




# Effects of the COVID-19 Pandemic on Parenting in Families with Autistic and ADHD Children Compared with Families with Neurotypical Children

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## Abstract

**Background:** This study was designed to compare the parenting frequencies from the perspective of mothers in the three groups of children with Attention deficit hyperactivity disorder (ADHD), Autism spectrum disorders (ASD), and without disease.

**Methods:** In this cross-sectional study, we enrolled 241 families consisting of 81 families in the autism group, 81 families in the ADHD group, and 79 families in the normal group. The interview consisted of questions asking about the rates of reward and punishment used before and after the lockdown. We further questioned the relationship between parents in these families and also used the general health questionnaire (GHQ-12) to assess mothers' mental health. Data analysis was performed using SPSS version 25.

**Results:** Analyzing the data revealed that the rate of reward has decreased significantly during the pandemic in all study groups ( $P=0.002$ ). The rate of punishment was also increased in most ADHD families but did not show any change in autism and normal families after the quarantine. We also reported that in the ASD group, most parents had experienced a decline in their relationship ( $P=0.011$ ). Mothers of ADHD children had a significantly lower mental health score (mean score of  $13.15\pm 6.32$ ) compared with mothers with ASD children (mean score of  $13.94\pm 4.72$ ) and mothers of neurotypical children (mean score of  $14.05\pm 4.66$ ) ( $P=0.036$ ).

**Conclusion:** In conclusion, quarantine and semi-quarantine situations could cause changes among families, such as changes in parenting styles (including the rate of using physical punishment), relationships between parents, or even parents' mental health.

**Keywords:** Autism, Autism spectrum disorder, Parenting, COVID-19, ADHD

**Conflicts of Interest:** None declared

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## Introduction

As is evident to all now, the recent pandemic is caused by COVID-19, which is a highly pathogenic virus and has cost us a high mortality and morbidity rate. In order to control the spread of infection, a state of quarantine and semi-quarantine has been declared in many countries, which has restricted outdoor activities to a great deal (1, 2). The pandemic has changed our way of life greatly, including parents working from home and children going to school online. Studies have shown that during the pandemic, there

has been an increase in the level of anxiety among the population, especially in subjects who were isolated. These drastic alterations have affected everyone, especially those with psychiatric disorders such as children with ASD or ADHD (3). These neurodevelopmental disorders affect not only the patient but also the caregivers, families, teachers, and even the community. Additionally, raising an autistic child has been shown to increase the risk of psychiatric disorders in mothers of these children (4). Due to the nature of

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### ↑What is “already known” in this topic:

This study was designed to compare the parenting frequencies from the perspective of mothers in the three groups of children with Attention deficit hyperactivity disorder (ADHD), Autism spectrum disorders (ASD) and without disease.

### →What this article adds:

Quarantine and semi-quarantine situations could cause changes among families such as changes in parenting styles (including the rate of using physical punishment), relationship between parents or even parents' mental health.

these disorders, children face difficult challenges and need lots of support from family, friends, school, society, and the government. The specific needs and prognosis of these children, in addition to the adverse effects of their disorder, cause great stress for the families and may affect their relationship with their children (5-7).

Autistic children have difficulties in different aspects, such as communication, understanding rapid change in the environment, expressing their emotions, social interactions, and even sensory processing. Therefore, during this time of rapid change in daily routine, parents and caregivers need to develop new roles in regard to supporting these children who now need an increased amount of care (8). This rapid change in lifestyle and the additional psychological strain caused by the pandemic could also affect ADHD children and worsen their symptoms. Further, most ADHD children could not get the routine professional care they need during the lockdown (9).

In the current situation, according to this issue, covid-19 can affect all aspects of the family, and considering the importance of parenting in children with autistic disorders, ADHD, and nervous children, parents are under a lot of pressure, and this can affect the way they raise their children. That these pressures may be different in families with children who need an increased amount of care or may have a different effect on parenting and require special support in this area. Therefore, this study was designed to compare the parenting frequencies from the perspective of mothers in the three groups of children with ADHD, ASD, and without disease.

