect on physical activity and caused an increase in daily sitting time by more than 28% [15]. Based on a study among Canadian parents, the levels of physical activity in children and youth decreased and screen time increased since the COVID-19 outbreak. Evidence has shown that sufficient levels of physical activity and limited screen time are linked to indicators of physical and mental health among children and youth [16]. In another study, the major findings were a reduction in physical activity levels [17].

The World Health Organization proposes that children and adolescents aged 5-17 years should participate in at least 60 minutes of moderate to vigorous intensity daily [18]. The physical profitable of meeting these recommendations include musculoskeletal and cardiovascular system health, a healthy body weight, and enhanced neuromuscular awareness. Also, participation in physical activity has a positive association with mental health. The psychological advantage includes managing anxiety and self-esteem, which is important for children's psycho-social improvement [5]. Physical activity participation has many benefits for these children with ASD, such as reducing stereotypic behaviors, improving social interactions, and enhancing physical fitness and motor skills [10]. It also has positive effects on self-confidence and self-efficacy [19]. According to our study of the impact of quarantine, it appears that children with ASD are experiencing psychological effects, and it is feared that the continued lockdown across the country will continue to exacerbate these issues. The COVID-19 pandemic has caused structural changes in the world that may lead to less involvement in physical activity and the need to apply new strategies. It is increasingly important that parents and educators do not permit children to follow sedentary lifestyles [20].

Furthermore, limited participation in daily physical activities is likely to induce mental stress, especially among children with ASD, and can lead to an escalation in challenging behaviors [8]. According to the reports of parents in our study, increases in stereotypic behaviors

were evident in children with ASD during the time of quarantine. This is consistent with the findings of another study, which demonstrated that children with ASD have presented increased stereotypic behaviors during this period. When patterns are changing, stress levels can be increased in children with ASD and the increase in stereotyped behaviors could be a behavioral result of stress [21]. Although home-based exercises are an alternative, the lack of infrastructure is a barrier reported by parents. However, people who were physically active before the pandemic reported fewer barriers to remain active [17]. Home-based physical activities can provide an opportunity for people to stay fit and healthy by involving facile movements while are quarantined [20]. Doing exercise at home using various safe, simple, and easily executable exercises are recommended. Because they do not require any equipment and can be done in a small place and at any time [22].

Measures should be taken to ensure that children with ASD engage in daily physical activity. Parents have an important responsibility. To remain the well-being of children with ASD during quarantine days, parents may encourage them by doing physical activities. When making decisions related to the type of physical activity, the opinions of children with ASD should be asked and should be paid attention to the activities that the participants enjoy [19]. A study implemented in Turkey demonstrated that parents are one of the main factors for children's participation in physical activity. Researchers emphasized the importance of parents' knowledge of physical activity profits and precedency in order to provide a greater physical activity experience for their children with ASD. The parents stated that they faced some barriers to their children's participation in physical activities. Parents' personal priorities and lack of free time are barriers to their children's participation in physical activity [22]. Parental perception of the impact of quarantine on children and adolescents was examined. Parental stress has been shown to predict stress reactions in children and therefore, parents need to manage their stress. The quarantine can cause stress in parents and negatively affects their mental health (aggression and maladaptive behavior). Parents can assist to administer their children's stress by managing their stress. The quarantine can also be used as a good opportunity to augment decisive interaction between parents and children [14].

Because of a rapid change in lifestyle since the COVID-19 onset, how to best address the needs and continue to preserve the health of children with ASD is a global public health preference [17]. The COVID-19 pandemic is distracting children from reaching and retaining persis-

tent physical activity, both now and in the future. If the children engaged in physical activities before the COVID-19, it is substantial that they follow them [23]. We suggest everyone everywhere be active and stay healthy and show solidarity during this period. This team spirit and empathy will help all of us to take on active challenges together. Sport has the power to change the world and is a powerful tool for strengthening social relationships, promoting sustainable development, peace, and continuous solidarity.

