

## Psychological health of Indian youth during COVID-19: a study through three chronological surveys

Babita Goyal<sup>1</sup>, Alka Sabharwal<sup>2</sup>, Vibha Chauhan<sup>3</sup>, Lalit Mohan Joshi<sup>4</sup>

<sup>1</sup>Department of Statistics, Ramjas College, University of Delhi, Delhi, India

<sup>2</sup>Department of Statistics, Kirori Mal College, University of Delhi, Delhi, India

<sup>3</sup>Kirori Mal College, University of Delhi, Delhi, India

<sup>4</sup>Department of Statistics, University of Delhi, Delhi, India

### Article Info

#### Article history:

Received Aug 27, 2022

Revised Feb 15, 2023

Accepted Mar 6, 2023

#### Keywords:

COVID-19

Difficulty score

Distress

Strength and Difficulty

questionnaire

Young adults

### ABSTRACT

The COVID-19 pandemic and its aftereffects have affected human lives psychologically, economically, and socially. The study examines the dynamics of mental health problems faced by young adults and the consequent effects on their daily lives during the pandemic period. Three surveys were conducted among colleges/universities going students in India during the time periods May-June 2020, October 2020-February 2021, and January-February 2022; using Strengths and Difficulties Questionnaire (SDQ) 17+ self-reported extended version. Through 1,021, 743, and 932 responses in the three surveys respectively, the effect of the pandemic on the mental health (characterized by behavioral problems and social dysfunction) of respondents, categorized on basis of demographic variables and 'COVID-19' status was studied. Females were found to be more 'distressed' than during this period. There was no effect of age and family income. The 45% of the respondents in the Non-COVID group and 48% in the COVID-19 group had severe distress. With the passing of time, both the number of problem areas and the severity of problems faced by young adults increased thus affecting their day-to-day activities. The proportions of the respondents in borderline and abnormal categories were much higher both for difficulty and the impact scores of SDQ than the standard proportions.

*This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



### Corresponding Author:

Alka Sabharwal

Department of Statistics, Kirori Mal College, University of Delhi

Delhi, India

Email: [alkasabh@gmail.com](mailto:alkasabh@gmail.com)

## 1. INTRODUCTION

The emergence of coronavirus-induced pandemic COVID-19 in late 2019 and early 2020 and its consequences have altered human life across the world forever. Apart from the physiological effects, the pandemic has affected human lives psychologically, economically, and socially. A number of preventive steps and policy decisions, such as lockdown, social distancing, and closure of academic institutions to check the transmission and spread of the disease, have further augmented these effects [1].

One of the most affected strata of society during the pandemic is the young adults studying in higher educational institutions. This group has reported psychological issues such as loneliness, depression, anxiety, and distress extensively not only due to the disease itself but also on account of lack of interaction with their friends and teachers during online classes, uncertainty about their studies and future careers, and loss of family income due to lockdown conditions [2]–[10]. Although mental health problems have been reported among young adults earlier also thereby affecting their academic performance as well as their social lives [11]–[17],

still the number of affected young adults has grown manifold as compared to what the numbers were before the onset of the disease [2]. Moreover, studies have shown that the majority of people throw themselves into survival mode while facing trauma due to a pandemic that severely affects mental health [18].

Studies suggest that initially when the disease outbreak occurred, this was the 'lockdown' that affected people more than the disease itself although the first wave of the disease was in force [2], [16]. As time progressed and the world saw the more deadly second wave of COVID-19, the high number of morbidities and mortality affected the mental health of young adults the most, especially in India [19]. With time, the problems among young adults persisted or even aggravated [9], [10]. Although various studies have identified the psychological health issues of young adults due to COVID-19, only a few studies have concentrated on the effect of these issues on the daily lives of young adults [20]. In particular, we did not find any such study in the Indian context although India was the most affected country in the world after America [21].

As is the case with physiological health problems, psychological problems are needed to be identified appropriately. A standard method of testing these problems is the use of a questionnaire [22]. Each questionnaire is designed for a specific purpose and is meant for a specific group and can be administered to an individual to get detailed information as well as through a survey to collect mass information. The surveys in this study were held using the Strength and Difficulties Questionnaire (SDQ) 17+ extended version. SDQ [23] is a questionnaire meant for children and young adults to study their strengths and difficulties. Its various variants are self-reported, teacher-reported and parents-reported. The basic version of SDQ has 25 items in it, whereas the extended version of the questionnaire has 33 items. This questionnaire is available in more than 80 languages and is one of the most widely used questionnaires to identify mental health issues among children and adolescents [24]–[26].

With this background and to study the effects of distress during the COVID-19 pandemic on the daily lives of young adults in higher educational institutions, and the change in the severity of these effects as time progressed, three surveys were held at different time points during the pandemic times on Indian students. The first survey, held in May–June 2020, was aimed at studying the effect of forced lockdown on the mental health of young adults [27]. Two subsequent surveys were held during December 2020–February 2021 and during October–December 2021. By the time of the second survey, although the strict lockdown measures had been relaxed to some extent but the teaching-learning process in colleges/universities was still in online mode. The uncertainties due to the prolonged pandemic were still prevailing. By the time of the third survey, India had witnessed the disaster caused by the 'Delta' variant of the CORONA virus during the second wave of COVID-19 [19], [24]. These surveys were meant to study the effect of the prolonged pandemic on the mental health of young adults.

The principal objective of this study is to examine the dynamics of mental health problems faced by young adults studying in higher educational institutions in India over the COVID-19 pandemic period (from May 2019–December 2021) through chronological surveys. This involves i) studying the onset and intensification of distress with the onset of COVID-19 pandemic and the consequent lockdown on young adults bifurcated on the basis of gender; ii) studying the changing proportion of young adults suffering from severe behavioral problems and distress over this period bifurcated according to gender with age, family income, and, COVID-19 status; and iii) the effect of distress on day-to-day activities of young adults. Further, this study aims to find out how the severity of psychological problems progressed due to COVID-19 over time by comparing observed values with the previous standards. Also, progression of psychological health of 162 respondents who participated in the three surveys was studied by comparing their difficulty and impact scores for the three time periods. A novelty of this study that the association between behavioral problems (as measured by 'difficulty' score) and distress or social dysfunction (as measured by 'impact' score) has been extracted empirically. To the best of our knowledge, no studies have been conducted with college/university students at multiple institutions across India during the pandemic by conducting the surveys at different points of time. Besides introduction, this paper contains three more sections. In section 2, methods and material have been described. Results are presented in section 3 and the paper concludes in section 4 with discussions and conclusion.

