

Effects of COVID-19 Lockdowns on the development of educational, social and emotional gaps between the children - A Retrospective Chart Review

tanya ebert (✉ ebertster@gmail.com)

1. Department of Psychiatry, The Ruth and Bruce Rappaport Faculty of Medicine, Technion, Israel
Institute of Technology

Case Report

Keywords: COVID-19, psychiatric problems, children, adolescents, suicide attempts

Posted Date: April 7th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1532981/v1>

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Abstract

Objective

School closures due to the COVID-19 outbreak have affected the world's students physically, socially, and psychologically with an increase in the number of children and adolescent with anxiety, depression and drug abuse.

Methods

This study included 380 children evaluated in the outpatient Child Psychiatric Clinic, and were divided into two groups: before the lockdowns (BLD) (n = 248), from 1.2019 to 2.2020, and during the lockdowns (LD) (n = 132), from 3.2020 to 4.2021.

Results

When comparing the LD to BLD there was increase in suicide attempts (9.8% Vs 2.8%), in the use of psychotherapy (81% Vs. 56%), and a decrease in the diagnoses of behavior disorders (29.5% Vs 44.8%), and ADHD (29.5% vs. 50%) and decrease in stimulants use (22.7% Vs. 38%).

Conclusion

Many children may develop educational, social, emotional and behavioral gaps alongside the loss of skills in dealing with everyday problems due to social isolation during LD, emphasizing the importance of the education system.

Introduction

The spread of the Coronavirus disease 2019 (COVID-19) has caused many changes in society and has led to isolation and distancing, economic crises and environmental changes at the family, academic and interpersonal level, in the affected countries. Globally, early childhood centers, primary and secondary schools have experienced closures for a long time as part of COVID-19. These measures bring a loss of education time, restricted access to peers and loss of daily structure. On a global scale, 463 million children have been unable to access remote learning in 2020 (1). When early childhood centers, primary and secondary schools returned to work, they worked inconsistently due to illness of staff or children and their group isolation. A sense of uncertainty, deaths due of Coronavirus, and fear of becoming infected by Coronavirus, all led to an exacerbation of anxiety, depression, and avoidant behavior, deepening the mental difficulties in minors and adults that had existed before. In studies addressing the psychological effects of COVID-19 in China, the authors were able to show that more than half of the adults who participated in the study, about 53.8%, developed stress, depression and anxiety responses in the first

wave of the plague. 84.7% of them chose to stay at home most of the day (2). Fear and anxiety due to the spread of the coronavirus, as well as consequences of the economic crisis following the pandemic, led to an increase in conflicts and quarrels within the family and an increase in the incidence of abuse, drug use and suicide (3, 4). In the shadow of the economic and health crises there has been a significant decrease in emergency room visits due to physical and psychological complaints, in particular among children and adolescents during the pandemic period compared with the preceding year (5). This finding raises concerns that psychiatric problems among minors remain unmonitored and untreated (5–7). The reduction in referrals to mental health care could be explained in several ways, one of which is lack of educational staff's attention to students' distress (7). However, a study from England that examined changes in emotional symptoms, behavioral problems and hyperactivity/inattention, using an online survey about the child's mental health at two points between March and May 2020, during early lockdown, has shown a deterioration in mental health symptoms among preadolescent children (8). Similar results were shown in a prospective cohort study done in Japan, which found an increase in the number of schoolchildren with severe emotional/behavioral problems during the COVID-19 pandemic (9), as well as a recent Israeli study which found an increase in depression, eating disorders, anxiety and stress-related diagnoses during the COVID-19 period (10). A family atmosphere that depends on the parents' financial and health situation, the lack of support of an extended family and the quality of the familial relationship added to this complexity. There indirect effects of COVID-19, including disruptions to daily life that impact on mental health and wellbeing, disrupted family income and increased household stress (11). There are several studies which try to describe the immediate predict and long-term consequences of the lockdowns and the economic and health crisis, and try to formulate recommendations for educational staff and parents regarding their conduct toward children, but there is still a long way to go in understanding the consequences of the pandemic (12).

In the present study we aim to examine the impact of COVID-19 and lockdown on the mental health of minors during the pandemic period and to characterize the type and number of referrals to a regional psychiatric outpatient clinic. We assumed that during LD fewer minors would be referred to psychiatric evaluation due to behavioral disorders and there would be a decrease in diagnosis of ADHD and stimulants use because of closure of the educational system, which carries a large weight in the detection of psychiatric disorders in children, especially those with manifestations of behavioral disorders. At the same time, we assumed there would be an increase in anxiety, depression, suicide, and eating and drug abuse disorders.