COVID-19 will change many aspects of life. However, the childhood experience cannot be repeated or rewound [8]. We should encourage parents to support their children to participate in physical activity at home. Parents should consider the child's ASD-related characteristics, and focus on the child's developmental ability [24]. We suggest that children with ASD and their parents should be a priority in any planning using a collaborative approach regarding the COVID-19 pandemic in the future. These suggestions are not obvious and comprehensive but they can be considered and be helpful for parents.

5. Conclusion

Based on the findings of this study, following the COVID-19 pandemic, the levels of physical activity in children with ASD have decreased. Parents and educators can play an important role in this physical activity promotion. Iranian parents express a clear need for regular physical activity participation for their children with ASD to help cope with challenges associated with the COVID-19 pandemic and home quarantine orders. Finally, research should examine specific recommendations for facilitating physical activity and home-based exercises in an attempt to uncover the utility of these activities prior to broad dissemination.

Limitation

In this study, we investigated only boys with ASD. Given the limitations of this study, future research should be conducted on girls with ASD, as well as samples with children experiencing varying levels of ASD, to understand their lived experiences during the COVID-19 pandemic.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article.

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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References

- [1] Caputo EL, Reichert FF. Studies of physical activity and COVID-19 during the pandemic: A scoping review. *Journal of Physical Activity and Health*. 2020; 17(12):1275-84. [DOI:10.1123/jpah.2020-0406] [PMID]
- [2] Orgilés M, Morales A, Delvecchio E, Francisco R, Mazzechi C, Pedro M, et al. Coping behaviors and psychological disturbances in youth affected by the COVID-19 health crisis. *Frontiers in Psychology*. 2021; 12:565657. [DOI:10.31234/osf.io/2gnxb] [PMID] [PMCID]
- [3] Pieh C, Budimir S, Probst T. The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. *Journal of Psychosomatic Research*. 2020; 136:110186. [DOI:10.1016/j.jpsychores.2020.110186] [PMID] [PMCID]
- [4] Jadhav RR. Physical activity during lockdown. *International Journal of Physical Education, Sports and Health*. 2020; 7(3):85-7.
- [5] Shahidi SH, Hassani F. Physical activity during COVID-19 quarantine. *Acta Paediatrica (Oslo, Norway: 1992)*. 2020; 109(10):2147-8. [DOI:10.1111/apa.15420] [PMID] [PMCID]
- [6] Courtenay K, Perera B. COVID-19 and people with intellectual disability: Impacts of a pandemic. *Irish Journal of Psychological Medicine*. 2020; 37(3):231-6. [DOI:10.1017/ipm.2020.45] [PMID] [PMCID]
- [7] McCoy SM, Morgan K. Obesity, physical activity, and sedentary behaviors in adolescents with autism spectrum disorder compared with typically developing peers. *Autism*. 2020; 24(2):387-99. [DOI:10.1177/1362361319861579] [PMID]
- [8] Lane K, Lieberman LJ, Haibach-Beach P, Perreault M, Columna L. Parental perspectives on physical education services for children with CHARGE syndrome. *The Journal of Special Education*. 2020; 55(2):90-100. [DOI:10.1177/0022466920942769]

