



# AMERICAN JOURNAL OF HUMAN PSYCHOLOGY (AJHP)

ISSN: 2994-8878 (Online)

VOLUME 2 ISSUE 1 (2024)



PUBLISHED BY  
E-PALLI PUBLISHERS, DELAWARE, USA

## The Impact of Virtual Schooling Due to COVID-19 Restrictions on Children's Mood and Behavior in the Clinical Context

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### Article Information

**Received:** December 05, 2023

**Accepted:** December 29, 2023

**Published:** January 01, 2024

### Keywords

*Virtual Schooling, Children, Mood, Behavior, Socio-Demographic Characteristics, ADHD Symptoms, Parental Stress, Pandemic Restrictions*

### ABSTRACT

The COVID-19 pandemic has caused significant educational system disruptions, leading to the transition to virtual schooling. This study evaluated the mood and behavioral shifts in students attending virtual school during COVID-19 restrictions. Participants included 66 children aged 6 to 14 and their parents from a pediatric outpatient clinic. A self-administered questionnaire was used to collect data, ADHD symptoms using Connor's modified scale, and parental stress levels using the Parental Stress Scale (PSS). Statistical analysis included descriptive statistics, Mann-Whitney Z-test, and Pearson correlation. ADHD scores and parental stress levels showed a substantial unfavorable connection. 60.6% of the 66 surveyed students were between 10 and 14; most were females (77.3%). Asthma was the most prevalent (7.6%), while nearly two-thirds (63.6%) reported being in good health during the epidemic. Between the PSS and ADHD scores, there was a strong negative connection ( $r=-0.387$ ). There were no discernible variations between the children's sociodemographic factors and their ADHD and PSS scores. Most kids scored within the normal range, with the mean ADHD score overall being 11.3. Children attending virtual school during COVID-19 restrictions did not appear to be significantly affected in terms of mood and behavior, as reported by parents. Parental stress, subsequently, was extremely high. The epidemic calls for the development of treatment plans for parental psychological issues. It is necessary to conduct further research to comprehend how virtual schooling affects children's well-being fully.

### INTRODUCTION

Education is a basic, most necessary need of every human being; however, the pandemic of COVID-19 shattered the world and its systems to the core. Every big or small organization was locked down, travel bans were imposed, and quarantine at home was advised by the government to protect from the disease, as the death toll increased exponentially every day. Initially, COVID-19 started in Wuhan, China; however, later on, it spread worldwide (Parmer & Sinha, 2020). This pandemic horribly affected businesses, healthcare systems, and the educational system (Martin & Mulvihill, 2021). The COVID-19 pandemic escorts to ubiquitous disruptions in education systems worldwide, with many schools transitioning to virtual schooling or remote learning as a response to the restrictions imposed to curb the spread of the virus (Catalano *et al.*, 2021). It is reported that the COVID-19 quarantine has affected 860 million children and adolescents worldwide (Orgilés *et al.*, 2020). Many countries implemented widespread school closures to control the spread of the virus. According to UNESCO, over 1.6 billion learners in more than 190 countries were affected by school closures at the pandemic's peak, representing 94% of the world's student population (Conto *et al.*, 2020). According to a report, over 91% of the education community was affected by national and international closures due to COVID-19. To manage the learning process, educational institutions implemented e-learning and remote learning technologies to support

the continuity of the educational process (Abumalloh *et al.*, 2021).

The global educational environment has been profoundly impacted by the COVID-19 epidemic, resulting in a transformation in the school system (Natividad & Abrogena, 2023). Schools and institutions have been shuttered to slow the spread of the virus, forcing the adoption of online education as an instructional tool. Considering the future is unknown, adaptable and resilient, educational systems were critical for the world to deal with the pandemic's issues (Natividad & Abrogena, 2023). With the closure of physical schools, there was a rapid shift to virtual schooling or remote learning. Schools adopted various approaches, including online classes, video conferencing, pre-recorded lectures, and digital learning platforms to continue education remotely (Babbar & Gupta, 2022). As e-learning or virtual schooling sought to be efficient and secure for students, one of the major challenges was unequal access to technology and internet connectivity (Dhawan, 2020; Kamysbayeva *et al.*, 2021). Many children, especially those from disadvantaged backgrounds, faced difficulties accessing the necessary devices and stable internet connections, leading to disparities in educational opportunities (Jalongo, 2021). Many children from struggling or developing countries faced difficulties abiding by the virtual education system as the resources were inefficient; thus, those children's mental health came at a cost due to the fear of missing out (Almajali *et al.*, 2021; Jalongo, 2021).