## Methods

### Patients

In this cross-sectional study, we enrolled 241 families, 81 of which were families with ASD children, 81 families with ADHD children, and 79 were families with neurotypical children. In order to enroll the families with autistic and ADHD children, we used the database in Imam Hossein Hospital, Tehran, Iran. Children with a definite diagnosis of ASD and ADHD by a child psychiatrist who were aged between 4 to 10 years old and their families consented to take part in the study were selected. Additionally, in order to include children with no psychiatric disorders, children were selected from certain kindergartens and elementary schools in Tehran. The selected children were then interviewed by telephone by a psychiatrist to investigate the presence of any psychiatric issues. We then included those families with children aged from 4 to 10 years who did not have a psychiatric diagnosis or social or learning difficulties and were not taking any psychiatric medications. We also excluded the children with any of the following criteria from all three groups: children with serious physical health issues, children with other psychiatric problems and or mental retardation and families who resided outside of Tehran. The questions were asked over the phone from the child's primary caregiver (who were their mothers in this study). Moreover, we asked the mothers an additional question which was about "relationship with spouse" during the lockdown period. The mother's mental health was also assessed using the 12-Item General Health Questionnaire

(GHQ-12).

### Measurement tools

In order to assess the alterations made in parenting styles, we first interviewed several families with ASD and ADHD children. The interview addressed the question of whether there have been any changes in the families' parenting methods during the quarantine (especially regarding reward and punishment). According to the answers to our interview, the following codes were obtained: changes in the amount of reward, changes in the types of reward, changes in the amount of punishment, and changes in the types of punishment (especially the need to use yelling or beating). These codes were used in order to design questions, and the questions were assessed by five child psychiatrists that who were specialists and faculty members with an average of 6.5 academic years. After the approval of these questions, we then used them to assess the alterations made in the families' parenting styles during the quarantine.

We also used the GHQ-12 questionnaire in order to assess mothers' mental health. The GHQ-12 questionnaire consists of 12 questions that asks about certain symptoms or behaviors and is very simple for study participants to understand. This scale is a validated and reliable measure of the responder's recent mental state (past 2 weeks) (10).

We used the Farsi translation of this questionnaire, the validity and reliability of which was measured by an Iranian study. Based on this study, reliability analysis showed satisfactory results (Cronbach's alpha coefficient = 0.87). Convergent validity indicated a significant negative correlation between the GHQ-12 and global quality of life scores, as expected ( $r = -0.56, P < 0.001$ ) (11).

### Statistical analysis

After data collection, data analysis was performed using SPSS version 25. All qualitative and quantitative variables were described along with their count, percentage, and mean $\pm$ SD. The normality of continuous data was evaluated using the Kolmogorov-Smirnov test. In order to analyze measures, Chi-Square, G-test, and t-test were used. A *P*-value of less than 0.05 was considered statistically significant in all data analyses.

## Results

### Demographics

We enrolled 81 families with ASD children with a mean age of  $7.86 \pm 1.67$ , 81 families with ADHD children with a mean age of  $9.25 \pm 2.55$ , and 79 families with neurotypical children with a mean age of  $6.79 \pm 2.17$ .

### Reward and punishment

In all study groups, the frequency of families who believed they used fewer rewarding methods during the quarantine was significantly higher than the families who used more or the same rate of rewarding methods ( $P=0.002$ ). This frequency was also significantly higher in the ADHD group compared with the normal group ( $P=0.006$ ) (Tables 1 and 2).

