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Evaluating the effect of COVID-19 pandemic on the psychological health of young adults in India

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ABSTRACT

COVID-19 pandemic has affected the mental health of individuals, particularly young adults. Using the 'strength and difficulty questionnaire 17^{+} extended version', we studied the severity of psychological problems and the resultant distress in young adults; the relationship between the 'difficulty' and 'impact' scores; and the effect of distress in terms of a number of day-to-day activities affected during a pandemic. Data was collected from 743 college/university students (December 2020-February 2021) in India. Descriptive, relative frequencies, and nonparametric tests are applied here. Females were facing more psychological behavioral problems as compared to males as the p-value is less than 0.001. Males with age<20 years were least affected by COVID-19. Day-to-day activities are affected by almost 45% of young adults because of distress. 'difficulty' and 'impact' severity bands were significantly different from the previous standard proportions. No significant association was there between 'difficulty' and 'impact' scores (p-value<0.001). 53% of those contracting COVID-19 had severe distress as against 45% of those who did not. 46% of the respondents were in the 'abnormal' category and 59 out of 327 were facing 'a great deal' problems in more than two areas.

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1. INTRODUCTION

The coronavirus-induced COVID-19 pandemic is unprecedented in recent history, with global impacts including high rates of mortality and morbidity. To break the chain of transmission, governmental decisions like isolation, social distancing, and closure of educational institutes and people staying in their homes negatively impacted individual's mental health [1]. Based on the household pulse survey, Kaiser Family Foundation found that during the pandemic, a larger number of young adults (ages 18-24) reported symptoms of anxiety and/or depressive disorder as compared to older adults [2]. The effect of COVID-19 on young people's mental health could be more damaging in the long run than the infection itself [3]. These findings are of critical importance and need immediate mental health interventions [4].

Early detection of psychological problems is the most challenging and important in tackling the problems. Psychological testing is done in general to screen for the presence or absence of common mental

health conditions and brief psychological measures can be used to 'screen' individuals for a range of mental health conditions. Screening measures are often the questionnaires completed by respondents. Hunt *et al*. study assessed the psychological resilience and distress of college students of Kent State University through the brief resilience scale and the kessler psychological distress scale respectively during the pandemic [5]. Lal *et al*. assessed the depression and anxiety of young people residing in Pakistan through patient health questionnaire-9 and generalized anxiety disorder-7 during COVID-19 [6]. Sabharwal *et al*. used the Strengths and Difficulties questionnaire (SDQ) questionnaire to study the effect of forced lockdown due to COVID-19 on the psychological behavior of college students in India [7]. In all the above-mentioned questionnaires, the Likert scale (0, 1, 2, 3 or 0, 1, 2) [8] is used to classify the data and then tested and analyzed statistically. Nonparametric tests are the obvious choice as no distribution assumption needs to be made. Further, these methods reduce the risk of drawing incorrect conclusions as no assumptions are made about the population, although they might have lower statistical power than parametric tests in some cases.

Closure of colleges/universities and resultant lack of daily routine and social interaction may have had a damaging impact on the mental health of young adults. In order to assess and address mental health issues among college-going youth in India, we conducted our second survey for this stratum (The first survey was conducted in May-June 2020 [7]). We report new data from a small cohort of young collegiates from India. The survey was conducted from December 2020-February 2021(online and offline, before the onset of the second COVID-19 wave) using SDQ 17^{+} extended version. The aim of the survey was to assess the consequential impact of COVID-19 on the mental health of 18-25 years old Indian youth. 743 undergraduate and postgraduate students participated in the survey.

Through this survey, the authors' aimed to assess two main problems. Firstly, are young adults (in terms of gender and age) more susceptible to reporting severity of psychological problems in respect of: conduct, emotional behavior, hyperactivity, and peers along with the distress affecting their day-to-day activities during pandemic times? For this problem, the hypothesis used is, 'no significant deviation in the observed proportions of individuals belonging to 'normal', 'border line', 'abnormal' bands, with the SDQ standard proportions of 80%, 10%, and 10% respectively, under the respective severity bands for normal times' [9]. Some other earlier studies on psychiatric disorders among the young population suggest that their prevalence rates are 10%, and 15% in developed and developing countries respectively under normal conditions [10]. Secondly, in assessing psychological health, through two components; 'difficulty' and 'impact' scores of SDQ, do the two scores provide similar conclusions? The hypothesis used for this problem is 'Existence of an association between the relative frequencies of 'difficulty' scores lying in 'normal', 'border line' and 'abnormal' bands with 'impact' scores lying in the same bands'. Further, our data reporting clearly suggests the 'extent' of distress related to the day-to-day activities of young adults; affecting themselves, their families, work/study, friends, and their hobbies.