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## LITERATURE REVIEW

Extended periods of school closures and the transition to virtual schooling resulted in learning loss for many students. The lack of in-person instruction and reduced interaction with teachers and peers impacted students' academic progress, particularly in subjects that require hands-on learning or specialized equipment (Agostinelli *et al.*, 2022). The pandemic and its associated disruptions significantly impacted children's mental health. The increased stress, social isolation, uncertainty, and changes in routine contributed to feelings of anxiety, depression, and loneliness in many children (Imran *et al.*, 2020; O'Sullivan *et al.*, 2021). School closures also limited access to vital support services provided within schools, such as counselling and mental health resources (Hoffman *et al.*, 2020).

The absence of face-to-face interaction and reduced opportunities for socialization affected children's social and emotional development. Peer relationships, teamwork, and social skills development were hindered, and children had to adapt to new ways of connecting with their classmates and teachers (Adnan & Anwar, 2020). Virtual schooling often meant that children were physically separated from their peers and teachers, reducing social interaction. The lack of face-to-face communication and limited opportunities for socialization can contribute to feelings of loneliness and isolation, which can negatively affect children's moods (Cockerham *et al.*, 2021; Magson *et al.*, 2021). The pandemic raised concerns about the health and safety of students and educators and heightened stress and anxiety in children and adolescents. Schools had to implement strict protocols, such as physical distancing, mask-wearing, and enhanced hygiene practices, to ensure a safe learning environment once schools reopened (Group *et al.*, 1996). The abrupt transition to virtual schooling and the challenges associated with adapting to new learning environments, technology, and increased screen time can cause stress and anxiety in children (Idris *et al.*, 2021). They may experience difficulties adjusting to the new format, managing time effectively, or understanding instructions without immediate teacher support. School closures also impacted extracurricular activities such as sports, arts, and clubs. These activities play a crucial role in children's holistic development, and their lack of access further limits their overall educational experience (Carey *et al.*, 2022; Ilari *et al.*, 2022).

The remote learning format led to decreased motivation and engagement in children. The absence of a physical classroom environment, peer interaction, and hands-on activities may result in diminished interest in academic tasks (Goldberg *et al.*, 2022). This led to a decline in academic performance and productivity. The pandemic also resulted in irregular routines and increased distractions, which led the students to slack off and distance themselves from their studies (Kwakye & Kibort-Crocker, 2021). Virtual schooling often disrupted the regular routines and structures children had become accustomed to in a traditional classroom setting (Apriyanti,

2020; Dorn *et al.*, 2020). Being at home during school hours can introduce various distractions, such as access to electronic devices, household chores, or other family members' activities, making it challenging for children to focus and concentrate on their studies (Commodari & La Rosa, 2021). Above all the consequences that the pandemic brought to the world, the lack of physical classes indirectly caused a greater impact on children's mental health; some children exhibited emotional and behavioral changes due to virtual schooling (Goldberg *et al.*, 2022). They may become more irritable, frustrated, or exhibit mood swings due to the added stressors and reduced social interactions. Additionally, prolonged screen time can contribute to eye strain, fatigue, and disrupted sleep patterns, further impacting emotional well-being and increased behavioral shifts (Bahkir & Grandee, 2020).

A change to virtual schooling was brought about by the coronavirus pandemic, which had a significant impact on the educational system. In contrast, the transformation came with difficulties like unequal access to technology and internet connectivity, diminished academic achievement, and mental health problems. Distractions and routine disruptions brought on by virtual learning affected students' motivation and engagement. This study examined how children who attended virtual school during the COVID-19 outbreak changed attitudes and behavior. To gather information, parents had to self-administer a questionnaire that asked them questions about their sociodemographic traits, their children's ADHD symptoms, and their levels of stress.

