

Effect of Quarantine of COVID-19 Pandemic on Egyptian Children with Attention-Deficit/Hyperactive Disorder

Original
Article

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ABSTRACT

Introduction: The study assessed symptoms of ADHD in a group of school children after release from quarantine.

Methods: This cross-sectional study included 20 boys with ADHD. The parents were annually interviewed for follow-up in February. The last annual questionnaire is considered the Before-Quarantine interview, which was repeated during the first follow-up visit after lockdown release (After-Quarantine interview).

Results: After quarantine, the median score increased significantly compared to before quarantine [51 (31-61) to 86 (14-98), $p < 0.001$]. Attention span decreased significantly ($p < 0.001$), and activity levels increased significantly after quarantine ($p < 0.001$). The online schooling score indicated problematic behavior in all but one child. Kids who received rehabilitation sessions had significantly lower scores before and after quarantine.

Conclusion: COVID-19 lockdown and school closure have a deleterious effect on the severity of symptoms of children with ADHD. These children showed a problematic performance of online schooling.

Key Words: Attention Deficit Disorder with Hyperactivity, COVID-19; Egyptian Children; Educational Status; Surveys and Questionnaires, Quarantine.

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INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurodevelopmental disorder in children^[1]. Approximately 5% school-aged children have ADHD^[2]. In December 2019, a viral pneumonia outbreak caused by a novel coronavirus began in Wuhan (Hubei, China) and subsequently attracting worldwide attention field^[3]. As a result of the COVID-19 pandemic, public health authorities in almost all countries recommended a "lockdown" to reduce viral spread. In Egypt a nationwide lockdown was enforced from March 15th till the end of June 2020. People were required to remain at home except for very limited purposes. All schools have been suspended nationwide. Globally, over 90% of registered students were not attending schools for a significant amount of time^[4].

Due to the COVID-19 pandemic, children and adolescents may be more susceptible to the negative mental health impacts of lockdown and school closure^[4, 5]. It is expected that children with neurodevelopmental disorders may be more vulnerable^[6]. Children with ADHD encounter significant difficulties during this "quarantine" due to the disruption of their daily schedule and the related

social interactions. These difficulties could make ADHD symptoms worse^[7].

In the current study, we reassessed symptoms of ADHD in a group of school children after the quarantine is lifted. In order to identify any potential effects of quarantine on ADHD symptoms, the children's pretreatment state was compared to their post-quarantine ADHD symptoms.

SUBJECTS AND METHODS

This study included 20 boys with ADHD aged 5 to 7 who were followed up in a private clinic. They were studying in an international school. Schools were closed in Egypt because of the COVID-19 pandemic, and all children were isolated at home since March 15th, 2020. They had online schooling for three months during the quarantine. Ethical approval for this study was obtained from the National Research Center Ethics Committee, Cairo, Egypt. The study was conducted according to international ethical standards for the biological rhythm research^[8]. Patients with other physical illnesses and any accompanying psychiatric diagnoses were excluded from the study.

Professional psychologists used different standardized assessment tools to diagnose the 20 boys with ADHD. All boys had received rehabilitation sessions before the quarantine and stopped the services for three months. Only one mother implemented a full home rehabilitation program following all recommendations. Her son was on medication (omega 3), he was committed to cycling three days per week and walking for 30 minutes, two days per week. Screen time was controlled to 30-60 minutes per day. Four more kids were committed to online rehabilitation sessions during the quarantine. These five children were compared to the remaining 15 patients.

Every year in February, follow-up interviews were held with the parents of the children who attended this clinic. The questionnaire used was the Vanderbilt assessment scale. The questionnaire consists of 55 questions. The questionnaire scores were directly proportional to ADHD severity, indicating severer symptoms whenever the score increases. The first 47 questions were scored 0 to 3 to assess symptom frequency (0: never, 1: occasionally; 2: often, 3: very often). Questions 48 to 55 evaluate school performance on a scale of 1 to 5 (1: excellent, 2: above average, 3: average, 4: somewhat of a problem, 5: problematic). After going over each item with the parent and what this score signifies, the physician completed the questionnaire in forty-five minutes.

We designated the February interview, which was the final annual questionnaire, as a Before-Quarantine interview. The questionnaire was repeated during the first follow-up visit after the lockdown release to establish the After-Quarantine interview. In order to evaluate the severity of symptoms following quarantine with those prior, we used the first 47 questions of the questionnaire. All parents consented to use the results of the questionnaire for research purposes.

