International Journal Dental and Medical Sciences Research
Volume 7, Issue 2, Mar - Apr 2025 pp 315-320 www.ijdmsrjournal.com ISSN: 2582-6018

Post Pandemic Mental Health Assessment in Adolescents

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Date of Submission: 15-04-2025 Date of Acceptance: 25-04-2025

ABSTRACT
Background: The scenario brought by the COVID-19 pandemic contributed to increased levels of fear, anxiety and stress, significantly affecting the psychological development of adolescents and leading to heightened feelings of withdrawal, with consequent negative effects on their mental health.
Objective: To assess adolescent mental health through the administration of two standardized questionnaires following the COVID-19 pandemic.
Method: Epidemiological, observational, and cross-sectional study conducted through the administration of the Strengths and Difficulties Questionnaire (SDQ) to adolescents aged 11 to 16 years, of both sexes, enrolled in two public schools. Additionally, participants completed a second questionnaire, which addressed topics relevant to mental health such as age, daily screen time, and weekly physical activity.
Results: A total of 227 questionnaires were administered, of which 19 (8.37%) were excluded due to incomplete responses. Among the 208 questionnaires analyzed, participantswere between 11 and 16 years old, with 156 (75%) being older than 12. Furthermore, 88 (42.3%) were male and 120 (57.7%) female. Regarding screen time, 112 (53.8%) reported an increase in screen use compared to the period prior to the COVID-19 pandemic, with social media cited as the primary reason in 125 (60%) cases. The SDQ identified emotional difficulties for 60 (28.8%) adolescents, of whom 44 (73.3%) were female, with an average age of 13.8 years. Statistically significant association was observed between emotional difficulties and age ($p = 0.017$), gender ($p < 0.001$), and the type of daily screen activity ($p = 0.049$).
Conclusion: A considerable percentage of adolescents presented clinical scores on the SDQ. Younger age and female gender were associated with higher scores, indicating a greater tendency for behavioral and emotional difficulties. Screen time increased following the Pandemic, likely due to cultural changes, resulting in excessive exposure to social media, a factor that possibly contributed to the rise in mental health problems.
Key-words: Adolescent, Pandemic, Mental Health, Epidemiology, Questionnaire.

I. INTRODUCTION

The COVID-19 pandemic introduced a range of stressors—including social distancing, school and university closures, economic recession, domestic violence, and uncertainty regarding the course of the pandemic—that negatively impacted mental health, particularly among adolescents,[1] resulting in an increased prevalence of psychosomatic disorders[2] and exacerbating pre-existing developmental challenges within this age group.[3]

According to the World Health Organization, adolescence encompasses individuals between 10 and 19 years of age, and represents a transitional phase between infancy and adulthood, marked by significant hormonal, emotional, and cognitive changes.[1]For this reason, the factors associated with depression and anxiety in adolescents are diverse and complex, involving psychological, individual, familial, and social domains.[3]

Several screening tools are available for the identification, diagnosis, and monitoring of mental health disorders in children and adolescents, such as the Patient Health Questionnaire 9-item (PHQ-9), the Patient Health Questionnaire modified for adolescents (PHQ-A), the Center for Epidemiologic Studies Depression Scale,[4] the

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Volume 7, Issue 2, Mar - Apr 2025 pp 315-320 www.ijdmsrjournal.com ISSN: 2582-6018

Social Phobia and Anxiety Inventory for Children, and the Screen for Child Anxiety Related Disorders (SCARED), among others.[5] Among these, the Strengths and Difficulties Questionnaire (SDQ) is one of the most widely used screening instruments for identifying emotional and behavioral difficulties in children and adolescents.[6] The SDQ was developed by Goodman in 1997 to assess children between 4 and 16 years of age and was validated in Brazil in 2000 by Fleitlich, Cartázar, and Goodman. It includes five subscales (emotional symptoms, hyperactivity/inattention, conduct problems, peer relationship problems, and prosocial behavior), which can be combined into a total difficulty score or analyzed individually as separate domains.[7]

The objective of this study was to identify emotional and behavioral difficulties among adolescents in a post-pandemic context using the SDQ.