## MATERIALS AND METHODS

This cross-sectional study investigated various aspects of children's health and well-being, specifically focusing on attention deficit hyperactivity disorder (ADHD) and parental distress. The study recruited participants from a pediatric outpatient clinic, targeting children aged 6 to 14 and their parents. A self-administered questionnaire was distributed to the guardians to gather relevant data, providing a comprehensive understanding of the participants' socio-demographic characteristics, ADHD symptoms in children using Connor's modified scale, and parental stress levels utilizing the parental stress scale (PSS).

The socio-demographic characteristics section of the questionnaire aimed to collect information about the participants' age, gender, educational background, occupation, child medical condition, child health condition during quarantine and other relevant factors. This data was essential for understanding the sample population's diverse backgrounds and potential influencing factors. By obtaining a comprehensive overview of these demographic variables, the study could account for potential confounding factors in the analysis and interpretation of the findings.

To assess ADHD symptoms in children, Connor's modified scale was employed, which is a widely recognized



tool in clinical research. This scale incorporates various dimensions related to ADHD, such as inattention, hyperactivity, and impulsivity. By utilizing this scale, the study intended to assess the presence and severity of ADHD symptoms in the participating children, allowing for a better understanding of the prevalence and impact of ADHD within the studied population. The parental stress scale (PSS) was added to the survey to measure the parents' stress symptoms. Parental stress is essential to consider, as it may significantly influence the child's well-being and overall family dynamics. The PSS provided a standardized measure to evaluate the levels of stress experienced by the parents, covering various domains such as personal stressors, parenting stressors, and perceived social support.

### Statistical Analysis

A variety of statistical methods, including numbers and percentages (categorical variables), the mean and standard deviation (continuous variables), were employed to sum up the entire group of respondents. The Mann-Whitney Z-test was used to compare the differences between ADHD and PSS scores based on the sociodemographic features of the children. The Kolmogorov-Smirnov test and the Shapiro-Wilk test were used to assess statistical collinearity. Results on the PSS and ADHD both have a non-normal distribution. The non-parametric tests were so used. Using Pearson Correlation, it has been determined whether ADHD and PSS scores are correlated. Various descriptive statistics, including numbers and percentages

(categorical variables), the mean and standard deviation (continuous variables), were employed to illustrate the entire group of respondents. All statistical tests were judged significant at a P-value of 0.05. The Statistical Package for Social Sciences, version 26 (SPSS, Armonk, NY: IBM Corp, USA) was used to analyses all statistical data for this project.

### RESULTS

This study addressed how common ADHD symptoms are in kids and how stressed out parents are. We gathered information on sociodemographic traits, ADHD symptoms, and parental stress levels using a self-administered questionnaire. The characteristics of the respondents were compiled using descriptive statistics. Statistical collinearity was evaluated using the Mann-Whitney Z-test, Shapiro-Wilk, Kolmogorov-Smirnov, and Pearson Correlation tests.

In a pediatric outpatient clinical environment, 66 pupils participated in this cross-sectional study. Asthma was the most frequently mentioned medical issue, while 63.6% of kids said they were in good health throughout the pandemic. They reported that wanting to be in charge, readily getting wounded, crying easily, shyness, and restlessness were the top five traits that affected their mood. Parental stress ratings were 68, and ADHD symptoms were 11.3. There were no significant differences depending on age, gender, medical condition, or improvement from medication. However, there was a strong inverse link between ADHD scores and parental stress levels.

**Table 1:** Socio-demographic characteristics of the children (n=66)

Study Data	N (%)
<b>Age group</b>	
5 – 9 years	26 (39.4%)
10 – 14 years	40 (60.6%)
<b>Gender</b>	
Male	15 (22.7%)
Female	51 (77.3%)
<b>Type of education</b>	
Governmental	63 (95.5%)
Special	03 (04.5%)
<b>Educational level</b>	
Kindergarten	03 (04.5%)
Primary education	59 (89.4%)
Secondary education	04 (06.1%)
<b>The child's medical condition</b>	
Asthma	05 (07.6%)
Chest problem	02 (03.0%)
Autism	01 (01.5%)
Difficulty learning	01 (01.5%)
Others	03 (04.5%)
There is nothing	54 (81.8%)

The child's health condition during quarantine	
Excellent	13 (19.7%)
Good	42 (63.6%)
Fair	08 (12.1%)
Poor	03 (04.5%)
Is there an improvement now, and is there a commitment to medication?	
Yes	33 (50.0%)
No	22 (33.3%)
I do not know	11 (16.7%)

This cross-sectional study involved 66 children in the pediatric outpatient clinical setting. As seen in Table 1, the most common age group was 10 to 14 years old, with females being dominant (77.3%). Nearly all (95.5%) were studying in a government school, with 89.4% being

students at primary school levels. The prevalent medical disorder was asthma (7.6%). Good health condition during the pandemic was reported by 63.6%, and half of them (50%) showed improvement due to a commitment to medication.

