



# COVID-19: A Source of Stress and Depression Among University Students and Poor Academic Performance

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Current research examines how COVID-19 has impacted the daily life of students, specifically personal and academic aspects. The authors investigated the role of academic and family stress caused by COVID-19 on students' depression levels and the subsequent impact on their academic performance based on Lazarus' cognitive appraisal theory of stress. The non-probability convenience sampling technique has been used to collect data from undergraduate and postgraduate students using a modified questionnaire with a five-point Likert scale. This study used structural equation modeling to examine the link between stress, depression, and academic performance during COVID-19. It was confirmed that educational and family stress significantly leads to depression among students, negatively affecting their academic performance and learning outcomes. This research provides valuable information to parents, educators, and other stakeholders concerned about their children's education and performance.

**Keywords:** academic stress, family stress, student learning, academic performance, COVID-19

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## INTRODUCTION

The outbreak of coronavirus diseases (COVID-19) has had a significant impact on the lives of people worldwide (1), particularly since the World Health Organization (WHO) declared a global pandemic (2) in the second week of March 2020. As a result, many countries implemented various anti-epidemic measures, including limiting foreign nationals' travel (1), closing public spaces, and shutting down the entire transit system (2) to contain the spread of highly contagious infections from human to human. The education sector is not immune to the fact that the conventional educational system is no longer effective, and academic institutions worldwide are exploring online education alternatives (3). This is because all educational institutions worldwide have been closed due to lockdowns, and the students cannot meet their teachers in person. COVID-19 is one of the most stressful pandemics that humanity has ever experienced. It has drastically disrupted people's daily routines and negatively affects their physical and mental (1). The impact of such incidents on students' psychological health is rarely investigated, and in Pakistan, inadequate information exists on it (4). Xiong et al. (2) published pioneering research on the general population in Italy, Turkey, Iran, Spain, Nepal, and the United States. The pandemic, it was declared, affects young and older people differently (5). As a result, it was determined that sociodemographic predictors of mental distress in students and their level of satisfaction with the continuous blended learning mode were necessary.

On February 26, 2020, the first case of COVID-19 was reported in Pakistan (6). As of March 20th, 2021, over 623,135 confirmed cases. To curb and contain the virus, the government instructed educational institutions to shut down their operations on March 13th, 2020. Following this, on March 23rd, 2020, a 14 days lockdown was enforced in which all unnecessary activities in daily life were prohibited (7). As with China and Italy, the nationwide smart lockdown began on March 27, 2020, later phased out (8). The goal of the activity restrictions was to save lives by preventing viral transmission, reducing its incidence, and alleviating the burden on the medical care system (9). School closures in response to pandemics such as the flu have remained a successful strategy for lowering virus transmission rates and flattening disease incidence peaks (9, 10). This strategy appeared to be quite effective because it minimized student-student contact and protected students from infection (11). On the other hand, it impacted students and the general public (9, 12). Wang et al. reported that restricted routine activities and self-isolation had a significant psychological impact on people (13). Recently, it was discovered that the COVID-19 pandemic is causing psychological distress in some people (14, 15).

One of the essential pillars of any nation's development is its higher education system (16). HEIs' success is mainly dependent on the success of their students, who are the primary stakeholders (17). Having the necessary skills and abilities to compete in today's rapidly changing industrial environment is essential for students to succeed (18). In today's intensely competitive academic climate, various factors play a significant role in how well students perform academically (19, 20). According to Aafreen, Priya, and Gayathri (17), academic life is stressful for students because of the constant pressure from various sources. In numerous countries, university and school closures have impacted young people's mental health, increasing anxiety and loneliness (21). Based on findings from previous studies conducted during pandemics, the WHO recognized that imposing measures such as social isolation may increase individuals' anxiety, stress, and anger (22, 23). Stress is frequently felt due to a threat to psychological, intellectual, or somatic wellbeing (24, 25). Any form of change that creates emotional, physical, or psychological distress is called stress. Sometimes, it also promotes deviant behavior (23). It is an individual body's reaction to anything that demands attention or action. To some extent, everyone experiences stress. Individual morale suffers greatly when they are subjected to much stress (23). It manifests when a person cannot control their inner and outer emotions. Stress can harm an individual's mental health if it persists for an extended period or reaches a certain level (26). Suicidal thoughts and unhappiness are common symptoms of depression, affecting people worldwide (27, 28).