The data reliability was tested using Cronbach alpha and Guttman lambda. In order to test our first hypothesis: The Mann-Whitney U and Wilcoxon rank-sum tests are applied to compare the psychological health measured in terms of the 'difficulty'and 'impact' scores by taking the groups: i) male and female adults of age<=20 years (age_0); ii) male and female adults for age>20 years (age_1); iii) age groups age_0 and age_1 for female adults; and iv) age groups age_0 and age_1 for male adults. In order to test our second hypothesis: The Chi-square test for goodness of fit is used to compare the observed number of individuals under different categories with expected (standard) numbers. Further, the association between the 'difficulty' scores and the 'impact' scores is tested through the Chi-square test for attributes. Results based on our sample are compared with the previous studies. Reporting has been done for the bifurcation of data on the basis of respondents who themselves or a family member of theirs contracted COVID-19 and respondents who did not. However, to the best of our knowledge, no study has yet investigated the effect of distress on the day-to-day activities of young adults.

2. RESEARCH METHOD

2.1. Materials

In this survey, data was collected on 743 students from various undergraduate and postgraduate courses in the months of December 2020-February 2021 before the onset of the second COVID-19 wave in India. The survey was held both online and through physical mode. Participants willingly submitted information on their age, sex, family annual income level, family composition, and personal experiences of and knowledge of family members with COVID-19 in the first part of the survey. The second part was based on the 17^{+} extended version of the SDQ self-reported questionnaire with 33 multiple-choice items. The basic version of the questionnaire has 25 items in it, describing five scales of strengths and difficulties of an individual, namely, 'conduct problems', 'peer problems', 'emotional symptoms', 'hyperactivity- inattention symptoms', and 'prosocial behavior'. The first four scales relate to difficulties in psychopathologies, the fifth

scale describes the personal strength of the individual. Each scale has five items in it which are scored on a three-point scale, with 0 for 'not true, 1 for 'somewhat true', and 2 for 'certainly true'. The sums of scores of individual items generate scores for the five scales (with a range 0-10). For a valid scale score, at least three items must be scored, remaining can then be prorated. The first four scales are added to compute the 'difficulty' score of an individual (with a range 0-40). The scores can then be divided into three bands: for total difficulty score, '0-15' indicates 'normal'; '16-19' indicates 'borderline' cases; and score '20-40' indicates 'abnormal' cases (self-reported version of SDQ). As for individual scales, the bands are as given in Table 1.

Table 1. Three band categorizations of five scales scores and impact score for 17+extended self-reported version of SDQ

Scale	Composition (items)	Normal	Borderline	Abnormal
Prosocial behaviour	1, 4, 9, 17, 20	6-10	5	0-4
Emotional symptoms	3, 8, 13, 16, 24	0-5	6	7-10
Conduct problems	5, 7, 12, 18, 22	0-3	4	5-10
Hyperactivity-inattention symptoms	2, 10, 15, 21, 25	0-5	6	7-10
Peer problems	6, 11, 14, 19, 23	0-3	4-5	6-10
Difficulty score	Emotional symptoms+conduct problems+hyperactivity-inattention symptoms+peer problems	0-15	16-19	20-40
Impact score	28, 29, 30, 31, 32	0	1	2-10

In the extended version of SDQ, items 28-32 measure the 'impact' of distress affecting their selves, their families, work/study, friends, and their hobbies. These items along with item 27 are answered only if the response to item 26 is 'yes' which is about 'any difficulties in areas of emotions, concentration, behavior or being able to get along with other people'. Item 27 is about the 'chronicity' (duration) of these problems. Items 28-32 are scored on a scale of 0-2, with 0 for 'only a little', 1 for 'quite a lot', and 2 for 'a great deal'; the range of impact scores, thus being 0-10. The three categories of impact scores are given in the table above [9], [11]–[13]. Item 33 measures the burden on family and friends of the respondents.

2.2. Methods

The data collected using a customized questionnaire both online and offline has been analyzed statistically. Data reliability is tested using Cronbach alpha and High values of these statistics indicate the high internal consistency of the data [14]. Non-parametric statistical tests namely, the Mann-Whitney U test and the Wilcoxon rank-sum tests have been used to test statistical hypotheses as the data is a ranked data and the parametric form of the underlying distribution is not specified. The Chi-square test for goodness of fit is used to estimate the deviation of the observed number of individuals under different categories from the expected (standard) numbers. Further, the Chi-square test for independent attributes has been used to find an association (if any) between the 'difficulty' and 'impact' scores.