II. METHOD

An epidemiological, observational, cross-sectional study was carried out using a convenience sample between October 2023 and November 2024 in two public schools located in a city in western Paraná, Brazil. The study included adolescents between 11 and 16 years of age, of both sexes, who were regularly enrolled and voluntarily agreed to participate. Participation required the signing of an Informed Consent Form by parents or legal guardians and an Informed Assent Form by the adolescents themselves. Following the signing of these documents, the SDQ was administered in person. Response options included: false (0), somewhat true (1), or true (2), with each item assigned a specific score. For the purposes of this study, the following score ranges were considered: <15 indicating normal development, 16–19 indicating borderline results, and 20–40 indicating a clinical score, allowing for the classification of adolescents as being at risk for mental health disorders. In addition to SDQ scores, the study also analyzed the following variables: age, sex, physical activity, screen time (including duration, content, and type of screen—TV, cell phone, computer), and place of residence (urban or rural).

Statistical analyses were performed using Stata/SE v.14.1 (StataCorp LP, USA, 2020). Descriptive statistics for participants' ages included mean, median, minimum and maximum values, first and third quartiles, and standard deviation. Qualitative variables were described considering frequencies and percentages. To assess the association between age and SDQ score classification, a one-way Analysis of Variance model was applied. Pairwise comparisons between SDQ categories with respect to age were performed using the LSD post hoc test. Associations between qualitative variables and SDQ score classification were evaluated using the Chi-square test and Fisher's Exact test, as appropriate. A p-value of less than 0.05 was considered statistically significant.
This study was approved by the Research Ethics Committee of Western Paraná State University, Cascavel, Brazil, under approval number 5.247.535, issued in February 2022.

III.RESULTS

A total of 227 questionnaires were administered, of which 19 (8.37%) were excluded due to incomplete responses. Among the 208 questionnaires analyzed, 60 adolescents (28.8%) scored above 20 on the SDQ. Participant age ranged from 11 to 16 years (mean: 13.67; median: 14), with 156 individuals (75%) being older than 12 years. Of the total, 88 (42.3%) were male and 120 (57.7%) female. Regarding screen time, 112 participants (53.8%) reported spending more time on screens compared to the pre-pandemic period. Social media was identified as the main reason for screen use by 125 adolescents (60%). Tables 1, 2, and 3 present the results of the study, showing the associations between SDQ scores and variables such as age, sex, physical activity, screen time, place of residence, and type of screen-based activity.

Table 1: Relationship between SDQ* score and age.

SDQ* score	n	Mean	Mínimum	1st quartil	Mean	3rd quartil	Maximum	SD**	p value***
Normal	88	13.3	11	12	14	14.3	16	1.6	
Borderline	60	14.0	11	13	14	15	16	1.3	0.017
Clinical	60	13.8	11	13	14	15	16	1.5	

* Strengths and Difficulties Questionnaire

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Volume 7, Issue 2, Mar - Apr 2025 pp 315-320 www.ijdmsrjournal.com ISSN: 2582-6018

**Standard-Deviation
***p significance < 0.05.

Table 2: Relationship between SDQ score and gender, physical activity, screen time and place of residence.

	SDQ score						
	Normal		Borderline		Clinical		p value
	n	%	n	%	n	%	
				Gender			
Female	37	42.0%	39	65.0%	44	73.3%	
Male	51	58.0%	21	35.0%	16	26.7%	<0.001
Total	88	100.0%	60	100.0%	60	100.0%	
				Physical Activity			
< 1 hour	33	37.5%	28	46.7%	31	51.7%	
Between 1 and 3 hours	23	26.1%	12	20.0%	12	20.0%	0.513
>3 hours	32	36.4%	20	33.3%	17	28.3%	
Total	88	100.0%	60	100.0%	60	100.0%	
				Screen time			
Upto 2 hours	7	8.0 %	2	3.3%	4	6.7%	
Between 2 and 3 hours	25	28.4%	11	18.3%	8	13.3%	0.131
>3 hours	56	63.6%	47	78.3%	48	80.0%	
Total	88	100.0%	60	100.0%	60	100.0%	
				Place of residence			
Urban area	86	97.7%	60	100.0%	59	98.3%	
Rural area	2	2.3%	0	0.0	1	1.7%	0.786
Total	88	100.0%	60	100.0%	60	100.0%	

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Tabela 3: Relationship between SDQ score and screen timecompared to pre-pandemicscreen time and type of screen-based activity.