Similarly, depression harms one's energy, ability to focus, and ability to make career decisions (29). To build an educated society, students are essential. When students are depressed, their academic performance suffers, significantly impacting their lives. Possible reasons are family problems, new lifestyles in colleges and universities, and poor academic grades. Stress and academic pressure can also be significant factors in developing depression (30). Home quarantine, a lack of physical activity, uncertainty

about the pandemic's trajectory, a lack of information, and fear of contracting COVID-19 were identified as risk factors for poor mental health among university students in Bangladesh (31). Moreover, fear of infection and a perceived high risk of infection were identified as factors affecting the mental health of university students in China (23, 31).

Multiple studies have investigated and confirmed that COVID-19 has increased stress and depression level in society. Some researchers investigated it from an organizational perspective, while some studied it from a family relationship perspective. However, the literature review indicates that rare attention is paid to this phenomenon from students' academic and family stress perspectives. Lazarus's theory, which focuses on a person's relationship to their environment, is used in this study to examine the impact of stress on a student's level of depression in the current pandemic period. It is also discussed how stress and depression impact students' academic performance. There are preliminary studies that examine the impact of stress on students' depression levels and academic performance during the COVID-19 pandemic, particularly in Pakistan, where the study was conducted (32). Apart from that, this study is unique. It examines the relationship between the variables listed using a multivariate statistical technique followed by structural equation modeling (SEM) and examines the stress by incorporating family and academic aspects.

## THEORY AND LITERATURE

In 1966, a psychologist named Richard Lazarus published *Psychological Stress and Coping*, which pioneered the concept of cognitive appraisal theory (33). Appraisal and coping are central concepts in any theory of psychological stress, according to this theory (34), and there is a strong connection between the two. The theory holds that stress is caused by a discrepancy between the demands placed on individuals and their capacity to cope with those demands (35). As a result of the recent adaptation, stress is not defined as a specific cause of incitement or as an individual's psychological, behavioral, or subjective reaction. Instead, it is viewed as a relationship between a person and their surrounding circumstances (36). People see the environment as essential to their wellbeing, and they try to deal with the overwhelming demands and challenges that come with living in modern society (37).

The cognitive appraisal model is predicated on the notion that one's expectations about the significance and outcome of an event, encounter, or function affect stress and other emotional processes (35). This explains why different people's reactions to the same environment elicit different levels of intensity, duration, and quality of emotion (15). Primary and secondary appraisals can be influenced by a wide range of factors (such as goals and values), and specific patterns can lead to different types of stress (38). Stress can cause a variety of mental and physical reactions in other people. According to Semedo et al. (39), individuals may experience stress due to the external environment or subjective feelings, resulting in mental health issues like anxiety and depression. Stress can have adverse effects on one's health

(40). Due to the high-stress levels, students' learning outcomes have been adversely affected (26). Stress can be dealt with in a variety of ways. Identifying the root causes of stress can lead to terms like family stress and academic stress, among others.

## Academic Stress and Students' Depression Levels

Adults' mental health is generally thought to improve, and depression disorder decreases between 18 and 25 years. On the other hand, high rates of depression are becoming more common (41), and many university students are testing above the clinical cut-off points for severe depression in this particular screen (42). According to Aafreen, Priya, and Gayathri (43), 30 percent of high school students suffer from depression in various ways. As a result, many recent high school graduates face an increased risk of developing depression upon entering college (44). Students' stress levels rise as they progress through the educational system. This is due in part to increasingly difficult coursework, tighter deadlines on assignments, and issues with finding housing for students who have relocated from other cities. Students' university experiences may also play a role in developing depressive symptoms. Subjective and objective experiences are closely linked to depressive disorders. The stress that comes with being a student at a university contributes to the wide range of depressive experiences that students have.

