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Investigating Distorted Thinking Patterns and Psychological Distress in Students taking Online Education during COVID-19 Outbreak

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ABSTRACT

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COVID-19, e-education, university students, cognitive distortions, psychological distress.

Purpose: The objective of this study was to assess the predictive association between distorted thinking patterns and psychological distress (depression, stress, anxiety) in university e-learners during COVID-19 outbreak. **Methodology:** In this correlational study, 643 participants between age 18 to 29 years ($M=21.27$, $SD=4.06$) participated online through convenient sampling technique. They were sent an online google questionnaire, including the informed consent form, the depression, anxiety, stress scale (DASS-21), and cognitive distortions scale in Urdu, which assessed the distorted thinking patterns of adults.

Findings: Analysis through Pearson product moment correlation revealed that the distorted thinking patterns of predictive thinking, rigid thinking and stress-creating thinking pattern had a strong positive association with depression, stress, and anxiety. The distorted thinking pattern of self-criticism/self-blame also had a strong positive association with depression and stress, and a moderate positive association with anxiety. Multiple stepwise regression was performed to calculate the predictive association between distorted thinking patterns and psychological distress of university students seeking digital education during the COVID-19 outbreak. Analysis revealed that distorted thinking patterns of stress-creating thinking, self-criticism/self-blame, and predictive thinking are predictors of depression. However, stress-creating thinking was the strongest predictor of depression. Stress-creating thinking, predictive thinking, and rigid thinking were predictors of anxiety in university students during online education and stress-creating thinking is the strongest predictor of anxiety as well. Moreover, the distorted thinking patterns of stress creating thinking, self-criticism/self-blame, and rigid thinking strongly predicted stress in university students engaged in distant education during the COVID-19 outbreak. **Implications to Research and Practice:** The study's findings emphasize the role of distorted thinking patterns in the stress experience of students during COVID and encourage teachers and universities to consider the findings while developing an online education system for the students.

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Introduction

On March 11, 2020, World Health Organization declared COVID 19 as a public health emergency and a pandemic (Cucinotta & Vanelli, 2020). On March 13, 2020, after confirming two COVID cases in Pakistan in February 2020, the local government imposed a total lockdown and closed all educational institutions. The Higher Education Commission and Federal Government directed all the country's educational institutions to prepare themselves to impart education through digital education via distance education until the situation persists. Therefore, the exams were rescheduled, and students were assisted through online classes (Joshi et al., 2020).

The COVID-19 pandemic has affected every aspect of the human life; likewise, it has had a severe impact on students, instructors, and educational institutions (Mailizar et al., 2020). To maintain the SOPs of COVID-19, conventional education was switched to digital education rapidly. This abrupt transformation led to several challenges and obstacles Crawford et al. (2020). However, not knowing when the situation would be back to normal, the educational institutions across the country decided to use their already existing technical resources. Online education material was created for students at all academic levels and fields to substitute for all conventional educational activities (Kaur, 2020).

Literature suggests educational institutions of many developed countries worldwide made sure that online learning should be easily managed. The learners got easy access to the learning material and had smooth interaction with their teachers. In this challenging circumstance, online education encouraged smooth learning for students where COVID-19 prevented them from seeking education in physical mode. The students learned asynchronously and became self-learners. However, many weaknesses were attached to electronic learning, including learning theory without practical skills, lack of face-to-face learning experience, submission of online objective assignments, and technological issues (Giusti et al., 2020; Mukhtar et al., 2020).

Pakistan is a developing country where technological constraints pose a severe challenge in adopting the online learning system. Students experience many challenges in adopting the shift in education. There is a lack of one-to-one interaction with the instructor, which is one of the primary concerns of online education. Confusions related to the lectures or any other concerns are shared with the instructor through social media apps, requiring response time. Students who are tactile learners do not benefit from online classes. Classroom socialization is another missing element from online classes (Qureshi et al., 2012). Most students struggle with online education as they do not have access to high-speed internet services (Adnan & Anwar, 2020). Recent literature suggests that the student's fears of e-education, academic year loss, and poor grades greatly influence their mental health and is also responsible for their psychological distress during COVID-19 lockdown (García-Rivera et al., 2022).