## 2. RESEARCH METHOD

Using SDQ 17+ self-reported extended version, data were collected thrice, both through online and offline modes, during the COVID-19 pandemic from young adults, between 17–24 years of age, studying in various higher educational institutes across India. In the first survey conducted online, information was gathered from 1,020 students. Apart from the basic information on the respondents, the questionnaire had 33 questions of SDQ 17+ extended version. The second survey conducted both in online and physical modes, received responses from 743 undergraduate and postgraduate students. For this survey, the questionnaire was divided into two parts. The first part had ten questions and looked for the demographic details of the respondents such as their age, gender, place of living, family composition, and family income along with details of the direct impact of

COVID-19 in terms of if the respondent or any family members of theirs suffered from COVID-19 and needed to be hospitalized. The second part of the questionnaire was based on SDQ 17+ extended version. The third survey was conducted using a questionnaire similar to the one used in the second survey, along with a general health questionnaire (GHQ) component to look for the most recent health of the respondents, i.e. the last four weeks. GHQ has 12 items in it to detect psychological distress. The items are measured on a Likert scale which is either 0–1 or 0, 1, 2, 3. Nine hundreds and thirty-four respondents participated in this survey. The three bands of severity for the ‘Difficulty’ and the ‘Impact’ scores were computed for every category. ‘Abnormal Impact’ scores were further analyzed in respect of the number of problems faced by a respondent and the areas which were most affected during this period.

The SDQ scores were categorized according to the standard classification of cut-off points in the SDQ manual. The ‘difficulty’ and the ‘impact’ scores were calculated and categorized in the ‘normal’ (clinically significant problems in this area are unlikely), ‘borderline’ (clinically significant problems), and ‘abnormal’ (substantial risk of clinically significant problems) categories according to the criteria described in Table 1 [22]. The detailed methodology of the study is presented in Figure 1. Whereas the first survey had grouping variables ‘chronicity’ and ‘gender’, in the other two surveys the grouping variables of interest were ‘gender’, ‘age’, ‘income’, and the ‘COVID-19 status’. In all the three surveys, the problem areas of the ‘abnormal impact’ scores were studied.

Table 1. Three-band categorization of ‘difficulty’ and ‘impact’ scores for 17+ extended version of SDQ

Scale	Composition (items)	Normal	Borderline	Abnormal
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

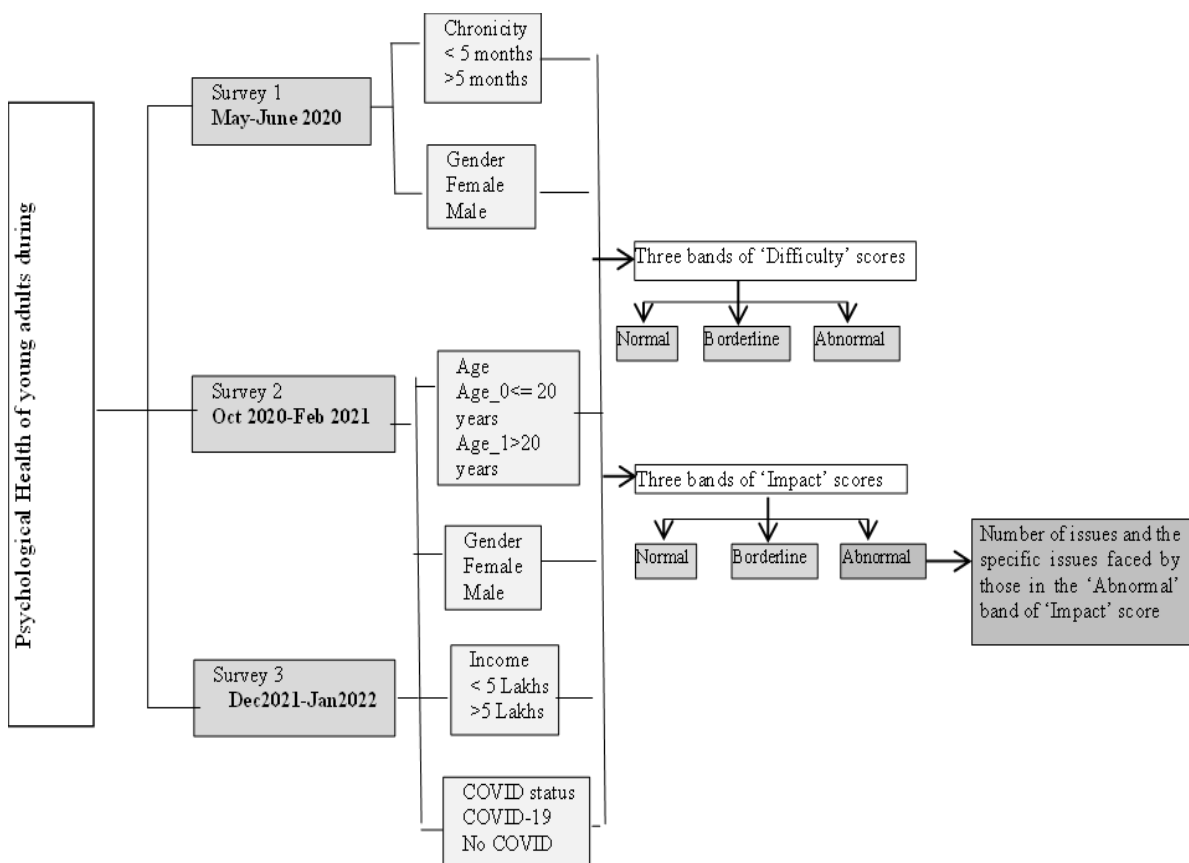


Figure 1. Algorithm for the comprehensive study on the mental health of young adults using SDQ 17+ self-reported extended version during COVID-19 pandemic through three chronological surveys

### 3. RESULTS

Data reliability was tested using Cronbach's alpha and Guttman Lambda [27]. The values were respectively: 0.83 and 0.89 (first survey); 0.86 and 0.89 (second survey) and; 0.88 and 0.86 for the third survey data. The reliable quotients are high and consistent for the three surveys.

