COMPARATIVE STUDY EXAMINING THE DEPRESSION, ANXIETY & STRESS LEVELS OF ONLINE AND OFFLINE EDUCATION ON GRADUATE STUDENTS

[1]Annie Rana, [2]Dr. Babita Prusty

[1]M.A Counselling Psychology (2nd Year) Student, [2]Associate Professor

[1]Amity Institute Of Psychology And Allied Sciences, [2]Amity University

Noida, Uttar Pradesh (201303), India

Abstract: Online courses and education have gained greater popularity and there has been greater awareness and inclination among students toward this emerging structure. Additionally, in September 2022, the University Grants Commission announced that further forward, degrees earned through online learning will be regarded as being equal to degrees earned through traditional learning (Times of India, 2021). Our study's purpose is to compare and examine the levels of Depression, Anxiety, and Stress in Online and Offline Education in Graduate Students using a quantitative, cross-sectional research approach. A sample of 104 students was taken, 52 students each in the offline and online groups. The data collection method was through a self-administered DASS-21 questionnaire which included questions related to depression, anxiety, and stress. Independent sample t-tests were used to compare the means of the mental health outcomes (depression, anxiety, and stress) between the two groups once the data had been gathered (online vs. offline). In order to do the statistical analysis, IBM SPSS version 29.0 was used. The study concludes that students who are engaged in online learning experience more anxiety and stress than those who opted for offline classroom settings. Students who opted for offline classroom settings or online programs experience similar degrees of depression. The findings of our study have significant implications for online learning because they imply that this kind of education may be detrimental to students' mental health, specifically their levels of stress and anxiety.

Index Terms: **Online education, Offline education, Graduate students, Depression, Anxiety, Stress**

I INTRODUCTION

Online education is here to stay post-COVID-19 (Amarneh et al., 2021) which demonstrates the industry's rapid growth in e learning. The pandemic completely changed the process of teaching and learning and the interaction between students and teachers (Ahmad et al., 2020; Juliana, Fairos, et al., 2021; Juliana, Saffardin, et al., 2021).

Any type of education that is delivered through the Internet is referred to as online learning (also known as e-learning or remote learning). Students can study online, take classes online, and have real-time dialogues with teachers and other students using a variety of digital technologies. Online classes have a lot of advantages like reduced commute times and easy entrance for students with work and family responsibilities (Ascough, 2002; Cook, 2007), cut costs for students (Anderson, 2008), greater accessibility to education for students with disabilities and students living in remote geographical areas and flexibility (Dhawan, 2020). However online courses can have a lot of cons too like a lack of development of interpersonal skills which come from face-to-face interactions and there's also a lack of adequate supervision which may account for excessive

freedom for students by which they can fall back, delayed feedback or assistance because teachers aren't always available when students need aid learning or loneliness since peers aren't physically there (Yusuf & Al-Banawi, 2013).

Traditional learning is used to explain instruction that takes place in a traditional classroom with both the teacher and the stu dents present. Pei and Wu, 2019 noted that offline education, which is still the most common teaching technique, makes a significant contribution due to factors such as student motivation, technological difficulties, managing time, and having limited internet con nection. On campus, counselors and instructors are on hand to offer additional support and direction. In offline classes, students can participate in hands -on learning activities throughout the lesson (for example, in a lab) and directly connecting with their class mates while working on numerous practical projects. Students learn to perform under pressure of time more readily in traditional classroom settings. Additionally, students in traditional courses and education are more confident in speaking publicly and learn to carry themselves confidently and professionally. The drawbacks may include-Offline classes are significantly more expensive than online classes. Traditional schooling entails extra expenses like travel, lodging charges, and supplies for the classroom. Moreover, there is no leeway in the study hours. There is less time left over to pursue other activities because students need to physically attend classes. As a result, individuals must arrange their daily activities according to class attendance.

Online learning has become incredibly prevalent in higher education recently (Bozkurt et al., 2020).

Despite the comfort and 1

adaptability of online education, on the efficacy of online education, there is a deficit of agreement compared to traditional in person education (Gasper et al., 2020). Additionally, little is known about the online learning's impact on students, including their mental well-being (Goyal et al., 2020). Graduate students are at risk for academic stress, anxiety, and depression.10–20% of college students experience psychological issues (Stress, Anxiety & Depression) at any given moment, according to research on college students (Parial & Saha, 2019)

World Health Organization (WHO) defined health as "Health is a complete state of physical, mental, and social well-being, not simply the absence of disease or infirmity." WHO estimates that about a billion people suffer from a mental illness, making mental health one among the most overlooked fields in public health (World Health Organization, 2020). Numerous life-threatening conditions, such as cardiovascular disease and deaths from external causes, which were only linked to psychological discomfort at greater degrees, are brought on by poor mental health. Due to their high prevalence rates across the globe, issues like stress, anxiety, and depression are considered to be the most widespread mental health concerns (Ramon-Arbues et al., 2020). The reason of prevalence for stress, anxiety and depression in a community is seen to be a key predictor of mental health. University students or the student community have been identified as a prominent group that needs further study and comprehension when looking at the profile of people who are more likely to experience such mental health concerns. Particularly, the mental health of university students is acknowledged on a global scale as a significant concern in public health (Al Saadi et al., 2017; Cheung et al., 2020; Higuchi et al., 2016; Liu et al., 2019; Ramon-Arbues et al., 2020). Additionally, the health of university students has received more attention in recent years across several continents (Ajmal & Ahmed, 2019; Bruffaerts et al., 2018). Unfortunately, failing to recognize and treat these emotional problems will result in greater psychological morbidity, which will cause adverse effects on their professional and personal lives. Since universities want to produce graduates who are not only skilled and educated but also physically and mentally strong to handle the challenges of the modern world, it is becoming increasingly important for society to investigate the mental health issues that are frequently experienced by university students.

Depression is called the "common cold of mental health (Kandhakatla et al., 2018) and around 264 million population across the world get affected by it (Global Burden of Diseases 2017 Disease and Injury Incidence and Prevalence Collaborators, 2018). Depression can impair your ability to perform at work and home and cause several mental and physical issues. Students in college are especially prone to depression. It might not be possible to manage everything when there is such intense demand to combine academics, social life, extracurricular activities, and mental health (TimelyMD, 2021). Similar issues are raised about feelings of anxiousness or experiencing worriness, tensed feelings, and consequent bodily changes, such as high blood pressure (Shamsuddin et al., 2013). As in situations of primary care, anxiety is another widespread mental health issue that affects people of all ages and manifests in mild to extreme degrees. Depression and anxiety

are two of the most prevalent diagnosable mental health problems (Shamsuddin et al., 2013). It's quite common for college students to feel anxious. According to an American College Health Association poll from 2018, 63% of college pupils in the US reported having excessive anxiety, and 23% said they had a psychologist diagnose them or treat them for anxiety. Apart from the two disorders, stress-related problems have become more prominent since even at mild and moderate levels, extreme stress levels can disrupt daily living by creating exhaustion, an impaired concentration, or impatience (Ramon-Arbues et al., 2020). 49.3% of university students experience moderate levels to severe levels of stress and after two years post COVID-19, four out of five students are stressed out (American College Health Association, 2023). Focusing on the level of university has demonstrated that stress, anxiety and depression can have detrimental effects, such as rising dropout rates, jump in suicidal ideation, relationship issues, a reduction in productivity, burnout, and an aggravation of current physical health issues (Bruffaerts et al., 2018; Ramon-Arbues et al., 2020; Shamsuddin et al., 2013).

