

**Psychosocial impact of COVID-19 in rising generation: An observational study from India****Garima Agrawal Varshney<sup>a</sup>, Nandini Dixit<sup>a</sup>, Perti Agrawal Saini<sup>b\*</sup>, Piyush Mishra<sup>c</sup>**<sup>a</sup>Department of Paediatrics, Nandkumar Singh Chouhan Government Medical College, Khandwa (MP), India.<sup>b</sup>Department of Pathology, Nandkumar Singh Chouhan Government Medical College, Khandwa (MP), India.<sup>c</sup>Department of Community Medicine, Statistician, Nandkumar Singh Chouhan Government Medical College, Khandwa (MP), India.**Abstract****Background:** Direct and indirect effects of the COVID-19 pandemic led to a significant change in the lives of children and adolescents. Changes in psychosocial behavior are one of them and are least noticed by parents and caregivers.**Objectives:** This study aimed to assess the mental and behavioral changes in children and adolescents of India before March 2020 and during the COVID-19 pandemic by Pediatric Symptom Checklist -17 (PSC-17).**Patients and Methods:** A cross-sectional observational study was conducted through an online questionnaire-based survey on children and adolescents of age group (5 -17 years) from 1st July to 15th July 2021 in India. Data were collected from parents regarding socio-demographic status, the behavior of study participants before and during the pandemic, and their perspective for the same. For statistical analysis chi-square test and the McNemar test was used.**Results:** Overall, 17.14% (77) of the study population scored positive during the covid pandemic on the total PSC-17 score. Participants residing in a metropolitan city, having nuclear family, and having no siblings were affected more as compared to others. The proportion of positive I scores ( $\geq 5$ ), A score ( $\geq 7$ ), E score ( $\geq 7$ ) & total score ( $\geq 15$ ) before and during COVID-19 were statistically significant among children.**Conclusion:** The psychological health of children and adolescents should be regularly screened by caregivers and teachers as early recognition and steps taken for it may help mitigate deleterious effects in the future.**Keywords:** COVID-19; Mental health; Children; Adolescent; PSC -17 scoring.**DOI:** 10.21608/svuijm.2023.186107.1487**\*Correspondence:** [perti.agrawal.saini@gmail.com](mailto:perti.agrawal.saini@gmail.com)**Received:** 11 January, 2023.**Revised:** 11 February, 2023.**Accepted:** 4 March, 2023.**Published:** 13 June, 2023**Cite this article as:** Garima Agrawal Varshney, Nandini Dixit, Perti Agrawal Saini, Piyush Mishra. (2023). Psychosocial impact of COVID-19 in rising generation: An observational study from India. *SVU-International Journal of Medical Sciences*. Vol.6, Issue 2, pp: 416-426.

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## Introduction

The COVID-19 began his journey from Wuhan (China) in late 2019 (Zhu et al., 2020), and spread very rapidly across the globe in a very short time and was declared as a pandemic on 11th March 2020 by the World health organization. India also reported large number of cases and deaths due to SARS-CoV-2 virus since 2020. Lives of the Indian people changed suddenly when the Government of India announced the first lockdown with the complete closure of schools, universities, non-essential businesses, and banned social gathering, and introduce home confinement to prevent the spread of this bad virus.

The COVID-19 pandemic not only affected the physical health of the people but also affected the mental health and well-being in terms of increased anxiety, depression and substance use by adults (Panchal et al., 2021). Similar to adults children and adolescents are also victims of physical and social restrictions and missing their school for a very long time and experienced the emotions of sadness, worries and loneliness as reported from various studies worldwide (Morgul et al., 2020, Lee 2020 and Omer et al., 2021). In India very few original studies (Saurabh and Ranjan, 2020) have conducted to assess the psychological impact of COVID-19 lockdown in children and adolescents, most of the studies are of review studies (Singh et al., 2020, Ghosh et al., 2020 and Panda et al., Panchal et al., 2021).

The present study was conducted to assess the mental and behavioral changes in children and adolescents of India before and during the lockdown, school closure and other social restrictions of COVID-19 pandemic by Pediatric Symptom Checklist - 17 (PSC-17). The PSC-17 scoring system and its subscale scores are reliable and good screening tool for measurement of children's

psychological functioning (Murphy et al., 2016).

