



Research article

Psychological impacts of COVID-19 and satisfaction from online classes: disturbance in daily routine and prevalence of depression, stress, and anxiety among students of Pakistan



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ARTICLE INFO

Keywords:

COVID-19

Pandemic

Panic

Stress management

Psychological impact

Students

ABSTRACT

The present study investigated the (i) socio-demographic predictors of psychological distress, (ii) socio-demographic predictors of satisfaction from online classes, and (iii) the relationship between psychological distress and satisfaction from online classes among university students of Pakistan during the COVID-19 pandemic. An online questionnaire-based survey was conducted. A total of 2220 respondents that was enrolled at the University of the Punjab (PU), University of Management and Technology (UMT), and the University of Central Punjab (UCP) were involved in the current study. Data were collected at a 64% response rate and analyzed with SPSS IBM Version 21.0. Results revealed that approximately 41% of the students were facing severe psychological distress while about 65% were found unsatisfied with online classes. Besides, a linear negative relationship between the independent variable, i.e. psychological distress and the dependent variable, i.e. satisfaction from online classes was found. Therefore, to minimize the level of psychological distress and increase students' satisfaction with online classes it is highly recommended to take precautionary measures by the relevant stakeholders.

1. Introduction

Stressful events such as the COVID-19 pandemic not only affect individuals' daily routine but also pose a significant negative impact on their mental and physical health [1]. The influence of such instances on the mental health of students is understudied and very little is known about it in Pakistan. However, in 2020 Xiong, J. and co-workers reported

a landmark research in the general population of China, Denmark, Iran, Italy, Nepal, Spain, Turkey, and the United States [2]. Besides, it is also proclaimed that the pandemic affects young and old people differentially [3]. Therefore, it was found obligatory to find out the socio-demographic predictors of psychological distress on students and their level of satisfaction from the ongoing mode of blended learning due to such stressful events.

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Pakistan reported its first COVID-19 case on 26th February 2020 [4]. There are over 623,135 confirmed cases, 29,576 active cases with almost 13,799 deaths as of 20th March 2021 (<https://covid.gov.pk/>). To contain and curb the spread of the virus, educational institutes were closed on 13th March 2020 and an initial 14-day lockdown was imposed on 23rd March 2020 restricting all unnecessary activities in everyday life [5]. Like China and Italy, the nationwide smart lockdown was imposed on 27th March 2020 that later ended in different phases [6]. The aim of restricting activities was to save lives by preventing viral transmission, to reduce its incidence, and to decrease the burden on the medical care system [7]. School closure due to pandemics like flu or severe acute respiratory syndrome (SARS), had remained a successful attempt to reduce the transmission rate of viruses and to flatten the peak of the incidence of disease [8, 9, 10]. This strategy appeared to be very effective in the way that it reduced the contact between the students and protected them from getting infections [11], but other hand it afflicted the daily routine of the students and everyone else [7].

After the SARS epidemic, many studies reported its negative effect on the mental health of people revealing that people minimized social gatherings and remained reluctant returning to their workplaces [12, 13]. SARS also resulted in social isolation, activity restriction, psychological morbidity, increased anxiety, and even a high suicide rate [14]. Wang and co-workers reported that the restricted routine activities and self-isolation psychologically affected people amply [15]. SARS caused serious distress among the Canadian patients during quarantine. The side effects of post-traumatic stress disorder (PTSD) and anxiety were observed in 28.9% and 31.2% of respondents respectively [16]. Similarly, a study in Hong Kong reported a significant level of apparent stress in non-medical students as compared to medical students [17]. Recently, the COVID-19 pandemic was also found to cause psychological disturbance among the people [18].