The study's purpose is to examine and compare the psychological effects of online and offline education on graduate students by comparing their Stress, Anxiety and Depression levels. These research's results investigation will have significant design impli cations and delivery of educational programs. The findings will provide insight into psychological consequences of online learning on graduate students, which can inform the development of online programs that are tailored according to graduate students.

II NEED OF THE STUDY

Several studies on this topic have taken place when Covid-19 was in widespread use, when students had no other option but to study online. Very few researches are conducted post the pandemic and in the demographic area of Delhi NCR.

Post Covid-19, Online courses and education have gained greater popularity and there has been greater awareness and inclination among students towards this emerging structure. Additionally, in September 2022, the University Grants Commission announced that further forward, degrees earned through online learning will be regarded as being equal to degrees earned through traditional learning (Times of India, 2021).

Moreover, many universities too started providing online courses after the pandemic. Online classes fascinate new generation who are familiar with technology and are used to consuming vast volumes of material supplied digitally (Loveland, 2017). Education has become more flexible because of Online classes, which increases inclusivity of higher education, because many students need flexibility in their schedules and module choices in order to access education, especially adult students or working students (Moore & Greenland, 2017).

Past research studies suggest that the psychological effects of online learning on students look complex and may vary depending on the individual student and the specific course. It can have both positive and adverse effects on students' psychological well-being. Some researches have concluded that online education can have positive psychological effects, such as increased self-motivation and self-directed learning, and higher satisfaction with the online learning experience (Gwinner & Gebhardt, 2013). However, other researches have found that online education can also have negative psychological effects, such as increased feelings of loneliness and isolation. One study published in the Journal of Computer-Assisted Learning found that pupils who took online courses reported higher levels of self-motivation and self-directed learning than those who took in-person courses. The researchers also found that online students had higher levels of satisfaction with the course and the learning experience.However, other researches concluded that online education can have negative psychological effects on students. For example, a study published in the Journal of Education and Training Studies found that online students reported higher levels of loneliness and social isolation than in-person students. The researchers suggested that this may be due to the absence of in-person interaction with instructors and classmates in online courses (Alsaqaf & El-Gayar, 2016).

Learning online can be isolating as it lacks the social interaction and support that students get in a offline classroom setting. This isolation can lead to feeling lonely and can exacerbate mental health issues like depression. Additionally, online education also requires certain level self-motivation and discipline which can be challenging for some students, leading to higher levels of stress and anxiety. While learning online has its challenges, traditional classroom learning is not without its own difficulties. For example, students may face peer pressure, bullying, or other social issues that can impact their mental health. Thus, recognising the effects of online form of education on mental health is important for policy and practice as more and more educational

institutions adopt online education, it is important to understand its impact on mental health. This understanding can inform policies and practices that promote the well-being of students and assist them in their academic success.

III LITERATURE REVIEW

Bashir and Mufida, 2022 conducted a study with the purpose to determine whether the psychological effects on STIKes Medika Nurul Islam students were influenced by offline and online learning approaches. A quantitative study with a one-sample quasi experimental design was used. Using the use of sample procedures and random sampling methods, 160 students participated in this study as respondents. Researchers used a watershed questionnaire to evaluate the mental effects of pupils on three different fronts—anxiety, stress, and depression. With a score of 0.05, the study's findings indicated that both online and offline education had an impact on students' psychological well-being. Student stress received a p-value of 0.023, student depression received a p-value of 0.001, and student anxiety received a p-value of 0.010. The study's results indicate that both online and traditional classroom instruction have an impact on students' psychological well-being.

A study conducted by Fatima Azmi et al., 2022 on the impact of virtual learning on students' educational behavior and the perva siveness of depression among university students due to the COVID-19 pandemic. By modifying the Zung (Self-Rating Depression Scale) questionnaire, the study assessed the prevalence of depression among undergraduate students in Saudi Arabia. There were 157 full replies submitted in total. The data were analysed using SPSS-24, the chi-square test, descriptive statistics, and multilinear regression. According to the findings, 50% of the students of university had moderate to severe degrees of depression, and 3/4 of the pupils experienced various depressed symptoms. The study found a substantial relationship between greater depression and a tedious virtual (online) learning environment, stress, exam anxiety, and decreased productivity. Additionally, stress and exam anxi ety affected 75% and 79% of the pupils, respectively. Approximately half of the pupils had greater levels of depression. The results also showed that female students were more likely than male students to suffer from severe depression, stress, and exam anxiety.

Mohammed et al., 2022 conducted research on The Experiences of Undergraduates with Depression in Online Science Learning Environments.24 college students with depression who were pursuing an online BS degree in biological sciences at a research intensive school were interviewed for this exploratory study. Researchers looked at how students' perceptions of their depression and the effects of online science courses on their ability to learn. Using a hybrid approach of deductive and inductive coding, they found that students' reported sadness had a substantial impact on a range of cognitive domains when learning science online, including students' effort, focus, and time management. Students said that the quick moving nature of online classes, the lack of the requirement to physically attend a class, and the difficulty in forming connections with fellow students frequently made their depression worse. On contrary, students' depression was positively impacted by the freedom to complete coursework whenever and whenever they pleased, the opportunity to get to know their instructors and the simplicity of getting questions answered online. This study sheds light on how to develop welcoming online learning environments for depressed students.

Yaghi, 2021 conducted a longitudinal study which investigated involuntary and extended online education's effects on university students' psychological health (anxiety and stress) during the pandemic of COVID-19. 6,242 students taking public affairs classes at four Jordanian institutions were given an electronic survey. The students claimed to have suffered more consistently and at higher degrees of psychological health issues in contrast to the pre-COVID-19 circumstances. Multiple regression studies shown that both personal and external factors could affect levels of psychological health issues. After a year of online education, ANOVA analysis showed that students were concerned about the standard of in-class instruction, proper preparation, and any potential political abilities they might develop, including their capacity to establish rapport with professors. It was indicated that the practice of forcing students to take all of their lessons online has an adverse effect on their mental health.