3. RESULTS AND DISCUSSION

The COVID-19 pandemic is unprecedented havoc that has affected people around the globe. People have suffered physically, economically, socially and as a consequence of these, mentally and psychologically [15], [16]. Various studies indicated that the mental health of young adults was affected severely during this pandemic [17], [18]. In order to study the effect of this pandemic on college-going Indian youth, we conducted an online and offline survey using SDQ 17^{+} extended version when the first wave of the pandemic had settled down the and second wave had not yet emerged in India. The sample was collected from undergraduate and graduate students in the months of December 2020 to February 2021. In this survey 743 students (all valid responses) from different institutions/Universities across India participated. The SDQ 17^{+} extended version questionnaire is a reliable screening tool that specifies the standard proportions of 'difficulty' and 'impact' scores of a healthy population in three severity bands, viz. 'normal', 'borderline', and 'abnormal' to assess the extent of mental health problems. The extended SDQ provides information on behavior problems and impairment measures [9].

The values of Cronbach alpha and Guttman lambda were 0.86 and 0.89 respectively; indicating the consistency of responses and relatively small errors. The average inter-item correlation was 0.16 and the signal-noise ratio was 6:1. Post-stratification of data was done according to gender with age and COVID-19 status. Out of 743 respondents, 360 (48.5%) were females and 383 (51.5%) males. The 413 (56.7%)

respondents were between the ages of 17-to 20 years and 330 (44.3%) were above the age of 20 years. The number of those who were affected by COVID-19 directly was 84.

3.1. Classification of responses according to gender with age

For mental health studies, gender and age are primarily considered as demographic variables. Thus the respondents were classified gender-wise. Further genders were classified into two age categories: 'age_0' referred to the group of respondents less than or equal to 20 years of age (first- and second-year undergraduates) and 'age_1' referred to the group of respondents who were more than 20 years of age (mostly in the third year of under-graduation and in higher studies). The categorization of gender according to age was done with the purpose of studying the effect of COVID-19 on the mental health of respondents when they are at decisions making age (age_1) regarding their careers with those who started their under-graduation (age_0). In Table 2, the descriptive statistics for all the five scales of the basic version and the impact score of the extended version component have been presented.

Table 2. Descriptive statistics for the five scales of SDQ and the impact score, classified according to gender with age both. (a ge_0-less than 20 years; age_1-20 years or more)

Subscale	Gender	Age	Count	Mean	Median	Mode	Standard deviation	Minimum	Maximum
Prosocial behaviour	Female	Age_0	188	8.10	9	9	1.74	0	10
		Age_1	172	8.12	8	9	1.53	4	10
		Total	360	8.11	8	9	1.64	0	10
	Male	Age_0	225	7.84	8	9	1.85	0	10
		Age_1	158	7.77	8	9	1.98	0	10
		Total	383	7.81	8	9	1.90	0	10
Peer problem	Female	Age_0	188	2.88	3	3	1.31	0	7
Conduct problem		Age_1	172	2.86	3	3	1.39	0	7
		Total	360	2.87	3	3	1.35	0	7
	Male	Age_0	225	2.56	2	2	1.49	0	7
		Age_1	158	2.65	2	2	1.51	0	8
		Total	383	2.60	2	2	1.50	0	8
Peer problem	Female	Age_0	188	2.75	2	2	1.70	0	8
		Age_1	172	2.86	3	2	1.71	0	7
		Total	360	2.80	3	2	1.70	0	8
	Male	Age_0	225	2.72	2	2	1.77	0	9
		Age_1	158	3.18	3	2	1.78	0	8
		Total	383	2.91	3	2	1.78	0	9
Emotional symptoms	Female	Age_0	188	4.10	4	3	2.46	0	10
		Age_1	172	4.29	4	5	2.49	0	10
		Total	360	4.19	4	3	2.48	0	10
	Male	Age_0	225	2.83	2	0	2.41	0	10
		Age_1	158	3.61	3	3	2.36	0	10
		Total	383	3.14	3	2	2.42	0	10
Hyperactivity-inattention symptom	Female	Age_0	188	3.45	3	2	2.02	0	9
		Age_1	172	3.73	4	4	2.03	0	8
		Total	360	3.58	3	4	2.03	0	9
	Male	Age_0	225	3.13	3	3	2.06	0	8
		Age_1	158	3.96	4	3	2.08	0	10
		Total	383	3.47	3	3	2.11	0	10
Impact score	Female	Age_0	147	2.05	1	0	2.18	0	9
		Age_1	143	1.97	1	0	2.10	0	8
		Total	290	2.01	1	0	2.14	0	9
	Male	Age_0	164	1.68	1	0	2.04	0	8
		Age_1	130	1.87	1	0	2.08	0	8
		Total	294	1.76	1	0	2.06	0	8