A cohort study of Chinese college students reported that 1% of students were confronted severe anxiety, while 2.7% and 21.3% were experiencing moderate and mild anxiety respectively due to the current pandemic [19]. Students were also stressed due to the impact of the pandemic on their studies and future employment [20, 21, 22]. A study in Pakistan on 1050 students revealed that more females (23.5%) were affected by pandemics than males (18.5%). The daily life of the majority of students (41.6%) was strongly affected by this pandemic. Almost 52% of students reported an online mode of learning to be nonproductive [23]. Therefore, it was pertinent to study the socio-demographic predictors of psychological distress among the students during this pandemic.

Contra-distinctive studies have shown that although there were some plans to use online learning during the pandemic, they were never implemented globally as in the case of the COVID-19 pandemic of 2020 [24]. All educational institutes have been closed in various countries, including Pakistan, during the current pandemic. Even universities have postponed their exams and on-campus classes have been suspended and shifted to online/e-learning mode. All these permutations have placed load and stress on students [6, 25]. A number of the students were from the remote peripheral parts that lacked smooth internet facilities. Such students were underprivileged, and this situation affected their final grades [26].

In the feedback of the online classes in India, 97% of the students (among which 87% were of the post-graduate class) were satisfied with this new mode of learning and suggested it to be a part of their curriculum [27]. Another study reported that most of the students in the Philippines were facing connectivity issues and were not ready for this mode of learning [28]. On the contrary, in Georgia, the experience of online learning was successful. The factors behind this success were that almost 79% of their homes have easy access to the internet and almost 62% of homes have computers which were substituted by smartphones in rural areas [29]. Recently, in a study conducted in Pakistan on a small number of such students (126), it has been reported that the majority of the students (71.4%) found online learning non-motivating, 50.8% of

students were reported to have difficulty in completing courses and 78.6% students were of the view that there should be mandatory physical presence of the teacher in class for learning [25]. Therefore, the students' feedback regarding satisfaction from online classes was important.

2. Method

2.1. Study area

The current study was conducted in Lahore, Punjab, Pakistan. Lahore is the provincial capital of Punjab and one of the biggest districts in terms of population. It is also an educational hub in Punjab with 37 Universities and Degree Awarding Institutions recognized by the Higher Education Commission (HEC) of Pakistan. Besides, the number of COVID-19 patients was the highest in Lahore, as compared to the other 35 districts of Punjab. Therefore, the students from three universities i.e. the University of the Punjab, the University of Management and Technology, and the University of Central Punjab that are situated in Lahore were selected to collect data about the prevalence of psychological distress and satisfaction from online classes in the current COVID-19 pandemic. The selection of the universities was purposeful because all universities started online classes using ZOOM, WhatsApp and were already sharing recorded lectures with the students as per the guidelines by the Higher Education Commission (HEC), Pakistan. The study was approved by the Bioethics Committee of the University of Okara, Punjab-Pakistan.

2.2. Recruitment of the respondents and response rate

A lottery method without replacement was used to randomly select the above-mentioned three universities. Students from these selected universities were recruited by an inclusion criterion. According to the criteria, the students from Lahore city who were enrolled in selected HEC recognized universities and/or degree awarding institutions were invited to participate in the study. A Written informed consent was obtained from the participants. The link of the online survey along with the invitation to participate in the study was shared with a total of 3,600 students; however, 2220 respondents provided data with a 62% response rate. The link to the survey was shared at the respective email address of the students with the help of the teams in respective universities. However, a lower response rate indicates that not every student had equal access to the internet and his/her emails. The unavailability of the internet and good quality connections, lack of appropriate technology and discontinuity in technical support from universities were some other factors contributing to the lower response rate.