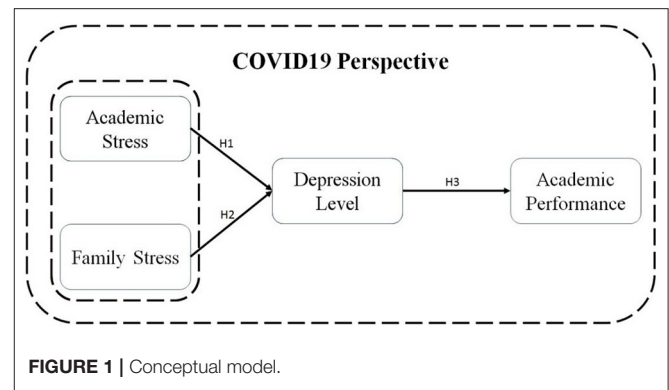
In a survey of students from Canadian universities, 42.3% of respondents said they had experienced severe anxiety and stress (45). Furthermore, 58.1% of students said academic projects are too complex to handle. The majority of Germans, Bulgarians, and Poles view assignments as a burden that cannot be compared to other concerns in life (41). Multiple studies on university students' stress have found a relationship between their educational needs and demands and depression disorder and apparent anxiety. Lörz et al. (46) found that even after controlling for 13 different risk factors for depression in a cross-sectional study of 900 Canadian university students, stress experienced as a result of academic workload was associated with high levels of negative symptoms (e.g., demographic features, abusive past, intellectual way, and personality, currently experienced stressful trials in life, societal support). Few studies have shown that students who complain about their academic workload or label it "traumatic" are more likely to suffer from depressive disorders (30).

In the current pandemic period, students are advised to consider all of the potential sources of stress before enrolling in college. The pandemic has created a sense of fear among students in ety. Thus, it is claimed that academic pressure created during the pandemic situation causes depression among students (see **Figure 1**). For this reason, the following hypothesis is proposed;

**H<sub>1</sub>**: Academic stress among students in the period of COVID-19 significantly generates depression among students.

## Family Stress and Students' Depression Levels

Topuzoglu et al. (47) found that from 3 to 16.9% of the world's population suffers from depression. University students are more



likely than the general population to experience depression. One-third of students (a subjective mean occurrence of 30.6%), as per Mirza et al.'s (48) study, report experiencing stress and depression, which indicates a 9% higher rate of depression among students than the general population (49). When depression sets in, a person's ability to lead an everyday, healthy life is severely impacted. Affecting students' social and family ties, academic performance, and physical wellbeing are just some of the possible outcomes of this problem. As a result, their abilities deteriorate, and they lose the desire to learn new things, which leads to subpar work and even university dropouts (50, 51). Depression is a significant risk factor for university students to commit suicide, so it is imperative to identify the factors that can cause students to become depressed.

In China, 75% of students who graduate from middle school are allowed to continue their education in a 4-year university. For every 10% increase in the number of students pursuing higher education, the rate of depression rises by 24–38% (52). University students are typically between the ages of 18 and 23, or in other words, in their late teens and early twenties. University students are referred to as "post-adolescents". Risk factors for adolescent depression are numerous and complex, involving a wide range of personal and family characteristics and educational and social circumstances (16). Relationship building with one's family is one of the most important aspects of overcoming depression because it has a significant impact on the growth and development of one's children (53). According to Halonen et al. (54), adolescent depression is influenced by factors such as family bonding. Depressed teenagers are more likely to have strained relationships with their parents than their peers who are not depressed.