## Patients and Methods

The present questionnaire based cross-sectional study was conducted to receive responses from parents of children and adolescents of 5-17 yrs of age using Google form from 1<sup>st</sup> July to 15<sup>th</sup> July 2021. Approval was taken from the institutional ethical committee. The Google form and informed consent form has been circulated by WhatsApp, Facebook and email to friends, using snow ball sampling technique. We have excluded previously diagnosed and treated children of any psychological disease and incompletely filled forms.

The form had 4 sections to collect data, first for socio-demographic details, second and third for behavioral assessment (based on PSC-17 scoring) before and after COVID-19 pandemic respectively and last for parent's perception regarding change in behavior of their children. This PSC- 17 scoring system consist of three subscales, internalization (I), attention (A) and externalization (E) each having 5, 5 and 7 questions related to emotional symptoms ( anxiety, fear, sadness), inattention/ hyperactivity and conduct problems respectively. Each question has options of "never", "sometimes" and "often" which were assigned 0, 1 and 2 points respectively. These points are added to obtain PSC-17 total and subscale scores. The positive score was defined as follows:  $\geq 5$  for I score,  $\geq 7$  for A and E score and  $\geq 15$  for total score (Murphy et al., 2016).

## Statistical analysis

Data were analyzed using SPSS software. Means and percentages were calculated for different variables. Non parametric McNemar's test was applied to compare the PSC-17 total and subscale scores among children and adolescents before and during COVID-19. We also used Chi square test to

compare different demographic parameters with respect to positive PSC 17 scores.

**Results**

We included 449 responses out of 462 responses, 13 were excluded as they were incompletely filled. We divided study participants among children (5 -10 years) and adolescents (11-17years) on basis of age. Children were 332 (73.94%) and

adolescents were 117 (26.05%) in number. Mean age of study sample was 8.78±3.11years and 54.3% of them were boys. As depicted in (Table.1), most of the participants were of metropolitan city (61%), had both working parents (59 %), residing in nuclear family (56.6 %) and had 2 or more children in house for company (61.7%).

**Table 1. Demographic profile of sample population**

Demographic profile	Children	Adolescents	Total
	(5-10 yrs)	(11-17 yrs)	
	N=332	N=117	
<b>Age</b>			
<b>Mean±SD</b>	7.20±1.60	13.24±1.74	8.78±3.11
<b>Gender</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>
• Boy	182 (54.8)	62 (53.0)	244 (54.3)
• Girl	150 (45.2)	55 (47.0)	205 (45.7)
<b>Father's Occupation</b>			
• Doctor	142 (42.8)	36 (30.8)	178 (39.6)
• Engineer	78 (23.5)	14 (12.0)	92 (20.5)
• Businessmen/Self employed	44 (13.3)	52 (44.4)	96 (21.4)
• Not having father	6 (1.8)	7 (6.0)	13 (2.9)
• Others	62 (18.7)	8 (6.8)	70 (15.6)
<b>Mother's Occupation</b>			
• Doctor	138 (41.6)	40 (34.2)	178 (39.6)
• Engineer	16 (4.8)	2 (1.7)	18 (4.0)
• Housewife	122 (36.7)	48 (41.0)	170 (37.9)
• Businesswomen/Self employed	5 (1.5)	7 (6.0)	12 (2.7)
• Others	51 (15.4)	20 (17.1)	71 (15.8)
<b>Working of parents</b>			
• Both parents working	203 (61.1)	62 (53.0)	265 (59.0)
• One parent working	122 (36.7)	48 (41.0)	170 (37.9)
• Single parent working	7 (2.2)	7 (6.0)	14 (3.1)
<b>Family type</b>			
• Nuclear	186 (56.0)	68 (58.1)	254 (56.6)
• Joint family	40 (12.0)	14 (12.0)	54 (12.0)
• Three Generation family	106 (31.9)	35 (29.9)	141 (31.4)
<b>Total children in house</b>			
• 1	132 (39.8)	40 (34.2)	172 (38.3)
• 2	170 (51.2)	67 (57.3)	237 (52.8)
• ≥3	30 (9.0)	10 (8.5)	40 (8.9)