2.3. Instruments

A self-administrated survey questionnaire was used as a tool for data collection in the study consisting of demographic characteristics, psychological distress, and satisfaction from online classes. For measuring psychological distress, 10 items following The Kessler Psychological Distress Scale (K10) (2003) were used in the original English language after taking permission from the authors. The scale had already been used in Pakistan to measure psychological distress [30, 31]. The scale ranges from all of the time (5) to none of the time (1). The Cronbach's alpha value of the scale is 0.865. All the 10 items were summed yielding a minimum score of 10 and the maximum score of 50. A higher score indicated a higher level of psychological distress and vice versa. Sixteen items scale of student satisfaction developed by the Research Initiative for Teaching Effectiveness (RITE) of the University of Florida was used in the original English language after taking permission from the authors. However, the use of this scale in Pakistan was not reported in the literature, which is one of the limitations of the study. This scale was being used since 1996 for assessing satisfaction from the online course. The scale ranges from strongly disagree (1) to strongly agree (5). The scale yields a 0.831 Cronbach's Alpha value. Besides, demographic

characteristics, i.e. gender, age, marital status, education, the field of the study, monthly income of the guardian, guardian sector, guardian's type of employment, and the mode of accessing online classes were also included in the survey.

2.4. Procedure of data collection

An online survey questionnaire was specially designed for the current study to collect the data from the respondents. The link of the survey was shared with three teams of data collection consisting of two male and two female students of the enrolled universities. The purpose of selecting the data collection team from the same university was to increase the response rate and timely data collection. Teams were provided the link to a survey questionnaire on 1st May 2020 and shared this link and invitation simultaneously with the students of their university from 2nd May 2020. Teams were instructed to give a reminder one week of sharing a link with the respondents. Until 22nd May 2020, a total of 2220 respondents provided their data. However, about 35% of the respondents were given a reminder one week of sharing links. A backcheck method using phone calls was used to check the quality of data and volunteer participation in the study.

Table 1. Socio-demographic characteristics (Base = 2220).

Variables	f	Valid %
Gender		
Male	1101	49.6
Female	1119	50.4
Age		
<20	796	35.8
21–30	1298	58.4
Above 30	126	5.8
Marital status		
Single	1976	89.0
Married	244	11.0
Education		
Intermediate	355	16.0
Graduation	1030	46.4
Master	678	30.5
Above Master	157	7.1
Field of study		
Science	1065	48.9
Arts	1155	51.1
Parents' income		
<20,000	519	23.4
21,000–35,000	556	25.0
36,000–50,000	450	20.3
Above 50,000	696	31.3
Mode of income		
Private sector	785	35.4
Government sector	780	35.1
Autonomous body	656	29.5
Type of employment		
Permanent	782	35.2
Temporary	490	22.1
Self-employed	680	30.6
Daily wages	269	12.1
Mode to access online classes		
Broadband	647	29.1
Mobile packages	1305	58.8
Internet café	81	3.6
Any other	187	8.4

2.5. Analysis of the data

Data retrieved from the online survey was in Microsoft Excel format, which was exported into SPSS IBM Version 21.0 for analysis. Both descriptive and inferential statistical tests were applied to find out the inferences. To find out the predictors of psychological distress and satisfaction from online classes, binary and multivariate logistic regression was used and odds ratios and adjusted odds ratios were calculated. On the other hand, mean comparison, bivariate correlation, and simple linear regression analysis were run to find out the relationship between both variables.

3. Results

3.1. Socio-demographic characteristics of the respondents

A total of 2220 students enrolled in academic institutions situated in Punjab participated in the study, and all the participants were residents of Punjab, Pakistan. The Study participants included both male and female students almost equally. More than half of the students were 21–30 years of age and only 5.7% were above 30 years of age. The majority of the participants were unmarried (see Table 1).

The majority of the respondents (46.4%) reported graduation as their education. On the contrary, 7.1% claimed their education above masters. About 48.4% reported their family income of 35,000 Pakistani rupees and less and 51.6% of the respondents reported their family income of more than 35,000 Pakistani rupees. While recording the guardian's mode of income, about 35.3% of the respondents reported the private sector, 35.1% reported the government sector and about 29% reported an autonomous body. About 35.2% of the guardians were permanent employees, 22.1% were temporary, 30.6% were self-employed and 12.1% were daily wagers. Nearly 60% of the students were taking their online classes using internet packages from the network providing companies and about 29.1% were using broadband internet facilities (see Table 1).