Both soft and hard risks can affect a family's health (55). Parents with little or no education are among the most challenging families to work with because of their weak family structure (economically). Depressed students are more likely to have several risk factors, including high-risk students (50). They have low self-esteem and cannot deal with emotional breakdowns, and students who come from families where they feel safe and secure (56). University students born into educated families, especially mothers with a college degree or higher, are less likely to suffer from depression than those

born into families with little or no education. A second reason is that children born to college-educated mothers are less likely to suffer from depression than children of less-educated mothers (57).

While studying depression in teenagers, it is also essential to consider one's social circle (53). The traditional Pakistani culture emphasizes family ties, sensitive feelings, collectivism, and peace. Students who live in hostels or share a room with other students lose this family inspiration when they are adolescents. Depression is a real possibility if this process goes unchecked (58). It's not uncommon for Pakistani university students to worry about finding a job after graduation. They must maintain a high-grade point average (GPA) throughout their academic career if they hope to land an excellent job in the future. Aside from the pressures of school and work, they have to deal with a myriad of other issues that they must deal with on their own. In the pandemic period, students are also experiencing stress in their family life. It is claimed that this stress in the COVID-19 perspective creates depression among students. Thus, the following hypothesis is proposed;

**H2:** Family stress among students in the period of COVID-19 significantly generates depression among students.

## Students' Depression Levels and Students' Academic Performance

Many people who attend college represent the transition from adolescence to adulthood, generally regarded as the most stressful period of one's life (26). Students' mental health may be jeopardized if stress from exams and shifting social circles is added to the mix. One-third of students suffer from moderate to severe depression throughout their college careers (56). For depressed, attainable-focused environments (e.g., colleges and universities) can lead to lower grades and a lack of self-confidence because they believe the world is unfair and have no control over their destiny. They are unsure of their future path in life. As a result, students with low self-esteem are reluctant to take on challenging assignments and projects, harming their educational careers (59).

Mental and physical processes and benightedness can be found in symptoms such as poor sleep schedule, lack of concentration, and a state of remorse that can be seen in people with depression (60). However, despite many students suffering from depression and the flawed educational system, rare studies have examined the impact of depression on academic performance, particularly in COVID-19 in the emerging economies, specifically Pakistan. Students who are emotionally stable and financially secure are more likely to perform poorly on exams. Their academic career suffers significantly due to their low self-esteem and depression (59). Depressed students are more likely to skip classes, tests, and assignments. They are more likely to drop out of college than their non-depressed peers if they find their classes too complicated (26). Depressed students are prone to becoming ruthless, harming their academic performance and making them moody.

Anxiety and academic performance have been shown to have an even more ambiguous relationship than previously

thought. Comprehensive studies have found that students' performance improves with increased anxiety (53). On the other hand, a few studies have found that anxiety does not appear to be correlated with lower academic performance (61). A higher level of anxiety can help students perform better in school. Even though there is a high incidence of depression among the students, their GPA is unaffected. This study is intended to find a more specific and straightforward answer to the shared relationship between students' depression levels and academic performance based on given differences in various research findings, particularly in the COVID-19 scenario. Based on the given arguments, the researcher formulates the following hypothesis:

**H3:** Depression among students during the COVID-19 period has a significant negative effect on their academic performance.

## METHODOLOGY

### Target Population and Sampling Procedure

Male and female students in higher education institutions focus on this study. Students from management sciences, engineering, and computer science departments participated and provided the researchers with their responses. The non-probability sampling technique has been used in this study, and students were given a survey to complete and asked to provide their thoughts on it on their own using a five-point Likert scale. Items for the study were taken from Maajida Aafreen et al.'s (43) study and were partially modified. The data were collected from February to May 2021. There were 721 questionnaires given out to the students, and 186 of those responses were useful. There were 118 female respondents, 65 male respondents, and one person who preferred not to disclose their gender.