Methods

In this study we compare the medical charts of minors who were brought for a first psychiatric evaluation during a period one year and two months before the lockdowns to the identical time period during lockdown.

Cohort group: The medical charts of 380 children were reviewed. All children were brought for a first psychiatric evaluation in the outpatient Child Psychiatric Clinic at the Hillel Yaffe Medical Center (Hadera,

Israel) between January 2019 and April 2021. We divided this study population in two groups: the first group includes minors who were brought for a first psychiatric evaluation during the time period between January 2019 to February 2020, before the lockdowns (BLD), and the second group includes minors who were brought for a first psychiatric evaluation in the time period between March 2020 to April 2021, during the lockdowns (LD). Demographics (age, gender, marriage, religious and socio-economic status, number of siblings and learning framework) and medical data (psychiatric heredity, medical comorbidity and children with developmental delay), the types of psychiatric diagnoses and recommended treatments were all taken from the medical records.

Statistical Analysis:

Descriptive statistics in terms of mean, standard deviation and percentage were performed for the all parameters in the study. Differences between the two groups (BLD vs. LD) according to quantitative parameters were tested by t-test. For categorical parameters, we used Fisher exact tests or Pearson chi square. Multivariate logistic regression models (with odds ratio and 95% confidence interval) were performed to: Suicide attempts, Suicide gesture, Drug use, PTSD, Depression, Anxiety disorder, Eating disorder, Behavior disorder and ADHD, according to BLD vs. LD groups and socio-economic status. SPSS version 27 was used for all statistical analysis. $P < 0.05$ was considered as significant.

Results

Demographics (Table 1): The BLD group includes a chart review of 248 children who were brought for a first psychiatric evaluation. Their demographic data were compared to the chart reviews of 132 children from LD. No clinically significant differences were found between the two groups in age, gender, marriage and socio-economic status, number of siblings and learning framework. However, we found a statistically significant increase in the number of referrals of minors from the religious population: in BLD 8.9% ($n = 22$) vs. LD 22% ($n = 29$), $p < 0.000$, OR = 2.9, and minors from families with first- or second-degree psychiatric heredity: in BLD 22.2% ($N = 55$) vs. LD 40.9% ($N = 54$), $p < 0.000$, OR = 2.43.

COVID-19 dependent Consequences (Table 2): There were no children who studied remotely in the BLD period; 94% of minors continued to study frontally. During the LD period most of children moved to study remotely: 68.2% ($n = 90$), due to closures of the education system, and only 21.2% ($n = 28$) continued to study frontally, most of them children from special education frameworks. Half of the children 50.4% ($n = 125$) in BLD were referred for the first psychiatric evaluation by educational staff compared to the LD period, when only 12.1% ($n = 16$) of children were referred by educational staff, $p < 0.000$, OR = 0.51. There was a statistically significant increase in the number of suicide attempts: 9.8% ($n = 13$) in LD vs. 2.8% ($N = 7$) in BLD, $p = 0.006$, OR = 3.75 and use of psychotherapy: 81% ($n = 107$) in LD vs. 56% (139) in BLD, $p < 0.000$, OR = 3.35, in LD. There was a statistically significant decrease in the number of children with behavior disorder: 29.5% ($n = 39$) in LD vs. 44.8% ($n = 111$) in BLD, $p < 0.000$, OR = 0.52; with ADHD diagnosis: 29.5% ($n = 39$) in LD vs. 50% ($n = 124$) in BLD, $p < 0.000$, OR = 0.42, and with stimulant use:

22.7% (n = 30) compared to the BLD: 38% (n = 95), $p = 0.002$, $OR = 0.47$. There was a statistically non-significant increase in the number of children with depression, anxiety and drug-use disorder.

COVID-19 dependent Consequences in low-income families (Table 3): In this table we compare the changes in psychiatric conditions in children and adolescents coming from low-income families. In this specific group the results were different from the general population. A statistically significant increase in depression: $OR = 2.69$, $p = 0.009$, drug use: $OR = 2.72$, $p = 0.053$, and behavioral disorders: $OR = 1.76$, $p = 0.011$, can be seen during the LD period in low-income families.