**Table 1.** Frequency of reward and punishment from the perspective of mothers before the quarantine among study groups

Variable	Categories	Groups			Chi-square test	P-value
		ADHD	Normal	Autism		
Rewarding child behaviors	Decrease	59(72.8%)	51(63%)	41(51.9%)	17.53	0.002
	No change	14(17.3%)	24(29.6%)	17(21.5%)		
	Increase	8(9.9%)	6(7.4%)	21(26.6%)		
Punishing child behaviors	Decrease	17(21%)	9(11.1%)	6(7.6%)	78.67	0.001
	No change	27(33.3%)	67(82.7%)	71(89.9%)		
	Increase	37(45.7%)	5(6.2%)	2(2.5%)		

**Table 2.** Frequency of increased rate of reward and decreased rate of punishment from the perspective of mothers among study groups

Variable	Comparison among study groups	G-test	P-value
Decreased rate of Reward	ASD, ADHD	1.82	0.182
	ASD, normal	2.01	0.163
	ADHD, normal	7.55	0.006
Increased rate of Punishment	ASD, ADHD	36.2	0.001
	ASD, normal	1.31	0.234
	ADHD, normal	47.38	0.001

**Table 3.** Frequency of using physical punishment from the perspective of mothers before the quarantine among the study groups

Variable	Categories	Groups			Chi-square test	P-value
		ADHD	Normal	Autism		
Physical punishment	Decrease	27(33.3%)	6(7.4%)	17(21.5%)	38.06	0.001
	No change	9(11.1%)	41(50.6%)	35(44.3%)		
	Increase	45(55.6%)	34(42%)	27(34.2%)		

**Table 4.** Physical punishment frequency compared among study groups

Variable	Comparison among study groups	G-test	P-value
Physical punishment	ASD, ADHD	2.99	0.088
	ASD, normal	1.03	0.302
	ADHD, normal	7.45	0.006

We also measured the rate of punishment among the families during the quarantine. In the ADHD group, the frequency of families who believed they used more punishment during the lockdown was significantly higher than the families who used less or the same rate of punishment methods ( $P=0.001$ ) (Table 1). Meanwhile, in the ASD and normal groups, the highest frequency belonged to the families who believed they had used the same amount of punishment during the lockdown. This difference, however, was not statistically significant ( $P>0.05$ ) (Table 2).

Moreover, the frequency of families who believed they used more aggressive punishment methods during the quarantine (such as physical punishment), was significantly increased in the ADHD group ( $P=0.001$ ). However, in the other two study groups, there were no significant differences between this frequency before and after the pandemic ( $P>0.05$ ) (Table 3). We also measured the differences in the frequency of "the need for using physical punishment" among the study groups (Table 4).

### Relationship with spouse

The number of mothers who believed that during the quarantine, they had more disagreements with their spouse regarding parenting styles was significantly higher in the ADHD group compared with the normal group ( $P=0.001$ ). Meanwhile, most mothers in the ASD and normal groups reported that there was no change regarding the disagreements about parenting styles with their spouses ( $P>0.05$ ) (Tables 5 and 6).

In all study groups, most mothers reported that there was no change regarding their Emotional relationship with their spouses (Table 7). Nevertheless, the number of mothers who believed that their relationship with their spouse had declined was significantly higher in the ASD group ( $P=0.011$ ) (Table 8).

### GHQ-12 questionnaire

Regarding mental health scores, which were measured

**Table 5.** Frequency of disagreement about parenting styles between spouses from the perspective of mothers before the quarantine among the study groups

Variable	Categories	Groups			Chi-square test	P-value
		ADHD	Normal	Autism		
Disagreements about Parenting Styles	Decrease	30(37%)	6(7.4%)	6(7.6%)	62.74	0.001
	No change	20(24.7%)	55(67.9%)	64(81%)		
	Increase	31(38.3%)	20(24.7%)	9(11.4%)		

**Table 6.** Frequency of increased disagreement on parenting styles after the quarantine, compared among groups

Variable	Comparison among study groups	G-test	P-value
Increased disagreement after quarantine	ASD, ADHD	3.48	0.061
	ASD, normal	4.87	0.303
	ADHD, normal	16.12	0.001

Table 7. Positive relationship with spouse before and after the quarantine

Variable	Categories	Groups			Chi-square test	P-value
		ADHD	Normal	Autism		
Positive relationship with spouse	Decline	18(22.2%)	22(27.2%)	9(11.4%)	19.38	0.001
	No change	47(58%)	54(66.7%)	66(83.5%)		
	Improvement	16(19.8%)	5(6.2%)	4(5.1%)		

Table 8. Frequency of decline in positive relationship with spouse after the quarantine, compared among study groups

Variable	Comparison among study groups	G-test	P-value
Decline in relationship with spouse	ASD, ADHD	0.53	0.461
	ASD, normal	6.54	0.011
	ADHD, normal	3.40	0.070

using the GHQ-12 questionnaire, mothers of ADHD children had a significantly lower mental health score (mean score of  $13.15 \pm 6.32$ ) compared with mothers with ASD children (mean score of  $13.94 \pm 4.72$ ) and mothers of neurotypical children (mean score of  $14.05 \pm 4.66$ ) ( $P=0.036$ ).