## DATA ANALYSIS AND RESULTS

The structural equation modeling (SEM) method investigated the link between stress, depression, and academic performance. Before SEM, confirmatory factor analysis (CFA) was performed to confirm the relationship between the elements of the manifest factors and their measuring model. CFA ensures that the measurement model is legitimate and unidimensional. The Cronbach's alpha value was examined to ensure data reliability, which presented a 0.889 value confirming the reliability of data (minimum suggested value as is 0.6). Because of this, it can be concluded that this measurement model has a high degree of accuracy. In terms of psychological legitimacy, factor loading can determine the ideal loading for established items.

Similarly, the minimum value of the average variance extracted (AVE) for all results should be  $>0.5$ , which were found ideally fitted with the required value. Based on these, empirical tests were carried out to ensure that all constructs were distinct from one another. According to Fornell and Larcker (62), variance in results should be more significant than other constructs to make this claim. AVE square root values are correlated more strongly than different AVE values. To be safe, a correlation of no more than 0.9 was

**TABLE 1** | Evaluating the Structural and measurement models.

The goodness of fit measures	CMIN/DF	NFI	GFI	AGFI	CFI	TLI	RMSEA	SRMR
Recommended value	≤3 <sup>a</sup>	≥0.9 <sup>b</sup>	≥0.9 <sup>b</sup>	≥0.9 <sup>b</sup>	≥0.9 <sup>b</sup>	≥0.9 <sup>b</sup>	≤0.08 <sup>c</sup>	≤0.08 <sup>d</sup>
Measurement model	1.886	0.923	0.921	0.919	0.917	0.920	0.047	0.0557
Structural model	1.998	0.926	0.931	0.919	0.925	0.926	0.059	0.0673

<sup>a</sup>Bagozzi and Yi (64).

<sup>b</sup>Bentler and Bonett (65).

recommended by Hair et al. (63). Hair et al. (63) and Fornell and Larcker (62) suggested that the constructs have adequate discriminant validity by demonstrating that both conditions were met. The analysis of structural and measurement models indicated significant results. The authors examined different fit indices for structural and measurement models, such as chi-square to degree of freedom, normative fit index, goodness of fit index, comparative fit index, etc. According to Bagozzi and Yi (64) the value of fit indices should be higher than 0.9. **Table 1** represents the list of fit indices with the suggested and obtained values of measurement and structural models.

## TESTING OF HYPOTHESES AND DISCUSSION

This study examines the relationship between stress and depression and their impact on students' academic performance during the COVID-19 pandemic. Specifically, the authors focused on students in higher education institutions. They analyzed how the family and academic stress during the COVID-19 pandemic has emerged and how these elements impact students' academic performance. The hypotheses are examined using the SEM technique and are supported by structural parameters. According to the findings, students' academic stress promotes depression with a beta value of 0.298 and a *p*-value of 0.003. The results suggest that students' depression levels are positively impacted by prolonged academic stress, specifically in COVID-19. Thus, the first hypothesis, i.e., academic stress among students in the period of COVID-19 significantly generates depression among students, is accepted.

Family stress also appears to have a significant source of depression among students with 0.321 beta and 0.002 *p*-values, respectively. Thus, the second hypothesis, i.e., family stress among students in COVID-19, significantly generates depression, is also accepted. Similarly, the student's academic performance is negatively linked with the student's level of stress and depression. The structural analysis indicated that academic performance is negatively related to students' depression with a -0.332 beta value and 0.001 *p*-values. This means that the more depressed a student is, the more their academic performance will suffer. Thus, the third hypothesis, i.e., Depression among students during the COVID-19 period has a significant negative effect on their academic performance, is also accepted.

The results of this study provide university institutions with new opportunities to support students' psychological

wellbeing and the conditions necessary to support it. There is a lack of support services for students' emotional wellbeing in higher education institutions, particularly in the COVID-19 pandemic. The psychological needs of these students are given little consideration, which is accelerating the stress and depression levels among students. Proper counseling, guidance from teachers, and family support can help alleviate stress and depression. Students should have access to stress and depression counseling services in their schools. Counselors have a responsibility to model and enforce good conduct and sound judgment in their students. Creating a positive and safe learning environment is the responsibility of school administrators. Teachers should also take responsibility for helping and guiding students who are depressed, as this will help them learn and perform better. The ability to rely on one's family for support is another critical factor in coping with stressful situations.