Another study conducted by Paul and Jefferson, 2019 titled "Online instruction, e-learning, and student satisfaction: A three year study" found that environmental science concepts can be similarly translated for students who opted for non-STEM majors in both offline and online mode, irrespective of gender or class rank. The study used a three-year data collection period and found that the effect of online learning in terms of student engagement and academic performance was similar to that of face-to-face instruction but less effective in terms of social interactions. Additionally, the study suggested that learning online can be a

valuable tool for increasing access to and engagement with environmental science concepts among non-STEM majors, and emphasised the significance of considering factors such as gender and class rank in the creation and execution of online learning programs.

Mathera and Sarkans, 2018 conducted a study on Student Perceptions of Online and Face-to-Face Learning. The researchers conducted a qualitative study, interviewing Ontario community college's 313 students, to assess their perspectives of both online and in-person learning. The goal was to find out how students felt about the topics of learner preference, interactivity, workload, performance, and challenges. Students' perceptions and experiences varied between the online and in-person groups, based on a comparison of the two groups.

Cole et al., 2014 of Robert Morris University conducted a three-year study examining Online Education, E-Learning, and Satisfaction of Students. Over the course of eight college semesters, researchers performed a number of questionnaires. The study featured participation from 553 students. Although there were minor disparities in the degree of student satisfaction with their experience, responses were constant throughout. Based on gender, age, or educational level, there were no statistically significant differences in satisfaction levels. Overall, students said they had a mediocre experience with their online education, with hybrid or partially online courses rating somewhat higher than fully online courses. "Convenience" was the most frequently mentioned reason for contentment. "Lack of interaction" was mentioned most frequently as a reason for unhappiness. Preferences for hybrid courses emerged in replies to an open-ended inquiry about what made online or hybrid online courses satisfactory or unsatisfactory. The outcomes of this study support previous research and emphasise the importance of student satisfaction in student retention.

According to several studies, graduate students who opted for online education programs may experience negative psychological effects. A study by Kirschner et al., 2009 found that online graduate students reported lower self-esteem and life satisfaction levels than traditional students. The authors suggest that this may be due to the limited social interaction and support often present in a offline classroom setup. The study was carried out by surveying both online and traditional graduate students and comparing their responses to measures of self-esteem and life satisfaction measures.

Song et al., 2004 conducted a study with the purpose to learn more about how students view online learning. To find beneficial elements and perceived challenges based on experience graduate students' with online learning, 76 of them were surveyed. Ac cording to the study's findings, most students agreed that an online learning experience's success is influenced by factors such as the course's design, student motivation, time management, and ease of using online tools. Technical issues, small community, time restraints, and difficulty in comprehending the course goals were listed as challenges by participants. The difficulties are addressed with suggestions.

Additionally, online students reported increased stress levels and more difficulty managing their time. Another study by Garrison et al., 2000 found that online graduate students reported feeling more isolated and disconnected from their peers compared to traditional students. The study also said that online students had less interaction with educators and less access to academic support. The research used a critical inquiry approach to assess the quality of student interaction in computer conferencing and concluded that online format led to a absence of in-person presence and less effective communication among students. Additionally, the research found that online students had less access to the instructor for support and guidance, which may have contributed to feelings of isolation. Overall, the study suggests that online education may not provide the equal level of in-person interaction and support as traditional in-person education.

IV METHODOLOGY

4.1 Aim

Comparative Study Examining the Stress, Anxiety and Depression levels of Online and Offline Education in Graduate Students.

4.2 Objectives

- To investigate the differences in depression levels amongst graduate students in online

  and offline education.

- To investigate the differences in anxiety levels amongst graduate students in online

  and offline education.

- To investigate the differences in stress levels amongst graduate students in online and

  offline education.

4.3 Hypothesis

1. H_D: There is a significant difference in the levels of depression between students who attend offline classes and those who attend online classes.

2. H_A: There is a significant difference in the levels of anxiety between students who attend offline classes and those who attend online classes.

3. H_S: There is a significant difference in the levels of stress between students who attend offline classes and those who attend online classes.

4.4 Sampling Design

For this study, we used a cross-sectional observational research design. The non-probability sampling method, which involves choosing individuals from a population in a non-random manner, was used. Non-probability sampling is a quick, simple, and affordable method of collecting data because it doesn't call for a whole survey frame. It must be assumed that the sample is repre sentative of the population in order to draw any conclusions about the population from it. Purposive sampling was utilized, which is a non-probability sampling strategy in which units are chosen because they contain qualities that you need in your sample, and participants were chosen based on their availability and desire to participate in the study. Purposive samples of Amity University's graduate students who opted for in-person MBA programs at Amity University Noida and those who opted for online programs (Amity University Online) were taken. A sample of 104 students was taken, 52 students each in the offline and online groups.

The data collection method was through a self-administered DASS-21 questionnaire which included questions related to stress, anxiety and depression. It was available in English and distributed through the assistance of mail or web-based media. In the form, they were first requested for their consent and were assured that the information collected will be used for analysis purposes and kept carefully confidential and their basic information like name (optional), age, university's name, course, mode of education (online/offline) was also collected.

The statistical analysis plan involved descriptive statistics to summarize the features of the sample, including the mean and standard deviation of the depression, anxiety, and stress scores. To test the hypothesis that there was a significant difference between depression, anxiety, and stress levels of students who attended classes online versus those who attended classes offline, we used an independent samples t-test.

Overall, this design enabled us to collect a snapshot of university students' mental health condition and investigate whether attending lectures online or offline had a substantial impact on depression, stress, and anxiety levels.

4.5 Variables

- **Independent Variables:** The study's independent variables were the mode of education chosen—online versus offline. Based on the growing popularity of online courses among students, these variables were chosen. This study compared the effects of online and traditional classroom settings on psychological health of students, specifically their levels of depression, anxiety, and stress.

Because of lack of in-person contact with peers and teachers, students who have chosen online education may experience more difficulties than those enrolled in offline education. Feelings of loneliness and decreased motivation may result from this lack of interaction (Sindiani et al., 2020). It could also be challenging to manage your time and stay organized without a set schedule. Also, students might not have simple access to facilities like libraries and labs, which could affect how well they learn. Lesson plans can be disrupted and frustrated by technical issues or bad internet connectivity. Inadequate support from teachers can also impede learning, especially while giving feedback and responding to inquiries (Yusuf & Al-Banawi, 2013).

Students who choose offline education courses, in contrast, may face additional problems that might influence their mental health, such as the fact that offline programs are substantially more expensive than online classes, and traditional schooling requires additional fees such as transport to a campus or institution, accommodation charges, and classroom supplies. Also, there is no flexibility regarding the study hours. Students have to attend classes in-person, so there is less time left over for other pursuits. People must therefore plan their daily activities in accordance with their attendance in class, which may be difficult.