It was challenging to determine the psychological consequences faced by Pakistani students during the pandemic. As the pandemic and e-education had negatively affected students' mental health, monitoring it with other relevant variables was immediately prioritized. However, there was no empirical evidence from Pakistan concerning students' distorted thinking patterns and associated psychological distress (depression, stress, and anxiety) due to an abrupt shift from a classical teaching approach to online education.

Adopting the online education system during the COVID-19 outbreak was a massive social experiment in Pakistan. The finding also suggests the role of distorted thinking patterns while mastering the new technical education environment in terms of the transition from the traditional model of education to e-education and their learning competencies (Lemaire, 2021). Although mental health issues and other related factors in e-learners during the COVID-19 period have been widely reported, there still were significant research gaps that were filled by this study.

This study attempted a study of distorted thinking patterns and psychological distress due to e-education in university students of Pakistan. This research was conducted to determine the predictive association between distorted thinking patterns and psychological distress in university students taking online classes during the COVID-19 outbreak. The importance of this study can be determined by the fact that students had unstable emotional responses and poor self-assessment for their academic success during the e-learning process.

Literature review

Research suggests that university students suffered from stress, anxiety, and depression during the lockdown period as they had to face many problems due to online classes (Islam et al., 2020). For instance, regarding the mental health of Sri Lankan undergraduate e-learners during COVID-19, research suggests that 51% of the sample was "psychologically distressed" with high anxiety levels, whereas 35% were depressed and 20% were experiencing low levels of Stress (Gamage & Herath, 2021). A review of psychological impact on students due to online education during COVID-19 in Malaysia also suggests that students are affected psychologically and show symptoms of depression and anxiety (Thandavaraj et al., 2021).

Recently, a study from China on the psychological effects of the COVID-19 pandemic suggests that 25% of their college students showed anxiety associated with impaired academic activities during online classes (Cao et al., 2020). Cognitive behavior therapy (CBT) was incorporated with educational websites to help students cope with the psychological effects of COVID-19 and to cope with the associated academic difficulties that they face due to involvement in e-education. The stressful factors leading to psychological distress in students included difficulty adjusting to the new mode of academic activities due to e-learning. The emotions experienced during this period were anxiety, fear, low mood, aggression, and guilt (Salza et al., 2020).

Cognitive behavior therapy is an individual therapy where the sufferer seeks help and learns to identify and change distorted thought patterns that negatively affect behavior and emotions (Hofmann et al., 2012). Findings of another study suggest that the students showed distorted thinking patterns while seeking e-education and adjusting to the academic activities in online classes. The distorted thinking patterns included all or no thinking (seeing things in extremes where something is either fantastic or terrible and a global negative evaluation of oneself or others), or catastrophizing (overestimation of risk and thoughts about worst-case scenarios), and intolerance of uncertainty (Giusti et al., 2020).

When irrational or distorted thought patterns are exaggerated, distorted thinking styles are called cognitive distortions, which lead to the onset or perpetuation of psychopathological states, such as depression, stress, and anxiety (Helmond et al., 2015). Due to these distorted thinking patterns, individuals inaccurately perceive reality, which leads to psychological distress (Joshi et al., 2020). During difficult situations, these distorted thinking styles contribute to a negative outlook of the world and a depressive or anxious mental state. This state of emotional dysfunction characterized by depression, stress, and anxiety symptoms is called psychological distress (Brewin et al., 2010).

Method

- *Research design*

A correlational study was used to assess the strength and direction of association between cognitive distortions and psychological distress in online education students. This design determined cognitive distortions, including distorted thinking patterns, in online classes predicting depression, anxiety, and stress.

- *Sample*

In this correlational study, 643 participants between ages 18 to 29 years ($M= 21.27$, $SD\pm 4.06$) participated online through a convenient sampling technique. They were sent an online google questionnaire, including the informed consent form, the depression, anxiety, stress scale (DASS-21), and cognitive distortions Scale in Urdu. The sample obtained was well distributed across male (43.5%, $n=280$) and female (56.5%, $n=363$). According to the inclusion/exclusion criteria, only those participants were included in the study who were: (a) taking online classes, (b) Pakistani nationals, (c) not suffering and seeking treatment for any mental health illnesses, and (d) educated (can comprehend English). The demographic characteristics of study participants are summarized in Table 1.

