

Research Article

Emotion Regulation Skills of Children with Autism Spectrum Disorder in the First 6 Months of COVID-19 Pandemic Period

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- COVID-19
- Pandemic
- Autism spectrum disorder
- Lability/negativity
- Emotion regulation

Abstract

Objective: The aim of this study is to determine the change in emotion regulation skills of children with autism spectrum disorder due to the pandemic period as well as the interruption of their rehabilitation services.

Method: Parents of 40 children with autism spectrum disorder aged 3-18 (with a mean age of 11.6), who discontinued their rehabilitation services due to the pandemic, completed the Emotion Regulation Checklist in April and September 2020 via Google form.

Results: The emotion regulation skills including emotion regulation ($Z = -2.758$; $p = 0.006$) and lability/negativity ($Z = -3.355$; $p = 0.001$) of children with autism spectrum disorder decreased significantly during the pandemic period.

Conclusion: This study provided the first evidence that children with autism spectrum disorder need support to adapt to routine life in the current pandemic conditions. In order for children with autism spectrum disorder to adapt to the challenges brought by the pandemic, health professionals need to develop and implement the necessary intervention plans that include improving their emotion regulation skills.

INTRODUCTION

In December 2019, an extraordinary pneumonia outbreak of an unknown cause erupted in Wuhan City, Hubei Province, China, and was dubbed COVID-19 by the World Health Organization (Liu et al. 2020). Turkish Republic Ministry of Health announced the first COVID-19 case in Turkey on March 10, 2020, followed by the first fatality 5 days later (Bayram et al. 2020).

With this outbreak schools in Turkey were first closed for a week on March 16, 2020, and online education began on March 23. Children under the age of 20 were subjected to curfews and social isolation between May 4, 2020 and April 16, 2021. Because public and commercial institutions switched to flexible working and working from home, mothers and fathers' social lives have become constrained as well. In line with these practices, a new era begun, in which all social life of children and families were at home and ending (Bayram et al. 2020; Şahin 2020; Şimşek 2020).

People faced terms such as "social distancing" and "isolation" and while trying to get used to it, the curfew greatly affected the lives of individuals bringing about a sudden and a radical change in the daily routines and lifestyles (Kumari et al. 2020).

Stress during the quarantine was also associated with increasing media coverage of the COVID-19 pandemic, as well as changes in work and education models, as well as overall lifestyle changes that affected millions of people worldwide. Research on adult population emphasized that social isolation measures and routine changes in daily life could negatively affect psychological health (Cusinato et al. 2020). Due to the serious psychological consequences of school closures and significant changes in daily routine, quarantine is known to have traumatic effects not only on the adult population but also on the pediatric population (Liu et al. 2020).

Research during the COVID-19 pandemic highlights that children and adolescents are more likely to show externalized symptoms such as inattention, constant questioning, irritability, and internalized symptoms such as anxiety and depression or hyperactivity (Wade et al. 2020).

Children with a disadvantage, such as autism spectrum disorder (ASD), are likely to show increased frustration as a result of disruption of their typical routine and social uncertainties (Dhiman et al. 2020). ASD is a neurodevelopmental syndrome characterized by deficits in social reciprocity and communication,

and unusually restricted, repetitive behaviors (Lord et al. 2020). Social skills such as inadequacy in social communication and interaction, difficulty in communicating with peers, and inability to speak are also observed. Restricted, repetitive behaviors and disinterestedness are typical characteristics of children with ASD. Such characteristics are associated with a preference for highly predictable environments, whereas individuals with ASD may feel stressed, anxious, or confused when unpredictable or complex changes occur (Baron-Cohen 2006). Children with ASD may fail to use emotion regulation strategies, defined as automatic or deliberate alteration of their emotional state that promotes adaptive or goal-directed behavior, and may instead react impulsively to emotional stimuli with tantrums, aggression, or self-intervention. Such behavior is often interpreted as intentional or defiant, but is due to inadequate emotion management (Mazefsky et al. 2013).