3.2. Satisfaction from online classes

The majority of the students in Punjab were not satisfied with their online classes (64.93%); however, 35.7% were satisfied with online classes because of the outbreak of COVID-19 in Pakistan (Figure-2). However, satisfaction from online classes was not the same among all the students. Students' socio-demographic data exhibited variations in their satisfaction from online classes. For example, satisfaction from online classes was higher among female students (OR 1.936 $p < 0.001$), above 30 years of age (OR 5.457 $p < 0.001$), among the master's students (OR 1.390 $p < 0.01$), and above master students (OR 1.631 $p < 0.01$). Similarly, the probability of satisfaction from online classes was also higher among the students who reported arts as their field of study as compared to those who reported science as their field of study. Besides, odds of satisfaction from online classes were higher among the students who reported their guardian's income from 21,000–35,000, 36,000–50,000, and above 50,000 Pakistani rupees as compared to the reference category of 20,000 and below income and below at 99% CI. Satisfaction from online classes was also higher among the students who reported their guardian's type of employment as “temporary” (OR 1.688 $p < 0.01$) and “daily wages” (OR 2.551 $p < 0.001$) as compared to the permanent employees (see Table 2).

On the contrary, students' marital status, guardians' mode of income, and mode to access online classes were not significant predictors of satisfaction from online classes at 95% CI (Table 2). In multivariate analysis of significant predictors of satisfaction from online classes at 95% CI, students' education and their guardians' type of employment lost significance. However, students' gender, age, the field of study, and guardians' income were retained significantly at 95% CI (see Table 3).

Relative odd ratios of satisfaction from online classes were significantly higher among female students as compared to male students at

Table 2. Binary logistic regression analysis of satisfaction from online classes.

Variables	Satisfaction from online classes	
	p-value	odds ratio
Gender		
Male	1	
Female	.000	1.936
Age		
<20	1	
21–30	.136	1.149
Above 30	.000	5.457
Marital status		
Single	1	
Married	.153	1.241
Education		
Intermediate	1	
Graduation	.055	1.274
Master	.015	1.390
Above Master	.017	1.631
Field of study		
Science	1	
Arts	.000	1.650
Guardian's income		
<20,000	1	
21,000–35,000	.000	2.089
36,000–50,000	.000	2.323
Above 50,000	.000	1.989
Mode of income		
Private sector	1	
Government sector	.062	1.219
Autonomous body	.289	1.124
Type of employment		
Permanent	1	
Temporary	.002	1.688
Self-employed	.559	1.936
Daily wages	.000	2.551
Mode to access online classes		
Broadband	1	
Mobile packages	.098	1.181
Internet café	.523	.858
Any other	.828	.963

99% CI. Similarly, satisfaction from online classes was higher among the students who were above 30 years of age (aOR4.706 $p < 0.001$) as compared to the students who were 20 years and below. Students who were enrolled in arts programs were also more satisfied with online classes as compared to the students who were enrolled in science programs. The probability of satisfaction from online classes was higher among the students who reported their guardians' income 21,000–35,000 (aOR 1.982), 36,000–50,000 (aOR 2.069), and above 50,000 (aOR 1.765) as compared to 20,000 and below income at 99% CI. Moreover, students' age and their guardians' income were the two strongest predictors of satisfaction from online classes in multivariate binary logistic regression analysis.

3.3. Predictors of psychological distress

Results indicated that 41.5% of the students enrolled in three universities in Punjab were facing psychological distress. However, about 11.8% of the students reported severe psychological distress.

