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Factors contributing to distress among school and college-going adolescents during COVID-19 Lockdown: A cross-sectional study conducted in Sibi Balochistan, Pakistan

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Abstract:

BACKGROUND: Due to the COVID-19 pandemic, many countries have implemented nationwide lockdowns. While this leads to a decrease in disease transmission, there is a concurrent increase in the levels of psychological distress. To estimate the levels of psychological distress in school- and college-going adolescents currently under lockdown and to determine the factors associated with this psychological distress.

MATERIALS AND METHODS: A cross-sectional study conducted in Army Public School and College (APSAC) Sibi, Balochistan province of Pakistan between March and May 2020. Students of APSAC Sibi were enrolled in this research. Modified Kuppaswamy Socioeconomic Scale, Godin Leisure-Time Exercise Questionnaire, and Kessler-10 were used for data acquisition. Chi-square and *t*-tests and univariate analysis (nonparametric test) were performed using the Statistical Package for the Social Sciences (SPSS) version 23.0 (IBM, Armonk, US).

RESULTS: Out of 225 participants, 57.4% were studying at school. Sixty-four percent of the participants were likely to be suffering from psychological distress. There is a significant effect of physical activity, sleep duration, bedtime at night, screen-time duration, and COVID-19 positive family member on the levels of distress. A moderate positive correlation was between psychological distress and bed-time at night ($r_{ho}[223] = 0.328, P < 0.001$) and screen time duration ($r_{ho}[223] = 0.541, P < 0.001$). A moderate negative correlation of physical activity ($r_{ho}[223] = -0.340, P < 0.001$) and a weak negative correlation of sleep duration hours ($r_{ho}[225] = -0.158, P = 0.018$) was found with psychological distress levels.

CONCLUSIONS: The COVID-19 lockdown and pandemic have had a considerable psychological impact on both school-going and college-going students, showing increased level of stress. A strong public health campaign along with mental and physical and social support programs are the need of the hour.

Keywords:

Adolescent, COVID-19, pandemic, psychological distress, quarantine, students

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Introduction

In December 2019, Wuhan City, Hubei, saw a bizarre upsurge of pneumonia

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cases of unknown etiology, which was identified as a novel coronavirus and coined the name COVID-19 by the World Health

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Organization (WHO). Shortly after, it was declared that the outbreak of COVID-19 imposed a severe concern to countries with unstable health-care systems and termed a Public Health Emergency of International Concern by the WHO.^[1]

Taking into account the ruthless severity of the disease and the alarmingly rapid spread of the disease beyond China, the WHO officially declared the novel coronavirus (COVID-19) outbreak a global pandemic on March 11, 2020.^[2]

The exponential spread of an infectious disease is an adverse event resulting in a serious and imminent threat to the lives of many of the worlds' population, thus triggering an amalgam of the public's self-relevant emotions.^[3] As the outbreak of COVID-19 ensued in China, a large online study was conducted to rate the impact of the outbreak on mental health, and 54% of the participants rated the outbreak to impact their mental health from moderate to severe with depressive symptoms often stated.^[4]

The incidence of psychological crises is drastically increasing owing to the negative impact on the mental health of the population surrounded by such public health emergencies resulting from COVID-19.^[5] Once confirmed or suspected as a case of the COVID-19, patients experience fear and potential death due to the lethal virus and a multitude of heightened feelings resulting from the imposed quarantine leading to boredom, frustration, and loneliness. Other related features of the illness, such as fever, shortness of breath, hypoxia, excessive coughing, and adverse effects of treatment, further affect the patient's morale. Reports included a range of psychiatric morbidities noticed in the early phase of the outbreak, including depression, anxiety, panic attacks, psychomotor excitement, delirium, and even suicidality.^[6]

The first report of a COVID-19 case in Pakistan came from Karachi on February 26, 2020.^[7] In response, the government mainly focused on the quarantine and self-isolation of either infected or suspected individuals.^[8] Furthermore, they announced a nationwide lockdown, which included the closure of educational institutions at every level. This not only interrupted the teaching for students, but also the closure coincided with a critical local assessment period. Many examinations were postponed or cancelled, further fuelling the stress and uncertainties that plagued these students.^[9]

