Original Article

Telemental Health Assessment of Adolescents During the COVID-19 Pandemic: A Follow-up Study

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ABSTRACT

Aim: This study aimed to understand how the pandemic has affected the mental health of adolescents with a previous psychiatric diagnosis.

Materials and Methods: Fifty-nine patients aged 12-18 years who had been previously followed up in the adolescent mental health unit were included in this study. The participants were interviewed via telephone between June-July, 2020 and December, 2020-January 2021. Their socio-demographic data, psychiatric diagnoses and the previous Clinical Global Impression (CGI) scores were obtained from the patient files. The clinical global follow-up scale was scored by the interviewing physician.

Results: Past CGI scores before the pandemic were significantly greater for those participants with more than one psychiatric condition (p=0.024). For those participants with more than one psychiatric condition, the difference between the CGI scores prior to the pandemic and during the early stages of the pandemic were significant (p=0.004). The total satisfaction scores for telepsychiatry services assessed via the telemedicine evaluation form were statistically higher for those participants with a single psychiatric disorder (p=0.023). The past and early pandemic CGI scores were found to be inversely correlated with the telemedicine evaluation form with r=-0.338, p=0.019, r=-0.353 p=0.014, respectively.

Conclusion: The present study offers a perspective for adolescent mental health during the pandemic, underlining the importance and caveats of healthcare delivery to the youth with mental health problems during lockdown.

Keywords: Child and adolescent psychiatry, COVID-19 pandemic, mental health, telemental health, telepsychiatry

Introduction

The coronavirus disease-2019 (COVID-19) pandemic has placed severe strains on mental healthcare services and its delivery worldwide (1-5). To control the transmission of the virus and prevent the exhaustion of healthcare resources, social distancing and quarantine measures were implemented across the globe. Anxiety towards an uncertain future created by a potentially mortal virus, and a marked disruption in the daily lives of the youth and adults alike created an immense burden on mental health (6,7). The closure of schools, special education and rehabilitation centers, and social skills groups are likely to cause psychological distress for children and adolescents with neurodevelopmental disorders (8,9). Mandated quarantine or the home confinement imposed on children and their caregivers might increase the risk of developing anxiety, depressive, stress and trauma-related conditions as well as relapses of existing psychiatric disorders (3,8,10,11).

While promoting mental health is an essential aspect of dealing with the COVID-19 pandemic, allocating available resources to infectious diseases and pulmonary care has been unavoidable. The reallocation of resources, combined with precautions to curb the spread of the virus such as social distancing policies resulted in the abatement of inpatient psychiatry unit capacities and severe restrictions on or outright suspension of outpatient psychiatric services in certain areas (4). Telemental health, where available, has replaced outpatient clinics to meet the needs of the youth and adults with mental disorders and disabilities with promising results (12-14). The present study aimed to understand how the pandemic affected the mental health of adolescents with a previous psychiatric diagnosis during it's the onset and progression of the pandemic.

Materials and Methods

Study Design

Sixty-seven patients with an appointment in the adolescent mental healthcare Clinic during the early stages of the pandemic (June 30th-July 30th, 2020) during which social distancing, mandated curfew policies were introduced were recruited for this study. During this time, telemental health approaches were implemented, and a psychiatric interview was conducted via telephone. A parent of the patient was also interviewed. The interview was structured into three sections via a questionnaire prepared by the authors: an interview with the patient comprising psychiatric complaints and neurovegetative changes, which included questions pertaining to sleep and alimentation habits based on the patients' subjective experiences, an interview with the parent, and a clinical assessment translated into a composite CGI score and medical or behavioral intervention if necessary. The participants were reevaluated after 6 months (December 30th 2020-January 30th 2021). Eight participants were unable to be reached and were excluded from this study; a total of 59 participants were contacted for follow-up. Socio-demographic data, psychiatric diagnoses assigned according to the DSM-5 criteria and other medical information were gathered retrospectively from the patients' health records. A telemedicine evaluation form prepared by the authors was also implemented in order to assess the effectiveness of the telemental healthcare services provided. Informed consent was sought from all participants and their legal guardians.