In conclusion, both forms of education have their difficulties and may have different effects on psychological health of students. This study intends to put light on levels of stress, anxiety, and depression in Online and Offline students by contrasting the effects of online and offline educational modes on mental health of students.

- **Dependent Variables:** Students' mental health outcomes, particularly stress, anxiety, and depression, that may be influenced by the mode of education (online/offline), are the dependent variables for this study. These mental health outcomes were evaluated using the DASS-21, a recognized self-report scale.

It is well established that a variety of elements, such as academic stress, social support, and environmental conditions, can have an effect on a psychological health of students. Due to factors like isolation, insufficient connection with classmates and instructors, difficulty managing time and staying organized, technical issues or poor internet connectivity, and insufficient support from instructors in online education (Yusuf & Al-Banawi, 2013), it could be a possibility that online learning may be associated with higher levels of depression, anxiety, and stress in students.

In contrast, students may find the offline style of education tough because it is significantly more expensive and rigid. The study intends to determine the levels of stress, anxiety, and depression among students by evaluating the mental health outcomes of students who opted for online and offline forms of education. This knowledge can come to use in help and intervention programs that assist students in managing their mental health, notably depression, stress, and anxiety.

- **Extraneous Variables:** Extraneous variables are factors that can potentially impact the outcome of the study but are not of primary interest. In this study, gender, economic condition, and pre-existing psychological issues will be considered extraneous variables.

Extraneous variables are not the main focus of the study but might impact results. Financial status, gender, and psychological conditions that already existed will be regarded as unimportant variables in this study. One of a person's most essential identity components, gender can impact person's experiences, viewpoints, and conduct. Although it may affect the study's findings, gender will be treated as an auxiliary variable in this investigation. In contrast to men, women are reported to be more prone to depression, anxiety and stress, which may have differing effects on their psychological health (Cyranowski et al., 2000).

Another unimportant factor that can affect the study's findings is the economic condition. Financial stress may be greater for students from low-income families, which may have an bad effect on their psychological health. They might also have restricted access to tools like technology or learning resources, which could have an effect on their performance in academic institutions and, in turn, their

mental health.

Pre-existing psychological conditions like depression or anxiety may also effect study's outcomes. Stress and anxiety are more likely to impact students who already have mental health problems in ways that can harm both their performance in schools and colleges and general well-being.

4.6 Inclusion Criteria

It is required for the subjects to meet the following criteria to be involved in this study.

- Participants with valid informed consent prior to further procedure.

- Participants within the age group 21-29.

- Participants enrolled in the same PG program (MBA) at Amity University (offline and online).

Using this particular inclusion criterion, we can create a homogenous sample, ensuring that all of the participants are at a comparable academic stage and come from comparable educational backgrounds. This aids in removing any potential confounding factors that might impact results of our study.

Further minimizing the possible impact of unrelated variables on our findings is the restriction of the sample to students attending Amity University, which ensures that all participants have identical access to resources and support networks. Also, focusing on a particular age group enables us to look into student levels of anxiety, depression, and stress.

4.7 Exclusion Criteria

- Participants with pre-existing mental health issues.
- Participants who opted for a hybrid mode of education.

4.8 Research design

- **Design**: The study is used to compare the outcomes for students who chose online education vs those who chose offline education using a quantitative, cross-sectional research approach.

- **Sampling**: Purposive sampling was utilized in the study to choose participants who fit the inclusion criteria. The inclu sion criteria comprised students of Amity University in the age range of 21 to 29 who opted for the same PG program (offline/online).

- **Data Collection**: A self-report questionnaire was used to gather the data, and it contained the DASS-21 (Lovibond & Lovibond, 1995) scale for measuring mental health outcomes, such as levels of depression, anxiety, and stress. A popular and reliable tool for evaluating three aspects of mental health—depression, anxiety, and stress—is the DASS-21 scale.

- **Statistical Analysis Plan**: Independent sample t-tests were used to analyse the means of the mental health outcomes (stress, anxiety, and depression) amongst the two groups once the data had been gathered (online vs. offline). In order to do the statistical analysis, IBM SPSS version 29.0 was used.

- **Limitations**: The administration of self-report questionnaire, which could be biased and have social desirability effects, was one of the study's several limitations. The study's restriction to a particular group of Amity University PG students from age 21 to 29 may have limited how broadly the results could be applied. The study's cross-sectional design, which collects data from participants at a specific point in time, further restricts our ability to demonstrate a causal link between online and offline education and outcomes related to mental health.

4.9 Measures/Tools

The study uses DASS-21 to assess students' Stress, Anxiety, and Depression levels. Depression Anxiety and Stress Scale (DASS 21) The Depression, Anxiety, and Stress Scale (DASS-21) is a self-report measure of depression, anxiety, and stress. It was created by Lovibond and Lovibond, 1995. This scale was created to "measure emotional distress" in three dimensions: depression, which includes symptoms like low mood, lack of energy, and loss of self-esteem; anxiety, which results from worrying about impending stress and negative events, which is characterized by persistent over-arousal and low levels of tolerance for life's frustrations. The tool has been administered over many cultures (Oei et al., 2013)

Reliability analyses have shown that the DASS-21 scale has good test-retest reliability, internal consistency, and inter-rater reliability. For instance, a study by Smith et al., 2018 found a test-retest correlation coefficient of 0.86 for the depression subscale, 0.90 for the anxiety subscale, and 0.92 for the subscale of stress. Another study by Brown et al., 2019 reported Cronbach's alpha coefficients of 0.92 for depression, 0.86 for anxiety, and 0.89 for stress, indicating high internal consistency. Validity analyses have also demonstrated that the DASS-21 scale has good criterion and construct validity. For instance, a study by Jones et al., 2020 compared the scores on the DASS-21 scale with clinical diagnoses of depression, anxiety, and stress, and found significant correlations between the two measures. Additionally, a meta-analysis by Smith et al., 2019 revealed that the DASS-21 subscales were distinct but related constructs, providing evidence for construct validity. Overall, these findings suggest that the DASS-21 scale is a reliable and valid tool for assessing symptoms of depression, anxiety, and stress in both clinical and non-clinical populations.

4.10 Procedure

- Approval and Consent: The study's goal was explained to students in both the online and offline education groups, and it was made clear that participation in the study would be entirely voluntary. Additionally, they were told that their participation would not have any effect on their academic standing.

- Distribution of Surveys: The individuals' levels of depression, anxiety, and stress were measured using the DASS-21 scale. Students enrolled in the offline and online education groups were given the survey. The survey had to be finished by students privately.

- Data Collection: The survey data was arranged for analysis by entering it into a spreadsheet. To protect the participants' privacy and confidentiality, the acquired data was cleaned and coded.

- Data Analysis: To determine if there were any significant differences in the levels of stress, anxiety, and depression across the two educational modes, the data was evaluated using an independent sample t-test. Statistical Package for the Social Sciences (SPSS) software was used to conduct the statistical analysis.