Table 1

Demographic Characteristics of study participants (N=643)

Variables	Frequency	Percentage
Gender		
— Female	363	56.5
— Male	280	43.5
City		
— Karachi	190	29.5
— Lahore	453	70.5
Academic Qualification		
— Graduate	120	18.7
— Undergraduate	523	81.3
Marital Status		
— Single	616	95.8
— Married	25	3.9
— Divorced	2	.3
Family Setup		
— Nuclear	411	63.9
— Joint	232	36.1
Birth Order		
— First Born	207	32.2
— Middle Born	261	40.6
— Last	160	24.9
— Only Child	15	2.3

- *Data Collection Instruments*

- *Demographic information form.*

This sheet included participants' university name, semester/academic year, age, gender, family system, marital status, family's monthly income, and presence of any diagnosed mental illness.

- *Cognitive Distortions Scale-Urdu.*

This 18-item measure assessed the dysfunctional thinking patterns in adults aged 18 and above. The measure had a 5-point rating scale with 5 = Absolutely applicable, 4= Very less applicable, 3= Apply to some extent 2= Would apply, and 1= Absolutely not applicable. The measure had a stress-creating thinking style subscale with 9-items, which included cognitive distortions of magnification and minimization, discounting the positives, catastrophization, labeling, overgeneralization, selective abstraction, and jumping to a conclusion; a Self-Blame/Self Criticism subscale with 3-items; including the cognitive distortions of should and must, personalization and self-blame; a rigid Thinking subscale with 3-items, include cognitive distortion of emotional reasoning and all or nothing and a predictive thinking subscale with 3 items including cognitive distortions of mind reading and future telling.

The scale internal consistency was reported to be $\alpha = .87$, $r=.86$; the temporal stability was moderately high with a moderately high split-half reliability $\alpha = .86$ and $r =.44$ to $.89$ is its concurrent validity which was also moderately high (Shakeel & Ali, 2015).

- *Depression, Anxiety, Stress Scale (DASS-21).*

DAS-21 is a 21-item scale that measures depression, anxiety, and stress, and it has three subscales with seven items in each. The subscale of depression access hopelessness, worthlessness, self-criticism, lack of interest, and anhedonia. The subscale of anxiety accesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The subscale of stress access chronic nonspecific arousal, difficulty relaxing, nervous arousal, easily upset, agitated, irritable, over-reactive, and impatient.

The Cronbach's alpha values for DAS-21 were 0.81, 0.89, and 0.78 for depressive, anxiety, and Stress subscales (Levterova-Gadjalova1 & Tsokov, 2021). The Urdu translation of DASS by Aslam and Kamal (2017) was used in this study. The translated DASS showed a good reliability with Cronbach's Alpha 0.93 with subscales having good reliability, where the stress subscale was $\alpha=0.83$, anxiety subscale $\alpha=0.86$, and depression subscale $\alpha=0.93$.

- *Data Analysis*

The sample's mean, standard deviation, frequencies, and percentages were calculated through descriptive analysis. Multiple stepwise regression was performed to calculate the predictive association between death anxiety and psychological distress of university students seeking digital education during the COVID-19 outbreak.

Results

This section presents the findings obtained from the stepwise multiple regression. In the analysis of the variables, each was added step by step in a 3-model regression analysis. The finding revealed predictive association and strong predictive associations of different distorted thinking patterns with depression, anxiety, and stress

Table 2

Relationship between cognitive distortions and psychological distress in university e-learners (N=643).

Measure	Depression	Anxiety	Stress
Stress creating thinking	.698	.580	.610
Self-Criticism/Self-blame	.515	.422	.514
Predictive Thinking	.370	.322	.366
Rigid Thinking	.444	.410	.471

Note: **Correlation is significant at the 0.01 level (2-tailed).

The table shows a strong positive association of stress-creating thinking with depression, stress, and anxiety, a strong positive association of Self-Criticism/Self-blame with depression and stress, and a moderate positive association with anxiety. Moreover, predictive and rigid thinking has a moderate positive association with depression, anxiety, and stress.

Table 3

Summary of Hierarchical Regression Analysis for Variables Predicting depression in university e-Learners during COVID-19 Outbreak (N=643).