Type of City			
• Mega city (>10 million population)	35 (10.5)	13 (11.1)	48 (10.7)
• Metropolitan city (>1 million population)	191 (57.5)	83 (70.9)	274 (61.0)
• Class I A towns (>1 lakh population)	106 (31.9)	21 (17.9)	127 (28.3)

Overall, 17.14% (77) of study population scored positive during COVID-19 on total PSC-17 score, children outnumbered the adolescents (12.7% Vs 4.45%) but no statistical significant difference (p = 0.98) was found. Total PSC -17 score of participants residing in

metropolitan city, nuclear family and having no siblings were affected more as compared to others and showed statistically significant difference. Whereas, other parameters like gender and occupation of parents, were not significant, (Table.2)

**Table 2. Frequency of children having significant PSC-17 score above or below 15 with respect to different demographic parameters**

Parameter	After Covid Total PSC -17 score		Total	P value
	≥15 n =77	<15 n= 372		
<b>Age Category</b>			<b>N = 449</b>	
• Children (6-10 years)	57 (17.2)	275 (82.8)	332	0.985
• Adolescent (11-17 years)	20 (17.1)	97 (82.9)	117	
<b>Gender</b>				
• Boy (n=244)	43 (17.6)	201 (82.4)	244	0.771
• Girl (n=205)	34 (16.6)	171 (83.4)	205	
<b>Working of parents</b>				
• Both parents	41 (15.5)	224 (84.5)	265	0.517
• One parent	34 (20.0)	136 (80.0)	170	
• Single separate parent	2 (14.3)	12 (85.7)	14	
<b>Fathers occupation</b>				
• Doctors	27 (15.2)	151 (84.8)	178	0.367
• Others	50 (18.5)	221 (81.5)	271	
<b>Mothers occupation</b>				
• Doctors	37 (20.8)	141 (79.2)	178	0.097
• Others	40 (14.8)	231 (85.2)	271	
<b>Family Type</b>				
• Nuclear	53 (20.9)	201 (79.1)	254	0.03*
• Joint family	9 (16.7)	45 (83.3)	54	

• Three Generation family	15 (10.6)	126 (89.4)	141	
<b>No. of Children in house</b>				
• 1	42 (24.4)	130 (75.6)	172	0.004*
• 2	31(13.1)	206 (86.9)	237	
• ≥3	4 (10.0)	36 (90.0)	40	
<b>Type of city</b>				
• Mega city	9 (18.8)	39 (81.3)	48	0.000*
• Metropolitan city	61 (22.3)	213 (77.7)	274	
• Class I A Town	7 (5.5)	120 (94.5)	127	

Note: Chi square test, \* p value <0.05- statistically significant

According to PSC-17 subscale score; total 62 participants (13.8%) had positive internalization symptoms (46 children vs. 16 adolescents), 46 participants (10.24%) had symptoms of inattention and hyperactivity (38 vs. 8) and 81 participants (18.04%) had conduct problems (58 vs. 23) after COVID-

19. McNemar test reveals proportion of positive I score (≥5), A score (≥7), E score (≥7) & total score (≥15) before and during covid were statistically significant among children whereas, in adolescents only positive E score and total score were statistically significant, (Table.3 & 4).

**Table 3 . PSC 17 total Score and subscales score among Children age 5-10 years**

Before COVID-19 I Score	Children (5-10 years) N=332			
	After COVID-19 I score			
	≥5 (+ve)	<5	Total N	P value
• ≥5 (+ve)	15 (55.6)	12 (44.4)	27	0.006*
• <5	31 (10.2)	274 (89.8)	305	
<b>Total</b>	46 (13.9)	286 (86.1)	332	
Before COVID-19A Score	After COVID-19 A score			
	≥7	<7	Total	P value
	• ≥7	8 (66.7)	4 (33.3)	12
• <7	24 (7.5)	296 (92.5)	320	
<b>Total</b>	38 (11.4)	294 (88.6)	332	
Before COVID-19 E Score	After COVID-19 E score			
	≥7	<7	Total	P value
	• ≥7	31 (81.6)	7 (18.4)	38
• <7	27 (9.2)	267 (90.8)	294	
<b>Total</b>	58 (17.5)	274 (82.5)	332	
Before COVID-19 Total Score	After COVID-19 Total score			