Identifying the vulnerable population of the emotional impact of the current pandemic is essential for public policy making and crisis response (Zhao et al. 2020). Young individuals with ASD are particularly at risk because of their vulnerability to unpredictable and complex changes. The COVID-19 pandemic has clearly created a fast-paced and rapidly changing environment, which may exacerbate the challenges in emotion regulation processes that individuals with ASD to adapt to routine life (Zhao et al. 2020). In addition, ASD is a lifelong disease. Education and social support systems and the continuity of these systems are extremely important for affected individuals and their parents (Samson et al. 2014). The pandemic has also disrupted this continuity. Moreover, hospital admissions and face to face rehabilitation services fell dramatically with the onset of the pandemic which had adverse effects for children on the spectrum requiring ongoing control (Patel et al. 2020).

The aim of this study is to examine the change in emotion regulation skills of children with ASD, whose rehabilitation and special education processes were interrupted during the 6-month period from the onset of the COVID-19 pandemic, through an online parent survey conducted in Turkey.

METHODS

The research was conducted using quantitative research methods to examine the emotion regulation skills of children with ASD during the COVID-19 pandemic, which is a rare period.

A study invitation was prepared and sent to the parents of children with ASD in the last week of March 2020; a week after it was declared a pandemic in Turkey. The study invitation, which includes the research content, purpose and method, was shared with ASD support groups via online channels (Facebook/Twitter). The compliance with the inclusion criteria of the participants who volunteered for the study was evaluated with the Sociodemographic Questionnaire Google Form sent via e-mail.

After the approval of the parents of children who met the inclusion criteria, the Emotion Regulation Checklist was applied to the parents via Google Forms in order to evaluate the emotion regulation skills of children with ASD at the beginning of April 2020. In September 2020, parents were invited to the study once again to evaluate the change in emotion regulation skills of

children with ASD. The evaluation was repeated with the same method, and the evaluation results were recorded in Google Forms.

Study Population

Inclusion criteria for the study; (a) being diagnosed with ASD between the ages of 3-18, (b) not having a secondary diagnosis other than ASD, (c) interrupting the special education and rehabilitation process due to the pandemic. The sample of the study was determined by the convenient sampling method, which is one of the non-random sampling methods.

After the invitations, the parents of 130 children agreed to participate in the study, and 52 of them did not meet the inclusion criteria: had another diagnosis with ASD (n=21), were not age-appropriate (n=28), had never attended special education (n=3).

As described in the study design, parents were invited twice for the online research. 38 families were excluded from the study because they did not accept the second evaluation for various reasons. The research was completed with 40 participants.

Measurements

Sociodemographic Form; It was created to collect demographic information such as the child's gender, age, diagnosis period, education levels of the parents, income status, and the number of children they have.

Emotion Regulation Checklist (ERC); It was developed by Shields and Cicchetti in 1997 (Shields and Cicchetti 1997). The scale was adapted to Turkish by Altan in 2006 and is used to evaluate children's emotion regulation skills (Altan-Aytun et al. 2013).

The ERC consists of two subscales, namely lability-negativity and emotion regulation, and 24 items. While the lability-negativity subscale includes item for acting out, reactivity, anger control, moodiness and inflexibility; the emotion regulation subscale includes items for appropriate developmental behavior, empathy, appropriate emotion display, and emotional awareness (Molina et al. 2014; Suveg and Zeman 2004).

The response options for each item of the Likert-type scale were grouped into four groups. In the original scale, Shields and Cicchetti found the Cronbach alpha internal consistency coefficient to be 0.96 for the lability/negativity subscale and 0.83 for the emotion regulation subscale (Shields and Cicchetti 1997). In this study with 145 children aged 4-6 was found the internal consistency coefficient for the overall scale to be 0.75 in the mother form and 0.84 in the teacher form.

Data Analyses

Statistical analyses were performed using SPSS software version 22. The variables were investigated using visual (histograms, probability plots) and analytical (Kolmogorov Smirnov/Shapiro-Wilk test) methods to determine whether they are normally distributed. Descriptive analyses were presented using the median and interquartile range (IQR) for the non-normally distributed and ordinal variables. Since the ERC points were not normally distributed; the Wilcoxon test was used to compare changes in these parameters between baseline and 6

months. A p value of less than 0.05 was considered to show a statistically significant result.

Ethical Approval

Ethics Committee approval was obtained for the study from Biruni University Non-Invasive Clinical Investigation Ethics Committee (Approval Number 2020/46-31) and examined by the ministry of health. The studies carried out in the COVID-19 pandemic were found in accordance with the regulation (File Number: 10T14_58_32) and the procedures used in this study adhere to the tenets of the Declaration of Helsinki.