Limitations exist in the current research as well. Researchers collected information from university students in Pakistan. More research will be needed in the surrounding areas to understand better how stress and depression affect university students' academic performance. For this reason, researchers should expand their geographic scope to include other regions. The outcomes of large-scale studies may be inconsistent. Further research will be needed to determine the impact of anxiety and depression on students' academic performance in the future. Further studies are also recommended to include different control variables, such as age, gender, study discipline, etc., to examine whether these factors make any difference in the main result or not.

## CONCLUSION

The pandemic has created a social disorder in society, and all industries are affected by it. The academic sector is also primarily influenced by it. This is among the pioneer studies that examine the relationship between students' academic and family stress and their effect on their depression level, leading to academic performance, specifically in the period of the COVID-19 pandemic. It is found that education and family stress in the period of the COVID-19 pandemic has a hugely significant adverse effect on students' personalities. It is a substantial source of depression among students from their academic and family perspective and ultimately negatively affect their academic performance. All related stakeholders should take initiatives to counter this issue by counseling students to tackle this future generation's problem.

## DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found here: <https://data.worldbank.org/>.

## AUTHOR CONTRIBUTIONS

ZJ and XJ: conceptualization, software, data curation, and writing—original draft preparation. RT: methodology, writing—reviewing, and editing. HD: visualization and investigation.

## REFERENCES

- Aristovnik A, Keržič D, Ravšelj D, Tomažević N, Umek L. Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability*. (2020) 12:8438. doi: 10.3390/su12208438
- Xiong J, Lipsitz O, Nasri F, Lui LM, Gill H, Phan L, et al. Impact of COVID-19 pandemic on mental health in the general population: a systematic review. *J Affect Disord*. (2020) 277:55–64. doi: 10.1016/j.jad.2020.08.001
- Abbas J, Kumari K, Al-Rahmi WM. Quality management system in higher education institutions and its impact on students' employability with the mediating effect of industry–academia collaboration. *J Econ Adm Sci*. (2021). doi: 10.1108/JEAS-07-2021-0135. [Epub ahead of print].
- Wang K-H, Su C-W. Asymmetric link between COVID-19 and fossil energy prices. *Asian Econ Lett*. (2021) 1:18742. doi: 10.46557/001c.18742
- Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health*. (2020) 17:1729. doi: 10.3390/ijerph17051729
- Mukhtar S. Mental health and psychosocial aspects of coronavirus outbreak in Pakistan: psychological intervention for public mental health crisis. *Asian J Psychiatry*. (2020) 51:102069. doi: 10.1016/j.ajp.2020.102069
- Chandir S, Siddiqi DA, Setayesh H, Khan AJ. Impact of COVID-19 lockdown on routine immunisation in Karachi, Pakistan. *Lancet Glob Health*. (2020) 8:e1118–20. doi: 10.1016/S2214-109X(20)30290-4
- Kouser S, Kausar S, Ghani M. COVID-19 lockdown: current situation and challenges facing in Pakistan during lockdown. *Biomedica*. (2020) 36:138–44. doi: 10.51441/BioMedica//BioMedica/5-445
- Storopoli J, Braga da Silva Neto WL, Mesch GS. Confidence in social institutions, perceived vulnerability and the adoption of recommended protective behaviors in Brazil during the COVID-19 pandemic. *Soc Sci Med*. (2020) 265:113477. doi: 10.1016/j.socscimed.2020.113477
- Safdar B, Habib A, Amjad A, Abbas J. Treating students as customers in higher education institutions and its impact on their academic performance. *Int J Acad Res Progress Educ Dev*. (2020) 9:176–91. doi: 10.6007/IJARPEd/v9-i4/8458
- Abdulmir A, Hafidh R. The possible immunological pathways for the variable immunopathogenesis of COVID-19 infections among healthy adults, elderly and children. *Electron J Gen Med*. (2020) 17:em202. doi: 10.29333/ejgm/7850
- Abbas J. HEISQUAL: a modern approach to measure service quality in higher education institutions. *Stud Educ Eval*. (2020) 67:100933. doi: 10.1016/j.stueduc.2020.100933
- Wang C, Pan R, Wan X, Tan Y, Xu L, McIntyre RS, et al. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain Behav Immun*. (2020) 87:40–8. doi: 10.1016/j.bbi.2020.04.028
- Arnout BA, Al-Dabbagh ZS, Al Eid NA, Al Eid MA, Al-Musaibeh SS, Al-Miqtiq MN, et al. The effects of corona virus (COVID-19) outbreak on the individuals' mental health and on the decision makers: a comparative epidemiological study. *Int J Med Res Health Sci*. (2020) 9:26–47.
- Ahsan MU, Nasir M, Abbas J. Examining the causes of plastic bags usages and public perception about its effects on the natural environment. *Int J Acad Res Bus Soc Sci*. (2020) 10:80–96. doi: 10.6007/IJARBS/v10-i10/7919
- Abbas J, Alturki U, Habib M, Aldraiweesh A, Al-Rahmi WM. Factors affecting students in the selection of country for higher education: a comparative