Measures

Clinical Global Impression (CGI): CGI is a measure of psychiatric symptom severity and treatment response, utilized in various settings and multiple countries as an effective assessment of the severity of mental disorders (15).

Telemedicine Evaluation Form: This form was comprised the following five five-point Likert questions: "I was able to understand the clinician clearly during the telemental interview.", "The telemental interview was as good as in person interviews.", "I would be falling behind on my work/school/chores if the interview wasn't conducted remotely.", "My family is satisfied with telemental health services." and "I am satisfied with telemental health services." This form was prepared by the authors to assess the effectiveness of telehealth and the participants' satisfaction.

Ethical Considerations

Permission to conduct this study was obtained from the Ege University Medical Research Ethics Committee (28.05.2020-20-5.1T/2) and the hospital where the research was performed.

Statistical Analysis

Statistical analyses were conducted with International Business Machines Statistical Package for the Social Sciences statistics v25.0. The Shapiro-Wilk test was utilized to assess the normality of the distribution. Gender and comorbidities were assigned as independent variables and intergroup changes in CGI and sleep duration were assessed with the Mann-Whitney U test. Categorical variables of gender, comorbidities and changes in appetite were assessed with pearson's chi-squared test and are presented in cross-tabulation. Changes during the follow-up in paired samples were assessed with the Wilcoxon ranked sum test. All non-parametric tests were two-tailed, and p-values <0.05 were considered statistically significant for all statistical analyses.

Results

Of the 59 patients participating in our study, n=36 (61%) were female and n=23 (39%) were male. The mean age of all participants was 15.94 (±1.43) years with the minimum and maximum values being 12 and 18, respectively. The relevant sociodemographic data and psychiatric diagnoses of the participants are summarized in Table I.

Changes in appetite and alimentation habits were assessed and while n=27 (45.8%) reported no changes during either interview, n=32 (54.2%) reported an increase, decrease or irregularities in their eating habits compared

Table I. Socio-demographic data and psychiatric diagnoses of the participants			
	Single psychiatric diagnosis (n=30)	**>1 psychiatric diagnoses (n=29)**	**Total number of patients (n=59)**
Age, mean, (SD)	15.7 (1.57)	16.20 (1.23)	15.94 (1.43)
Gender, n (%)			
Male	10 (33.3)	13 (44.8)	23 (39.0)
Female	20 (66.7)	16 (55.2)	36 (61.0)
Education, n (%)			
Primary education	3 (10.0)	3 (10.3)	6 (10.2)
Secondary education	27 (90.0)	26 (89.7)	53 (89.8)
Psychiatric diagnoses, n (%)			
ADHD	8 (13.6)	21 (35.6)	29 (49.2)
Conduct disorder	0 (0.0)	5 (8.5)	5 (8.5)
Major depressive disorder	7 (11.9)	17 (28.8)	24 (40.7)
Anxiety disorder	11 (18.6)	12 (20.3)	23 (39.0)
Specific learning disorder	0 (0.0)	4 (6.8)	4 (6.8)
Autism spectrum disorder	0 (0.0)	1 (1.7)	1 (1.7)
Obsessive-compulsive disorder	1 (1.7)	4 (6.8)	5 (8.5)
Post-traumatic stress disorder	1 (1.7)	0 (0.0)	1 (1.7)
Tic disorder	0 (0.0)	1 (1.7)	1 (1.7)
Enuresis	1 (1.7)	0 (0.0)	1 (1.7)
Communication disorder	0 (0.0)	1 (1.7)	1 (1.7)
Affective disorder	1 (1.7)	2 (3.4)	3 (5.2)
Psychosis	0 (0.0)	0 (0.0)	0 (0.0)
Conversion disorder	0 (0.0)	2 (3.4)	2 (3.4)
Panic disorder	1 (1.7)	0 (0.0)	1 (1.7)
Maternal age, mean (SD)	44.0 (4.84)	44.87 (6.42)	44.45 (5.67)
Maternal education (completed), n (%)			
None	0 (0.0)	1 (4.0)	1 (2.0)
Primary	11 (23.9)	12 (26.1)	23 (50.0)
Secondary	7 (15.2)	7 (15.2)	14 (30.4)
Tertiary	3 (6.5)	5 (10.9)	8 (17.4)
Paternal age mean (SD)	48.13 (5.60)	49.20 (7.33)	48.69 (6.51)
Paternal primary education, n (%)			
None	0 (0.0)	1 (2.2)	1 (2.2)
Primary	9 (19.6)	13 (28.3)	22 (47.8)
Secondary	7 (15.2)	6 (13.0)	13 (28.3)
Tertiary	5 (10.9)	5 (10.9)	10 (21.7)
n: Number, SD: Standard deviation, ADHD: Attention deficit hyperactivity disorder			