RESULTS

40 parents, 28 mothers and 12 fathers, were included in this study. Mean parental age was 39.7 years (SD = 47,1); with a mean age of mothers being 38.6 (SD = 6.9) and fathers 42.4 (SD = 7.5). The mean age of the children was 11.6 years (SD = 8.6). Parent and child characteristics are summarized in (Table 1) .

According to the ERC results, it is seen that there were statistically significant changes in the emotion regulation and lability-negativity sub-dimensions and total scores of children with ASD in the 6-month period of the pandemic period. While the mean of emotion regulation scores was 17.67 at the beginning of the pandemic, it decreased to 16.55 after 6 months ($p=0.006$); lability-negativity scores increased from 33.47 to 36.47 points ($p=0.001$) (Table 2).

In addition, Appendix 1 shows in detail in which specific emotion regulation areas children with ASD showed changes.

DISCUSSION

According to this study, quarantine during the COVID-19 pandemic resulted in significant unfavorable alterations in the emotion regulation skills of children with ASD. According to the study findings, significant weakness occurred in both of the two main dimensions of emotion regulation, "emotion regulation" and "lability-negativity", within 6 months from the onset of COVID-19.

Changes in routine, no matter how minor or insignificant, cause anxiety in children with ASD (Altable 2020). Various changes in daily life routines have been happening all around the world since the commencement of the COVID-19 pandemic. The closure of special education centers, kindergartens, schools, and universities, as well as switching to online instruction, were among the changes. The working population continued to work from home and there were cases where parks, sports and fitness centers were closed or curfews were operated at specific times of the day or week in order to reduce physical contact (Vuković et al. 2021). Although these changes may have impacted everyone in society, they have been especially traumatic for children with ASD, who are less tolerant to routine changes.

Successful emotion regulation entails directing one's emotion regulations correctly (Samson et al. 2012). The results of the study show that the COVID-19 period causes changes in emotion regulation processes such as children with ASD being very volatile in their mood, decreased ability to control their excitement, and giving sudden reactions without thinking. Mutluer et al. stated

Table 1. Characteristics of participants (N = 40).

	Mean(SD)	Range
Age of child (years)	11.6(8.6)	3-18
Age of parents		
Mother	38.57(6.9)	28-56
Father	42.4(7.5)	27-67
	Frequency	Percent
Gender		
Girl	5	12.5
Boy	35	87.5
Income status		
Low	15	37.5
Middle	22	55
Good	3	7.5
Completing the checklist		
Mother	28	70
Father	12	30

SD: standard deviation

that the pandemic, especially affects individuals with ASD who have emotion regulation disorder, which is seen as a basic feature of mood and anxiety disorders (Mutluer et al. 2020). In another study conducted with caregivers of children with ASD during the pandemic period, caregivers stated that it is difficult to manage children's emotional dysregulation (White et al. 2021). Emotions allow rapid assessment of situations (external or internal stimuli) and preparation for subsequent actions and behaviors to maintain well-being. Therefore, children's emotion regulation skills have an impact on a variety of areas, including social communication, interaction, emotional expression, and daily life, including peer and parent interactions (Mazefsky et al. 2013).

Lability-negativity is the tendency to show negative affect with mood lability in the child. It refers to the child's level of reactivity, weakness of anger control, moodiness and inelasticity (Berkovits et al. 2017). The results of the study show that the pandemic period causes an increase in negative behaviors of children with ASD, such as being disappointed quickly, anger outbursts and an increase in moodiness and whining. It is thought that situations such as disruption of children's routines, inability to continue their education, restrictions on going out, and social and physical limitations increase the moodiness and impulsivity of children, followed by the pandemic period intensify children's lability-negativity behaviors. According to Stankovic et al. (2020), parents were concerned about a probable rise or exacerbation of their children's symptoms as a result of changes in their daily routine; another study claims that daily constraints and disruptions influence the psychological health of children with ASD (Wright et al. 2020). It is well recognized that the daily stress situations faced by parents of children with ASD can be reflected in the child's negativity and difficult behaviors (Costa et al. 2017). Dismissal due to the pandemic, altering working conditions, anxiety and worry from the pandemic, interruptions and/or changes in children's schooling and/or rehabilitation processes, and interruptions in health services are all factors

Table 2: Change in children’s ERC scores during the pandemic period.