#### 3.1. Effect of 'lockdown' on the mental health of young adults-first survey

To study the effect of forced lockdown on the psychological health of young adults, the responses were divided into two categories: gender (male and female) and by chronicity of distress. There were 462(45.29%) males and 558(54.71%) females. The term 'chronic' describes the course or rate of onset and development of illness. Chronicity, as measured by item 27 of SDQ, was considered only for those respondents who responded 'yes' to item 26 of the questionnaire measuring the presence or absence of 'distress' (social dysfunction). Out of 1020 respondents, 877 reported 'distress' ('yes' to item number 26). Among these, 38(4.33%) were in the 'no chronicity' group; 483(55.1%) had faced 'distress' for 'less than one month'; 218(24.86%) had faced 'distress' for 'one to five months', and remaining had distress for more than six months. The 'no chronicity' (No\_dur) category consisted of those respondents, who had not experienced any distress during this period. For chronicity of 'up to\_1M'; and '1M\_to\_5M' groups, the proportions of young adults in 'borderline' and 'abnormal' bands of 'difficulty' scores were much higher than the standard proportions of 10%, and 10%; whereas the 'normal' band proportions were substantially less than the standard proportion of 80%. The 'No chronicity' group exhibited healthy proportions. The results are presented in Figure 2.

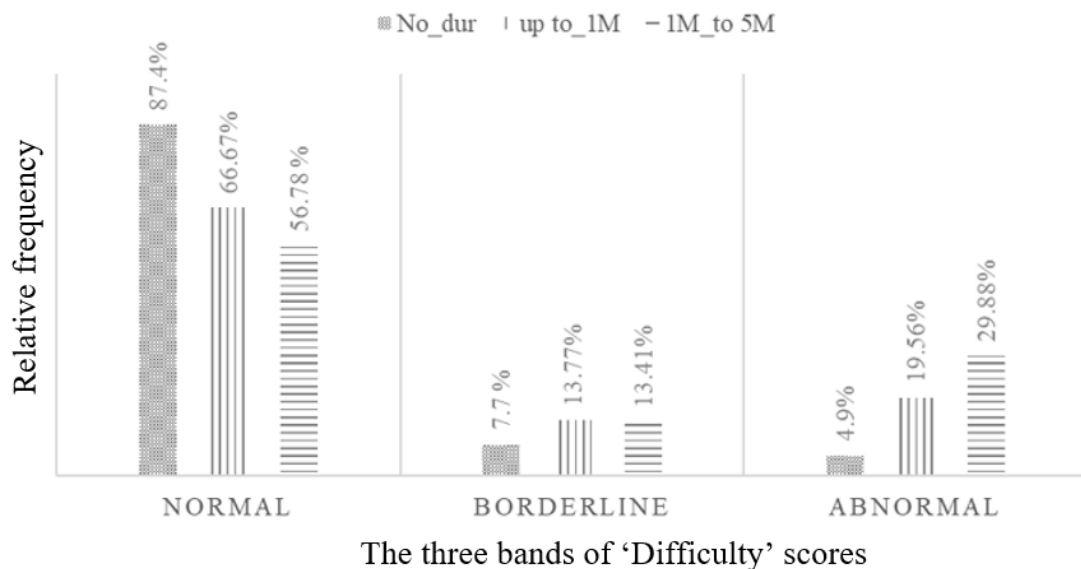


Figure 2. The relative frequency of young adults for 'no chronicity (No\_dur)', 'less than one month (up to\_1M)' and 'one to five months (1M to\_5M)' groups in 'Normal', 'Borderline' and 'Abnormal' bands of 'Difficulty' scores

#### 3.2. Progression of psychological problems due to prolonged pandemic with the course of time

To study the effect of gender, 'difficulty' and the 'impact' scores of groups by gender were computed for all three surveys along with the means and standard deviations of the scores. For all three surveys, females had higher mean 'difficulty' and 'impact' scores than males. For the chronological comparison, the mean 'difficulty' scores of the first two surveys based on gender were approximately similar, but were much higher in the third survey; the mean values being very close to 'abnormal'. For 'impact' scores, only the 'abnormal' band was considered (for the other two bands means were constant and standard deviations zero). The mean 'impact' scores in this band were higher than the cut-off value of '2' and increased consistently in the three surveys for both genders. Also, the proportions of males and females in the 'abnormal' band were very high and had reached 50% for females and 47% for males by the time of the third survey. The detailed results are presented in Table 2.

Table 2. Descriptive statistics of males and females in the three surveys for ‘difficulty’ and ‘abnormal impact’ scores

Subscale	Gender	Survey	Proportions	Mean	Std. deviation
Difficulty score (1,020-first, 743-second and 934-third)	Female	1	54.71	13.15	4.949
		2	48.45	13.44	5.287
		3	56	15.44	5.77
	Male	1	45.29	12.89	5.232
		2	51.55	12.11	5.743
		3	44	14.69	6.037
Abnormal impact score (360/877-first, 267/584- second and 379/773-third)	Female	1	46.12	3.36	2.60
		2	45.70	3.89	1.79
		3	50.00	4.33	2.08
	Male	1	42.23	3.12	2.55
		2	45.73	3.59	1.70
		3	46.99	4.31	2.30

### 3.3. Effect of age with the passing of time—age being a proxy for career entering time

At the time of the first survey, due to strict lockdown and other preventive measures, it was expected that the pandemic would soon be over and there would be no long-term effect in terms of studies and careers of the young adults and hence the effect of age was not studied. However, the emergence of new waves of the pandemic added to the psychological burden of young adults. This effect was apparent from increasing proportions of young adults in the ‘borderline’ and the ‘abnormal’ bands of both the ‘difficulty’ and the ‘impact’ scores. Table 3 presents the proportions of both male and female young adults categorized based on age (Age\_0 for respondents below or equal to 20 years of age; and Age\_1 for respondents above 20 years of age) in the three severity bands, ‘normal’, ‘borderline’, and ‘abnormal,’ of both the ‘difficulty’ and the ‘impact’ scores.

Table 3. The proportions of males and females categorized age-wise in the three bands

Scale	Group	Survey	Female			Male				
			Count	Normal	Borderline	Abnormal	Count	Normal	Borderline	Abnormal
Difficulty	Age_0	2	188	69.15	19.15	11.70	225	80.89	8.00	11.11
		3	284	43.66	29.93	26.41	209	58.37	18.18	23.44
	Age_1	2	172	65.12	18.60	14.89	158	65.19	22.15	12.66
Impact	Age_0	3	239	56.90	21.76	21.34	201	52.74	24.38	22.89
		2	147	29.73	24.32	45.95	164	46.01	8.59	45.40
	3	239	28.87	17.57	53.56	175	37.14	15.43	47.43	
	Age_1	2	143	32.17	22.38	45.45	130	37.69	16.15	46.15
		3	202	35.64	17.33	47.03	157	40.13	14.01	45.86

Both the ‘difficulty’ (except for males in the Age\_0 category of survey 2) and ‘impact’ scores suggested deviations from the healthy proportions; the ‘impact’ scores were more subtle indicators. In survey 2, Age\_1 young adult was more affected for both genders. The proportion of females in the ‘abnormal’ band of ‘impact’ scores was approximately 45% but in survey 3, 53.56% of female Age\_0 respondents were in ‘abnormal’ band as compared to 47% of females Age\_1.