Table 1
Demographic Characteristics:

Characteristics	BLD: % (n)	LD: % (n)	P - value	OR
<i>Number of children referred for first psychiatric evaluation</i>	248	132		
<i>Male</i>	66% (164)	60% (79)	P = 0.26	Ref.
<i>Female</i>	34% (84)	40% (53)		1.31 (0.84–2.03)
<i>Age, mean ± SD</i>	10.5 ± 3.9	11.19 ± 4	P = 0.12	1.044 (0.984–1.102)
<i>Number of siblings, mean ± SD</i>	1.9 ± 1.5	2.11 ± 1.8	P = 0.33	1.065 (0.939–1.208)
<i>Single parents</i>	37% (92)	39% (52)	p = 0.66	1.102 (0.714–1.701)
<i>Low-income family</i>	33% (82)	33% (44)	p = 1.00	1.012 (0.647–1.858)
<i>Religious (Jewish) family</i>	8.9% (22)	22% (29)	p < 0.000	2.9 (1.58–5.27)
<i>Learning framework:</i>	3.6% (9)	8.3% (11)	p = 0.069	Ref.
- Without				0.45 (0.18 – 0.124)
- Regular	69% (171)	71.2% (94)		0.325 (0.121– 0.872)
- Special	27.4% (68)	20.5% (27)		
<i>Psychiatric heredity (family with first or second degree relatives)</i>	22.2% (55)	40.9% (54)	p < 0.000	2.43 (1.536–3.842)
<i>Medical Comorbidity</i>	3.2% (8)	6.8% (9)	p = 0.12	2.19 (0.826–5.830)
<i>Children with developmental delay</i>	19% (47)	17.4% (23)	p = 0.78	1.108 (0.714– 1.701)

Table 2
COVID-19 dependent Consequences:

Characteristics	BLD: % (n)	LD: % (n)	P -value	OR
<i>Referring factor:</i>	46.4% (115)	84.9% (112)	p < 0.000	Ref.
by parents	50.4% (125)	12.1% (16)		0.131 (0.073–0.235)
by educational staff	3.2% (8)	3% (4)		0.513 (0.15–1.733)
by social services				
<i>Form of learning:</i>	94% (233)	21.2% (28)	p < 0.000	na
frontal learning	0%	68.2% (90)		
remote learning	6% (15)	10.6% (14)		
<i>without academic framework</i>				
<i>Social difficulties</i>	23.4% (58)	18.2% (24)	p = 0.29	0.73 (0.43–1.24)
Suicide attempts	2.8% (7)	9.8% (13)	p = 0.006	3.75 (1.46–9.63)
<i>Suicide gesture and threat</i>	12.9% (32)	8.3% (11)	p = 0.23	0.61 (0.299–1.261)
<i>Drug use</i>	3.6% (9)	5.3% (7)	p = 0.43	1.48 (0.541–4.09)
<i>PTSD</i>	1.6% (4)	1.5% (2)	p = 1.00	0.94 (0.17–5.19)
<i>Depression Disorder</i>	6.5% (16)	11.4% (15)	p = 0.11	1.86 (0.88–3.84)
<i>Anxiety Disorder</i>	28.6% (71)	37.9% (50)	p = 0.083	1.52 (0.973–2.37)
<i>Eating Disorder</i>	3.6% (9)	1.5% (2)	p = 0.34	0.41 (0.087–1.091)
<i>OCD</i>	6% (15)	3.8% (5)	p = 0.47	0.61 (0.217–1.72)
<i>Psychotic Disorder</i>	3.6% (9)	4.5% (6)	p = 0.78	1.27 (0.44–3.633)
Behavior Disorder	44.8% (111)	29.5% (39)	p = 0.004	0.52 (0.33–0.81)
ADHD	50% (124)	29.5% (39)	p < 0.000	0.42 (0.27–0.657)
Stimulant use	38% (95)	22.7% (30)	p = 0.002	0.47 (0.293–0.766)
<i>SSRIs drug use</i>	15% (37)	22% (29)	p = 0.09	1.61 (0.936–2.76)
<i>Antipsychotic drug use</i>	26% (65)	24% (32)	p = 0.71	0.91 (0.55–1.47)
Psychotherapy	56% (139)	81% (107)	p < 0.000	3.35 (2.031–5.547)