		T1		T2		Z	p
		Mean(SD)	Range	Mean(SD)	Range		
ERC	Emotion Regulation	17.67(3.44)	12-26	16.55(3.4)	11-25	-2.758	0.006*
	Lability/Negativity	33.47(5.25)	22-54	36.47(5.35)	26-49	-3.355	0.001*
	Total	51.13(6.41)	39-72	53.13(6.74)	40-67	-2.598	0.009*

*p<0.05; T1: April ; T2: September; ERC: The Emotion Regulation Checklist; SD: standart deviation

Appendix 1. Change in ERC scores of children with ASD during the pandemic.

	T1		T2		Z	p
	Mean (SD)	Range	Mean (SD)	Range		
1.Is a cheerful child.	2.73(0.75)	2-4	2.2(0.76)	1-4	-3.75	0.000***
2.Exhibits wide mood swings (child’s emotional state is difficult to anticipate because he/she moves quickly from a positive to a negative mood.		1-4	2.67(0.73)	1-4	-1.633	0.102
3.Responds positively to neutral or friendly overtures by adults	2.7(0.76)	1-4	2.3(0.72)	1-4	-3.258	0.001**
4.Transitions well from one activity to another, doesn’t become angry, anxious, distressed or overly excited when moving from one activity to another.	2.13(0.85)	1-4	2.15(0.89)	1-4	-0.76	0.939
5.Can recover quickly from upset or distress (for example, doesn’t pout or remain sullen, anxious, or sad after emotionally distressing events).	2.17(0.87)	1-4	2.12(0.85)	1-4	-0.355	0.723
6.Is easily frustrated.	2.37(0.67)	1-4	2.8(0.79)	1-4	-2.831	0.005**
7.Responds positively to neutral or friendly overtures by peers.	2.3(0.79)	1-4	2.05(0.87)	1-4	-2.138	0.033*
8.Is prone to angry outbursts/tantrums easily.	2.17(0.63)	1-4	2.47(0.82)	1-4	-1.769	0.077
9.Is able to delay gratification.	2.07(0.73)	1-4	1.9(0.74)	1-4	-1.577	0.115
10.Takes pleasure in the distress of others (for example, laughs when another person gets hurt or punished; seems to enjoy teasing others).	1.45(0.59)	1-3	1.55(0.71)	1-4	-0.816	0.414
11.Can modulate excitement (for example, doesn’t get “carried away” in high energy situations or overly excited in inappropriate contexts).	1.7(0.65)	1-3	1.62(0.67)	1-3	-0.905	0.366
12.Is whiny or clingy with adults.	2.12(0.8)	1-4	2.52(0.93)	1-4	-2.973	0.003**
13.Is prone to disruptive outbursts of energy and exuberance.	1.8(0.69)	1-4	2.27(0.96)	1-4	-3.499	0.000**
14.Responds angrily to limit setting by adults.	2.5(0.72)	1-4	2.72(0.72)	1-4	-2.065	0.039*
15.Can say when he/she is feeling sad, angry, or mad, fearful or afraid.	1.87(0.96)	1-4	1.9(1.06)	1-4	-0.277	0.782
16.Seems sad or listless.	1.8(0.65)	1-3	2.18(0.87)	1-4	-2.985	0.003**
17.Is overly exuberant when attempting to engage others in play.	2.15(1.03)	1-4	2.1(1.06)	1-4	-0.577	0.564
18.Displays flat affect (expression is vacant or inexpressive; child seems emotionally absent.	1.7(0.88)	1-4	1.8(0.99)	1-4	-1.265	0.206
19.Responds negatively to neutral or friendly overtures by peers (for example, may speak in an angry tone of voice or respond fearfully.	1.92(0.83)	1-4	2.12(0.94)	1-4	-1.848	0.065
20.Is impulsive.	2.45(0.71)	1-4	2.67(0.73)	1-4	-2.138	0.033*
21.Is empathetic toward others; shows concern when others are upset or distressed.	2.02(0.89)	1-4	1.9(0.84)	1-4	-1.811	0.07
22.Displays exuberance that others find intrusive or disruptive.	2.15(0.95)	1-4	2.3(0.97)	1-4	-1.761	0.078
23.Displays appropriate negative emotions (anger, fear, frustration, distress) in response to hostile, aggressive, or intrusive acts by peers.	2.4(0.77)	1-4	2.4(0.78)	1-4	-0.832	0.405
24.Displays negative emotions when attempting to engage others in play.	2(0.68)	1-3	2.17(0.75)	1-4	-1.265	0.206