Variable	Model 1		Model 2			Model 3			
	B	SEB	B	B	SEB	β	B	SE(B)	β
Stress-Creating Thinking	.37	.02	.63**	.36	.02	.60**	.35	.02	.59**
Self-Criticism/Self Blame	.18	.06	.11**	.16	.06	.10**	.15	.06	.09**
Predictive Thinking				.11	.05	.07**	.10	.05	.05
Rigid Thinking							.07	.06	.04
R2	.49		.50			.50			
F for change in R2	9.44**		4.35**			1.52			

Note. $p < .05$

The table shows that stress-creating thinking, self-criticism/self-blame, and predictive thinking are predictors of depression. However, stress-creating thinking was the strongest predictor of depression preceding self-criticism and blame, the second strong predictor of depression during online education in university students [R^2 , .45; $F=211.33$, $p < .05$].

Table 4

Summary of Hierarchical Regression Analysis for Variables Predicting Anxiety in university e-Learners during COVID-19 Outbreak (N=643).

Variable	Model 1		Model 2			Model 3			
	B	SEB	B	B	SEB	β	B	SE(B)	β
Stress-Creating Thinking	.27	.02	.53**	.25	.02	.50**	.24	.02	.467**
Self-Criticism/Self Blame	.11	.06	.08	.09	.06	.07	.07	.06	.055
Predictive Thinking				.11	.05	.07**	.07	.05	.051
Rigid Thinking							.14	.06	.100**
R2		.34			.35			.35	
F for change in R2		3.92			4.23**			6.03**	

Note. $p < .05$

The table shows that stress-creating thinking, predictive thinking, and rigid thinking were predictors of anxiety in university students during online education. However, stress-creating thinking is the strongest predictor of anxiety preceding rigid thinking, the second strongest predictor of anxiety in students [R^2 , .35; $F=169.94$, $p < .05$].

Table 5

Summary of Hierarchical Regression Analysis for Variables Predicting Stress in university e-Learners during COVID-19 Outbreak (N=643).

Variable	Model 1		Model 2			Model 3			
	B	SEB	B	B	SEB	β	B	SE(B)	β
Stress-Creating Thinking	.27	.02	.48**	.25	.02	.45**	.22	.02	.39**
Self-Criticism/Self Blame	.31	.06	.21**	.28	.06	.19**	.25	.06	.17**
Predictive Thinking				.15	.05	.10**	.10	.05	.06
Rigid Thinking							.23	.06	.14**
R2		.40			.40			.42	
F for change in R2		26.81**			7.81**			13.62**	

Note. $p < .05$

The table shows that stress creating, self-criticism/self-blame, and rigid thinking strongly predicted stress in university students engaged in distant education during the COVID-19 outbreak [R^2 , .41; $F=150.74$, $p < .05$].

Discussion

The predictive association between cognitive distortions and Psychological Distress in university students taking online classes during COVID-19 outbreak was determined in this study. Our findings revealed that stress-creating thinking patterns and other cognitive distortions were strong predictors of depression, anxiety, and stress in e-learners. Distorted thinking patterns, including self-criticism/self-blame and predictive thinking, predicted depression. Rigid thinking predicted anxiety and stress creating, self-criticism/self-blame, and rigid thinking were the strongest predictors of stress in university students engaged in distant education. The findings of this study also indicated the distressing concerns of higher education students regarding Digital education, which led to the activation of distorted thinking patterns leading to psychological distress. These study findings are in

line with the reviewed literature from other parts of the world where [Giusti et al. \(2020\)](#) suggested that the students during their e-learning process showed distorted thinking patterns of all or nothing thinking (seeing things in extremes where something is either fantastic or terrible and a global negative evaluation of oneself or others), Catastrophizing (overestimation of risk and thoughts about worst-case scenarios), and intolerance of uncertainty. [Gamage and Herath \(2021\)](#) also suggested that distorted thinking patterns act as a predictor of psychological distress and stressed on the role that distorted thinking patterns has played in distressing students while mastering the new technical education environment.

Recent literature suggests that digital education post-COVID-19 Pandemic could not have been able to produce desired learning outcomes for Pakistani higher education students. As the country is underdeveloped, most students face internet connectivity and other technical issues. Students face other issues in the form of a lack of face-to-face interaction with the instructor and the absence of traditional classroom socialization. Pakistan, an underdeveloped country, has a traditional mode of teaching and learning where the administrative activities are carried out manually ([Salam et al., 2017](#)). Due to the abrupt shift of education from manual to digital mode, many educational institutions merely focus on transferring learning content electronically rather than using online teaching and delivery methods ([Zhou et al., 2020](#)).