	≥15	<15	Total	P value
• ≥15	26 (86.7)	4 (13.3)	30	0.000*
• <15	31 (10.3)	271 (89.7)	302	
<b>Total</b>	57 (17.2)	275 (82.8)	332	

**Note- Mcnemar test ,\* Statistically significant < 0.05**

**Table 4. PSC 17 total score and subscales score among Adolescents age 11-17 years**

Before COVID-19 I Score	Adolescents (11-17 years) N=117			
	After COVID-19 I score			P value
	≥5	<5	Total	
≥5	3 (37.5)	5 (62.5)	8	0.096
<5	13 (11.9)	96 (88.1)	109	
<b>Total</b>	16 (13.7)	101 (86.3)	117	
Before COVID-19 A Score	After COVID-19 A score			
		≥7	<7	Total
≥7	3 (50.0)	3 (50.0)	6	0.727
<7	5 (4.5)	106 (95.5)	111	
<b>Total</b>	8 (6.8)	109 (93.2)	117	
Before COVID-19 E Score	After COVID-19 E score			
		≥7	<7	Total
≥7	12 (92.3)	1 (7.7)	13	0.006*
<7	11 (10.6)	93 (89.4)	104	
<b>Total</b>	23 (19.7)	94 (80.3)	117	
Before COVID-19 Total Score	After COVID-19 Total score			
		≥15	<15	Total
≥15	10 (83.3)	2 (16.7)	12	0.039*
<15	10 (9.5)	95 (90.5)	105	
<b>Total</b>	20 (17.1)	97 (82.9)	117	

**Note- Mcnemar test, \*Significant <0.05**

We also found that there was increase in mean total scores and subscales scores during COVID-19 pandemic among both children and adolescents, ( Fig 1,2).

The present study also tried to identify the possible contributing factors from the perspective of parents for change in mental health and behavior of their children.

The results showed missing their friends company (78.57%), decreased physical activity (74.55%) and increased screen time

(72.76%) were the more commonly perceived factors,(Table.5).

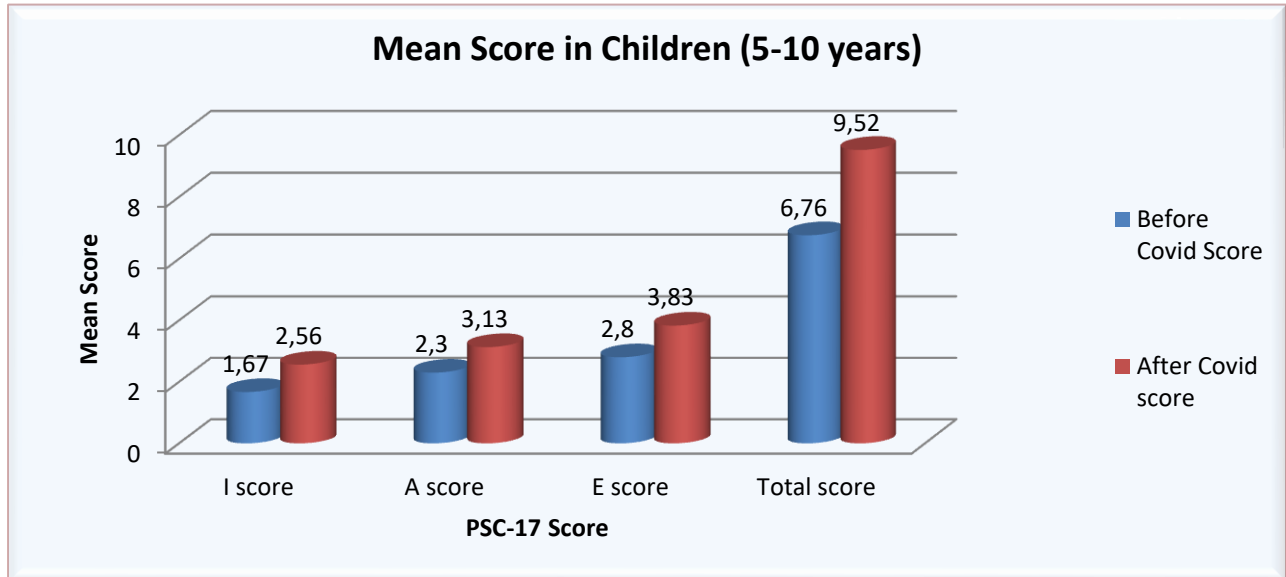


Fig.1. Mean score of total PSC-17 score and its subscales in children before and after COVID-19.