*p<0.05; **p<0.005; ***p<0.001; ERC: Emotion Regulation Checklist; T1: April ; T2: September; ERC: The Emotion Regulation Checklist; SD: standart deviation.

impacting parents' mental health (Brown et al. 2020; Kuruhalil et al. ; Spinelli et al. 2020). For this reason, providing parents of children with ASD with assistance during the pandemic period is critical.

Implications for Clinicians

This study has some implications for clinical applications. The social measures brought by the COVID-19 pandemic are important to reduce/prevent the spread of the epidemic. Taking these precautions, however, may have a negative impact on the normal development of children with disabilities such as ASD. Significant impairments in the emotion regulation systems of children with ASD appear in the 6-month period following the commencement of the pandemic. Our findings suggest that during this time, children with ASD, who may be hypersensitive to even slightest changes in daily life, should have their emotion regulation processes handled more carefully and comprehensively. Considering the emotional/behavioral changes such as an increase in anger tantrums, weakening of peer relationships, sudden sadness reactions, and rapidly changing emotional states, clinicians should develop strategies to ensure that children with ASD continue their social contacts and routine lives in a way that does not pose a risk. With these findings, it is evident that with the pandemic period, children with ASD requiring assistance with emotion regulation required more and/or different types of help. Therefore, professionals who work with children with ASD, such as child development specialists, occupational therapists, language and speech therapists, and psychologists should evaluate the changes in children's routines and emotion regulation processes during the pandemic period.

For his, even though precautions are taken for the pandemic; hospitals, medical care and rehabilitation services, health system leaders, public health authorities and community leaders should focus on efforts to ensure children with ASD and other special needs are able to obtain rehabilitation services. In order to avoid adverse outcomes that may arise from the interval given in rehabilitation services due to extraordinary situations affecting life, like the COVID-19 pandemic, use of alternative rehabilitation models like telerehabilitation services must be supported. Given the increased time spent at home as a result of the pandemic, family-based rehabilitation programs should be designed, home programs should be increased/intensified, and the family should play an active role in the child's rehabilitation. It is critical to provide psychological assistance to families of children with ASD, who are sensitive to even minor changes in their social environment's emotional condition.

Strengths and Limitations

This study reported the change in emotion regulation skills of children with ASD during the pandemic period, based on parental reporting. As far as we know, it is one of the first studies to evaluate the emotion regulation skills of children with ASD during the pandemic period. Considering the predictions that the pandemic will continue for many years, significant changes in a 6-month period may disrupt the daily lives of children with ASD in the long term. We think that this study can serve as a resource for professionals involved in the rehabilitation and education of children with ASD, as well as parents of children with ASD.

With this strong conclusion, the study has several limitations.

First, due to the pandemic conditions, the participants to be included in the study were reached through online platforms, so a heterogeneous group of participants in terms of age and gender could be obtained. Analyses with more homogeneous age groups in later research may avail deeper interpretations by expanding the number of participants.

A second limitation is the geographical location constraint. COVID-19 is a global pandemic and strategies and measures to cope with the pandemic differ in different countries. This study is limited to the sample of Turkey.

The third limitation is that the results of the study are limited to parent reports. It would be useful to employ observational, questionnaire-based assessment methods with children via face-to-face interviews, online interview methods, or social isolation rules, and to support and elaborate the findings with semi-structured interviews with parents.

CONCLUSION

This study stresses the need of taking into account changes in emotion regulation behaviors of children with ASD within the scope of the pandemic. The findings suggest that during the pandemic, children's with ASD emotions and behaviors, such as emotion regulation and lability/negativity, should be assessed and relevant interventions implemented. The study also showed the necessity of special education and rehabilitation for emotion regulation processes of children with ASD. In order to reach evidence-based conclusions, it would be useful to compare children who continue with rehabilitation and those who do not.

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Code availability: Not applicable

Ethics approval: Ethics approval was received from the Non-invasive Research Ethics Board at Biruni University in Ankara, Turkey. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent to participate: All respondents and their parents signed written informed consent forms for participation.

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