'Prosocial behavior' is a scale measuring the strength of an individual. A high score on this scale is considered to be good. All the four groups had their average scores in 'normal' range of 6-10. Females did better than males in respect of this scale for both the age groups but the effect of age was not much visible and males age_1 exhibited the least strength. For the other four scales measuring the extent of difficulty, viz. 'conduct problems', 'peer problems', 'emotional symptoms', 'hyperactivity-inattention symptom', lower scores are preferred. For 'conduct problems', the scores for all the four groups were in 'normal' range of (0-3) and were not very different from each other. Similar observations were made on the 'hyperactivity-inattention symptom' scale although, for this scale, male age_1 showed an increase in mean scores. For 'peer problem' also, the maximum extent of the problem was exhibited by males age_1; and males age_0 exhibited the least difficulty in this scale. The mean score of 'emotional symptom' in females was maximum (4.291)

and observation is consistent with Di Renzo *et al.* study which concluded that women are more susceptible to "emotional hunger" and subsequent increased food intake than men during COVID-19 quarantine [19]. The 'hyperactivity-inattention symptom' mean score was highest (3.962) in the age_1 group of males.

Impact scores were available only for those respondents who answered 'yes' to item 26. The number of these respondents was 584 (78.6%). Mean scores of all the four groups were more than the 'borderline' category of score 1 and were very close to being in 'abnormal' category; for females age_0, the mean scores were actually more than 2. Female scores for both the age categories were higher than the corresponding male scores. This observation is in line with the results of previous studies; conducted by Lal *et al*. on young people in Pakistan, suggesting that females were showing more depressive and anxiety symptoms as compared to males [6]; conducted by Mazza *et al.* that found an association between the female gender and increased psychological distress [20].

We compared the 'difficulty' and the 'impact' scores of; i) male and female respondents for age_0; ii) male and female adults for age_1; iii) age_0 and age_1 for females; and iv) age_0 and age_1 for males. the following hypotheses were set for the 'difficulty' scores:

H_{0D}: For gender *G*, difficulty scores for age_1and age_0 are not significantly different

H_{1DG}: For gender *G*, difficulty scores for age_1and age_0 are significantly different

H_{0DA}: For age *A*, difficulty scores for males and females are not significantly different

H_{1DA}: For age *A*, difficulty scores for males and females are significantly different

G=male, female; *a*=age_0 and age_1

Similar hypotheses were set for 'impact' scores and tested using Mann-Whitney U and Wilcoxon rank-sum statistics. The results are presented in Table 3. The role of gender was observed in age_0 in respect of 'difficulty' scores where males and females were found to be significantly different with p-value<0.001. This result is consistent with Nathiya *et al.* [21] and González-Sanguino *et al.* [22]. which suggested a relationship between gender and anxiety level confirming females tended to develop more anxiety symptoms in reaction to health emergencies and imposed quarantine than their male counterparts The role of age was observed in males as age_0 and age_1 'difficulty'scores were found to be significantly different with p-value <0.001. The results were consistent with previous studies which have found that factors such as age, gender, economic background, geographic location, and physical and mental health conditions are responsible for the variation in the effect of the pandemic on different individuals [23].

Table 3. Non-parametric Mann-Whitney U statistic and Wilcoxon rank-sum statistic to test if gender and age affect the difficulty and impact scores of SDQ

Test statistic	Difficulty score				Impact score			
	Female age_0 and age_1	Male age_0 and age_1	age_0 female and male	age_1 female and male	Female age_0 and age_1	Male age_0 and age_1	age_0 female and male	age_1 female and male
Mann-Whitney U	15.148.5	13.738	16.476	13.074.5	10.428	9.883.5	10.610	8.933.5
Wilcoxon W	32.914.5	39.163	41,901	25.635.5	20.724	23.249.5	23.976	17.448.5
Z	-1.036	-3.792	-3.876	-0.594	-0.220	-1.031	-1.897	-0.571
Asymp. Sig. (2-tailed)	0.300	0.000	0.000	0.552	0.826	0.302	0.058	0.568

3.3. The relative frequencies in three bands of the scales of basic version SDQ

The relative frequencies corresponding to each band: 'normal', 'borderline', and 'abnormal' for the five scales of a basic version of SDQ are depicted in Figures 1 and 2. It was observed that the respondents in age_1 had higher relative frequencies in the bands 'borderline' and 'abnormal' for both genders. Further, the relative frequencies of the 'emotional symptom' scale in females for both the age groups and in males for age_1 in 'borderline/slightly raised' and 'abnormal/advance' bands were 30% (approx), which indicate at the problem on the emotional front. Also, the relative frequency of scale 'peer problem' in males for both the age groups in the 'borderline' and 'abnormal' bands was 40% against 28% and 30% in females of age_0 and age_1 group respectively suggesting that males face more problem due to isolation (colleges and universities were closed) than females.