### Discussion

The results of this study showed that during the COVID-19 pandemic, most families in all three groups experienced a decrease in reward and an increase in punishment, which were significant in mothers with the ADHD group. Also, in this group, unlike the others, the majority of mothers expressed that the use of physical punishment and parental disagreement has also increased.

In a recent study, Shah et al. surveyed 29 families with ADHD children about the impact of the COVID-19 pandemic and quarantine on their lives. They report that during the lockdown, parents have been experiencing an increase in negative behaviors such as physical punishment, yelling, and verbal abuse (12). This finding was similar to our results, which indicated that the only study group with a significantly increased rate of Physical punishment was the ADHD group. It can be further deduced that the reason for these results is the increased time the parents spend with their children, which could lead to exhaustion and irritability. Also, ADHD parents may need some guidance on how to manage the time spent with their child during the lockdown and semi-lockdown. Moreover, they report that there has been an increase in the use of praise by parents, which is a type of reward. This finding is unlike our results, as we reported that most parents in all study groups reported a decrease in using rewarding methods during the quarantine and this was more significant in the ADHD group than in the ASD. Shah et al., further found out that during the lockdown, ADHD symptoms have worsened, including hyperactivity, impulsivity, and irritability (12, 13). Further, in a study conducted in 2017 in Turkey, researchers found an association between the style of parenting and ADHD symptoms. They have reported that certain parenting styles are less frequent among parents with ADHD symptoms, including authoritative style or attitudes resembling acceptance. They also found out that the stricter the parenting styles are towards these children, the more defiant they behave. Therefore, we can also conclude that one reason for the worsening of ADHD symptoms during the lockdown is the use of more strict discipline by their parents (14).

Another finding in our study was that the mean score for mental health of mothers in the ADHD group was significantly less than the other study groups. Several previous studies have also found similar results. In one study, the level of anxiety and depression among the mothers of ADHD children was reported to be higher than mothers with normal children. In this study, the researchers also found that there was an association between the presence of anxiety and depression among ADHD children and the presence of these symptoms in their parents (15). Other studies, report that parents of ADHD children believe the reason for their high anxiety levels is the behavior of their children in addition to their need for support, which is not currently met. Further, parents believe they are in need of professional support regarding their mental state and require help from the healthcare system (16, 17). Our results also indicated a difference of opinion on parenting styles between parents with ADHD children. This difference was not significant in other study groups. Hence, one hypothesis is that this higher level of disagreement in the ADHD group may be due to the parents' psychopathological state (i.e., depression, irritability, and anxiety).

We also measured the changes in the amount of reward and punishment used towards ASD children. We found that the reward rate significantly decreased. However, there was no significant change in the punishment rate. Although we did not measure the changes in ASD symptoms during the lockdown, these alterations in parenting styles could be due to the worsening of ASD symptoms during this period of time. Due to the nature of their disorder, ASD children do not adapt to change easily, and drastic lifestyle changes (such as quarantine situations), could lead to the worsening of this disorder (18). The way these children react to lifestyle changes causes hardship for their families during the pandemic and makes it necessary for them to apply modifications to their parenting skills. It will become mandatory to establish a new daily routine and schedule for meals, playtime, studying and other tasks. The caregivers and family members of ASD children might also find it necessary to modify their methods for encouragement and punishment, which we tried to assess in this research. However, contrary to our results, Li et al. concluded that punishment resulted in an increased level of cooperation (19). Moreover, as was discussed before, ASD children may present with frustration and lack of cooperation during the pan-

demic. Therefore, we expected to observe an absolute increase in all kinds of punishments used towards these children. However, our results contradicted this expectation, and we found no significant changes in the punishment rate. One explanation is that children with ASD have a lower reward and punishment sensitivity compared with normal children, and they seek less social stimuli (20). This causes abnormal responses to different methods of positive or negative reinforcement, resulting in the lack of a certain pattern.