### 3.4. Effect of income on the psychological issues faced by young adults

Previous studies suggested that the prevalence of the pandemic and consequent loss of economic activities, and incomes of many families were adversely affected and this was a factor responsible for the increase in stress levels of young adults. In order to study the effect of family income, the respondents of the second and the third surveys were categorized on the basis of annual family income- ‘less than 5 lakhs’ per annum and income ‘more than 5 lakhs’ per annum. The effect was not considered in the first survey as the lockdown was too recent at that time.

The respondents of both income categories were severely affected and proportions in ‘abnormal’ band were higher than that of 10% in the healthy population. However, there was no clear effect on mental health issues with respect to the two income groups. Whereas in the second survey the higher-income category respondents were more affected (48.47% in the ‘abnormal impact’ band) than their lower-income category counterparts (41.33% in this band), the situation reversed by the time of the third survey when the lower-income group was more affected with 53.59% being in ‘abnormal impact’ band as compared to 41.67% of the higher income group in this band. The mean scores of ‘difficulty’ and ‘impact’ scores under each group in survey 3 were higher. The detailed results are given below in Table 4.

Table 4. The descriptive statistics of the 'abnormal' band of the 'difficulty' and the 'impact' scores of the respondents categorized income wise

Income	Scale	Survey	Total count	Count (abnormal)	Proportion (%)	Mean	Std. deviation
<5 lakhs	Difficulty	2	287	34	11.85	22.74	2.526
		3	571	153	26.8	23.07	2.764
	Impact	2	225	93	41.33	3.9355	1.949
3		474	254	53.59	4.3043	2.159	
>5 lakhs	Difficulty	2	456	61	13.38	22.70	2.759
		3	363	69	19	22.65	2.93
	Impact	2	359	174	48.47	3.6322	1.628
3		300	125	41.67	4.472	2.292	

### 3.5. Direct effect of COVID-19-respondents who themselves or a family member of theirs had COVID-19

The effect of the pandemic on the psychological health of those who had faced it directly by the way of themselves or a family member of theirs being caught by the disease and those who did not suffer directly was studied by dividing the data into 'COVID-19' and 'Non COVID' categories. Table 5 presents the descriptive statistics in the 'abnormal' band of the 'difficulty' and 'impact' scores of the respondents categorized according to their COVID-19 status in the second and the third surveys. The proportions of those who suffered from COVID-19 directly in the 'abnormal' bands of the 'difficulty' as well as 'impact' scores in survey 3 were much higher as compared to those in survey 2. The proportions in 'abnormal impact' score band were already very high in survey 2 and these increased further reaching almost 50% for the Non COVID group in survey 3. The proportions of all the categories were very different from the standard of 10% in both surveys.

Table 5. The descriptive statistics of the 'difficulty' and 'impact' scores of the respondents categorized on the basis of COVID-19 status (if they or a family member of theirs caught COVID-19 or not)

Scale	COVID status	Survey	Count	Proportion in 'abnormal' band	Mean	Std. deviation
Difficulty	Non COVID	2	658	12.31	22.86	2.7917
		3	533	22.51	22.97	2.7802
	COVID-19	2	84	13.09	22.36	1.3618
		3	401	24.69	22.92	2.8798
Impact	Non COVID	2	512	44.72	3.74	1.7569
		3	428	49.53	4.33	2.158
	COVID-19	2	71	45.07	3.71	1.7227
		3	347	47.84	4.34	2.2285

### 3.6. Impact of time on the psychological health of respondents

One hundred and sixty-two respondents were found to have participated in all the three surveys. Descriptive statistics of the 'difficulty' and the 'impact' scores of these respondents were computed in order to analyze the pattern of their psychological health over the course of time. It was observed that both the scores first declined from the time of first survey to the time of the second survey and then increased by the time of the third survey. The mean impact score of the third survey was above the 'abnormal' cut-off value of 2. The mean difficulty score for the third survey was very close to the 'borderline' cut-off value of 16. Both the median and the modal values of both the scores are highest for the third survey. Moreover, the proportion of those who responded with a 'yes' to item number 26 was highest by the time of the third survey. The detailed results are presented in Table 6.

Table 6. The descriptive statistics of the 'difficulty' and 'impact' scores of 162 respondents who had participated in all the three surveys

Statistic	Difficulty			Impact		
	Survey 3	Survey 2	Survey 1	Survey 3	Survey 2	Survey 1
Mean	15.13	11.19	13.88	2.11	1.51	1.53
Median	15	11	13.5	2	1	1
Mode	13	12	12	2	0	0
Standard deviation	5.7657	5.1624	5.4096	0.8871	1.9627	2.724
Total (proportion of 162)	162	162	162	140 (87%)	105(65%)	130 (80%)

As far as the proportions in the three categories of scores were concerned, the results were never close to the standard proportions of 80%, 10%, and 10%. Similar to the findings on the complete data for the three surveys, the deviations in 'impact' scores were more than the deviations in the 'difficulty' scores; although least deviations were observed in the second survey. The results are presented in Table 7.

Table 7. The proportions in the three severity bands of the ‘difficulty’ and ‘impact’ scores of 162 respondents who had participated in all the three surveys

Score categories	Normal			Borderline			Abnormal		
	Survey 3	Survey 2	Survey 1	Survey 3	Survey 2	Survey 1	Survey 3	Survey 2	Survey 1
Difficulty	47.27	58.23	54.23	28.23	24.47	25.23	24.5	17.30	20.54
Impact	35.19	38.34	37.57	16.16	17.56	17.29	48.65	44.10	45.14

**3.7. Number and type of affected areas due to distress**

In the three surveys, it was observed that the distribution of the respondents in the ‘abnormal’ band of the ‘impact’ score was very diverse in terms of the number of issues they were facing. For a score to lie in ‘abnormal’ band, either the respondent has at least two or more problem areas in ‘quite a lot’ category; or at least one problem areas in ‘a great deal’ category while some other areas may be in ‘not at all’ or ‘only a little’ categories. The number of respondents in ‘abnormal’ band of ‘impact’ scores with one problem area only (i.e. in ‘quite a lot’ category of that area) were 112 in survey 1, 80 in survey 2, and 93 in survey 3. As the time progressed, most of the respondents in ‘abnormal’ band of ‘impact’ scores were having problems in two or more areas; some even had problems in all the five areas of ‘impact’ scores by the time of survey 3. Figure 3 below presents the number of respondents having problems in two, three, four, and all the five areas in all three surveys.