Other factors contribute to psychological stress in this demographic as well, increased screen time being one of them. A study conducted by Imran *et al.* attributes this to excessive exposure to media, which is focused on creating

sensationalism and spreading misinformation.^[10] This is further confirmed by studies that show a higher level of distress among young adults as compared to juveniles.^[11] Another recently conducted study reveals that young adults mostly use social media for obtaining information, which can further trigger stress.^[12] Furthermore, the quarantine itself has a negative psychological impact, causing significant distress and confusion.^[13]

The extent of the psychological impact of this situation on the general population is still very much unknown. At the moment, literature on the subject is not extensive, especially studies focusing on adolescents, who make up about 50% of Pakistan's population.^[14] They are among the most at-risk populations for psychological impacts.^[15] To our knowledge, this study is the first of its kind done in Balochistan, a province which suffers from a myriad of resource allocation, budgeting and healthcare problems,^[16] examining the psychological impact of the COVID-19 lockdown on school-going children and adolescents. This study aims to address the need of providing parents, care-givers, and institutions with guidelines to reduce the impact of the strict lockdown on their children. Focusing on the factors that could contribute to or alleviate the distress will help us find ways to counter the effects of this dire situation and contribute to the wellness of this specific demographic. Furthermore, our study can serve as a springboard for further enquiries into this particular subject matter.

Materials and Methods

Study design and setting

This study was performed on the students enrolled in Matriculation (Secondary School Certificate [Secondary School]) and Intermediate (Higher Secondary School Certificate [HSSC]), in Army Public School and College (APSAC) Sibi, Balochistan, Pakistan. This study was conducted using a descriptive, cross-sectional design from March to May 2020. Data collection was done using online Questionnaire through Google-Form (<https://forms.gle/LBYk4Xk4ePmdNveg9>). The link to the questionnaire was rotated in all the official Facebook and WhatsApp groups through the official account of APSAC. At the start, the questionnaire was distributed among 25 students for pilot studying. After checking the validity and removing the questionnaire's ambiguities, the final questionnaire was sent to all students. The Cronbach's alpha for the reliability coefficient of the questionnaire (24 items) was calculated as. 682.

Study participants and sampling

Students enrolled in Army Public School and College, Sibi, Balochistan, participated in this online survey. This school was selected due to feasibility reasons. Matriculation/SSC and Intermediate/HSSC students

were included in this study. Incomplete forms were excluded. A total of 280 students were selected, resulting in the receipt of 277 (98.8%) questionnaires, 225 (80.36%) of which were valid. All participants were informed about the survey's aim. The confidentiality and anonymity of all participants were fully maintained.

Data collection tools and technique

The Modified Kuppaswamy Socioeconomic Scale updated for the year 2019 was used to assess respondents' socioeconomic status.^[17] Family incomes mentioned in the modified Kuppaswamy socioeconomic scale in Indian rupees were converted to Pakistani rupees (PKR) using an online converter. They were rounded off to the nearest 500 in PKR.^[18] By using relevant data, respondents were classified according to this scale as upper (i.e., upper), upper-middle and lower-middle (i.e., middle), upper-lower (i.e., poor), and lower (i.e., very poor) classes.

The Godin Leisure-Time Exercise Questionnaire^[19] was used to measure students' leisure-time exercise habits. By using one of the response options (0, none; 1, 1–3 times a week; 2, 4–6 times a week; 3, 7 times a week or more), students were asked to indicate the number of times they engaged in mild, moderate, and strenuous leisure-time exercise bouts of at least 15 min of duration in a typical week; examples of such activities were provided for each intensity category. The number of bouts at each intensity level was then multiplied by 3, 5, and 9 metabolic equivalents (for mild, moderate, and strenuous activity, respectively) and summed to derive a leisure-time exercise score for each student. Then, students were grouped into active, moderately active, and sedentary according to Godin scale scores. The Cronbach's alpha for this scale was 0.692.

Psychological distress was measured using the Kessler-10 (K10). This 10-item, self-administered questionnaire was developed for the use in the USA National Health Interview Survey.^[20] It is designed to yield a global measure of psychological distress based on questions related to anxiety and depressive symptoms experienced in the most recent 30-day period. Each item is presented in a 5-point Likert scale format, with responses ranging from "none of the time" to "all of the time". The sum of these ten items produces a combined score out of a possible 50, where higher scores indicate greater psychological distress.^[20] K-10 scores were further divided into the comparative levels of psychological distress defined as a score under 20 are likely to be well, score 20–24 are likely to have a mild mental disorder, score 25–29 are likely to have a moderate mental disorder and score 30 and over are likely to have a severe mental disorder. The Cronbach's alpha value calculated for this questionnaire was 0.875, indicating acceptable internal consistency.