- SSRIs: FLUOXETINE, ESCITALOPRAM, SERTRALINE
- Antipsychotic drugs: RISPERDAL, QUETIAPINE, OLANZAPINE, CLOTHIAPINE, ARIPIPRAZOLE

Table 3
 COVID-19 dependent Consequences in low-income families:

	Odds ratio	Lower- Upper	p-value
Suicide attempts			
Group: LD vs. BLD	3.75	1.46–9.65	P = 0.006
low-income family	1.37	0.539–3.479	P = 0.51
Suicide gesture and threat			
Group; LD vs. BLD	0.61	0.29–1.26	p = 0.18
low-income family	1.71	0.896–3.59	P = 0.10
Drug use			
Group; LD vs. BLD	1.49	0.54–41.1	P = 0.44
low-income family	2.72	0.98–7.48	P = 0.053
PTSD			
Group; LD vs. BLD	0.94	0.17–5.2	P = 0.94
low-income family	2.04	0.41–10.26	P = 0.38
Depression			
Group; LD vs. BLD	1.88	0.89–3.96	P = 0.098
low-income family	2.69	1.27–5.67	P = 0.009
Anxiety Disorder			
Group; LD vs. BLD	1.52	0.97–2.38	P = 0.066
low-income family	1.17	0.74–1.85	P = 0.50
Eating disorder			
Group; LD vs. BLD	0.41	0.086–1.92	P = 0.26
low-income family	0.195	0.025–1.54	P = 0.12
Behavior disorder			
Group; LD vs. BLD	0.51	0.32–0.805	P = 0.004
low-income family	1.76	1.14–2.74	P = 0.011
ADHD			
Group; LD vs. BLD	0.42	0.27–0.65	P < 0.001

	Odds ratio	Lower- Upper	p-value
low-income family	1	0.64–1.55	P = 1.00

Discussion

This study evaluated the impact of the COVID pandemic on demographic, medical characteristics and the cause for the initial psychiatric evaluation of minors who were brought to our outpatient clinic in the BLD period compared to a similar period (13-month) during the LD. Our main results are a decrease in the number of children who were referred for the first psychiatric evaluation in LD period. Probably the fear of being exposed to COVID-19 and the paralysis of the educational system brought about this phenomenon. Our findings correspond to previous studies which showed a significant decrease in the number of referrals to general and psychiatric emergency rooms among the population of children and adolescents at the beginning of the spread of the pandemic (5–7). It is also possible that for some of the minors, the reduction in demands of the education system could lead to a decrease in certain kinds of difficulties in the initial stage of the LD period, or that they would remain undetected.

No statistically significant difference was found in demographic characteristics such as sex, age, marital or socioeconomic status of the families and medical comorbidity of the children. There was an interesting finding that demonstrates a statistically significant increase in the number of children coming from religious families during the LD period. A possible explanation for the increase in the number of referrals from the religious population is the decrease in social support, which has great importance due to families' inability to meet with extended family, go to synagogues and vent the internal tensions and pressures experienced by each family. We found a statistically significant increase in the number of referrals from families with first- or second-degree psychiatric heredity. We assumed that economic and family pressures resulting from the lockdowns, fears of COVID-19 infection and social isolation in a vulnerable population caused outbreaks of psychiatric disorders more frequently in families with psychiatric heredity. We found that during the LD period most of the children were referred by their parents, compared to the BLD period when about half of the children were referred by educational staff. There was no statistically significant difference between the two groups in relation to educational framework, whether it was a special education framework or a regular education. In the LD group only 21.2% continued to study frontally. These were children who studied in special education learning frameworks. Sixty eight percent of children (68%) from a regular education framework studied remotely during the LD period. A higher percentage of children dropped out of school during the LD period compared to the BLD period, but the difference was not statistically significant. The explanation for this, among other things, was the inability of the educational staff to monitor the children's school attendance well due to the LD period. The isolation's influence on children's mental health and the number of children who committed self-harm or suicidal attempts tripled during the LD period and the difference was significant. The incidence of depression was doubled during the LD period, but the difference was statistically significant in low-income families. These findings reflect an injury to minors' emotional

development through a reduction in group mutual support, a lack of support from the education system and a lack of a healthy routine that would allow regulation of stress and anxiety in minors. A similar finding was found in different studies around the world (13–20). Conflicting data are reported in the literature regarding the incidence of anxiety disorder, OCD, psychotic disorders and PTSD. Our study did not find a significant difference in the incidence of those disorders. Our results matched the findings from a recent study evaluating the American adolescent. They also demonstrated similar incidence in anxiety, depression and stress-related disorders during LD periods (21). There was a statistically significant increase in adolescents' drug use in low-income families. There was a decrease in the number of children suffering from eating disorders and we anticipated that the reason was referral of these cases to specialized units or centers.