to their previous psychiatric assessments. In contrast, n=31 (52.5%) patients reported stable appetite and feeding habits in the follow-up interview, and n=28 (47.5%) reported an increase, decrease or irregularities. Changes in sleep habits were assessed and n=19 (32.2%) reported no changes during their initial interview while n=1 (1.7%), n=10 (16.9%) and n=29 (49.2%) reported decreased, increased or irregular sleep (shifts in day-night cycles, mid-day sleep, staying up late and sleeping in etc.), respectively. An increase or decrease in the duration or irregularities in sleep patterns were reported by n=37 (62.7%) participants in the follow-up interview, with n=7 (11.9%), n=5 (8.5%), and n=25 (42.4%) reporting an increase in sleep duration, a decrease in sleep duration and irregularities in sleeping habits compared to the pre-pandemic period, respectively. Twenty-two participants (37.3%) reported no changes in their sleep patterns in comparison to the pre-pandemic period. The mean sleep duration in the early and later phases of the pandemic was 9.67 (±1.71) and 8.10 (±3.46) hours with median sleep durations being 10 and 9 hours, respectively. This difference was found to be statistically significant (p=0.041). The changes in alimentation and sleep habits during the early and late phases of the pandemic are summarized in Table II.

The median values of CGI for each period for those participants with a single psychiatric disorder (n=30) and those with more than one psychiatric condition (n=29) were compared. The CGI scores prior to the pandemic between the two groups were significantly greater for those participants with more than one psychiatric condition (p=0.036). However, no significant differences were found in the CGI scores in the early (p=0.847) or later stages (p=0.496) of the pandemic compared to the pre-pandemic period. Subsequently, changes in the CGI scores across the time periods in each group were separately analyzed. For those participants with a single diagnosed psychiatric disorder, no significant changes across the three designated time periods were observed. However, for those participants with more than one comorbid psychiatric conditions, CGI scores were conversely decreased following the pandemic, with the difference between the median CGI scores prior to the pandemic and during the early stages of the pandemic being significant (p=0.002). No significant differences in the CGI scores between the other periods were observed. The CGI scores of the participants, the differences among the groups and changes in the CGI scores over time are summarized in Table II and III, respectively.

The telemedicine evaluation form prepared by the authors was utilized to assess the participants' general satisfaction with telephone based telemental health. Of the 59 participants, 48 accepted to complete the telemedicine evaluation form via telephone. No item in the form was found to be statistically significant between those participants with a single or more than one co-occurring psychiatric disorder. However, the total satisfaction scores were statistically higher for those participants with a single psychiatric disorder (p=0.023). The telemedicine evaluation form and associated data are summarized in Table IV and V.