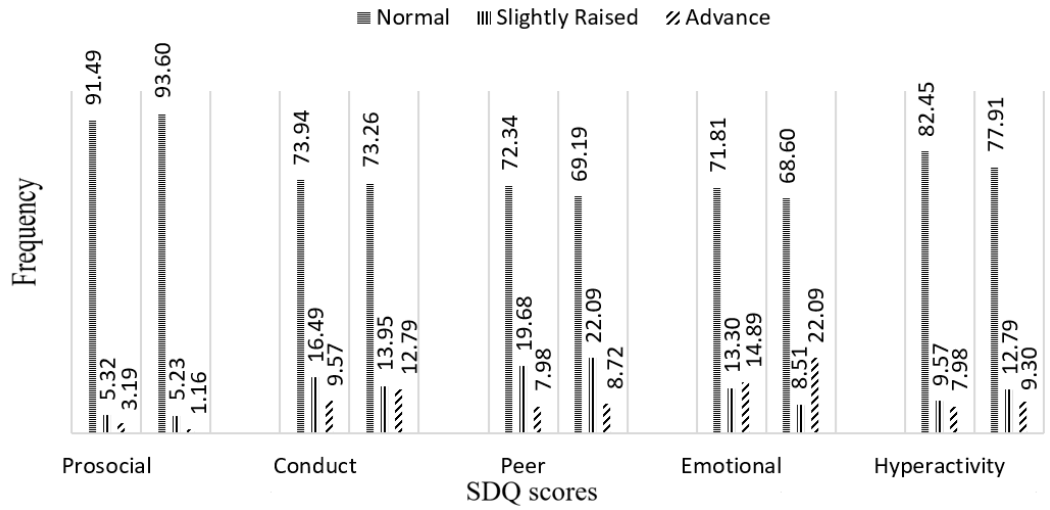


Figure1. Relative frequencies for the three bands of the five scales of SDQ scores of females grouped on the basis of age: first set of three bars is for age_1; second set of three bars is for age_0

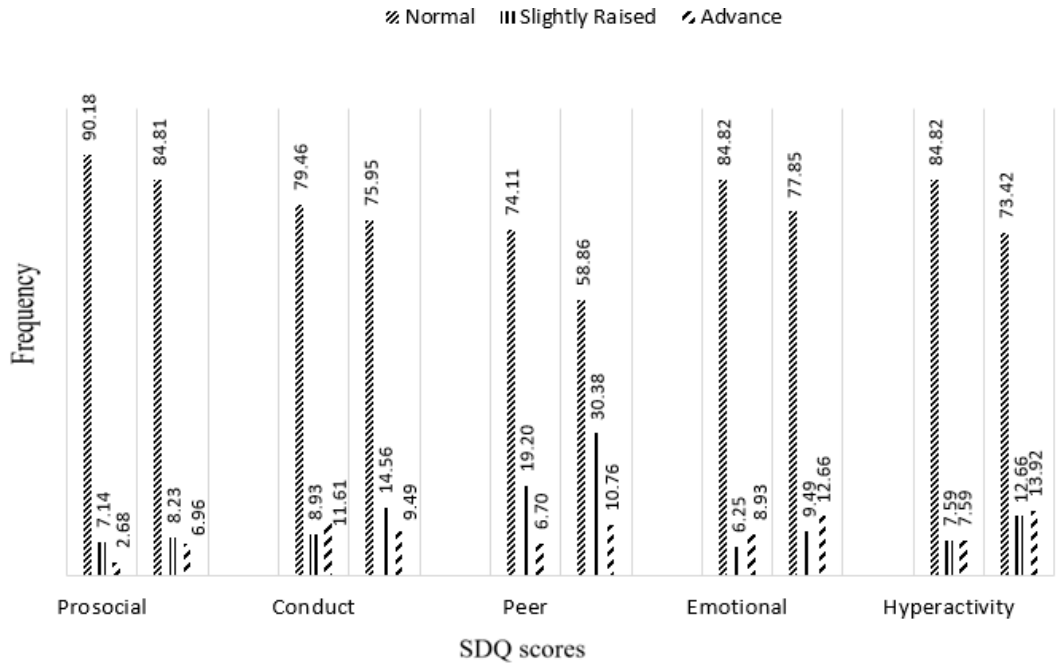


Figure 2. Relative frequencies for the three bands of the five scales of SDQ scores of males categorized on the basis of age: first set of three bars is for age_1; second set of three bars is for age_0