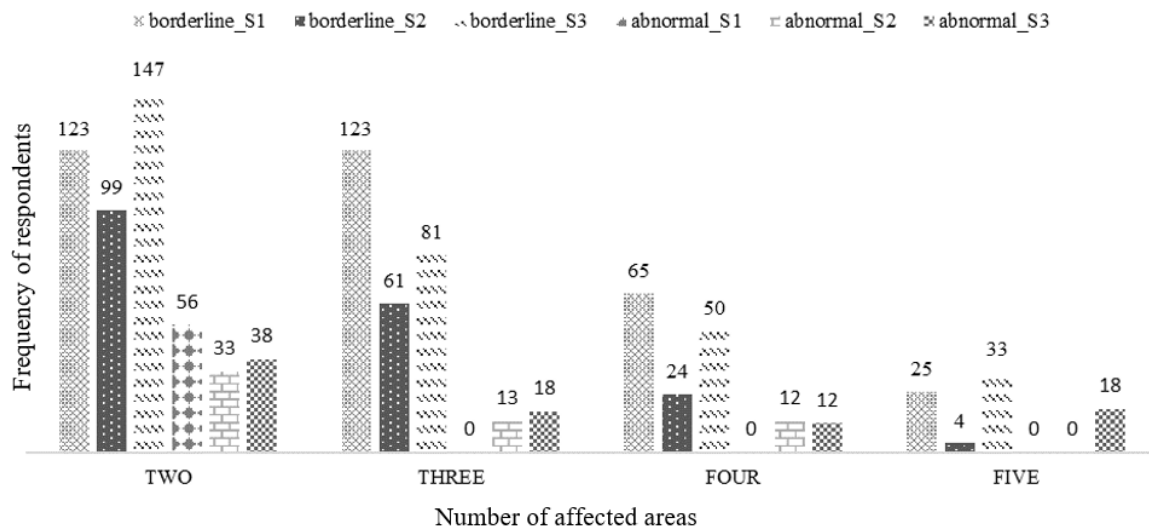


Figure 3. Frequency distribution of respondents in the ‘abnormal’ band of impact scores when the individual affected areas were in ‘borderline’ and ‘abnormal’ bands in surveys 1, 2, and 3

Although the ‘impact’ score quantifies the effect of ‘distress’ in five areas of the daily lives of young adults, not all the areas are equally affected. However, a high score, ‘A great deal’, in only one area can shift the ‘Impact’ scores to ‘abnormal’ band of severity. Table 8 presents the breakup of the areas affected for those whose ‘impact’ scores were in the ‘abnormal’ band during the three surveys. The single most affected area was ‘studies’ followed by ‘friends’ in all three surveys. ‘Studies’ was invariably one of the areas in all three surveys when more than one area having ‘a great deal’ score was considered. The scatter of the combination of affected areas was much more during the third survey when almost all the combinations had non-zero frequencies as compared to the first two surveys. For the first time, ‘a great deal’ severity was observed in 18 cases in all the five areas of distress during the third survey. The detailed results are presented in Table 8.

**3.8. Extracting the relationship between behavioral problems and distress empirically**

Table 9 presents the association between the level of behavioral problems (as identified by ‘difficulty’ score) and the level of distress (as identified by ‘impact’ score). In survey 2, 20.46% of respondents were facing ‘abnormal’ distress but ‘normal’ difficulty (<=15). ‘Normal band’ of ‘difficulty score’ do not ensure that respondents are not facing any behavioral problems. This is evident from the responses of two participants randomly taken from the survey 2 whose difficulty scores were less than 15: i) a female student who had only

one 'a great deal' problem (emotional symptoms); and ii) a male student who had one 'a great deal' problem (conduct problem) and one 'borderline' problem (peer problem). Both these respondents had 'abnormal' level of distress. Further, respondents who had 'abnormal level' of difficulty in general, had 'abnormal' level of distress also i.e., 72% and 74% as against 5% and 0% having 'normal' level of distress in surveys 2 and 3 respectively.

Table 8. Break up of most affected areas of 'distress' in the three surveys of those who had 'abnormal impact' score

Attributes		Survey 1	Survey 2	Survey 3	
One	Self	2	0	21	
	Family	0	9	10	
	Friends	30	24	10	
	Studies	55	29	33	
	Hobby	25	18	19	
Two	Self & family	19	0	1	
	Self & friends	0	0	2	
	Self & studies	1	0	7	
	Self & hobby	0	0	2	
	Family & friends	0	4	3	
	Family & studies	0	3	1	
	Family & hobby	0	6	2	
	Friends & studies	9	3	3	
	Friends & hobby	5	2	3	
	Studies & hobby	22	15	14	
	Three	Self, family, & friends	0	0	1
		Self, family, & studies	0	0	1
		Self, family, & hobby	0	0	2
Self, friends, & studies		0	0	1	
Self, friends, & hobby		0	0	1	
Self, studies, & hobby		0	0	3	
Family, friends, & studies		0	4	2	
Family, friends, & hobby		0	1	0	
Family, studies, & hobby		0	4	4	
Friends, studies, & hobby		0	4	3	
Four		Self, family, friends, & studies	0	0	3
	Self, family, friends, & hobby	0	0	2	
	Self, family, studies, & hobby	0	0	3	
	Self, friends, studies, & hobby	0	0	2	
	Family, friends, studies, & hobby	0	12	2	
Five	Self, family, friends, studies, & hobby	0	0	18	

Table 9. Frequency distribution of young adults in three bands of 'difficulty' and 'impact' scores in three surveys

Difficulty score	Survey	Impact score					
		Normal		Borderline		Abnormal	
		Number	Proportion	Number	Proportion	Number	Proportion
Normal	1(489)	283	57.87	119	24.34	87	17.79
	2(391)	190	48.59	121	30.95	80	20.46
	3(434)	183	42.17	63	14.42	29	6.68
Borderline	1(168)	46	27.38	64	38.09	58	34.52
	2(106)	19	17.92	43	40.57	45	42.45
	3(330)	0	0	45	13.64	186	56.36
Abnormal	1(115)	14	12.15	45	39.13	56	48.69
	2(87)	5	5.74	19	21.83	63	72.41
	3(170)	0	0	18	10.59	126	74.12

#### 4. DISCUSSION

Depression and other mental health issues are seen often among young adults studying in higher education. A number of causes have been assigned with these mental health issues among young adults. Deb *et al.* [12] found that 37.7%, 13.1%, and 2.4% of the students in Indian universities were suffering from moderate, severe, and extremely severe depression respectively. With the emergence of COVID-19, not only the severity of these mental health problems increased but persisted over time also [7], [16], [21].