Table II. Changes in alimentation and sleep habits during the early and late phases of the pandemic

Neurovegetative habits, n (%)	Early pandemic				Late pandemic				
	Regular	Increase	Decrease	Irregular	Regular	Increase	Decrease	Irregular	p-value
Appetite/Alimentation habits	27 (45.8)	18 (30.5)	8 (13.6)	6 (10.1)	31 (52.5)	9 (15.3)	11 (18.6)	8 (13.6)	-
Sleep habits	19 (32.2)	10 (16.9)	1 (1.7)	29 (49.2)	22 (37.3)	7 (11.9)	5 (8.5)	25 (42.4)	-
Sleep continuance, mean (SD)	Early pandemic				Late pandemic				
Sleep duration (h)	9.67 (1.71)				8.10 (3.46)				0.04*

*p-values less than 0.05 were considered statistically significant
n: Number, SD: Standard deviation

Table III. The CGI scores of participants with a single and more than one psychiatric diagnoses

CGI scores	Single psychiatric diagnosis (n=30)		>1 psychiatric diagnoses (n=29)		p-value
	Median	Mean (SD)	Median	Mean (SD)	
Past CGI scores (Prior to the pandemic)	3.0	2.76 (0.23)	4.0	3.48 (0.23)	0.036*
CGI scores early pandemic	3.0	2.70 (0.20)	3.0	2.82 (0.17)	0.847
CGI scores late pandemic	3.0	2.70 (0.26)	3.0	3.07 (0.21)	0.496

*p-values less than 0.05 were considered statistically significant
n: Number, SD: Standard deviation, CGI: Clinical Global Impression

Table IV. The changes in CGI scores of participants over time

CGI scores	Single psychiatric diagnosis (n=30)	>1 psychiatric diagnoses (n=29)
	p-value	p-value
CGI past-CGI early pandemic	0.617	0.002[*]
CGI early-CGI late pandemic	0.869	0.307
CGI past-CGI late pandemic	0.696	0.159

[*]p-values less than 0.05 were considered statistically significant
n: Number, CGI: Clinical Global Impression

Table V. The telemedicine evaluation form satisfaction scores between those participants with a single and more than one psychiatric disorder

Telemedicine evaluation form items	Single psychiatric diagnosis (n=24)		>1 Psychiatric diagnoses (n=24)		p-value
	Median	Mean (SD)	Median	Mean (SD)	
1. I could easily hear the doctor during the telemedicine interview	4.0	4.37 (0.71)	4.0	4.04 (0.95)	0.193
2. The telemedicine interview was as good as a face-to-face interview	3.5	3.25 (1.03)	2.0	2.75 (1.07)	0.065
3. If it wasn't for telemedicine, I would have been behind on my school/work	2.0	2.70 (1.12)	2.0	2.45 (1.10)	0.356
4. My family is satisfied with telemedicine	4.0	4.08 (0.50)	4.0	3.83 (0.96)	0.463
5. I am satisfied with telemedicine	4.0	3.83 (0.70)	4.0	3.54 (0.88)	0.266
6. Telemedicine evaluation form total scores	18.0	18.25 (2.54)	16.0	16.62 (2.73)	0.023[*]

[*]p-values less than 0.05 were considered statistically significant
n: Number, SD: Standard deviation

The past and pandemic era CGI scores were found to be inversely correlated with the telemedicine evaluation form with r=-0.338 p=0.019, r=-0.353 p=0.014, respectively. The correlation between the CGI scores during the follow-up and the telemedicine evaluation form scores were found to be statistically non-significant (r=-0.243, p=0.097).

Discussion

The disruption of the daily routines of adolescents and their parents alike was significant in the present unprecedented health crisis of the modern era. Changes in daily routines brought with them changes in neurovegetative habits. A significant increase in sleep duration in the present study during the later stages of the pandemic without significant impairment in psychosocial functioning may be attributed to an increase in free time. This is in line with the extant literature as an increase in sleep duration was reported during school-closures resulting from the pandemic (16).

Significant difficulties in adjusting to online education were reported by the parents of those children with attention deficit hyperactivity disorder (ADHD) during the pandemic.