To assess the sleeping patterns, participants were asked about their bedtime at night, wake-up time, and total sleep duration (hours per day). Participants were asked about the number of times breakfast (taken before noon) per week, proper meals (including breakfast, brunch, lunch, tea break, and dinner) taken per day, and fast food ordered per week to evaluate dietary habits. The participants also reported screen time using the following question: "How many hours per week do you spend in front of computers, television, cell-phones, and other electronic devices?"

A sociodemographic questionnaire consisting of age, gender, and grade was used. Students were also asked about having any family member suffering from the coronavirus.

Statistical analysis

Sociodemographic characteristics were described in terms of frequencies and percentages between males and females. At first, we applied the Chi-square and *t*-tests to assess the differences in the measured characteristics between school and college-level students for the categorical and continuous variables, respectively. Second, a univariate analysis (nonparametric test) was used to explore the significant associations between sample characteristics and distress levels during the COVID-19 quarantine among adolescents. The Spearman correlation coefficient was calculated to find the strength of the relationship between measured characteristics and levels of psychological distress. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) v. 23.0 (IBM, Armonk, US). A two-tailed $P < 0.05$ was considered statistically significant.

Results

The age of the participants ranged from 15 to 19 years ($M = 17.9$, standard deviation [SD] = 1.22), with the majority being formed by females 118 (52.4%). Out of 225 participants, 130 (57.4%) were studying at school, whereas 95 (42.2%) were studying at the college level. Most participants (87.1%) had no relatives or acquaintances that were infected with COVID-19. Table 1 shows the gender-wise distribution of sociodemographic details.

Table 2 shows the Chi-square test of independence comparing the frequencies of measured characteristics among adolescents distributed by education levels. An independent samples *t*-test was calculated comparing the frequency of sleep duration and the number of breakfast (taken before noon) in school and college students. A significant difference was found for sleep duration ($t[223] = 3.411$, $P < 0.05$) between the means of two groups. The mean of the college students was

Table 1: Sociodemographic characteristics of students by gender distribution

Characteristics	Total, n (%)	Male, n (%)	Female, n (%)	P
Level of education				
School/matriculation	130 (57.8)	43 (46.2)	87 (65.9)	0.003**
College/intermediate	95 (42.2)	50 (53.8)	45 (34.1)	
Residence				
Rural	15 (6.7)	9 (9.7)	6 (4.5)	0.129
Urban	210 (93.3)	84 (90.3)	126 (95.5)	
Socioeconomic status				
Upper class	106 (47.1)	48 (51.6)	58 (43.9)	0.019*
Upper middle class	86 (38.2)	25 (26.9)	61 (46.2)	
Lower middle class	25 (11.1)	15 (16.1)	10 (7.6)	
Upper lower class	7 (3.1)	4 (4.3)	3 (2.3)	
Lower class	1 (.4)	1 (1.1)	-	
COVID-19 positive family member				
Yes	27 (12)	15 (16.1)	12 (9.1)	0.110
No	198 (88)	78 (83.9)	120 (90.9)	

* $P < 0.05$, ** $P < 0.01$. COVID-19=Coronavirus 2019

Table 2: Measured characteristics among adolescents

Characteristics	Total, n (%)	School, n (%)	College, n (%)	χ^2 (df)	P	ϕ_c
Physical activity						
Active	97 (43.1)	63 (48.5)	34 (35.8)	6.521 (2)	0.038*	0.170
Moderately active	41 (18.2)	17 (13.1)	24 (25.3)			
Sedentary	87 (38.7)	50 (38.5)	37 (38.9)			
Sleep pattern						
Bedtime at night						
8 pm - 12 am	52 (23.1)	36 (27.7)	16 (16.8)	6.349 (2)	0.042*	0.168
1 am - 4 am	116 (51.6)	58 (44.6)	58 (61.1)			
Later than 4 am	57 (25.3)	36 (27.7)	21 (22.1)			
Wake-up time						
Earlier than 8 am	32 (14.2)	14 (10.8)	18 (18.9)	3.032 (2)	0.220	0.116
8-12 pm	109 (48.4)	65 (50)	44 (46.3)			
12 pm onwards	84 (37.3)	51 (39.2)	33 (34.7)			
Dietary pattern						
Proper meals taken per day (times)						
≤ 2	80 (35.6)	36 (27.7)	44 (46.3)	10.118 (2)	0.006**	0.212
3-5	116 (51.6)	72 (55.4)	44 (46.3)			
> 5	29 (12.9)	22 (16.9)	7 (7.4)			
Fast food ordered						
Yes	77 (34.2)	42 (32.3)	35 (36.8)	0.501 (1)	0.479	0.047
No	148 (65.8)	88 (67.7)	60 (63.2)			
Screen time (per week) (h)						
< 8	129 (57.3)	84 (64.6)	45 (47.4)	6.784 (2)	0.034*	0.174
8-12	60 (26.7)	29 (22.3)	31 (32.6)			
Greater than 12	36 (16)	17 (13.1)	19 (20)			
Distress						
Well	80 (35.6)	46 (35.4)	34 (35.8)	0.056 (3)	0.997	0.016
Mildly unwell	63 (28)	36 (27.7)	27 (28.4)			
Moderately unwell	37 (16.4)	22 (16.9)	15 (15.8)			
Severely unwell	45 (20)	26 (20)	19 (20)			