We observed a statistically significant reduction in children with behavioral disorders and ADHD diagnosis during the LD period with a parallel statistically significant reduction in recommendations for stimulant medications in the general population. We assumed that this phenomenon related to a decrease in educational staff attention and detection of learning and behavior problems. Interestingly, among low-income families our findings were different. We found in that group a statistically significant increase in the number of children with behavior problems. We assume that it was related to larger psychological and economic pressures in low-income families. No difference was observed in the number of children who were recommended to be given antipsychotic treatment, however, a non-significant increase in the recommendation for SSRI use was observed during the LD period. Moreover, statistically significant more children were referred for psychotherapy during the LD period compared to the last year before the LD.

The strength of this study is that it compared data from a psychiatric regional out-patient clinic which evaluated each patient personally and separately and all intakes were done by professional psychiatrists, in contrast to other studies which used data from surveys or a database.

Conclusions

In our study, we found a significant change in the characteristics of the referrals for the first psychiatric evaluation. Therefore, it can be seen that indirect effects of COVID-19 include the disruptions to daily life that impacted on mental health and wellbeing, delayed health-seeking behaviors, disrupted family income and increased household stress. These indirect effects were associated with higher suicide attempts and an increase in depression rate among children, with a parallel decrease in referrals for first psychiatric evaluation because of behavioral disorders, ADHD diagnosis and stimulant drug use. The educational system has great importance in identifying learning and behavioral difficulties among children. It is likely that during the LD period many children may develop educational, social, emotional and behavioral gaps alongside the loss of skills in dealing with everyday problems. More research is needed to understand the trajectory of adolescents' mental health experiences during the COVID-19 pandemic, including the long-term impact of the lockdowns and social isolation. In the case of LD and

social isolation, it is important to develop national programs to monitor the mental state of children and provide support for children and their families.

Limitation

This study represents a specific group of children and adolescents who have reached a psychiatric assessment and the results do not reflect the mental health problem in the general population. This is a retrospective study and the size of the groups was relatively small.

Declarations

Disclosures

Drs. Tanya Ebert, Nimrod Goldschmid, Edmond Sabo and Efrat City-Elifaz had no conflicts of interest or financial ties to disclose.

Summary

School closures due to the COVID-19 outbreak have affected the world's students physically, socially, and psychologically with an increase in the number of children and adolescent with anxiety, depression and drug abuse. This study included 380 children evaluated in the outpatient Child Psychiatric Clinic, and were divided into two groups: before the lockdowns (BLD) (n=248), from 1.2019 to 2.2020, and during the lockdowns (LD) (n=132), from 3.2020 to 4.2021. Our main results are a decrease in the number of children who were referred for the first psychiatric evaluation in LD period. No statistically significant difference was found in demographic characteristics such as sex, age, marital or socioeconomic status of the families and medical comorbidity of the children. When comparing the LD to BLD there was increase in suicide attempts (9.8% Vs 2.8%), in the use of psychotherapy (81% Vs. 56%), and a decrease in the diagnoses of behavior disorders (29.5% Vs 44.8%), and ADHD (29.5% vs. 50%) and decrease in stimulants use (22.7% Vs. 38%). The educational system has great importance in identifying learning and behavioral difficulties among children. These findings reflect an injury to minors' emotional development through a reduction in group mutual support, a lack of support from the education system and a lack of a healthy routine that would allow regulation of stress and anxiety in minors. Many children may develop educational, social, emotional and behavioral gaps alongside the loss of skills in dealing with everyday problems due to social isolation during LD, emphasizing the importance of the education system.

Ethics approval and consent to participate: The name of the Ethics Committee is: HYMC-0032-21 and the Ethical Approval Number: 45405

Consent for publication: Not applicable

Availability of data and materials: There a retrospective chart review

Competing interests: Not applicable

Funding: Not applicable

Authors' contributions: Not applicable

Acknowledgements: Not applicable

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