Moreover, our findings indicated that the frequency of parents who had experienced a decline in their positive relationship during the lockdown was significantly higher in the ASD group compared with the ADHD and normal groups. This may be explained by the nature of this neurodevelopmental disorder, which can be overwhelming for the parents. The presence of an ASD child in a family could cause multiple issues for the family members, such as higher levels of physical and mental problems (i.e., anxiety and depression) and decreased effectuality of parenting (21). These problems are higher in prevalence among families with ASD compared with families with normal children or families of children with other developmental disorders. Additionally, having an ASD child is accompanied by increased costs and takes up a lot of time from all family members. Therefore, higher rates of divorce and lower overall welfare among family members are observed in these families (22).

To this date, only a few studies have investigated the alterations made in parenting styles by parents of ADHD and ASD children during the pandemic. By comparing the results of our interview among ADHD, ASD, and normal groups, we have brought evidence to the fact that parents of children with neurodevelopmental disorders require professional help for how to manage their child during the quarantine. COVID-19 and the mandatory quarantines still remain to be one of the greatest challenges all over the world and therefore, the issues raised at home for these children and their parents need to be addressed promptly.

Nevertheless, our study had some limitations as well, including limited sample size and the fact that subjects were not chosen randomly from among the target population. Also, due to the quarantine situation, subjects could not be interviewed in person, so they replied to the questions by telephone. During a telephone interview, communication might be harder, and therefore, the subject might misunderstand the questions. Furthermore, we did not have the exact method of parenting these families before COVID-19 and did not develop a questionnaire, and our results have only summarized the opinions of mothers with ADHD and ASD children.

### Conclusion

In conclusion, quarantine and semi-quarantine situations could cause changes among families, such as changes in parenting styles (including the rate of using rewards, and punishment especially physical punishment), relationships between parents, or even parents' mental health. These alterations may especially be severe in families with non-neurotypical children, and as a result, these families require

extra support from the healthcare system, including parenting guidance in the form of interventions. Future studies with larger sample sizes using structured questionnaires could reach more definitive results regarding parenting techniques suitable for these children. We also suggest future trials which aim to intervene in punishment and reward systems in families of ASD and ADHD children in order to reach more apt systems for these children.

### Authors' Contributions

MH: study design, Material preparation, acquisition of Data, interpretation of the results, Writing-original draft; MK: Supervisor, study design, interpretation of the results, Review and editing; FDA: study design, interpretation of the results, Review and editing; KR: statistical analysis; SS: manuscript submission and editing; FA: Editing.

### Ethical Considerations

This study was conducted in accordance with the Helsinki declaration. Consent was obtained from all participant families, and the study protocol was approved (IR.SBMU.MSP.REC.1399.328) by the ethics committee of Shahid Beheshti University of Medical Sciences.

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### Conflict of Interests

The authors declare that they have no competing interests.