* $P < 0.05$, ** $P < 0.001$. ϕ_c =Cramér's V

significantly lower ($M = 7.31$, $SD = 2.02$) than the mean of the school going students ($M = 8.29$, $SD = 2.22$). However, no significant difference was found for number of breakfasts taken ($t[223] = 1.256$, $P = 0.210$). School-going students were more active (48.5%) than

college students (35.8%). Chi-square tests confirmed a significantly increased proportion of college-going adolescents with a decreased level of physical activity, late bedtime at night after 12:00 am and \leq two proper meals taken per day. The screen time duration was

significantly lower (<8 h/week) in school-going students during the lockdown. The majority of the participants, 145 (64.4%), were likely to be suffering from psychological distress, while 80 (35.6%) were likely to be well.

Factors contributing to distress among adolescents

The univariate analysis shows that there is a significant effect of physical activity ($P < 0.001$), sleep duration ($P < 0.002$), bedtime at night ($P < 0.001$), screen-time duration ($P < 0.001$), and corona-positive family member ($P < .001$) on the levels of distress. A Spearman ρ correlation coefficient was calculated to estimate the strength of the relationship between statistically significant variables from the univariate analysis and levels of distress. A moderate positive correlation was found for bed-time at night ($\rho[223]=0.328$, $P < 0.001$) and screen time duration ($\rho[223] = 0.541$, $P < 0.001$) indicating a significant relation with levels of psychological distress. However, a moderate negative correlation of physical activity ($\rho[223] = -0.340$, $P < 0.001$) and a weak negative correlation of sleep duration hours ($\rho[225] = -0.158$, $P = 0.018$) was found with psychological distress levels. Thus those students who were sleeping late at night, spending more time in front of screens, living a sedentary life, and had less sleep duration were more likely to be suffering from psychological distress. Table 3 shows a correlation between knowledge scores and demographic variables.

Discussion

Due to the lockdown, a major part of the everyday life of children was shut down. School and college are responsible of the lion’s share of their grooming and mental development. Out of the 280 students participating in this study, the majority (57.8) were in matriculation/SSC. The results indicate that 64.4% of the students reported being psychologically, either mildly, moderately or severely unwell during the lockdown. Those sleeping late at night, spending more time in front of electronic screens, living a sedentary life, and having less sleep duration were more likely to be suffering from the psychological impacts of quarantine.

In our study, 35.6% of the participants showed no signs of psychological distress. A study conducted in Rawalpindi,

Punjab, and Pakistan on a somewhat similar demographic showed 57.3% to be well, whereas 42.7% showed some signs of psychological distress.^[21] This difference might be explained by the lack of a strong public health campaign, as health-care system of the province suffers from a number of deficiencies.^[16] Students partaking in physical activity were found to be in lesser psychological distress. A similar study conducted by Cao *et al.* in China and Kleppang *et al.* in Norway showed a similar relationship.^[22,23] A significant proportion of school-going students were found to have an active lifestyle compared to college-going students, while the proportion that was sedentary was approximately the same. Although further research is needed to clarify this finding, extreme physical activity behaviors can be partly attributed to the suspension of End Year Examinations (EYE). The Government of Balochistan implemented a lockdown earlier than the rest of Pakistan and just 1 day before the start of the annual SSC EYE. The sudden relief of exam-stress might explain their great indulgence in exercise, compared to college-going students. The presence of such high levels of physical activity is also an indirect measure of the ineffectiveness of lockdown measures and may have aided in transmitting the virus.^[24]