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- analysis of international students in Germany and the UK. *Sustainability*. (2021) 13:1–17. doi: 10.3390/su131810065
- Aafreen MM, Priya VV, Gayathri R. Effect of stress on academic performance of students in different streams. *Drug Invent Today*. (2018) 10:5. Available online at: <http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09757619&AN=131123674&h=YK%2Fk7frAOPDsSSw64lpFCcM7bi7YmgpCQamoS7F%2BX5ioPtUCC7fvOZqDKGVilaTN1WSvVkbj4pBZ43iXQE4lqA%3D%3D&crl=c>
- Aamir A, Jan SU, Qadus A, Nassani AA, Haffar M. Impact of knowledge sharing on sustainable performance: mediating role of employee's ambidexterity. *Sustainability*. (2021) 13:12788. doi: 10.3390/su132212788
- Kumari K, Abbas J, Rashid S, Haq MAU. Role of corporate social responsibility in corporate reputation via organizational trust and commitment. *Rev Manag Sci*. (2021) 3:42–63. doi: 10.53909/admin.v3i2.84
- Abbas J, Muzaffar A, Shoaib M, Mahmood HK. Do business schools really fulfill industry requirements? An investigation of industrial performance of business graduates. *World Appl Sci J*. (2014) 31:1378–84. doi: 10.5829/idosi.wasj.2014.31.07.424
- Chaabane S, Doraiswamy S, Chaabna K, Mamtani R, Cheema S. The impact of COVID-19 school closure on child and adolescent health: a rapid systematic review. *Children*. (2021) 8:415. doi: 10.3390/children8050415
- Sintema EJ. Effect of COVID-19 on the performance of grade 12 students: implications for STEM education. *Eurasia J Math Sci Technol Educ*. (2020) 16:em1851. doi: 10.29333/ejmste/7893
- Abbas J. Impact of total quality management on corporate sustainability through the mediating effect of knowledge management. *J Clean Prod*. (2020) 244:118806. doi: 10.1016/j.jclepro.2019.118806
- Holland D, Wheeler H. *College Student Stress and Mental Health: Examination of Stigmatic Views on Mental Health Counseling*. (2016). Available online at: <https://www.semanticscholar.org/paper/College-Student-Stress-and-Mental-Health%3A-of-Views-Holland-Wheeler/bb5d5a72ea91520dade31052832f72b160aa9273> (accessed March 10, 2022).
- Seaward BL. *Managing Stress*. Sudbury, MA: Jones & Bartlett Learning (2017). 609 p.
- Yang C, Chen A, Chen Y. College students' stress and health in the COVID-19 pandemic: the role of academic workload, separation from school, and fears of contagion. *PLoS ONE*. (2021) 16:e0246676. doi: 10.1371/journal.pone.0246676
- Aldieri L, Bruno B, Vinci CP, A. multi-dimensional approach to happiness and innovation. *Appl Econ*. (2021) 53:1300–10. doi: 10.1080/00036846.2020.1828807
- Abbas J. Impact of total quality management on corporate green performance through the mediating role of corporate social responsibility. *J Clean Prod*. (2020) 242:118458. doi: 10.1016/j.jclepro.2019.118458
- Cregg DR, Cheavens JS. Gratitude interventions: effective self-help? A meta-analysis of the impact on symptoms of depression and anxiety. *J Happiness Stud*. (2021) 22:413–45. doi: 10.1007/s10902-020-00236-6
- Akinola M, Kapadia C, Lu JG, Mason MF. Incorporating physiology into creativity research and practice: the effects of bodily stress responses on creativity in organizations. *Acad Manag Perspect*. (2019) 33:163–84. doi: 10.5465/amp.2017.0094
- Jiang R. Knowledge, attitudes and mental health of university students during the COVID-19 pandemic in China. *Child Youth Serv Rev*. (2020) 119:105494. doi: 10.1016/j.childyouth.2020.105494