On a scale of 1 to 5, the mothers' evaluation of the children's activity level and attention span both before and after the quarantine were recorded. A different set of questions was used to evaluate students' performance in online learning as well.

Statistical Analysis:

Statistical analysis was done using IBM© SPSS© Statistics version 23 (IBM© Corp., Armonk, NY, USA). Numerical data were expressed as mean and standard deviation or median and range as appropriate. Comparison of repeated measures of the scores was made using the Wilcoxon signed-ranks test. A *p-value* < 0.05 was considered significant.

RESULTS

Table 1 shows the baseline characteristics of the studied group. Only five boys (25%) received online therapy, and 6 (30%) were practicing sports during the quarantine.

Table 1: Baseline characteristics of the studied group (n=20).

	Value
Age (years)	6.0±0.5
Online Therapy	5 (25%)
Screen time during quarantine (Controlled/Increased)	1/19
Sports during quarantine	
Cycling	2 (10%)
Walking	2 (10%)
Cycling + Walking	1 (5%)

Data are expressed as mean±SD, or number (%)

Table 2: Change of total score, attention span, and activity levels after quarantine.

	Before Quarantine	After Quarantine	<i>p-value</i>
Total Score	51.0 (31.0-61.0)	86.0 (14.0-98.0)	< 0.001
Attention span	3 (2-3)	1 (1-4)	< 0.001
Activity level	3 (2-4)	4 (1-5)	< 0.001

Data are expressed as median (range)

After quarantine, the questionnaire's total score increased significantly compared to before quarantine (*p* < 0.001). Attention span decreased significantly, and activity levels increased significantly after quarantine (Table 2). The median online schooling score was 24 (range: 18-30). The score indicates problematic behavior in all children except one child.

The five kids who received rehabilitation sessions during quarantine had significantly lower total score before (*p* = 0.020) and after (*p* = 0.009) quarantine. They had median scores of 41 (range: 31-42) and 74 (14-78) before and after quarantine, respectively. The remaining 15 patients' scores were 50 (40-61) and 85 (68-98). The kid whose mother followed the home program had the lowest median score of 14 after quarantine in the whole group. He was the only boy with a score of 1 of activity level and the longest attention span of 4 hours after quarantine. He was also the only body with average online schooling performance while all others showed inadequate performance.

DISCUSSION

Our survey of parents of children with ADHD offered us the opportunity to show the impact of COVID-19 lockdown on their mental condition. The annual surveillance of these children provided comparative data of their ADHD status before the quarantine. Despite the small sample size of this study ($n=20$), it may be significant in providing robust statistical evidence of worsening symptoms of ADHD after the extended lockdown and school closure. Included children experienced worsening of all the attention and hyperactivity-impulsive symptoms after three months of at-home confinement. The attention span and activity levels increased significantly after quarantine. The median online schooling score was 24 (range: 18-30).

In fact, not much is known about the mental health effects of extensive outbreaks on children. Some research is available about the psychological impact of Severe Acute Respiratory Syndrome (SARS) on patients. But, evidence in children is scarce, particularly those with mental health disorders. The current study is a trial to bridge this noticeable gap in research.

The mechanism of the impact of lockdown can be thought of as a stressful life event that can exert a severe negative influence. Many studies reported depressive episodes in association with stressor events that show a dose-response relationship^[9]. Early studies from adults reported deteriorations in anxiety, mental health, and well-being during lockdown^[10-13]. It is reasonable to suspect that lockdown also negatively affects children's mental health and might have long-term adverse consequences on children and adolescents^[14]. This effect depends on the vulnerability factors in this age group, including the developmental age, educational status, and mental health condition^[15]. Loneliness in children may be followed by mental health issues, primarily depression^[16]. Suspended access to play and activities may harm mood homeostasis^[17]. Children struggling with mental health issues are affected due to the impact of lockdown on mental health services^[18].

Companionship is necessary for normal psychological development in children^[19]. Missing the caregivers put the child in a crisis state and might increase psychiatric problems^[20]. It was found that quarantined children were more likely to develop acute stress and adjustment disorders^[21]. School closing has a significant effect on children with mental health issues as the school routines are considered important coping mechanisms in this vulnerable group. When schools are closed, they lose an anchor in life that may worsen their symptoms.