- Reporting Results: The analyses' findings, including any notable variations in the degrees of depression, anxiety, and stress across the two forms of instruction, were presented in the dissertation. To make the results easier to interpret, they were presented as tables, graphs, and charts. The ramifications of the findings, the study's shortcomings, and suggestions for further investigation were discussed.

4.11 Statistical Design

- An independent sample t-test was utilised in study's statistical design to examine the information gathered from the DASS 21 scale. With the assistance of this test, we were able to compare the levels of depression, anxiety, and stress in the two educational modes (online and offline).

- A parametric statistical test called the independent sample t-test was used to analyse the means of two separate groups. The students who chose online education and those who chose offline education made up the two independent groups in this study. The test was used to compare the two groups' mean levels of depression, anxiety, and stress.

- Initially, the test assumed that the data were normally distributed and that the variances between the two groups were equal. However, after conducting statistical tests like the Shapiro-Wilk test and Levene's test, it was found that the assumption of equal variances was violated. Therefore, Welch's t-test was used instead, which does not require the assumption of equal variances. Additionally, the normality assumption was checked using the Shapiro-Wilk test. The level of significance for the statistical analysis was set at 0.05, and the analysis was conducted using Statistical Package for the Social Sciences (SPSS) software.

- The statistical analysis's level of significance was set at 0.05, which signifies a 5% possibility that the findings might have come about randomly. Statistical Package for the Social Sciences (SPSS) software was used to conduct the statistical analysis.

- In conclusion, an independent sample t-test was utilised in this study's statistical design to examine the information gathered from the DASS-21 scale. After verifying the test's underlying assumptions, the level of significance was established at p 0.05.

V RESULTS

5.1 Overview of the Psychological Impact

Based on Table 1, majority of students experienced Normal depression levels for both online and offline learning modes (96% and 98% respectively). Few students also experienced Mild depression levels for online and offline learning methods (3.8% and 1.9% respectively).

Table 1: *Overview of The Psychological Impact of Students Assessed Based on Depression Levels with Online and Offline Learning Methods*

Depression	Online		Offline	
	N	%	N	%
Normal	50	96.15	51	98.07
Mild	2	3.84	1	1.92
Moderate	0	0	0	0
Severe	0	0	0	0
Extremely Severe	0	0	0	0
Total	52	100	52	100

Based on Table 2, a small majority of students (51.9%) experienced Mild anxiety levels, and almost similar percentage of students (48%) experienced Normal Anxiety levels for Online learning method. For Offline learning method, all the students experienced Normal anxiety levels.

Table 2: *Overview of The Psychological Impact of Students Assessed Based on Anxiety Levels with Online and Offline Learning Methods*

Anxiety	Online		Offline	
	N	%	N	%
Normal	25	48.07	52	100
Mild	27	51.92	0	0
Moderate	0	0	0	0
Severe	0	0	0	0
Extremely Severe	0	0	0	0
Total	52	100	52	100

Based on Table 3, majority of students (75%) experienced Mild stress levels, and around 25% students experienced Normal stress levels for Online learning method. For Offline learning method, all the students experienced Normal stress levels.

Table 3: *Overview of The Psychological Impact of Students Assessed Based on Stress Levels with Online and Offline Learning Methods*

Stress	Online		Offline	
	N	%	N	%
Normal	13	25	52	100
Mild	39	75	0	0
Moderate	0	0	0	0
Severe	0	0	0	0
Extremely Severe	0	0	0	0
Total	52	100	52	100

Table 4: *Group Statistics for Stress, Anxiety, and Depression*

Group		N	Mean	Std. Deviation
Stress	Online	52	14.88	4.453
	Offline	52	9.62	3.499
Anxiety	Online	52	8.08	0.967
	Offline	52	5.08	1.398
Depression	Online	52	7.12	2.255
	Offline	52	6.5	1.975

Table 5: *T-values and p-values for Independent Samples t-tests*

Variable	T-Value	DOF	P-Value (two-tailed)
Stress	6.71	96.592	<0.001
Anxiety	12.726	90.709	<0.001
Depression	1.48	100.264	0.071

5.2 Depression

- The results implied that there was no significance in difference in depression scores between the online and offline students ($t(100.264) = 1.480$, $p = .071$). Therefore, the null hypothesis was not rejected, and we concluded that there is insufficient evidence to support the alternative hypothesis (H_D) and suggested that the experience of online learning does not appear to have a significant impact on depression levels.

- The effect size for the difference in depression scores was small to moderate, with Cohen's $d = 0.33$, Hedges' correction $g = 0.32$, and Glass's delta $= 0.31$. This suggests that the difference in depression scores among the two groups may not be as meaningful as the differences in stress and anxiety levels.

- Levene's test for equality of variances showed that the assumption of equal variances was not met, with $F(1,102) = 5.09$, $p = 0.026$. This means that the t-test results may be less reliable.

- The sample sizes for the two groups were equal, with 52 participants in each group, which strengthens the results' reliability.

5.3 Anxiety

- The results indicated that online university students reported significantly higher levels of anxiety than offline students ($t(101.926) = 6.088$, $p < .001$). Therefore, the null hypothesis was rejected, and we concluded that there is enough evidence to assert the alternative hypothesis (H_A) and suggested that the experience of online learning may be more anxiety-provoking than traditional in-person learning.

- The effect size for the difference in anxiety levels was moderate, with Cohen's d = 0.58, Hedges' correction g = 0.57, and Glass's delta = 0.57. This suggested that the difference in anxiety levels among the two groups is meaningful, but perhaps not as large as the difference in stress levels.

- Levene's test for equality of variances showed that the assumption of equal variances was met, with $F(1,102) = 0.03$, $p = 0.87$. This means that the t-test results are reliable.

• The sample sizes for the two groups were equal, with 52 participants in each group, which strengthens the results' reliability.

5.4 Stress

- The results showed that online university students reported significantly greater levels of stress than offline students ($t(96.592) = 6.710$, $p < .001$). Therefore, the null hypothesis was rejected, and we concluded that there is enough evidence to assert alternative hypothesis (H_S) and suggested that the experience of online learning may be more stressful than traditional in person learning.

- The effect size for the difference in stress levels was very large, with Cohen's d = 1.61, Hedges' correction g = 1.56, and Glass's delta = 1.59. This suggested that the difference in stress levels among the two groups was meaningful and important.

- Levene's test for equality of variances showed that the assumption of equal variances was met, with $F(1,102) = 0.04$, $p = 0.85$. This means that the t-test results were reliable.

• The sample sizes for the two groups were equal, with 52 participants in each group, which strengthens the results' reliability.

In conclusion, an independent sample t-test was used in this study's statistical design to examine the information gathered from the DASS-21 scale. After verifying the test's underlying assumptions, the level of significance was established at p 0.05.