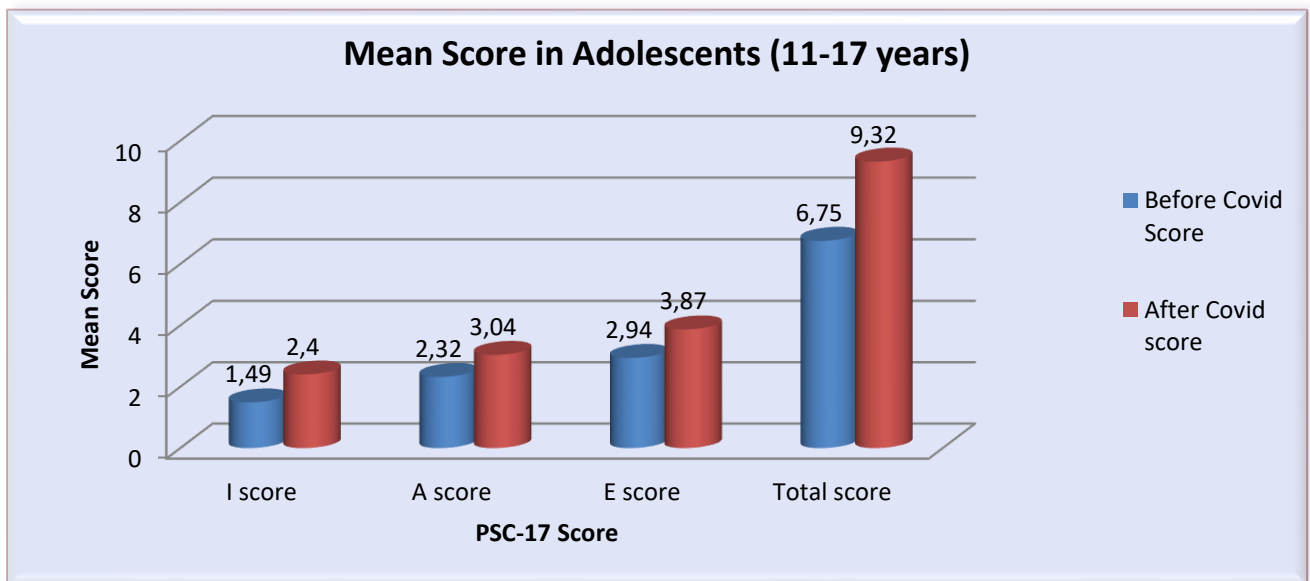


Fig.2. Mean score of total PSC-17 score and its subscales in Adolescents before and after COVID-19 .

**Table 5. Parents perspective of possible factors/reasons responsible for change in behavior of their children**

Sr No.	Possible reason by parents	No. of parents choosing the reason N= 449 n(%)
1.	Covid associated illness or death in family or in close relative	46 (10.26)
2.	Parents overburdened and not giving enough time to kids.	200 (44.64)
3.	Missing their friends company	352 (78.57)
4.	Increased screen time of Children	326 (72.76)
5.	Less interest in online teaching/no fear of exam or teachers	222 (49.55)
6.	Discussion of negative news on various social platforms	94 (20.98)
7.	More obligations on child by parent(wear mask, frequent hand washing etc	108 (24.11)
8.	Decreased physical activity/outdoor games	334 (74.55)
9.	Decrease Leisure time/social gatherings/parties	276 (61.60)

### Discussion

The present study was conducted to analyze the mental health challenges faced by children and adolescents of India due to different consequences of COVID-19 pandemic. Index study found that overall 17.14% of the study population was mentally affected during COVID-19 which was much lower as compared to studies from China (Jia et al., 2020 and Zhou et al., 2020), and UK (Waite et al., 2020). This variation may be due to: a) lower sample size which represents the only iceberg of cases, b) difference in study population, as most of our participants belong to middle and upper- middle socioeconomic class, not having financial constraints. They may be having easy access to internet, playing area and good facilities to keep their children engaged in indoor and other activities.