Children are not immune to the COVID-19 epidemic's effects. They experience fears, worries, physical and social isolation. However, knowledge about children's responses to stressful adverse events during epidemics remains scarce^[22]. Many studies demonstrated common manifestations of psychological stress, including anxiety, depression, lethargy, impaired social interaction, and reduced appetite^[23-25]. A preliminary study from China showed that clinginess, distraction, and irritability are the most common psychological problems among children and adolescents aged 3-18 were. Children in the age group, 3-6 years, were more likely than older children to manifest symptoms, such as clinginess and fear of family members' infection. The authors implemented an online questionnaire incorporating the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria^[26]. Another study observed increased irritability, inattention, and clinging behavior in all children of all age groups^[27].

A study in Bangladesh assessed the mental health of children 5-15 years. The authors found depression, anxiety, and sleep disorder as common problems among these children^[28]. In Italy and Spain, parents of children aged 3 to 18 responded to a survey about their children's quarantine effects, compared to before the home confinement period. The authors reported changes in emotions and behavior in 85.7% of the children during the quarantine. The observed changes include difficulty concentrating (76.6%), boredom (52%), irritability (39%), restlessness (38.8%), and nervousness (38%)^[29]. A rapid systematic review of 63 studies showed an increased risk of depression after social isolation and loneliness. Duration of loneliness was strongly associated with mental health symptoms^[16].

It is evident that children with special needs, like those with ADHD, face more challenges during the lockdown. Their symptoms are likely to be aggravated due to obligatory restrictions and unfavorable environment. They also encounter difficulties in following instructions and understanding the complexity of the pandemic^[15]. Closure of schools and care clinics deprives these children of resource material, group interactions, and developing essential social and behavioral skills. These factors might lead to deterioration of the past behavior and relapse of symptoms^[4]. The chances of hyperactivity in ADHD children increases due to confinement in one place associated with heightened impulses. Therefore, it becomes difficult to engage these children in meaningful activities^[30].

In the current study, a small number of children benefit from online rehabilitation sessions and simple daily sports. These activities were associated with less severe symptoms after quarantine compared to children who did

not receive online rehabilitation sessions. A full therapeutic program had a considerable improving effect on one child. Therefore, adoption of this program might have a protective effect on children with ADHD during obligatory quarantine. However, we cannot generalize these findings owing to the small number of managed children.

We can conclude that COVID-19 lockdown and school closure have an adverse consequence on the severity of symptoms of children with ADHD. After quarantine, children had shortened attention span and high activity level. These children could not cope with online schooling; almost all of them showed a poor performance. We recommend online rehabilitation sessions to protect against symptom aggravation in these circumstances. Parents are encouraged to follow a broader home care program controlling screen time and encouraging playing sports so their children can tolerate the stress of quarantine and school deprivation.

SUMMARY

Children with Attention-deficit/hyperactivity disorder (ADHD) experienced significant troubles under the lockdown of the COVID-19 pandemic. This study aimed to assess the effect of the lockdown of the COVID-19 pandemic on the symptoms of ADHD in a group of school children. This cross-sectional study included 20 boys 5-7 years old with ADHD followed up in a private clinic. These children received an online schooling program for three months during the quarantine period. These children's parents were routinely interviewed in February for annual follow-up using the Vanderbilt assessment scale. The last annual questionnaire was used as a "Before-Quarantine" interview. The questionnaire was repeated during the first follow-up visit after the lockdown release to establish the "After-Quarantine" interview. The mothers' evaluation of the children's activity level and attention span both before and after the quarantine were recorded. A different set of questions was used to evaluate students' performance in online learning.

Only one child was under a full rehabilitation home program during the quarantine. Four more kids were committed to online rehabilitation sessions during the quarantine. After quarantine, the total median score of the Vanderbilt assessment scale increased significantly compared to before quarantine [51 (31-61) to 86 (14-98), $p < 0.001$]. Attention span decreased significantly ($p < 0.001$), and activity levels increased significantly after quarantine ($p < 0.001$). The median online schooling score was 24 (range: 18-30), indicating problematic behavior

in all children except one. The five kids who received rehabilitation sessions during quarantine had significantly lower total scores before ($p = 0.002$) and after ($p = 0.004$) quarantine. The kid who followed the full rehabilitation home program had the lowest median score of 13 after quarantine. It can be concluded that COVID-19 lockdown and school closure have a negative effect on the severity of symptoms of children with ADHD. These children showed a poor performance in online schooling. Online therapeutic rehabilitation sessions are recommended to improve symptoms during quarantine and school closure.

CONCLUSION

COVID-19 lockdown and school closure have a negative effect on the severity of symptoms of children with ADHD. These children showed a poor performance of online schooling.

LIST OF ABBREVIATIONS

ADHD: Attention Deficit/ Hyperactivity Disorder

SARS: Severe Acute Respiratory Syndrome

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