**Table 2:** Assessment of children's mood during COVID-19 using the Conners Comprehensive Behavior Rating Scale <sup>(n=66)</sup>

Statement	Mean $\pm$ SD
Wants to run things	1.09 $\pm$ 0.89
Feeling easily hurt	0.86 $\pm$ 0.80
Cries easily	0.52 $\pm$ 0.81
Shy	0.48 $\pm$ 0.77
Restless in the "squirmy" sense	0.42 $\pm$ 0.72
Speaks differently from others of the same age (baby talk, stuttering, hard to understand)	0.41 $\pm$ 0.72
Daydreams	0.35 $\pm$ 0.71
Excitable, impulsive	0.38 $\pm$ 0.67
Distractibility or attention span is a problem	0.33 $\pm$ 0.71
Problems with eating, e.g. poor appetite	0.33 $\pm$ 0.69
Mood changes quickly and drastically	0.30 $\pm$ 0.70
Problems with making or keeping friends	0.27 $\pm$ 0.62
Fearful (of new situations, new people or places)	0.27 $\pm$ 0.62
Problems with sleep, e.g. cannot fall asleep, up at night	0.26 $\pm$ 0.62
Easily frustrated in efforts	0.26 $\pm$ 0.59
Childish or immature (wants help he should not need, clings, needs constant reassurance)	0.23 $\pm$ 0.60
Puts and sulks	0.24 $\pm$ 0.58
Quarrelsome	0.21 $\pm$ 0.57
Stomach aches	0.20 $\pm$ 0.59
Bowel problems (frequently loose, irregular habits)	0.20 $\pm$ 0.59
Destructive	0.20 $\pm$ 0.56
Headaches	0.20 $\pm$ 0.53
Fails to finish things	0.20 $\pm$ 0.50
Picks at things (nails, fingers, hair, clothing)	0.18 $\pm$ 0.55
Difficulty in learning	0.18 $\pm$ 0.55
Carries a chip on his shoulder	0.18 $\pm$ 0.46
Does not <i>get along</i> well with brothers or sisters	0.17 $\pm$ 0.54
Worries more than others (about being alone; illness)	0.17 $\pm$ 0.51
Denies mistakes or blames others	0.17 $\pm$ 0.45
Gets into more trouble than others of the same age	0.18 $\pm$ 0.49
Does not like or does not follow restrictions	0.15 $\pm$ 0.50

Unable to stop a repetitive activity	0.15 ± 0.47
Boasts and brags	0.15 ± 0.47
Other aches and pains	0.14 ± 0.49
Sucks or chews (thumb, clothing, blanket)	0.14 ± 0.46
Fights constantly	0.12 ± 0.50
Disobedient or obeys but resentfully	0.12 ± 0.45
Vomiting or nausea	0.12 ± 0.45
Restless, always up and on the go	0.12 ± 0.37
An unhappy child	0.11 ± 0.43
Let yourself be pushed around	0.11 ± 0.39
Sassy to grown-ups	0.09 ± 0.38
Disturbs other children	0.09 ± 0.38
Feels cheated in a family circle	0.09 ± 0.34
Tells lies or stories that are not true	0.08 ± 0.36
Steals	0.06 ± 0.34
Cruel	0.05 ± 0.27
Bullies others	0.03 ± 0.25
<b>Total ADHD score</b>	<b>11.3 ± 14.3</b>
Level of ADHD	
Normal (score ≤60 points)	59 (89.4%)
Slightly atypical (61 – 70 points)	04 (06.1%)
Very atypical (>70 points)	03 (04.5%)

The response ranges from “not at all” coded with 0 to “very much” with 3

Source: (buckinghampediatrics.com, 2022)

In Table 2, the top 5 statements that mostly affected the mood of the children during the pandemic were “want to run things (mean score: 1.09)”, “feeling easily hurt” (mean score: 0.86), “cries easily” (mean score: 0.52), “shy” (mean score: 0.48) and “restless in the squirmy sense” (mean score: 0.42) while “bullies others” showed the least concern (mean score: 0.03). The overall mean score for ADHD was 11.3 (SD 14.3%), with nearly all (89.4%) being normal, 6.1% slightly atypical, and 4.5% very typical ADHD levels.