Table 4 presents the proportions of total ‘difficulty’ and ‘impact’ scores of the four groups in three severity bands. The observed proportions for both the ‘difficulty’ and ‘impact’ scores were not close to standard proportions of 80%, 10%, and 10% in the three severity bands. Both the genders had higher proportions in the ‘borderline’ and ‘abnormal’ bands as compared to standards and the proportions in the ‘normal’ band were lowest in females for both the age groups. This raises a question: Is modification required in standard proportions of 80%, 10%, and 10% in the three bands respectively of the young adult population in pandemic time/under abnormal conditions? The Chi-square test of goodness of fit was applied to test the null hypothesis that there is no significant deviation of the observed proportions from the standard proportions under each category of severity for normal times. The results are presented in Table 5.

Table 4. Proportions of 'difficulty' and 'impact' scores of the four groups in the three bands of 'normal', 'borderline', and 'abnormal' score

Scale		Female			Male		
		Normal	Border line	Abnormal	Normal	Border line	Abnormal
Difficulty score	Age_0	69.15	19.15	11.7	80.89	8.00	11.11
	Age_1	65.12	18.6	14.89	65.19	22.15	12.66
Impact score	Age_0	29.73	24.32	45.95	46.01	8.59	45.6
	Age_1	32.17	22.38	45.45	37.69	16.15	46.15

Table 5. Comparison of 'difficulty' and 'impact' scores' proportions under the three severity bands with the standard proportions of 80%, 10%, and 10%

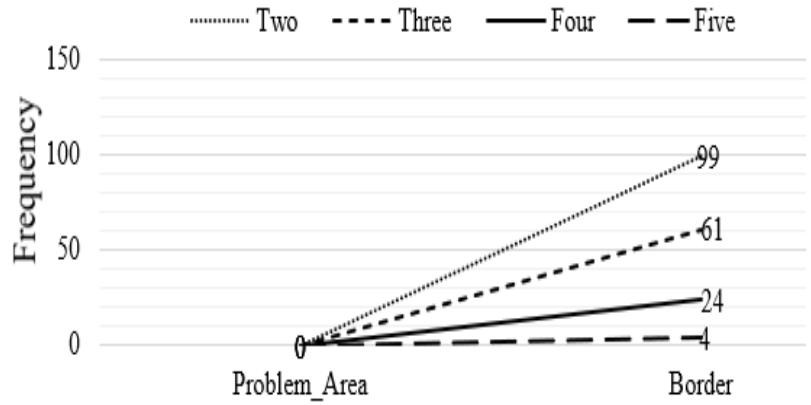
Group		Difficulty			Impact		
		Normal	Borderline	Abnormal	Normal	Borderline	Abnormal
Female	Observed	243	69	48	90	68	133
	Expected	288	36	36	233	29	29
	Test statistic		44.35			518.72	
	p-value		<0.001			<0.001	
Male	Observed	284	54	45	124	35	134
	Expected	307	38	38	234	29	29
	Test statistic		10.97			435.08	
	p-value		0.004			<0.001	

The null hypothesis is rejected for both 'difficulty' and the 'impact' scores for both genders. In fact, for 'impact' scores, the deviation from the standard proportions was much higher. The mental health of young adults, who otherwise are healthy, has been affected significantly by the COVID-19 pandemic as p-value is less than 0.001 in both the female and male groups. We found that psychological problems during COVID-19 have increased considerably in young adults. This finding is also similar to studies; conducted on American adults using a modified version of the perceived stress scale and some COVID-19 related questions [23]; an increased percentage of people with high and very high levels of distress as compared to the European epidemiological statistics conducted before the COVID-19 [19]; Elmer *et al.* conducted a study on college students which concluded that students were on average more depressed, slightly more anxious, more stressed, and felt more lonely during COVID-19 than half a year earlier [24]. Chen and Lucock study based on a survey in early 2021 reported that 1 in 5 (21%) adults experienced depression in early 2021, more than double that found before the COVID-19 pandemic (10%) [25]. The increased frequency of distress found in the current sample could be interpreted as an effect due to COVID-19. The home confinement for indefinite periods, differences among the stay-at-home orders issued by various jurisdictions, and conflicting messages from government and public health authorities may be responsible for intensifying distress [26].