This work is meant to study the effect of COVID-19 and its consequences over time on the psychological health of young adults with the help of three chronological surveys using SDQ. In the first survey, conducted in the months of May–June 2020, the need was felt to study the effect of forced lockdown



and its consequences on the mental health of young adults. As portrayed by ‘difficulty’ scores [27]–[29], lack of interaction with their peers and teachers, no social activities, and forced stay indoors affected the mental health of the respondents adversely. The distress indicating ‘impact score’ was significantly different (high) when ‘less than five months’ distress was compared with ‘over five months’ distress.

With the passing of time, the effect of ‘chronicity’ was no longer observable. Although the stringent lock-down conditions were relaxed to some extent recurring waves of pandemics, a very large number of deaths, and the panic arising out of this situation, particularly after the second wave of COVID-19 affected the mental health of young adults very severely. Prevailing social and economic conditions along with the other persisting factors further affected the mental health of young adults with the passage of time [19]. Two subsequent surveys, during October 2020–February 2021 and December 2021–January 2022 examined the mental health of young adults due to prolonged pandemic and its aftereffects. Not only the ‘Impact’ scores increased gradually with higher means but the proportions of young adults (except for females in the second survey) in the ‘abnormal’ band of ‘impact’ scores also increased. The finding that up to 50% of the respondents (both males and females) were facing severe distress was consistent with the earlier studies which suggested that a very high proportion of young adults was facing severe mental health issues in pandemic times [17], [29], [30]. Throughout the time horizons of the study, females were found to be more severely ‘distressed’ than males and the mean difficulty score of females (behaviour and conduct problems) was higher than males’ score. This finding was consistent with most of the previous studies [6], [20], [30], [31].

The effect of age on gender was examined in surveys 2 and 3. It was observed in survey 2 that the proportion of individuals in the ‘abnormal band’ was higher in Age\_1 corresponding to difficulty scores for both male and female groups. But this pattern was not observed in survey 3. Also, this observation was different from previous studies stating that the effect of the pandemic on the mental health of people varies with age [6], [28], [30], [31]. However, for all the four categories of age with gender the proportions in non-healthy bands were higher in survey 3 except for Age\_1 (Male) ‘Impact’ where it was almost the same.

Loss of family income along with the other persisting factors affected the mental health of young adults more severely with the passage of time [19]. For the two income groups viz. income less than five lakhs per annum; and income more than or equal to five lakhs per annum, mean scores were much higher than the cut-offs of 20 for the ‘difficulty’ score and 2 for the ‘impact’ score for both income groups. Also, the proportions in non-healthy bands had increased considerably from the second survey to the third survey except for the ‘Impact’ score for the higher income. However, in this case also, the mean score of 4.472 at the time of the third survey was much higher than the mean score of 3.6322 at the time of the second survey. Contrary to general results that mental health problems were higher for the lower income group [6], [9], [30], [31], we did not find any evidence of the effect of income. Both the income groups were severely affected as shown in Table 4.

COVID-19 status question i.e. participants themselves or family member(s) of theirs faced Covid-19 (‘COVID-19’ group) or not (‘Non COVID’ group) was included in surveys 2 and 3. The proportions in non-healthy bands were higher for COVID-19 group except for the proportions in ‘impact’ in Survey 3, which were almost the same for the two groups as shown in Table 5). This is in accordance with the previous findings that those who had contracted the disease themselves or a family member of theirs were more susceptible to mental health issues than those who had not faced the disease directly [6], [20], [32]. The effect of time was clearly visible from the second survey to the third survey. Although the difference between the proportions in the ‘abnormal’ band of ‘impact’ scores of ‘Non COVID’ (45%) and ‘COVID-19’ (53%) groups was there at the time of the second survey, by the time of the third survey, the two groups were equally severely affected. A possible reason for this could be a deadly second COVID-19 wave resulting in a high number of mortalities [18].

For all the categories of young adults in all the three surveys, the proportions were very different from the standard proportions of 80%, 10%, and 10% in the ‘normal’, ‘borderline’, and ‘abnormal’ band for both the ‘difficulty’ and the ‘impact’ scores. However, the ‘impact’ scores showed greater variations as compared to ‘difficulty’ scores. Also, the ‘impact’ scores (stress) were more affected with the passing of time. It was observed that 14 respondents (4.05%) in survey 1 were facing behaviour problems (higher ‘difficulty score’) and were not stressed indicated by ‘impact score’ (answer to SDQ item no 26 was NO). In surveys 2 and 3 there were just 5, 0 (2.07% and 0%) respondents who were not stressed yet facing behaviour problems (‘difficulty score’ more than 20) respectively. This observation suggests that ‘impact’ scores are better at predicting mental health issues as compared to ‘difficulty’ scores since it takes into account the chronicity, distress, social impairment, and burden; and exhibit the effect on the day-day lives of the respondents of a problem as perceived by the respondent [22], [32].

The ‘impact’ score is further divided into categories to find the number of areas in which a respondent is having problems. In survey 1, the maximum number of respondents in the ‘abnormal’ band of ‘impact’ score was having two or three borderline problems (62.7%) and just 14.3% had severe problems in one area only.

None of the participants had severe problems in two or more areas. In survey two, the corresponding figures were 48.9% and 35.7% (one or more areas). By the time of survey 3, the figures were 63.6% and 36.4% respectively. Even 4% of the participants were facing severe problems in all five areas of the 'impact' score at the time of survey 3. 'Studies' was their most affected area irrespective of the number of areas the young adults were having problems in. As time passed, not only young adults were feeling problems in more areas but also the severity of problems increased thus affecting their day-to-day activities.