**Table 3:** Assessment of parental stress scale (PSS) (Pontoppidan *et al.*, 2018) (n=66)

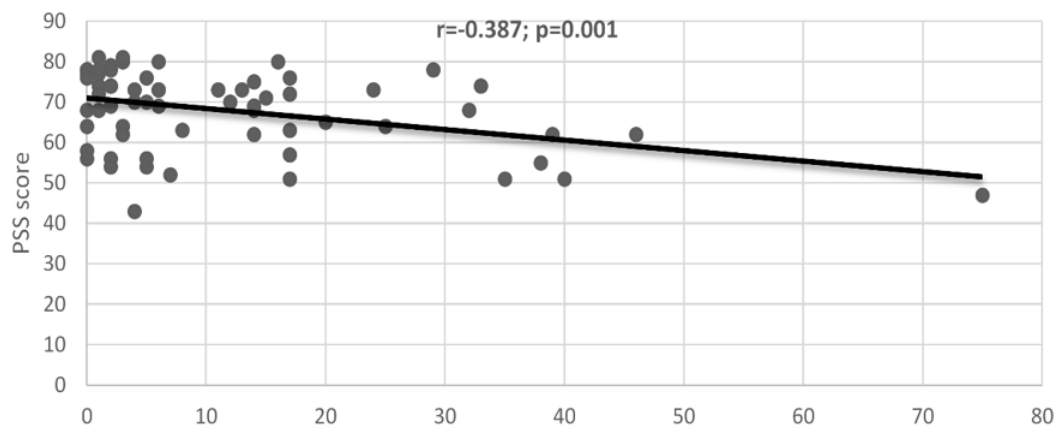
Statement	Mean ± SD
I am satisfied as a parent †	4.68 ± 0.84
I find my child enjoyable †	4.64 ± 0.82
I am happy in my role as a parent †	4.62 ± 0.87
If I had it to do over again, I might decide not to have a child	4.56 ± 0.95
My child is an important source of affection for me †	4.48 ± 0.99
I enjoy spending time with my child †	4.36 ± 1.02
There is little or nothing I would not do for my child if it were necessary †	4.35 ± 0.98
I feel close to my child †	4.32 ± 1.01
The major source of stress in my life is my child	4.05 ± 1.32
The behavior of my child is often embarrassing or stressful to me	3.98 ± 1.34
Having a child has meant having too few choices and too little control over my life	3.88 ± 1.37
It is not easy to balance different responsibilities because my child	3.68 ± 1.33
Having a child has been a financial burden	3.62 ± 1.37
Having a child gives me a more certain and optimistic view of the future †	3.47 ± 1.56
Having a child leaves little time and flexibility in my life	3.06 ± 1.48
Caring for my child sometimes takes more time and energy than I have to give	2.32 ± 1.29
I sometimes worry whether I am doing enough for my child	2.05 ± 1.19

I feel overwhelmed by the responsibility of being a parent	1.91 ± 1.36
<b>Total PSS score</b>	<b>68.0 ± 9.55</b>

The response ranges from “strongly agree”, coded with 1, to “strongly disagree”, coded with 5.

† Reverse-coded items

In the assessment of parental stress (Table 3), it was revealed that the top 5 statements where parents showed the highest ratings were “I am satisfied as a parent” (mean score: 4.68), “I find my child enjoyable” (mean score: 4.64), “If I had it to do over again, I might decide not to have a child” (mean score: 4.56) and “My child is an important source of affection for me” (mean score: 4.48). The overall mean score of PSS was 68 (SD 9.55).



**Figure 1:** Correlation between ADHD score and PSS score

In Figure 1, it was observed that there was a significant inverse correlation between ADHD results and PSS results ( $r = -0.387$ ;  $p = 0.001$ ).