Our survey revealed that about 29% of students were the victim of moderate psychological distress and 17.6% were facing mild psychological distress. On the other hand, only 11.8% were not facing

psychological distress, according to the set cutoff scores that are used to quantify psychological distress in the Victorian Population Health Survey (2001). However, binary logistic regression analysis was used to find out the predictors of psychological distress among the student. Binary logistic regression analysis indicated that the odds of psychological distress are significantly higher (1.555 times) among females as compared to male students. Besides, odds of psychological distress are significantly lower among the students of graduation (OR .627), master (OR .629), and above master (OR .550) as compared to the students who reported intermediate as their education. Psychological distress was also significantly higher among the students who reported their monthly income from 36,000–50,000 (OR 1.750 $p < 0.01$) and above 50,000 (OR 1.628 $p < 0.01$) as compared to the student who reported their family income 20,000 and below. It was also found significantly lower among the students who reported that their guardian was daily wage worker (OR .638 $p < 0.05$) as compared to the category of permanent employees (see Table 4).

Results also indicated that psychological distress was also significantly lower among the students who were using mobile packages for accessing online lectures during the pandemic compared to the students who were using broadband packages. However, age, marital status, the field of study, and mode of income were not significant predictors of psychological distress among the students. Multivariate binary logistic regression analysis was performed, including all the significant predictors of binary logistic regression analysis, i.e. gender, education, and a guardian's income, type of employment, and the mode of accessing online classes (see Table 4). The result of multivariate analysis indicated that the probability of psychological distress was significantly higher among female students as compared to male students. On the other hand, psychological distress is significantly lower among the graduation students (aOR0.652 $p < 0.05$) and master students (aOR0.639 $p < 0.05$) as compared to the intermediate students. Besides, the probability of psychological distress was also higher among the students who reported

Table 3. Multivariate binary logistic regression analysis of satisfaction from online classes among students.

Variables	Satisfaction from online classes	
	p-value	Odds Ratio
Gender		
Male	1	
Female	.000	2.012
Age		
<20	1	
21–30	.621	1.053
Above 30	.000	4.706
Education		
Intermediate	1	
Graduation	.151	1.216
Master	.201	1.217
Above Master	.078	1.465
Field of study		
Science	1	
Arts	.001	1.614
Guardians' income		
<20,000	1	
21,000–35,000	.000	1.982
36,000–50,000	.000	2.069
Above 50,000	.000	1.765
Type of employment		
Permanent	1	
Temporary	.058	.784
Self-employed	.740	1.041
Daily wages	.053	.734

Table 4. Binary logistic regression analysis of psychological distress among the students.

Variables	Psychological distress	
	p-value	odds ratio
Gender		
Male	1	
Female	.001	1.555
Age		
<20	1	
21-30	.165	1.211
Above 30	.678	.892
Marital status		
Single	1	
Married	.648	.908
Education		
Intermediate	1	
Graduation	.030	.627
Master	.040	.629
Above Master	.047	.550
Field of study		
Science	1	
Arts	.364	.846
Guardian's income		
<20,000	1	
21,000–35,000	.110	1.327
36,000–50,000	.005	1.750
Above 50,000	.005	1.628
Mode of income		
Private sector	1	
Government sector	.964	.993
Autonomous body	.348	.859
Type of employment		
Permanent	1	
Temporary	.254	1.241
Self-employed	.991	1.002
Daily wages	.022	.638
Mode to access online classes		
Broadband	1	
Mobile packages	.000	.541
Internet café	.606	.814
any other	.696	.892

their guardian's income from 36,000 to 50,000 as compared to the students who reported the category of 20,000 and below income (aOR 1.578 $p < 0.05$). On the other hand, the probability of psychological distress was significantly lower among the students who were accessing online classes using mobile packages as compared to the category of broadband (Figure 1) (aOR0.578 $p < 0.01$) (see Table 5). However, only the variable of types of employment lost statistical significance in multivariate regression analysis.