The effect of time was studied by collecting data on the respondents who had participated in all the three surveys. There were 162 such respondents. At the time of the first survey, it was the effect of lockdown which was more persistent [27] as indicated by the high mean difficulty score (behavioral problems) as well as impact scores (day-to-day activities) and also by the fact that as many as 87% respondents answered 'yes' to item number 26. Almost 45% of these respondents were in the 'abnormal' category of 'impact' scores. By the time of the second survey, the lockdown was not that stringent and people were hopeful of returning to the pre-pandemic era so both difficulty and impact scores declined; and also, the proportions of those answering 'yes' to item number 26 as well as those in the 'abnormal' category of both the score. However, the situation reversed by the time of the third survey which was held after the havoc created by the delta variant of CORONA virus during the second wave of the pandemic [7], [18], [24]. All the three statistics were found to have higher values than those for the first two surveys. The response of the participants over three surveys reflected the effect of the pandemic on their psychological health and was consistent with the larger group of respondents, (see Tables 6 and 7). Further, there is a need to modify the standard proportions 80%, 10%, and 10% of the population in 'normal', 'borderline', and 'abnormal' categories of SDQ scores or new proportions to meet the crises times such as COVID-19 pandemic [28].

To the best of our knowledge, all the previous studies concentrated on the consolidated 'impact' score and none of the studies has attempted to break up the score according to the severity in the different number of areas as measured by 'impact' score. The examination of the association between the level of behavioral problems and level of distress given in Table 9 suggests that respondents who were not distressed were generally not facing any behavioral problems. There were only 14%, 5%, and 0% respondents facing severe behavioral problems but no distress as observed in the three surveys respectively.

## 5. CONCLUSION

Through this study, we were able to establish that the COVID-19 pandemic not only affected the mental health of young adults but the problems aggravated with the passage of time. Also, SDQ was able to identify the proportions of problems of young adults (college-going) in different categories of 'difficulty' and the 'impact' scores. The observations from the three-survey suggested that 'impact' scores were better at finding the severity of the mental health issues than 'difficulty' scores. The study can be taken to be a representative study for any crisis time as SDQ and does not ask anything specific about the nature of the crisis but examines the mental health of the respondents at the time of the crisis.

However, this study has its limitation. A limitation of the study is that in all three surveys, respondents are young adults in higher education. Young adults who are engaged in informal modes of education are not included in these surveys.




## REFERENCES

- [1] OECD, "OECD policy responses to coronavirus (COVID-19)," <https://www.oecd.org/coronavirus/en/policy-responses>, 2021. (accessed May 30, 2022).
- [2] S. Singh, D. Roy, K. Sinha, S. Parveen, G. Sharma, and G. Joshi, "Impact of COVID-19 and lockdown on mental health of children and adolescents: A narrative review with recommendations," *Psychiatry Research*, vol. 293, p. 113429, Nov. 2020, doi: 10.1016/j.psychres.2020.113429.
- [3] A. Dawel *et al.*, "The Effect of COVID-19 on Mental Health and Wellbeing in a Representative Sample of Australian Adults," *Frontiers in Psychiatry*, vol. 11, 2020, doi: 10.3389/fpsyt.2020.579985.
- [4] W. Chang, L. Shi, L. Zhang, Y. Jin, and J. Yu, "The Mental Health Status and Associated Factors Among Medical Students Engaged in Online Learning at Home During the Pandemic: A Cross-Sectional Study from China," *Frontiers in Psychiatry*, vol. 12, 2021, doi: 10.3389/fpsyt.2021.755503.
- [5] S. Lischer, N. Safi, and C. Dickson, "Remote learning and students' mental health during the Covid-19 pandemic: A mixed-method enquiry," *PROSPECTS*, vol. 51, no. 4, pp. 589–599, 2022, doi: 10.1007/s11125-020-09530-w.
- [6] P. Sahu, "Closure of Universities due to coronavirus disease 2019 (COVID-19): impact on education and mental health of students and academic staff," *Cureus*, 2020, doi: 10.7759/cureus.7541.
- [7] T. Jain, R. Ranjan, N. Chaudhary, P. Kumar, and S. Ahmad, "Effect on Mental Health among Undergraduate College Students of India during the COVID-19 Pandemic: A Cross-Sectional Multicentric Study," *Psychiatr. Danub.*, vol. 33, no. Suppl. 13, pp. 392–398, 2021.
- [8] N. Panchal, R. Kamal, C. Cox, and R. Garfield, "The Implications of COVID-19 for Mental Health and Substance Use," *Kaiser Family Foundation*, vol. 21, 2020.
- [9] D. Posel, A. Oyenubi, and U. Kollamparambil, "Job loss and mental health during the COVID-19 lockdown: Evidence from South Africa," *PLOS ONE*, vol. 16, no. 3, p. e0249352, 2021, doi: 10.1371/journal.pone.0249352.