- [9] Busetto L, Wick W, Gumbinger C. How to use and assess qualitative research methods. *Neurological Research and Practice*. 2000; 2:14. [DOI:10.1186/s42466-020-00059-z] [PMID] [PMCID]
- [10] Haegele JA, Zhu X, Holland SK. School-based bullying experiences as reflected by adults with visual impairments. *Psychology in the Schools*. 2020; 57(2):296-309. [DOI:10.1177/02646196211009927]
- [11] Sekulic D, Blazevic M, Gilic B, Kvesic I, Zenic N. Prospective analysis of levels and correlates of physical activity during COVID-19 pandemic and imposed rules of social distancing: Gender specific study among adolescents from Southern Croatia. *Sustainability*. 2020; 12(10):4072. [DOI:10.3390/su12104072]
- [12] Papaioannou AG, Schinke RJ, Chang YK, Kim YH, Duda JL. Physical activity, health and well-being in an imposed social distanced world. *International Journal of Sport and Exercise Psychology*. 2020; 18(4):414-9. [DOI:10.1080/1612197X.2020.1773195]
- [13] Imran N, Aamer I, Sharif MI, Bodla ZH, Naveed S. Psychological burden of quarantine in children and adolescents: A rapid systematic review and proposed solutions. *Pakistan Journal of Medical Sciences*. 2020; 36(5):1106-16. [DOI:10.12669/pjms.36.5.3088] [PMID] [PMCID]
- [14] Pisano L, Galimi D, Cerniglia L. A qualitative report on exploratory data on the possible emotional/behavioral correlates of Covid-19 lockdown in 4-10 years children in Italy. 2020. [DOI:10.31234/osf.io/stwbn]
- [15] Guerrero MD, Vanderloo LM, Rhodes RE, Faulkner G, Moore SA, Tremblay MS. Canadian children's and youth's adherence to the 24-h movement guidelines during the COVID-19 pandemic: A decision tree analysis. *Journal of Sport and Health Science*. 2020; 9(4):313-21. [DOI:10.1016/j.jshs.2020.06.005] [PMID] [PMCID]
- [16] Gallo LA, Gallo TF, Young SL, Moritz KM, Akison LK. The impact of isolation measures due to COVID-19 on energy intake and physical activity levels in Australian university students. *Nutrients*. 2020; 12(6):1865. [DOI:10.3390/nu12061865] [PMID] [PMCID]
- [17] Ammar A, Brach M, Trabelsi K, Chtourou H, Boukhris O, Masmoudi L, et al. Effects of COVID-19 home confinement on eating behaviour and physical activity: Results of the ECLB-COVID19 international online survey. *Nutrients*. 2020; 12(6):1583. [DOI:10.3390/nu12061583] [PMID] [PMCID]
- [18] Jadhav RA, Gupta G, Nataraj M, Maiya GA. Knowledge, attitude and practice of physical activity promotion among physiotherapists in India during COVID 19. *Journal of Bodywork and Movement Therapies*. 2021; 26:463-70. [DOI:10.1016/j.jbmt.2020.12.042] [PMID]
- [19] Kumazaki H, Muramatsu T, Kobayashi K, Watanabe T, Terada K, Higashida H, et al. Feasibility of autism-focused public speech training using a simple virtual audience for autism spectrum disorder. *Psychiatry and Clinical Neurosciences*. 2020; 74(2):124-31. [DOI:10.1111/pcn.12949] [PMID]
- [20] Narzisi A. Handle the autism spectrum condition during Coronavirus (COVID-19) stay at home period: Ten tips for helping parents and caregivers of young children. *Brain Sciences*. 2020; 10(4):207. [DOI:10.3390/brainsci10040207] [PMID] [PMCID]
- [21] Chen P, Mao L, Nassis GP, Harmer P, Ainsworth BE, Li F. Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science*. 2020; 9(2):103-4. [DOI:10.1016/j.jshs.2020.02.001] [PMID] [PMCID]
- [22] Esentürk OK. Parents' perceptions on physical activity for their children with autism spectrum disorders during the novel Coronavirus outbreak. *International Journal of Developmental Disabilities*. 2020; 67(6):446-57. [DOI:10.1080/20473869.2020.1769333] [PMID] [PMCID]
- [23] Yarımka E, Esentürk OK. Promoting physical activity for children with autism spectrum disorders during Coronavirus outbreak: Benefits, strategies, and examples. *International Journal of Developmental Disabilities*. 2020; 1-6. [DOI:10.1080/20473869.2020.1756115]
- [24] Ku B, Stinson JD, MacDonald M. Parental behavior comparisons between parents of children with Autism Spectrum Disorder and parents of children without Autism Spectrum Disorder: A meta-analysis. *Journal of Child and Family Studies*. 2019; 28(6):1445-60. [DOI:10.1007/s10826-019-01412-w]

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