ADHD and being part of an individualized education program seem to be among the challenges in the adaptation to remote learning during the COVID-19 pandemic, (17,18) especially for those children and adolescents with additional neurodevelopmental disorders (19,20). However, the increase in depressive and anxiety symptoms associated with the changes in daily living and support networks in the lives of children and adolescents during the pandemic should also be taken into account, especially for those youth with neurodevelopmental disorders, in the assessment of the mental effects brought about by the lockdown (21). While developmental disorders such as ADHD, depressive and anxiety symptoms all contribute to the deterioration of psychosocial functioning, an interesting finding of the present study, contrary to our hypothesis, are the changes in psychosocial functioning across time. While no significant changes in CGI scores were observed for those participants with a single psychiatric condition, a decrease in the CGI scores, marking an improvement in psychosocial functioning, was observed in the early stages of the pandemic for those youth with more than one comorbid psychiatric diagnosis. While an increase in psychiatric

symptoms in various settings during the pandemic was previously reported, a possible explanation of our results might be the alleviation of social and academic pressures during the pandemic, especially for those youth with the aforementioned developmental problems such as ADHD and depressive or anxiety symptoms/disorders. Suspension of in-person education facilities and the adoption of online education, combined with a marked reduction in the peer-related social pressures of adolescence might have relieved stress in those youth with good support systems in place (i.e., supportive and caring parents with established productive hobbies and pastimes), resulting in an overall improvement in their mental health and preventing the worsening of any previously diagnosed psychiatric conditions (22-24).

These findings are also in line with CGI scores increasing for the aforementioned group, albeit non-significantly from a statistical standpoint, as the later phases of the pandemic were marked with an increase in uncertainty towards the future, a possible increase in financial strains and the reintroduction of social and academic stresses with policies being implemented in favor of normalization i.e., schools reopening on certain days of the week along with academic examinations. A recent study from England reported an increase in self-rated emotional and functional diffculties as well as depressive mood after school re-openings during the COVID-19 pandemic (25). Similarly, an increase in psychiatric symptoms, diagnoses, and psychotropic medication use in youth was reported in several studies in the later phases of the pandemic. As such, better follow-up and assessment of those youth with existing psychiatric disorders is advised in order to minimize the possible distress and exacerbations this population might experience as the pandemic progresses (26,27).

Study Limitations

The major limitation of the present study is the small sample size. Although the pandemic itself imposed certain limitations on study design, further studies with an emphasis on prospective research with more sizable samples are needed to accurately assess the effects of the pandemic on mental health and the utility telemental approaches.

Conclusion

Different telemedicine approaches ranging from telephone-based interviews to videoconference calls were utilized before and during the pandemic (28,29). Our study provides an understanding into the lesser employed telephone-based telemedicine practices for psychiatric evaluation. While effective for follow-up purposes, the marked dissatisfaction of those youth with multiple comorbid psychiatric disorders may indicate that telephone-based telepsychiatry is inefficient in the assessment of those youth with complex psychiatric needs. However, the inverse correlation between the CGI scores and telemedicine satisfaction scores underlines a critical aspect of the pandemic for those youth with multiple psychiatric disorders. Our study highlights that those youth with lower prior and pandemic CGI scores were more satisfied with receiving the psychiatric help they required, although this association disappeared as the pandemic progressed.

Overall, the effects of the pandemic on mental health fluctuated across different time periods and varied for different cultures and populations. The present study offers a perspective for adolescent mental health across the pandemic for those adolescents with mental health issues prior to the pandemic. However, multicenter and nationwide population-based studies are needed to validate the results of the present study concerning the effects of the pandemic on adolescent mental health, as the data procured from a single tertiary adolescent mental health clinic does not represent the colorful and varied experiences of all adolescents during the pandemic.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the Local Ethics Committee of Ege University Medical Research Ethics Committee (28.05.2020-20-5.1T/2)

Informed Consent: Informed consent was taken from the participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: B.Ş.P., T.Ö., F.A., S.H., B.Ö., Z.Y., Concept: B.Ş.P., D.Ç., T.Ö., G.C., T.B., Design: B.Ş.P., İ.İ.K., S.K., B.Ö., Z.Y., S.E., T.B., Data Collection and/or Processing: B.Ş.P., İ.İ.K., D.Ç., T.Ö., F.A., S.H., Analysis and/or Interpretation: İ.İ.K., G.C., S.K., S.E., Literature Search: İ.İ.K., D.Ç., T.Ö., F.A., S.H., Writing: B.Ş.P., İ.İ.K., D.Ç.

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