In Table 4, there were no significant differences in the score of ADHD concerning age group, gender, medical condition, child's health condition, and improvement due

to commitment to medication ( $p > 0.05$ ).

Table 5 shows no statistically significant variations in PSS scores according to age, gender, medical condition, the children's health while in quarantine, or the current improvement brought on by commitment to treatment (all  $p > 0.05$ ).

**Table 4:** Difference in the ADHD score according to the Socio-demographic characteristics of the children ( $n = 66$ )

Factor	ADHD Score (144) Mean ± SD	Z-test	P-value §
Age group			
5 – 9 years	9.46 ± 9.74	0.053	0.958
10 – 14 years	12.6 ± 16.6		
Gender			
Male	8.87 ± 12.2	0.714	0.475
Female	12.1 ± 14.8		
Having medical condition			
Yes	17.5 ± 16.9	1.234	0.217
No	9.98 ± 13.4		
The child's health condition during quarantine			
Good/Excellent	11.4 ± 14.8	0.311	0.756
Fair/Poor	11.1 ± 11.7		
Is there an improvement now, and is there a commitment to medication?			
Yes	14.1 ± 17.8	0.688	0.491
No/I do not know	8.61 ± 9.05		

§ P-value has been calculated using Mann Whitney Z-test

**Table 5:** Difference in the PSS score according to the Socio-demographic characteristics of the children <sup>(n=66)</sup>

Factor	PSS Score (90) Mean $\pm$ SD	Z-test	P-value <sup>§</sup>
Age group			
5 – 9 years	69.8 $\pm$ 7.91	0.848	0.397
10 – 14 years	66.9 $\pm$ 10.4		
Gender			
Male	71.3 $\pm$ 9.87	1.831	0.067
Female	67.1 $\pm$ 9.31		
Having medical condition			
Yes	68.3 $\pm$ 9.42	0.033	0.973
No	67.9 $\pm$ 9.67		
The child's health condition during quarantine			
Good/Excellent	68.4 $\pm$ 9.47	0.698	0.485
Fair/Poor	66.0 $\pm$ 10.2		
Is there an improvement now, and is there a commitment to medication?			
Yes	67.4 $\pm$ 9.14	0.854	0.393
No/I do not know	68.6 $\pm$ 10.1		

<sup>§</sup> P-value has been calculated using Mann Whitney Z-test

## DISCUSSION

This study examined the effect of COVID-19 restrictions and virtual schooling on the mood and behavior of children attending the pediatric outpatient clinic. The findings of this study revealed that the COVID-19 restrictions have no significant impact on children's moods and behaviors, as per parental reports. Based on the Conners Comprehensive Behavior Rating Scale, out of 144 total score points, the mean score was only 11.3 (SD 14.3), indicating a very limited impact. Only 6.1% were considered slightly atypical, and only 4.5% were considered a very atypical level of ADHD; the rest were normal (89.4%). Of all the statements included in the questionnaires (48 items), only the statement "Wants to run things" reached more than 1 point (scale out of 3 points), and the rest were below 1 point. These findings did not seem to coincide with the paper of Orgilés *et al.* (Orgilés *et al.*, 2020). According to their accounts, 85.7% of the parents in Spain and Italy saw changes in their child's mental states and behavior while in quarantine. The researchers concluded that Spanish parents reported the symptoms more frequently than Italian parents and included difficulty concentrating, boredom, impatience, restlessness, nervousness, the sensation of loneliness, discomfort, and worry as some of the most prevalent symptoms. In a similar vein, research conducted in Europe (Francisco *et al.*, 2020) discovered that throughout the pandemic, children's psychiatric and behavioral symptoms, screen time, and sleep hours/night had increased, while a decline in physical activity time also became a problem. Italian children showed fewer behavioral and psychiatric signs compared to Portuguese or Spanish children. In Jeddah, similar incidents have also been reported (Almugti *et al.*, 2021).

In comparison to the pre-pandemic period, studies

have shown that during the pandemic, 30% of students displayed higher irritation, and mood swings with screen time were shown to occur more frequently. Physical activity and sleep time also decreased. Despite this, 22% of the children became calmer, and 14% were seen to be more thoughtful at the time of the pandemic.