One of the factors that might have led to dysfunctional thought patterns and psychological distress in Pakistani students might be a lack of motivation while studying via online classes. Students find classes in a physical mode more motivating than e-education because of the face-to-face interaction and engagement with their resource persons. During this period of e-education, students felt that complete courses were not being taught. Students were also unable to cope with the fast-paced online and technological skills to learn from online lectures ([Adnan & Anwar, 2020](#)).

Throughout e-education, there was a cognitive load on the students mastering the electronic environment. Research supports that there has been an effect of cognitive distortions on students' self-efficacy, leading them to depression, anxiety, and stress. The cognitive distortion happens because of distorted perception, poor understanding, and the efforts put into mastering the electronic education content ([Kaunang & Usagawa, 2017](#)). According to recent research findings, more than half of their student sample, reported online education as their primary distressing concern ([Leahy et al., 2010](#)).

Our students were overly distressed after the massive transition from physical to online teaching mode because they believed online education was not as effective as onsite education. [Irawan et al. \(2020\)](#) support that constant pressure to complete academic tasks online contributes to students' stress. This pandemic has significantly affected students' mental health, and its psychological effects will be long-lasting ([Chang et al., 2020](#)).

Conclusion

COVID-19 became the biggest threat to Pakistan's educational system because of the transition from traditional face-to-face learning to online academics. The Pakistani educational institutions struggled to a great extent to adjust to the e-learning mode of teaching for two years until returning to the traditional method of learning. This study has

highlighted the negative impact of online academics on Pakistani students who were used to conventional academics. The study findings suggest that cognitive distortions where the thought patterns are related to creating stress are the strongest predictor of psychological distress in students. Distorted thinking patterns related to self-criticism, self-blame, and the thinking patterns lead to the pessimistic prediction of the future acted as predictors of depression. Stress creating and rigid thinking patterns both predicted anxiety, where stress creating thinking is the strongest predictor of anxiety. Moreover, stress creating, self-criticism/self-blame, and rigid thinking patterns were found to be the strongest predictors of stress in university students engaged in distant education during the COVID-19 outbreak.

The study concludes that the COVID-19 outbreak and lockdown have caused significant distortion in the academic world and have led to a compromised educational system. However, pandemic like COVID-19 has encouraged to development of skills to indulge in online academics. In developing countries like Pakistan, there is still a need to develop a reliable, cost-effective, and secure online academic system because it is a source of distress for the students of this country. Identifying the distorted thinking patterns as a robust predictor of psychological distress can address intervention on such a modifiable risk factor. It is hoped that this study will act as baseline research and help develop new cognitive-behavioral strategies for students in distress. After some time, students worry about their health, and their fear of contracting the virus will subside. However, normalizing new things might affect students' academic achievement. Therefore, teachers and university administration should be cautious after returning to the traditional teaching method regarding their adjustment issues.

Despite having a good sample size, this study had a few limitations; the sampling technique used was a non-probability convenient sampling. This non-random sample selection limited the participation of students from remote areas where students had serious network issues and faced more difficulties during online classes. A study should be conducted as a future endeavor, including a sample from rural and remote areas to highlight the underprivileged students' academic and mental health issues. Including teaching faculty as a sample in future research is also essential as students and faculty suffered a lot psychologically due to online education.

The study's findings emphasize the role of distorted thinking in the stress experience of students during COVID and encourage teachers and universities to consider the findings while developing an online education system for the students. To the best of our knowledge this research is the first one to report on the distorted thinking patterns and psychological distress in Pakistani e-learners due to institutional closure during the COVID-19 pandemic. This research will help the government and educational policymaker to recognize the mental health of the student and take more appropriate action to resolve the issues related to e-learning if it is needed in future. There are several avenues to overcome psychological distress through institutional administration, and the instructor can address the associated factors. Institute and instructor counseling, providing attractive learning materials, secure internet access, efficient e-course module, can all support the positive thinking of students, and ultimately improve their mental health.

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