- [10] Y. Gong *et al.*, “COVID-19 Induced Economic Slowdown and Mental Health Issues,” *Frontiers in Psychology*, vol. 13, 2022, doi: 10.3389/fpsyg.2022.777350.
- [11] G. Kumar, A. Jain, and S. Hegde, “Prevalence of depression and its associated factors using Beck Depression Inventory among students of a medical college in Karnataka,” *Indian Journal of Psychiatry*, vol. 54, no. 3, pp. 223–226, 2012, doi: 10.4103/0019-5545.102412.
- [12] S. Deb, P. R. Banu, S. Thomas, R. V. Vardhan, P. T. Rao, and N. Khawaja, “Depression among Indian university students and its association with perceived university academic environment, living arrangements and personal issues,” *Asian Journal of Psychiatry*, vol. 23, pp. 108–117, 2016, doi: 10.1016/j.ajp.2016.07.010.
- [13] E. P. Bettinger, L. Fox, S. Loeb, and E. S. Taylor, “Virtual Classrooms: How Online College Courses Affect Student Success,” *American Economic Review*, vol. 107, no. 9, pp. 2855–2875, 2017, doi: 10.1257/aer.20151193.
- [14] A. R. Hurlbut, “Online vs. traditional learning in teacher education: a comparison of student progress,” *American Journal of Distance Education*, vol. 32, no. 4, pp. 248–266, 2018, doi: 10.1080/08923647.2018.1509265.
- [15] S. Grover, V. R. V. A. Sharma, and R. Shah, “Depression in Children and Adolescents: A Review of Indian studies,” *Indian Journal of Psychological Medicine*, vol. 41, no. 3, pp. 216–227, 2019, doi: 10.4103/IJPSYM.IJPSYM\_5\_19.
- [16] J. F. Huckins *et al.*, “Mental Health and Behavior of College Students During the Early Phases of the COVID-19 Pandemic: Longitudinal Smartphone and Ecological Momentary Assessment Study,” *Journal of Medical Internet Research*, vol. 22, no. 6, p. e20185, 2020, doi: 10.2196/20185.
- [17] T. Shah and T. Pol, “Prevalence of depression and anxiety in college students,” *Journal of Mental Health and Human Behaviour*, vol. 25, no. 1, pp. 10–13, 2020, doi: 10.4103/jmhbb.jmhbb\_16\_20.
- [18] G. P. Singh, “The Second Wave of the COVID-19 Tsunami and Mental Health,” *The Primary Care Companion For CNS Disorders*, vol. 23, no. 5, 2021, doi: 10.4088/PCC.21com02995.
- [19] R. Baltà-Salvador, N. Olmedo-Torre, M. Peña, and A.-I. Renta-Davids, “Academic and emotional effects of online learning during the COVID-19 pandemic on engineering students,” *Education and Information Technologies*, vol. 26, no. 6, pp. 7407–7434, 2021, doi: 10.1007/s10639-021-10593-1.
- [20] W. Cao *et al.*, “The psychological impact of the COVID-19 epidemic on college students in China,” *Psychiatry Research*, vol. 287, p. 112934, May 2020, doi: 10.1016/j.psychres.2020.112934.
- [21] Worldometers, “Countries where COVID-19 has spread,” [Online]. Available: <https://www.worldometers.info/coronavirus/countries-where-coronavirus-has-spread/>. 2021 (accessed May 30, 2022).
- [22] R. Goodman, “The Extended Version of the Strengths and Difficulties Questionnaire as a Guide to Child Psychiatric Caseness and Consequent Burden,” *Journal of Child Psychology and Psychiatry*, vol. 40, no. 5, pp. 791–799, 1999, doi: 10.1111/1469-7610.00494.
- [23] C. C. O. R. Consortium, “Outcome & Experience Measures,” *Anna Freud National Centre for Children and Families*. 2021.
- [24] S. Thakar, S. Singh, A. E. Dalton, and K. K. K., “Psychological impact of the second wave of the COVID-19 pandemic on non-frontline healthcare workers: results of a cross-sectional study in a tertiary care hospital in India,” *International Journal Of Community Medicine And Public Health*, vol. 8, no. 6, pp. 2829–2938, 2021, doi: 10.18203/2394-6040.ijcmph20211982.
- [25] C. Demetriou, B. U. Ozer, and C. A. Essau, “Self-Report Questionnaires,” *The Encyclopedia of Clinical Psychology*. John Wiley & Sons, Inc., pp. 1–6, 2015. doi: 10.1002/9781118625392.wbecp507.
- [26] T. M. Achenbach *et al.*, “Multicultural assessment of child and adolescent psychopathology with ASEBA and SDQ instruments: research findings, applications, and future directions,” *Journal of Child Psychology and Psychiatry*, vol. 49, no. 3, pp. 251–275, 2008, doi: 10.1111/j.1469-7610.2007.01867.x.
- [27] A. Sabharwal, B. Goyal, and K. E. S. Unni, “Effect of Lockdown due to COVID-19 on Psychological Health of Young Adults- A Survey Report,” *The Journal of Medical Research*, vol. 6, no. 5, pp. 203–211, 2020, doi: 10.31254/jmr.2020.6507.
- [28] T. Chen and M. Lucock, “The mental health of university students during the COVID-19 pandemic: An online survey in the UK,” *PLOS ONE*, vol. 17, no. 1, p. e0262562, 2022, doi: 10.1371/journal.pone.0262562.
- [29] A. Lal, A. Sanaullah, M. K. M. Saleem, N. Ahmed, A. Maqsood, and N. Ahmed, “Psychological Distress among Adults in Home Confinement in the Midst of COVID-19 Outbreak,” *European Journal of Dentistry*, vol. 14, no. S 01, pp. S27–S33, 2020, doi: 10.1055/s-0040-1718644.
- [30] D. Ochnik *et al.*, “Mental health prevalence and predictors among university students in nine countries during the COVID-19 pandemic: a cross-national study,” *Scientific Reports*, vol. 11, no. 1, p. 18644, 2021, doi: 10.1038/s41598-021-97697-3.
- [31] P. Wu *et al.*, “The psychological impact of the SARS epidemic on hospital employees in China: Exposure, risk perception, and altruistic acceptance of risk,” *Canadian Journal of Psychiatry*, vol. 54, no. 5, pp. 302–311, 2009, doi: 10.1177/070674370905400504.
- [32] R. Goodman, D. Renfrew, and M. Mullick, “Predicting type of psychiatric disorder from Strengths and Difficulties Questionnaire (SDQ) scores in child mental health clinics in London and Dhaka,” *European Child & Adolescent Psychiatry*, vol. 9, no. 2, pp. 129–134, 2000, doi: 10.1007/s007870050008.

## BIOGRAPHIES OF AUTHORS







**Babita Goyal**    is a Professor of Statistics at Ramjas College, University of Delhi. Her areas of interest are statistics in finance, actuarial science, stochastic processes, and biostatistics. Currently, she is working on psychological problems faced by young adults. She can be contacted at email: [goyalbabita@gmail.com](mailto:goyalbabita@gmail.com).







**Alka Sabharwal**     is a Professor of Statistics at Kirori Mal College, University of Delhi. Her areas of interest are in the field of stochastic processes and biostatistics. Previously she has published many research papers on problems related to diabetes and its complications, chronic kidney problems, mental disorders, and adolescent behavioural problems through statistical modelling. Currently, she is working on psychological and behavioral problems related to young adults. She can be contacted at email: [alkasabh@gmail.com](mailto:alkasabh@gmail.com).



**Vibha S. Chauhan**     is Principal, Kirori Mal College, University of Delhi. She holds degrees in various disciplines like education and law. Her Ph.D. research focuses on a sociological approach to culture and comparative literature. Chauhan has wide experience in teaching, administration, and research at schools as well as higher education institutions. She is the Founder Secretary of HELM, a group that has worked extensively among the widows in Vrindavan, and the indigenous communities in parts of Gujarat and Chattisgarh. She can be contacted at email: [vibha20\\_2000@yahoo.com](mailto:vibha20_2000@yahoo.com).



**Lalit Mohan Joshi**     is a research scholar at the Department of Statistics, University of Delhi, Delhi, India. Currently he is pursuing his Ph.D. in the statistical analysis of psychological problems faced by young adults in India. His areas of interest are Bio-Statistics. He can be contacted at email: [lalitjstats12@gmail.com](mailto:lalitjstats12@gmail.com).