3.4. Relationship between satisfaction from online classes and psychological distress

Researchers assumed a negative relationship between the independent variable i.e. psychological distress and the dependent variable i.e. satisfaction from online classes. For measuring the relationship, results are presented both in graphical form as well as in table form. Comparison of means indicated a negative relationship between both the variables. The mean of satisfaction from the online classes was highest (29.69) for the first category “likely to be well”. However, the mean score of satisfaction from online classes is 26.10 for the second category of mild

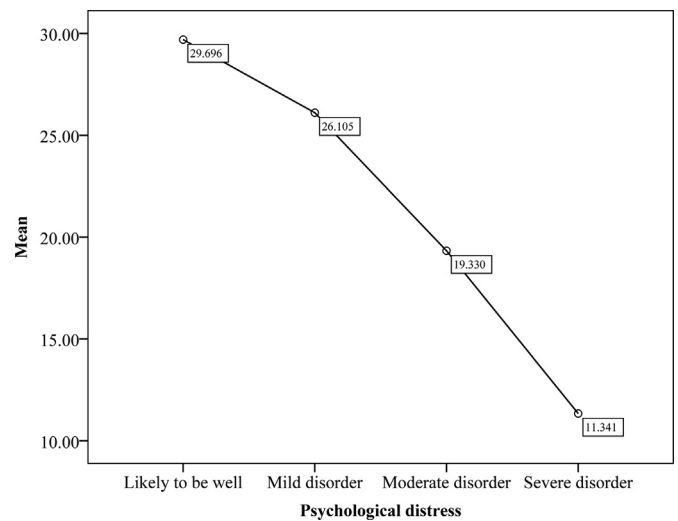


Figure 1. Comparison of mean between psychological distress and satisfaction from online classes.

psychological distress. The mean score of satisfaction from online classes decreased to 19.33 in the third category of moderate psychological distress. The category of severe psychological distress indicated the least satisfaction from the online classes and the mean score was lower as compared to the other categories (Figure 2). These results indicated a somehow linear negative relationship between both the variables, i.e. increase in the level of psychological distress decreases the satisfaction from online classes.

For quantifying the correlation between both variables, the Pearson Correlation test was applied. The results indicated a strong correlation (-0.833) between psychological distress and satisfaction from online classes at a 99% confidence interval. Simple linear regression analysis was also conducted to further predict the value of the dependent variable

Table 5. Multivariate binary logistic regression of psychological distress among the students.

Variables	Psychological distress	
	p-value	odds ratio
Gender		
Male	1	
Female	.001	1.564
Education		
Intermediate	1	
Graduation	.050	.652
Master	.050	.639
Above Master	.062	.566
Guardian's income		
<20,000	1	
21,000–35,000	.167	1.286
36,000–50,000	.030	1.578
Above 50,000	.089	1.393
Type of employment		
Permanent	1	
Temporary	.079	1.413
Self-employed	.654	1.080
Daily wages	.408	.837
Mode to access to online classes		
Broadband	1	
Mobile packages	.001	.578
Internet café	.655	.835
any other	.746	.909