In a study by Li *et al.* (Dugas *et al.*, 2005), 22.3% of children and adolescents were suffering from depressive symptoms, and the most well-known risk factors were smartphone addiction, internet addiction, and being a resident of Hubei province. Another study conducted by Bosch *et al.* (Bosch *et al.*, 2022) showed that the quality and quantity of a child's social networks during a lockdown, the child's daily routines following parental rules, the child's worries about their health, and the existence of economic and learning issues brought on by the pandemic were all significant predictors of a child's emotional disorder. In Tabuk (Jamileh *et al.*, 2021), A study found that living in a tiny house or not having an outdoor play place for children has a greater psychological influence on feelings and behavior in men. However, we discovered no statistically significant correlation between the ADHD score and any of the socio-demographic characteristics of the children in our study, including age, gender, medical condition, health status during quarantine, and improvement as a result of medication adherence ( $p > 0.05$ ). Further investigation is required to establish the effect of children's mood and behavior in terms of socio-demographic characteristics.

The Parental Stress Scale's total mean score was 68 (SD 9.55) out of 90, indicating significant stress. Additionally, we discovered no statistically significant correlation between the respondents' sociodemographic information and their overall PSS score ( $p > 0.05$ ). In Germany (Christner *et al.*, 2021), an investigation revealed that most



parents and children had experienced lockdown-related stress, and the primary challenge was not being able to meet friends and family members outside the household. Among Italian parents of 2 to 14-year-old children (Spinelli *et al.*, 2020), parents were shown to exhibit more stress in dealing with quarantine issues resulting from increasing children's dilemmas. However, no effects were seen on families' well-being regarding the quality of the home environment, living in a more at-risk area, or their relationship with the pandemic effects. Parents must balance personal life, job, raising children, and being alone without any support, however, dealing with the consequences of quarantine is particularly more stressful among parents. This occurrence left parents at increased risk of developing distress, leading to being vulnerable and their capability to be caring caregivers becomes futile. It is important to state that there was a significant inverse correlation between ADHD score and PSS score, suggesting that better mood and behavior in children correlate with increased parental stress. Theoretically, these results may not reflect the reality of the situation. However, we would like to emphasize that most of the psychological items in our questionnaire did not significantly influence our children, which could be one of the main reasons why it was inversely associated with parental stress. Also, consideration for other interferences should be considered, including personal life struggles during quarantine, jobs, resources, and other matters affecting parents' mental health conditions. Recommendation to further investigate its correlation is highly advised.

On the other hand, a study carried out among Qatari children (Chaabane *et al.*, 2021) reported that the most common contributing factor to increased anxiety and loneliness among children was school closure. Hence, as the school closure extended its duration, the likelihood of decreased physical activity may occur, and in return, it may increase the Body Mass Index and incidence of childhood obesity. Likewise, in Riyadh (Alnamnakani *et al.*, 2022), the anxiety levels of children increased during the pandemic (28.1%), wherein 36.8% of the children reported incidences of panic attacks and agoraphobia; this is in the separation of physical injury fears for 35.1%, in generalized anxiety disorder/overanxious for 27.3%, anxiety fear for 26.8%, in obsessive-compulsive for 25.1%, and social phobia for 19%. The COVID-19 pandemic resulted in negative impacts on the mental and intellectual development of children. A structured plan for intervention is needed to address the mental problems of our youth.

## CONCLUSION

Despite COVID-19 restrictions, parents of children attending the pediatric outpatient setting did not seem to identify virtual schooling as having a significant effect on their children's mood and behavior. Most children were reported to have good health conditions during quarantine. However, despite their good mood

and behavior, it is surprising to know that their parents had increased stress levels. Further, children's age, gender, medical condition, child health condition during quarantine, and improvement due to commitment to medication did not seem to affect our population's mood and stress. Further advanced studies are needed to establish the effect of mood and behavior in children during online classes during the pandemic.

## LIMITATIONS

A combination of the small sample size and specialized outpatient setting of this study, there is little opportunity for generalizability. The conclusions also depended on parents' memories of their kids' attitudes and behaviors during virtual schooling, which could have caused recall bias and minimized the true impact of the pandemic.

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