Bed time and sleep duration were also found to be associated with psychological distress, with students who slept late and woke up late having a higher level of distress. These findings are in line with recent literature^[25] with a study in China performed on home-quarantined students showing similar results.^[26] A higher percent of school-going and college-going students had a bedtime between 12 and 4 a.m. and woke up between 8 a.m. and 12 p.m. These derangements of sleep time can be attributed to the sudden cessation of academic activities. The loss of productivity can account for the higher levels of stress in these students. A similar relation was found between screen time and distress, which is in line with results from similar studies.^[27] Although the cause of lower screen time among college students remains uncertain, the relationship of screen time with stress is definitive. While the effect of mobile phone usage is well-documented,^[28] the effect seen in this study can be due to the effect of social media misinformation, and in turn, can impact the students’ risk perception.^[3,29]

Table 3: Correlation between significant factors and psychological distress

Variables	Bedtime	Screen duration	Physical activity	Sleep duration	COVID-19 positive family members	Psychological distress
Bedtime	-	-	-	-	-	-
Screen duration	0.348**	-	-	-	-	-
Physical activity	-0.201**	-0.235**	-	-	-	-
Sleep duration	0.024	-0.028	0.022	-	-	-
COVID-19 positive family members	0.205**	0.303**	-0.166*	-0.060	-	-
Psychological distress	0.328**	0.541**	-0.340**	-0.158*	0.383**	-

*Correlation is significant at the 0.05 level (two-tailed), **Correlation is significant at the 0.01 level (two-tailed). COVID-19=Coronavirus 2019

A strong and significant association was found between the number of proper meals per day and distress. Those students having <2 meals/day and those having more than 5 meals/day suffered the most considerable psychological distress. Low socioeconomic status is one of the determinants of psychological distress.^[30] However, 96% of students who participated in this study were above the lower-middle class status, thus prompting further inquiry into this relation.

A similarly strong association was found between stress and having a family member/close friend being COVID-19 positive. This can be due to several reasons, i.e., fear for their life, fear of getting infected, or, in general, the fear which uncertainty of the future brings.^[24]

Limitations

As this is a cross-sectional study, all the inherent drawbacks of this study design are also applicable in this case. The present study has a few limitations, the main being that it was not possible to interview the students directly due to government restrictions, so information was gathered by online questionnaires, which required the sacrifice of detail for brevity. This, in addition to the highly targeted nature of this study, does not allow for complete assessment of geographical, cultural, and religious factors at play, making generalizability limited. However, questionnaires were distributed officially by the administration of the institution which minimizes the risk of bias. Despite these limitations, this study, to the best of our knowledge, is the first providing data on the psychological repercussion of the COVID-19 lockdown on school-going children and adolescents in far-flung areas. Future studies should follow the psychological responses of youth during the quarantine to detect the need for interventions and rehabilitation, as required and as early as possible.

Conclusions

In conclusion, the COVID-19 lockdown and pandemic have had a considerable impact on the psychological health of students of APSAC Sibi, with a significant portion (64.4%) of students being affected. Overall, physical activity, sleep duration, bed time at night, screen time duration, and having COVID-19 positive family member were associated with a higher level of psychological distress. This study has elucidated various risk factors for psychological distress in time of COVID-19, and could facilitate the identification of those at greater risk of suffering psychological distress and their subsequent stratification into groups that require medical assistance and groups that do not whilst also identifying prompts for intervention. Furthermore, interventions should also be aimed at the aforementioned risk. A strong public health campaign which provides

up-to-date information about COVID-19 combined with physical and mental health programs, and social support programs are need of the hour. Further studies need to be conducted on a larger scale with the aim of identifying those at risk of clinically relevant distress in order to identify relevant clinical or etiological markers helpful in the initiation of interventions in other far-flung areas of Pakistan.

Ethical considerations

Consent for using Modified Kuppaswamy Socioeconomic Scale and Godin Leisure-Time Exercise questionnaire was obtained via E-mail, while the K10 is in the public domain. Permission from the Ethics Committee of Rawalpindi Medical University was taken. Following approval from the Principal and Board of Members of the institution, the questionnaires were distributed among participants. Informed consent was obtained, and anonymity as well as confidentiality of the participants was ensured.

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Conflicts of interest

There are no conflicts of interest.

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