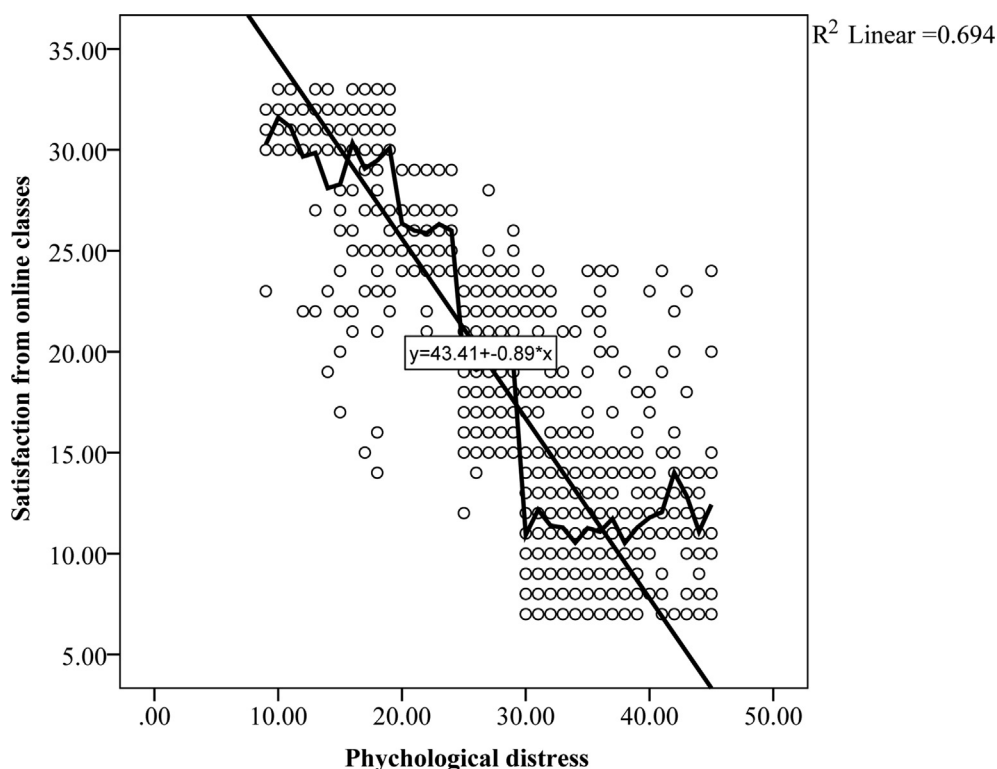


Figure 2. Relationship between psychological distress and satisfaction from online classes.

because of the independent variable. Results indicated that about 69.3% of the variables were being explained by psychological distress in the satisfaction from online classes at $F = 5021.95$ CI 99%. The value of the unstandardized coefficient beta (B) indicated that a one unit increase in the value of psychological distress decreased 0.779 units of satisfaction from online classes by 99% CI. This implied a negative relationship between independent and dependent variables.

4. Discussion

The present study investigated the predictors of psychological distress and satisfaction from online classes during the current COVID-19 pandemic and the relationship between psychological distress and satisfaction from online classes among university students in Pakistan. Various studies at the global level reported that previous pandemics like the flu, plague, SARS had a serious impact on the daily life, psychology, and mental health of the general population, including students, patients, and health care workers [19, 32, 33, 34, 35, 36, 37, 38]. A relatively higher level of psychological distress was found in the current investigation as compared to several other studies. In this context, a lower level of depression, anxiety, and stress was found in Vietnam [39]. However, the level of psychological distress was relatively similar to a study conducted in the Philippines [40].

The current study reported gender to be the first predictor as distress prevailed more in females than in males. These findings are similar to a longitudinal study conducted previously [41] where a higher level of depression among women as compared to men was reported. Educational levels were seen to be another predictor because distress was reported more in students of intermediate classes than higher classes. The reason for this may be that university students are more familiar with digital gadgets than college students. Socioeconomic status was found to be another predictor of distress, as distress was reported more in students with higher status. The type of internet connection was also found to be another predictor of stress during the COVID-19 pandemic.

These findings were supported by a recent study conducted in Pakistan on 1050 students, where gender was found as an important

predictor as female students were more affected by the pandemic than males [23]. Another similar study from Argentina that was conducted on 4408 quarantined people found that certain demographic characters (females, young ones, those with a previous history of distress) were at more risk of psychological distress during this pandemic [42]. A study conducted on 408 subjects from India reported that psychological distress was seen more in students and health care professionals [43]. Some studies reported old age and loneliness as other great risk factors of psychological distress during the COVID-19 pandemic [44, 45, 46].