#### *Socio-demographic comparison*

**Age:** Children of 5-10 years of age are psychologically more affected as compared to adolescents, as similar to studies of Omer et al.(2021) and Waite et al.(2020). Children are more dependent for their studies, routine work and recreational

activities on parents while parents are busy in their work along with COVID-19 associated stress whereas adolescents have been doing better during covid lockdown through social networking sites, online chats, etc. However, one study by Duan et al.(2020) from China found just a contrast finding.

**Gender:** We did not found any difference in psychological impact among boys and girls but studies conducted in China observed depressive and anxiety symptoms were more in girls (Zhou et al., 2020; Duan et al., 2020). Waite et al.(2020) also concluded that in girls emotional domain was more affected whereas in boys conduct problems and inattention and hyperactivity symptoms were more common.

**Working status of parents:** In line with Glynn et al.(2022) present study also did not find any association between the working status of parents (single or both) and mental health of children and adolescents. We also tried to compare the symptoms of mental illness in children of frontline workers (Doctors) with other children but not found any significant



association. Whereas, study by **Omer et al.(2021)** from Pakistan which was conducted on doctor's children found 36.1% of children with positive PSC -17 score.

**Number of children in house and Type of Family:** Similar to the study on toddlers and preschool children by **Aguilar - Farias et al.(2021)** we observed that single child in house was psychologically more affected as compared to those who have siblings for company. In addition to studies of **Waite et al.(2020)** and **Duan et al.(2020)** our study found children of nuclear families experienced more emotional and behavioral problems as compared to joint families. A joint family offers a positive environment, sense of security, division of labor and more helping hands to family members. Grandparents in a joint family not only help in household chores but also give emotional support to young ones. They engage the children in playing like a friend, in storytelling and other creative work as a teacher. Overall joint family provides large number of resources to their family members for social and emotional satisfaction to ameliorate the symptoms of anxiety and loneliness.

**City of Residence:** In present study, we found that children residing in metropolitan cities were significantly more affected as compared to class I A towns. In contrast, **Zhou et al.( 2020)** and **Miranda et al.(2020)** observed a lower frequency of anxiety and depression in metropolitan areas and urban areas. This opposite finding may be due to geographical variation in the number of COVID-19 cases, the severity of social restrictions and availability of better health system. In India, cases are concentrated in larger cities and even serious and referred cases also finally came to these cities for better treatment so they are facing longer and strict legislation regarding closure and lockdown which may be the factor for development of mental symptoms.

**Comparison of mental behavior of children and adolescents before and after COVID-19:** This study was designed to explore how the mental health of children and adolescents is changed from the beginning of COVID-19 to the second wave and lockdown. Similar to **Jiao et al.(2020)** and **Waite et al.(2020)** we observed statistically significant rise in all three symptoms (emotional, hyperactivity/inattention and conduct) and overall mental health of children aged 5-10 years. While in adolescents overall mental health and conduct problem was significantly more affected with little and insignificant rise in emotional and attention symptoms.

**Parent's perception regarding change in mental health and behavior:** Similar to the studies by **Omer et al.(2021)** and **Chen et al.(2020)** present study found main contributing factors were missing peers/feeling lonely, increased screen time and decreased physical activity and outdoor games. In India schools were closed since March 2020 which may be the big culprit for psychological distress in children and adolescents. As schools are second home for children, where they not only gain academic knowledge but also socially interact with their peers, seniors and teachers in form of sports and other extracurricular activities. So school is a place where they fulfill their social and emotional needs. Due to prolonged school closure their daily routine is disturbed resulting in sluggish lifestyle, lazy and careless attitude. Their habit of getting up early in the morning, going to school on time, doing homework daily are slowly dying out. Online platforms and media acts as double-edged sword which on one side helps them in online teaching, social connectivity, fight loneliness and boredom while at the same time causing disruption in sleep patterns, addiction of gadgets, increase in anxiety and irritability.

The strengths of our study were broader age group (5 -17 yrs), assessment of all three domains of psychosocial function and their correlation with respect to various socio-demographic parameters. The major limitations were lower sample size and purposive sampling technique which may not be representative of total population.

### Conclusion

Social awareness should be spread among parents, caregivers and teachers regarding early recognition of changes in behavior of children so that timely intervention can be done. A large scale study should be conducted on children of all socioeconomic status to know the exact impact of COVID-19 on mental health of our future generation.

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