	SQD classification						
	Normal		**Borderline**		**Clinical**		**p value**
	n	**%**	**n**	**%**	**N**	**%**	
			Screen time comparison				
Decreasedtime	26	29.5%	17	28.3%	11	18.3%	
Increased time	43	48.9%	33	55.0%	36	60.0%	0.513
Similar time	19	21.6%	10	16.7%	13	21.7%	
Total	88	100.0%	60	100.0%	60	100.0%	
			Type of screen (content)-based activity				
Social network	46	54.1%	38	63.3%	41	68.3%	
Gaming	36	42.4%	16	26.7%	13	21.7%	0.049
Another	3	3.5%	6	10.0%	6	10.0%	
Total	85	100.0%	60	100.0%	60	100.0%	

IV.DISCUSSION

In March 2020, the World Health Organization declared the spread of Coronavirus-19 a global pandemic,[8] leading to drastic changes in daily life, including social isolation, disruption of daily routines, school closures, and a marked decline in physical activity and social interaction.[9] These experiences affected children and adolescents across all age groups, placing unprecedented pressure on the mental health of a population already burdened by the biological and emotional changes inherent to this developmental stage.

In the present study, a high percentage of adolescents scored in the range suggestive of a predisposition to mental health disorders, consistent with findings in the literature that indicate an increase in anxiety and depression symptoms in the post-pandemic period.[8,10] Earlier studies reported lower percentages, and although a high SDQ score does not necessarily indicate a psychiatric disorder, it does identify individuals who may benefit from further evaluation by mental health professionals.[6]

As observed in the literature, age was associated with psychiatric symptoms, suggesting that depressive and anxious symptoms can impair quality of life during adolescence. This period is already characterized by increased vulnerability to mental health issues due to the biopsychosocial changes intrinsic to this developmental stage, and the Pandemic may have further contributed to the emergence or intensification of these symptoms.[11,12,13]

Consistent with findings from other studies, this research also found an association between females and a higher prevalence of emotional and behavioral challenges. Some studies identify being female as a risk factor for elevated levels across various mental health indicators.[11,14,15] A study carried out in 2021, which aimed to estimate the prevalence of depression and anxiety in children and adolescents following pandemic-related lockdowns, reported that girls had twice the prevalence of these comorbidities compared to boys.[12]

The literature shows that, since the onset of the pandemic, access to the internet, media devices, and the time spent on digital technologies—particularly on social media—has increased and continues to rise. While these tools proved vital during the time of the pandemic, allowing adolescents to attend school virtually and stay socially connected, they are now having a detrimental effect on adolescent well-being. Excessive screen use has been linked to information overload, psychological distress, sleep disruption, anxious symptoms, and premature exposure to sexuality. Although this study didn`t find asignificant association between screen time

and emotional or behavioral changes, it is noteworthy that the type of screen activity most reported in the post-pandemic context was excessive use of social media, with significant association with higher SDQ scores, in line with findings from previous research.[11,16,17,18]

This study was subject to certain limitations. First, the questionnaire was completed solely by adolescents, which limits the perspective to a single source and restricts the range of collected information. Additionally, data collection took place four years after the pandemic was officially declared, meaning that other events or conditions may have influenced mental health quality during this time. The study also did not assess whether participants had any previous mental health diagnoses. Finally, the relatively small sample size may have compromisedthe statistical power of the results.

IV. CONCLUSION

The COVID-19 Pandemic had a significant impact on adolescent mental health, particularly among females and those in early adolescence, differing according to the nature of content accessed by participants. Although this study was conducted several years after the pandemic, it is undeniable that COVID-19 brought about cultural changes in daily habits that continue to influence adolescent life today. For this reason, pediatricians should be familiar with validated mental health screening tools, which are valuable in clinical practice for identifying individuals at risk, providing appropriate follow-up, promoting mental well-being, and preventing long-term consequences.

Disclosure Statement: the authors declare no conflict of interest.
Funding: the authors declare no funding source to this research.

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