Regarding the second research objective of the present study, gender, age, educational level, the field of study, and socioeconomic status were established as important predictors of satisfaction from the online classes. The majority of students were not satisfied with this online mode of learning. Many developing countries like Pakistan were not ready for this mode of learning that resulted in the dissatisfaction of students. Only a few studies have been conducted on it as before this the online learning was applied only in small cases and not globally as in the case of the COVID-19 pandemic of 2020 [24]. Our findings were supported by many recently conducted studies. For instance, a study reported important predictors of satisfaction from online classes that were gender, the field of study, education level, and socioeconomic status. They reported that students with certain predictors (male, first level, low socioeconomic status, and applied sciences) were found to be less satisfied with the online mode of learning [1]. A study in Pakistan stated that students with low socioeconomic status and living in rural areas are unable to attend the classes due to poor signal strength [47]. A study conducted in the Philippines reported that most students are not satisfied with this online mode of learning. The reason behind this could be that they were facing connectivity issues [28]. Whereas another study conducted in India reported that 97% of students were satisfied with the online mode of learning. But, the number of students enrolled in this report was less than 100. So it doesn't present a clear picture [27]. Another study conducted on Pakistani students reported that almost 52% of students stated the online mode of learning to be non-productive [23]. The most reliable evidence-based treatment was cognitive behavior therapy (CBT), especially Internet CBT that could prevent the spread of infection during the pandemic [48, 49, 50].

Adnan and Anwar (2020) reported in Pakistan that the e-learning mode could not give the desired results in countries like Pakistan where the majority of students were unable to access the internet and faced connectivity issues [51]. In line with it, Sarwar *et al* (2020) conducted a study on 1207 dental students that also described educational level as an important predictor of satisfaction. They revealed that first-year students were not satisfied with this mode of learning that might be due to poor interaction with teachers [52].

The prediction about the third research objective was to find out the relationship between psychological distress and satisfaction from online classes. We found that a negative relationship existed between both variables. Satisfaction from online classes decreased with an increase in psychological distress. Our findings are also supported by the study of Ramji and Sultana (2020). They reported that almost 43% of students were not able to attend online classes due to psychological distress [53]. Similarly, it has been found that students with mental stress were more reluctant to attend online classes, suggesting a correlation between psychological stress and satisfaction from online classes. Multivariate Logistic regression analysis indicated college students' anxiety regarding the pandemic was associated with their gender, age, field of study, and source of parental income which was consistent with previous studies [54]. On the other hand, the finding that the higher stress level in females than males, was different from another study conducted in China [19].

The strength of the present study is that it is conducted when the outbreak was at its peak, educational institutes were closed and students were sifted from traditional to online learning. Hence, principal findings are that students are highly stressed and depressed due to the current situation, their daily routine life got disturbed, and they are not satisfied with their online classes.

5. Limitations

The study is only conducted in Lahore, a developed city of Punjab-Pakistan, using a structured survey questionnaire. The respondents were urban residents and students from other cities were not included in the study, which may affect its generalizability. This study mainly used self-reported questionnaires to measure psychiatric symptoms and did not make any clinical diagnosis. The gold standard for establishing psychiatric diagnosis involved structured clinical interviews and functional neuroimaging [55, 56].

6. Conclusion

The present study is the best attempt at exploring satisfaction levels from online classes, psychological stress, and the relationship between the two, amid COVID-19. The research findings indicate that more than half of the university students (64.93%) were not satisfied with online classes. On the other hand, about 70% of students were reported to have severe (41.5%) to mild (29%) psychological distress. Moreover, we have found that there is a negative correlation between psychological distress and satisfaction from online classes. Keeping in view the above scenario, this study concluded that mental health care is important to bring satisfaction from online classes. Therefore, the relevant policy-makers as main stakeholders are needed to take care of student's mental health and are to implement appropriate psychological strategies, interventions, and precautionary measures to minimize the level of psychological distress and to increase students' satisfaction from online classes.

Declarations

Author contribution statement

Muhammad Babar Khawar, Muddasir Hassan Abbasi, Nadeem Sheikh: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Shabbir Hussain, Hafiza Nabeela Amaan, Adil Farooq: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Mehwish Riaz, Mussarat Rafiq, Rabia Mehmood, Sana Fatima, Faiza Jabeen, Zaira Ahmad: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data associated with this study has been deposited at XXX under the accession number YYY.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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