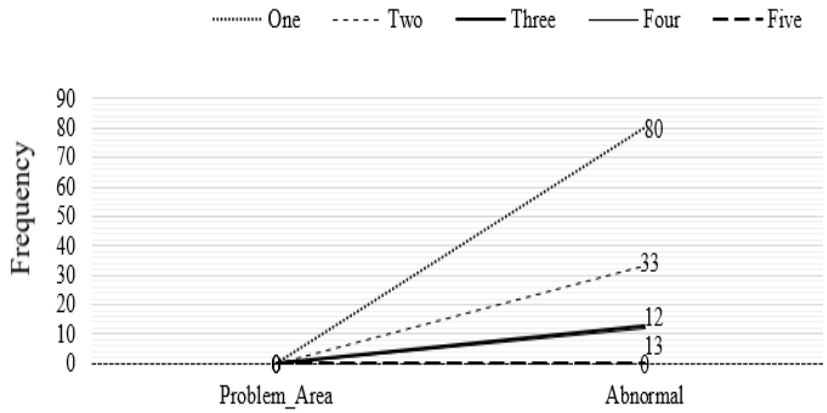
3.4. Association between the 'impact' and the 'difficulty' scores

Impact score items are part of an extended version of SDQ and are used to measure the 'extent' of distress on the respondents affecting themselves, their families, work/study, friends, and their hobbies. The scoring system in the 'impact' score puts a respondent in the 'abnormal' category if he/she is facing a problem with 'a great deal' in at least one of the areas or 'quite a lot' in at least two areas. Figures 3(a) and 3(b) below represent the frequency distributions of respondents having 'abnormal impact' scores when the individual affected areas were in the 'quite a lot' category and 'a great deal' category respectively. The total number of respondents in the 'abnormal' band of impact score was 327 (out of 584). Out of these 327, 188 respondents had 'quite a lot' problems in two or more areas; a maximum of respondents faced problems in two areas (99). 28 respondents were severely affected as they had problems in almost all the areas. The number of respondents having 'a great deal' problems in at least one area was 139 (out of 327). Around 19% were facing problems in three or four areas. In all, 46% of the respondents were in the 'abnormal' category and 59 out of 327 (approx. 18%) were facing 'a great deal' problems in more than two areas, i.e., impact score was at least 4. Most of the students are not able to manage their studies because of distress indicated by a higher 'impact score' matches with the previous study suggesting psychological distress negatively impacts student learning, participation, and their experience of university life [27].

'Impact' scores are better at predicting mental disorders and provide more information than the 'difficulty' scores [22], [23]. One of the objectives of the study was to test if the 'difficulty' and 'impact' scores lead to the same conclusion regarding the psychological health of respondents. To test for the association between the 'difficulty' score and 'impact' score', we applied the Chi-square test for independence of attributes. The results are presented in Table 6.



(a)



(b)

Figure 3. Frequency Distribution of respondents in 'abnormal' category of impact scores when the individual affected areas were in 3(a) 'quite a lot' category and 3(b) 'a great deal' category

Table 6. Chi-square test for independence of attributes to test the association between 'difficulty' and 'impact' score

Difficulty score		Impact Females				Males			
		0	1	2	Total	0	1	2	Total
0	Count	78	48	59	185	112	25	69	206
	Expected count	57.2	43.2	84.6	185.0	87.2	24.6	94.2	206.0
1	Count	10	14	37	61	9	7	29	45
	Expected count	18.9	14.3	27.9	61.0	19.0	5.4	20.6	45.0
2	Count	2	6	37	45	3	3	36	42
	Expected count	13.9	10.5	20.6	45.0	17.8	5.0	19.2	42.0
Total	Count	90	68	133	291	124	35	134	293
	Expected count	90.0	68.0	133.0	291.0	124.0	35.0	134.0	293.0
Pearson Chi-square					48.23				50.82
Asy.sig(2-sided)					<0.001				<0.001

As no expected cell frequency (female's and male's) is less than 5, therefore Chi-square test was applied directly without applying continuity correction. Statistically, there was no significant association between the two scores (p-values<0.001) for both genders. Moreover, there were approximately 14% females and 12% males in the 'abnormal' band of 'difficulty'; and 45% females and 45% males in the 'abnormal' band of 'impact' scores. Our observations are similar to previous studies which suggested that 46% of the respondents lacked motivation towards activities (hobby) and 36% were less inclined to do their daily chores (work) [28]. Similar findings were observed in our previous survey which was conducted when the pandemic had just begun and the lockdown was imposed all over the country [7]. Also, a study conducted in Pakistan based on young people suggested that participants reported having depressive (54%) and anxiety (48%) symptoms [6].