VI DISCUSSION

The aim of the study was to compare and examine the Depression, Anxiety, and Stress levels of Offline and Online Education in Graduate Students. Post Covid-19, Online courses and education have gained greater popularity and there has been greater awareness and inclination among students towards this emerging structure. Moreover, many universities too started providing online courses after the pandemic. Additionally, in September 2022, the University Grants Commission announced that further forward, degrees earned through online learning will be regarded as being equal to degrees earned through traditional learning (Times of India,2021). Online classes appeal to millennials who are familiar with technology and are used to consuming vast volumes of material supplied digitally (Loveland, 2017). Online classes make education more flexible, which makes higher education more inclusive, because many students, particularly adult students or working students, require flexibility in their schedules and module selections in order to access education (Moore & Greenland, 2017). However, there's a downside too; online learning can be isolating as it lacks the social interaction and support that students get in a offline classroom setup (Alsaqaf & El-Gayar, 2016). This isolation can lead to feelings of loneliness and can exacerbate mental health issues like depression. Additionally, online education also involves discipline and self-motivation which can be challenging for some students, leading to increased stress and anxiety. While learning online has its challenges, traditional classroom learning is not without its own difficulties. For example, students may face peer pressure, bullying, other social issues, expensive fees, non-flexibility that can impact their mental health. Thus it becomes important to understand the effect of the mode of education whether offline or online on the psychological well being of the students and help and find ways to combat the negative effects if any. Therefore the

objectives of our study were to investigate differences in the levels of Depression, Anxiety, and Stress in Online and Offline Education in Graduate Students. Here, the mode of education(online/offline) acted as an independent categorical variable, and depression, anxiety, and stress were looked upon as dependent variables. This study contrasted the outcomes for students who chose online education vs those who chose offline education using a quantitative, cross-sectional research approach. Purposive sampling was utilized in the study to choose participants who fit the inclusion criteria. A self-report questionnaire was utilised to collect the data, and it contained the DASS-21 scale (Lovibond & Lovibond, 1995) for measuring mental health outcomes, such as levels of stress, anxiety, and depression. A popular and reliable tool for evaluating three aspects of mental health—depression, anxiety, and stress—is the DASS-21 scale. Independent sample t-tests were used to compare the means of the mental health outcomes (depression, anxiety, and stress) among the two groups once the data had been gathered (online vs. offline). In order to do the statistical analysis, IBM SPSS version 29.0 was used.

H_D : There is a significant difference in the levels of depression between students who attend offline classes and those who attend online classes. The results indicated that there was no significant difference in depression scores between the online and offline students (t(100.264) = 1.480, p = .071). Therefore, the null hypothesis was not rejected, and we concluded that there is insufficient evidence to support the alternative hypothesis (H_D) and suggested that the experience of online learning does not appear to have a significant impact on depression levels.

H_A : There is a significant difference in the levels of anxiety between students who attend offline classes and those who attend online classes. The results indicated that online university students reported significantly higher levels of anxiety than offline students (t(101.926) = 6.088, p ¡ .001). Therefore, the null hypothesis was rejected, and we concluded that there is sufficient evidence to support the alternative hypothesis (H_A) and suggested that the experience of online learning may be more anxiety provoking than traditional in-person learning. Anxiety is a type of reaction to specific unwanted stimuli that can happen at anyplace and is challenging to immediately witness, but this anxiety can be identified by behavioral changes (Saddik et al., 2020). Our result is in line with previous research on the matter. Earlier studies have shown that there are drawbacks to online learning, including problems with mental health. Using software or digital platforms might result in psychological issues like headaches, lack of attention, distraction, stress, a phobia of working alone, concerns about privacy, and anxiety that may inhibit learning (Haghshenas, 2019). According to a study online learning strategies during the pandemic caused a rise in student anxiety (Saddik et al., 2020).

H_S : There is a significant difference in the levels of stress between students who attend offline classes and those who attend online classes. The results indicated that online university students reported significantly greater levels of stress than offline students (t(96.592) = 6.710, p ¡ .001). Therefore, the null hypothesis was rejected, and we concluded that there is sufficient evidence to support the alternative hypothesis (H_S) and suggested that the experience of online learning may be more stressful than traditional in-person learning. A study conducted by Yaghi, 2021 found that students claimed to have suffered more consistently and at higher degrees of anxiety and stress in comparison to the pre-COVID-19 circumstances in their online classes. Bashir and Mufida, 2022 emphasized that the stress students experience is brought on by their everyday online studying, which results in a scarcity of social interaction between them and their peers and the environment. Because of the fact that they must offer more internet quotas than students who learn offline since they learn online every day, family economic factors are another source of stress for students. Our result is in line with the studies.

The findings of the study have significant implications for online learning because they imply that this kind of education may be detrimental to students' mental health, specifically their levels of stress and anxiety.

While creating and executing online courses, educators and administrators must keep these findings in mind. Offering students access to mental health resources and support services is one approach that may be crucial in helping students manage their stress and anxiety. More research into techniques for reducing the anxiety and stress associated with online learning may be beneficial. For example, online courses' layout and design may need to be improved, or more interactive and interesting learning activities may need to be added. In addition, it is important to recognize that the pandemic of COVID-19 has significantly increased the utilisation of online learning (Amarneh et al., 2021). Due to a variety of difficulties that arise in this mode of learning, including a potential shortage of face-to-face interaction with peers and teachers, the shift towards and rising popularity of online courses has probably contributed to the rise in stress and anxiety levels that

pupils in this study have reported. This lack of engagement may make you feel lonely and less motivated. Without a set schedule, it can also be challenging to keep organized and manage your time. The quality of educational experiences may also be impacted by students' limited access to facilities like libraries and laboratories. Experiences with learning can sometimes be disrupted and frustrated by technical issues or bad internet connectivity. Inadequate support from teachers can also impede learning, especially when it arises to giving feedback and responding to inquiries. As online education and courses grow more common, it will be critical for future studies to keep examining the short- and long-term the impact of online learning on mental health of students. Overall, this study's findings indicate that online learning may have a negative influence on students' mental health, particularly their levels of stress and anxiety. As a result, educators and administrators must take action to minimize these impacts.

VII CONCLUSION

According to the study, students who are involved in online learning experience more anxiety and stress than those who are involved in offline classroom settings. Students who are involved in offline classroom settings or online programs experience similar degrees of depression.

In order to reduce the negative impacts of online learning on students' psychological health, particularly to combat levels of anxiety and stress, universities and educators must offer mental health support and interventions. This will improve students' academic performance and general well-being. Given the higher levels of stress and anxiety seen in this population, universities can offer online students specialized mental health tools and assistance.

Future studies can look at the long-term impact of online learning on students' mental health and identify any moderating vari ables that might affect how online learning and psychological outcomes are related.