### References

- Li G, Hu R, Gu X. A close-up on COVID-19 and cardiovascular diseases. Nutrition, metabolism, and cardiovascular diseases. *Nutr Metab Cardiovasc Dis.* 2020 Jun 25;30(7):1057-1060.
- Parment WE, Sinha MS. Covid-19 - The Law and Limits of Quarantine. *N Eng J Med.* 2020;382(15):e28.
- Kong M. What COVID-19 means for non-neurotypical children and their families. *Pediatr Res.* 2021 Feb;89(3):396-397.
- Fairthorne J, Jacoby P, Bourke J, de Klerk N, Leonard H. Onset of maternal psychiatric disorders after the birth of a child with autism spectrum disorder: A retrospective cohort study. *Autism.* 2016;20(1):37-44.
- Ahmadi A, Sharifi E, Zalani HA, Bolouk S, Amrai K. The needs of Iranian families of children with autism spectrum disorder, cross-cultural study. *Procedia - Social and Behavioral Sciences.* 2011;15:321-6.
- Garrido D, Carballo G, Garcia-Retamero R. Siblings of children with autism spectrum disorders: social support and family quality of life. *Qual Life Res.* 2020;29(5):1193-202.
- Wiener J, Biondic D, Grimbois T, Herbert M. Parenting Stress of Parents of Adolescents with Attention-Deficit Hyperactivity Disorder. *J Abnorm Child Psychol.* 2016;44(3):561-74.
- Eshraghi AA, Li C, Alessandri M, Messinger DS, Eshraghi RS, Mittal R, et al. COVID-19: overcoming the challenges faced by individuals with autism and their families. *Lancet Psychiatry.* 2020;7(6):481-3.
- Zhang J, Shuai L, Yu H, Wang Z, Qiu M, Lu L, et al. Acute stress, behavioural symptoms and mood states among school-age children with attention-deficit/hyperactive disorder during the COVID-19 outbreak. *Asian J Psychiatry.* 2020;51:102077.
- Goldberg D, Williams P. General health questionnaire. Granada Learning Group; 1988.
- Montazeri A, Harirchi AM, Shariati M, Garmaroudi G, Ebadi M, Fateh A. The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version. *Health Qual Life Outcomes.*

- 2003;1:66.
12. Shah R, Raju VV, Sharma A, Grover S. Impact of COVID-19 and Lockdown on Children with ADHD and Their Families-An Online Survey and a Continuity Care Model. *J Neurosci Rural Pract.* 2021;12(1):71-9.
  13. Chafouleas SM, Iovino EA. Comparing the initial impact of COVID-19 on burden and psychological distress among family caregivers of children with and without developmental disabilities. *School Psychology (Washington, DC).* 2021.
  14. Çöp E, Çengel Kültür SE, Şenses Dinç G. [Association Between Parenting Styles and Symptoms of Attention Deficit Hyperactivity Disorder]. *Türk Psikiyatri Dergisi.* 2017;28(1):25-32.
  15. Xia W, Shen L, Zhang J. Comorbid anxiety and depression in school-aged children with attention deficit hyperactivity disorder (ADHD) and self-reported symptoms of ADHD, anxiety, and depression among parents of school-aged children with and without ADHD. *Shanghai Arch Psychiatry.* 2015;27(6):356-67.
  16. Leitch S, Sciberras E, Post B, Gerner B, Rinehart N, Nicholson JM, et al. Experience of stress in parents of children with ADHD: A qualitative study. *Int J Qual Stud Health Well-being.* 2019;14(1):1690091.
  17. Bonifacci P, Massi L, Pignataro V, Zocco S, Chiodo S. Parenting Stress and Broader Phenotype in Parents of Children with Attention Deficit Hyperactivity Disorder, Dyslexia or Typical Development. *Int J Environ Res Public Health.* 2019;16(11).
  18. Schaaf RC, Toth-Cohen S, Johnson SL, Outten G, Benevides TW. The everyday routines of families of children with autism: examining the impact of sensory processing difficulties on the family. *Autism.* 2011;15(3):373-89.
  19. Li J, Zhu L, Chen Z. The association between punishment and cooperation in children with high-functioning autism. *J Experim Child Psychol.* 2018;171:1-13.
  20. Hedger N, Dubey I, Chakrabarti B. Social orienting and social seeking behaviors in ASD. A meta analytic investigation. *Neurosci Biobehav Rev.* 2020;119:376-95.
  21. Ekas NV, Lickenbrock DM, Whitman TL. Optimism, social support, and well-being in mothers of children with autism spectrum disorder. *J Autism Dev Disord.* 2010;40(10):1274-84.
  22. Karst JS, Van Hecke AV. Parent and family impact of autism spectrum disorders: a review and proposed model for intervention evaluation. *Clinl Child Fam Psychol Rev.* 2012;15(3):247-77.