3.5. Direct effect of COVID-19

Out of 743 respondents in the survey, 84 were affected directly by COVID-19 19. Out of these 84 respondents, 71 (84.52 %) 'yes' to item number 26. Table 7 presents the descriptive statistics of the 'difficulty' and 'impact' scores of these 71 respondents along with those who did not contract COVID-19.

When compared with non-COVID-19 cases, those who had suffered from COVID-19 had higher mean, median, and mode of 'difficulty' and 'impact' scores. The relative frequency distribution of these scores for the two groups has been presented in Figures 4(a) and 4(b): For 'difficulty' scores, the proportions in the 'normal' band were almost the same. In the other two bands, the proportions were almost reversed. Although both the groups deviated from healthy proportions of 80%, 10%, and 10%, the deviation was greater in the COVID-19 group with the proportion in the 'abnormal' category being 16.47%. This observation matches with the Plenty *et al.* suggesting that young adults who reported contact with COVID-19, financial worries, and health worries experienced increased anxiety and depression [29]. For 'impact' scores both the groups were unhealthy. For the Non-COVID-19 group, almost 63% of the population was not 'normal' but for the COVID-19 group, this proportion was almost 68%.

Table 7. The descriptive statistics of the 'difficulty' and 'impact' scores of those respondents who either themselves or a family member suffered from COVID-19 and the respondents who did not suffer from COVID-19

Scale		Count	Mean	Median	Mode	Standard deviation	Minimum	Maximum
Difficulty	Non COVID-19	658	12.69	12	12	5.60	1	33
	COVID-19	84	13.31	13	14	5.26	2	25
Impact	Non COVID-19	512	1.85	1	0	2.02	0	9
	COVID-19	71	2.11	2	0	2.15	0	8

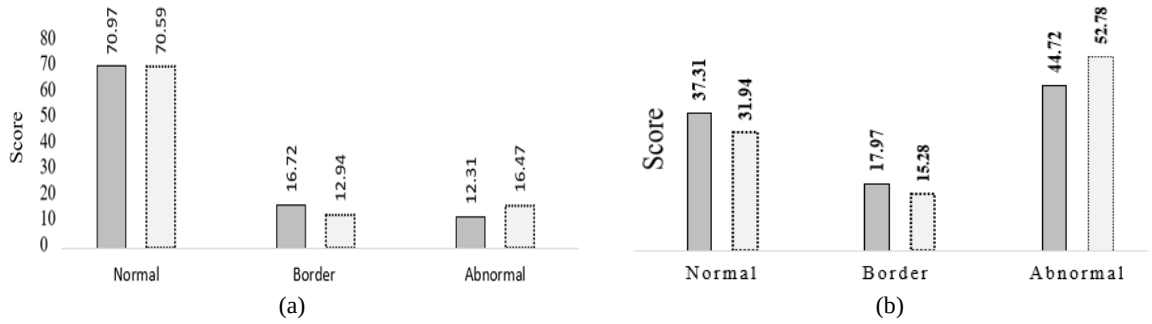


Figure 4. Relative frequency distributions of COVID-19 patients and non-COVID-19 respondents across three bands of severity (a) difficulty scores and (b) impact scores

We compared the mental health of non-COVID-19 respondents with those who have directly faced a pandemic by taking a random sample of size 100 from non-COVID-19 cases. By applying Mann Whitney test, taking groups as COVID-19 and non-COVID-19, the two groups were found to be significantly different for the 'impact' score with p-value<0.001. Previous studies suggest that this disease affected more in cases where they directly contacted COVID-19 [30]. Our study corroborated this finding as 53% of respondents who were directly affected were in the 'abnormal' band of 'impact' score against 45% of those who were affected indirectly.

4. CONCLUSION

Our study showed that female students are at more risk of psychological behavioral problems in case of health emergencies. Since the pandemic severity and duration are uncertain, young adults who are on the verge of career decisions are more distressed than the other respondents. Impact score (distress affecting day-to-day activities) is a better indicator of psychological health and behavioral problems, as only 2% who were not facing any distress had behavioral problems. Further, our study suggests the SDQ extended version is a better tool than the basic version. Moreover, 46% of the respondents were distressed and 18% among these were facing 'a great deal' problems affecting their day-to-day activity in more than two areas. This number is more than double of normal times, suggesting a need for modification in standard proportions in three bands of the severity of mental health or different standards may be suggested for a pandemic or abnormal times.

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