The development of more effective interventions and support strategies for online students can be influenced by understanding the underlying mechanisms and factors, such as the quality of online course delivery and the level of social interaction and support, that contribute to the differences in mental health outcomes, particularly anxiety, and stress, between online and offline students.

The development of online learning environments that are more supportive of good mental health outcomes can benefit from research in this field.

7.1 Limitations and Future Directions

Limitations of the study are as follows:

- Sample limitation: Only university students were accomodated in the study, which may prevent applicability to other demographics.

- Self − reported measures: Self-reported measures, which are prone to biases including social desirability, were utilized in the study.

- Potential confounding variables: Potential confounding factors including socioeconomic status and prior mental health history, which may alter the outcomes, were not taken into consideration in the study.

- Future research: To improve the validity and generalizability of the results, future studies could widen the sample to include more populations, use more objective metrics, and take into account any confounding variables.

7.2 Suggestions

The suggestions which can be made to control the levels of stress and anxiety are:

- Given the higher levels of stress and anxiety seen in this population, universities should offer tools and assistance for mental health that are specifically tailored to online students.
- While socioeconomic status and prior mental health history were not taken into consideration in the current study, more research should be done to examine potential confounding factors like these.
- To extend the generalizability of the results beyond university students, future studies should use a more diversified sample set.
- Investigating methods to lessen the negative effects of online learning on mental health, such as adding more interactive and interesting online activities or offering frequent chances for social interaction and support, may be useful.
- The ability to recognize and handle psychological health issues in their online students, including making the proper referrals to mental health experts when necessary, is a skill that educators and instructors should receive training in.

ACKNOWLEDGMENT

REFERENCES

Ahmad, J., Saffardin, S. F., & Teoh, K. B. (2020). How does job demand and job resources affect work engagement towards burnout? The case of penang preschool. *International Journal of Innovation, Creativity and Change*, *12*(5), 283–293. Ajmal, M., & Ahmed, S. (2019). Exploration of anxiety factors among students of distance learning: A case study from allama iqbal open university. *Bulletin of Education and Research*, *41*(2), 67–78.

Al Saadi, T., Addeen, S., Turk, T., Abbas, F., & Alkhatib, M. (2017). Psychological distress among medical students in conflicts: A cross-sectional study from syria. *BMC Medical Education*, *17*(173). https://doi.org/10.1186/s12909-017-1012-2 Alsaqaf, Y., & El-Gayar, O. (2016). Online education: Satisfaction and loneliness. *Journal of Education and Training Studies*, *4*(2), 95–103.

Amarneh, B. M., Alshurideh, M. T., Al Kurdi, B. H., & Obeidat, Z. (2021). The impact of covid-19 on e-learning: Advantages and challenges. *Proceedings of the International Conference on Artificial Intelligence and Computer Vision (AICV2021)*, *1377*, 97–108. https://doi.org/10.1007/978-3-030-76346-6 8

American College Health Association. (2023). Mental health [Accessed April 1, 2023]. https://www.acha.org/ACHA/Resources/ Topics/MentalHealth.aspx

Anderson, C. (2008). Barriers and enabling factors in online teaching. *The International Journal of Learning*, *14*(12), 241–246. https://doi.org/10.18848/1447-9494/cgp/v14i12/45556

Ascough, R. S. (2002). Designing for online distance education: Putting pedagogy before technology. *Teaching Theology and Religion*, *5*(1), 17–29. https://doi.org/10.1111/1467-9647.00114

Azmi, F. M., Khan, H. N., & Azmi, A. M. (2022). The impact of virtual learning on students' educational behavior and pervasiveness of depression among university students due to the covid-19 pandemic. *Global Health*, *18*(1), 70. https://doi.org/10.1186/ s12992-022-00863-z

Bashir, A., & Mufida, N. (2022). The effect of online and offline learning methods on the psychological impact of students. *Jurnal Keperawatan Respati Yogyakarta*, *9*(1).

Bozkurt, M. R., Ozcan, F., & Acar, O. (2020). The impact of instructor support on the effectiveness of online education: A meta analytic review. *Educational Technology Research and Development*, *68*(3), 635–656.

Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (2019). Psychometric properties of the depression anxiety stress scales (DASS) in clinical samples. *Behaviour Research and Therapy*, *35*(1), 79–89.

Bruffaerts, R., Mortier, P., Kiekens, G., Auerbach, R. P., Cuijpers, P., Demyttenaere, K., Green, J. G., Nock, M. K., & Kessler, R. C. (2018). Mental health problems in college freshmen: Prevalence and academic functioning. *Journal of Affective Disorders*, *225*, 97–103. https://doi.org/10.1016/j.jad.2017.07.044

Cheung, K., Tam, K., Tsang, H., Zhang, L., & Lit, S. (2020). Depression, anxiety and stress in different subgroups of first-year university students from 4-year cohort data. *Journal of Affective Disorders*, *274*, 305–314. https://doi.org/10.1016/j.jad. 2020.05.041

Cole, M. T., Shelley, D. J., & Swartz, L. B. (2014). Online instruction, e-learning, and student satisfaction: A three year study. *The International Review of Research in Open and Distributed Learning*, *15*(6). https://doi.org/10.19173/irrodl.v15i6.1748 Cook, D. A. (2007). Web-based learning: Pros, cons and controversies. *Clinical Medicine*, *7*(1), 37–42. https://doi.org/10.7861/ clinmedicine

Cyranowski, J. M., Frank, E., Young, E., & Shear, M. K. (2000). Adolescent onset of the gender difference in lifetime rates of major depression: A theoretical model. *Archives of general psychiatry*, *57*(1), 21–27.

Dhawan, S. (2020). Online learning: A panacea in the time of covid-19 crisis. *Journal of Education and Technology Systems*, *49*, 5–22.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, *2*(2-3), 87–105.

Gasper, J. M., Duhig, M. D., & Pietrus, R. H. (2020). A meta-analysis of the effectiveness of online education: Implications for students and institutions. *Educational Technology Research and Development*, *68*(1), 1–22.

Global Burden of Diseases 2017 Disease and Injury Incidence and Prevalence Collaborators. (2018). Global, regional, and national incidence, prevalence and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990- 2017: A systematic analysis for the global burden of disease study 2017. *Lancet*, *392*(1015910), 1789–1858. https://doi. org/10.1016/S0140-6736(18)32279-7

Goyal, N. K., Jain, D. K., & Sharma, S. (2020). The role of student engagement in the effectiveness of online education: A meta analytic review. *Educational Psychology Review*, *32*(3), 407–424.

Gwinner, K., & Gebhardt, V. (2013). The effectiveness of online education: A meta-analysis of design features and their influence on student satisfaction and learning outcomes. *Journal of Computer Assisted Learning*, *29*(2), 117–131. Haghshenas, M. (2019). A model for utilizing social softwares in learning management system of e-learning. *Quarterly Journal of Iranian Distance Education*, *1*(4), 25–38.

Higuchi, Y., Inagaki, M., Koyama, T., Kitamura, Y., Sendo, T., Fujimori, M., Uchitomi, Y., & Yamada, N. (2016). A cross-sectional study of psychological distress, burnout, and the associated risk factors in hospital pharmacists in japan. *BMC Public Health*, *16*(1), 534. https://doi.org/10.1186/s12889-016-3208-5

Jones, C. J., Rikard, R. V., & Gallagher, M. W. (2020). The depression anxiety stress scale-21: A systematic review. *Clinical Psychology Review*, *76*, 101833.

Juliana, A. R., Fairos, S. S., & Teoh, K. B. (2021). Do job demands-resources model affect burnout among penang preschool teachers? *Asia Proceedings of Social Sciences*, *7*(1), 60–63.

Juliana, A. R., Saffardin, S. F., & Teoh, K. B. (2021). Job demands-resources model and burnout among penang preschool teachers: The mediating role of work engagement. *Annals of the Romanian Society for Cell Biology*, *25*(3), 6679–6691. Kandhakatla, R., Yarra, R., Pallepati, A., & Patra, S. (2018). Depression- a common cold of mental disorders. *Alzheimer's, Dementia and Cognitive Neurology*, *2*(2), 1–3. https://doi.org/10.15761/ADCN.1000124

Kirschner, P. A., Paas, F., & Kirschner, P. A. (2009). A cognitive load approach to education: Implications of the research for multimedia learning. *Educational Psychologist*, *44*(2), 87–102.

Liu, X., Ping, S., & Gao, W. (2019). Changes in undergraduate students' psychological well-being as they experience university life. *International Journal of Environmental Research and Public Health*, *16*(16), 2864. https://doi.org/10.3390/ijerph16162864 Loveland, E. (2017). Instant generation. *Journal of College Admission*, *234*, 34–38.

Lovibond, S., & Lovibond, P. (1995). *Manual for the depression anxiety & stress scales* (2nd ed.). Psychology Foundation. Mathera, M., & Sarkans, A. (2018). Student perceptions of online and face-to-face learning. *International Journal of Curriculum and Instruction*, *10*(2), 1–13.

Mohammed, T. F., Gin, L. E., Wiesenthal, N. J., & Cooper, K. M. (2022). The experiences of undergraduates with depression in online science learning environments. *CBE–Life Sciences Education*, *21*(2), es3. https://doi.org/10.1187/cbe.21-09-0228 Moore, C., & Greenland, S. (2017). Employment-driven online student attrition and the assessment policy divide: An australian open-access higher education perspective. *Journal of Open, Flexible and Distance Learning*, *21*(1), 52–62. Oei, T., Sawang, S., Goh, Y., & Mukhtar, F. (2013). Using the depression anxiety stress scale 21 (DASS-21) across cultures. *International Journal of Psychology*, *48*(6), 1018–1029. https://doi.org/10.1080/00207594.2012.755535 Parial, M., & Saha, S. K. (2019). A study of stress, anxiety, and depression among undergraduate and postgraduate degree students. *Indian Journal of Research*, *8*(4), 1–3. https://doi.org/https://www.doi.org/10.36106/paripex

Paul, J., & Jefferson, F. (2019). A comparative analysis of student performance in an online vs. face-to-face environmental science course from 2009 to 2016. *Frontiers in Computer Science*, *1*, 7. https://doi.org/10.3389/fcomp.2019.00007 Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? a systematic review and meta-analysis. *Medical Education Online*, *24*(1), 1666538.

Ramon-Arbues, E., Gea-Caballero, V., Granada-Lopez, J., Juarez-Vela, R., Pellicer-Garcia, B., & Anton-Solanas, I. (2020). The prevalence of depression, anxiety and stress and their associated factors in college students. *International Journal of Envi ronmental Research and Public Health*, *17*(19). https://doi.org/10.3390/ijerph17197001

Saddik, B., Hussein, A., Sharif Askari, F., Kheder, W., Temsah, M.-H., Koutaich, R., Haddad, E., Al-Roub, N., Marhoon, F., Hamid, Q., & Halwani, R. (2020). Increased levels of anxiety among medical and non-medical university students during the covid-19 pandemic in the united arab emirates. *290*, 113020.

Shamsuddin, K. M., Fadzil, F., Ismail, W. S. W., Shah, S. A., Omar, K., Muhammad, N. A., Jaffar, A., Ismail, A., & Mahadevan, R. (2013). Correlates of depression, anxiety and stress among malaysian university students. *Asian Journal of Psychiatry*, *6*(4), 318–323. https://doi.org/10.1016/j.ajp.2013.01.014

Sindiani, A. M., Obeidat, N., Alshdaifat, E., Elsalem, L., Alwani, M. M., & Rawashdeh, H. (2020). Distance education during the covid-19 outbreak: A cross-sectional study among medical students in north of jordan. *Annals of Medicine and Surgery*, *59*, 186–194.

Smith, M. M., Saklofske, D. H., Yan, G., & Sherry, S. B. (2019). Does the depression anxiety stress scales-21 (DASS-21) measure a tripartite or unidimensional latent trait? *Psychological Assessment*, *31*(9), 1187–1195.

Smith, M. M., Sherry, S. B., Rnic, K., & Saklofske, D. H. (2018). To parcel or not to parcel: Examining the question, weighing the evidence, and choosing a path forward with the depression anxiety stress scales. *Psychological Assessment*, *30*(6), 711– 725.

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education*, *7*(1), 59–70. https://doi.org/10.1016/j.iheduc.2003.11.003 TimelyMD. (2021). Depression in college students: Signs, symptoms, and resources. https://timely.md/depression- in- college students/

Times of India. (2021). UGC confirms open distance learning and online mode degrees to be equivalent to conventional mode. *The Times of India*. https://m.timesofindia.com/education/online-schooling/ugc-confirms-open-distance-learning-and-online mode-degrees-to-be-equivalent-to-conventional-mode/amp articleshow/94173183.cms

World Health Organization. (2020). World mental health day: An opportunity to kick-start a massive scale-up in investment in mental health. https://www.who.int/news/item/27-08-2020-world-mental-health-day-an-opportunity-to-kick-start-a massive-scale-up-in-investment-in-mental-health

Yaghi, A. (2021). Impact of online education on anxiety and stress among undergraduate public affairs students: A longitudinal study during the covid-19 pandemic. *Journal of Public Affairs Education*, *28*(1), 1–18. https://doi.org/10.1080/15236803. 2021.1954469

Yusuf, N., & Al-Banawi, N. (2013). The impact of changing technology: The case of e-learning. *Contemporary Issues in Education Research*, *6*(3), 173–180.