32. Song Y, Chen B, Tao R, Su C-W, Peculea AD. Does bilateral political relations affect foreign direct investment? *Econ Res-Ekon IstraŽivanja*. (2020) 33:1485–509. doi: 10.1080/1331677X.2020.1755880
33. Lazarus RS. *Psychological Stress and the Coping Process*. New York, NY: McGraw Hill (1966).
34. Gordon-Hollingsworth AT, Yao N, Chen H, Qian M, Chen S. Understanding the impact of natural disasters on psychological outcomes in youth from Mainland China: a meta-analysis of risk and protective factors for post-traumatic stress disorder symptoms. *J Child Adolesc Trauma*. (2018) 11:205–26. doi: 10.1007/s40653-015-0051-2
35. Lazarus RS, Folkman S. *Stress, Appraisal, and Coping*. New York, NY: Springer Publishing Company (1984).
36. Lazarus RS. Progress on a cognitive-motivational-relational theory of Emotion. *Am Psychol*. (1991) 46:819834. doi: 10.1037/0003-066X.46.8.819
37. Su C-W, Naqvi B, Shao X-F, Li J-P, Jiao Z. Trade and technological innovation: the catalysts for climate change and way forward for COP21. *J Environ Manage*. (2020) 269:110774. doi: 10.1016/j.jenvman.2020.110774
38. Abbas J, Sagsan M. Identification of key employability attributes and evaluation of university graduates' performance: instrument development and validation. *High Educ Ski Work-Based Learn*. (2019) 10:449–66. doi: 10.1108/HESWBL-06-2019-0075
39. Semedo ASD, Coelho AFM, Ribeiro NMP. Authentic leadership and creativity: the mediating role of happiness. *Int J Organ Anal*. (2017) 25:395–412. doi: 10.1108/IJOA-03-2016-0994
40. Chou H-L, Chou C, A. multigroup analysis of factors underlying teachers' technostress and their continuance intention toward online teaching. *Comput Educ*. (2021) 175:104335. doi: 10.1016/j.compedu.2021.104335
41. Yaghmour A, Alesa A, Anbarserry E, Abdullah Binmerdah M, Alharbi A, Housawi A, et al. Challenges and obstacles faced by trainee female physicians: an integrative research on gender discrimination, stress, depression and harassment. *Healthcare*. (2021) 9:160. doi: 10.3390/healthcare9020160
42. The Hearty Soul. *Using Social Media is Causing Anxiety, Stress and Depression*. (2016). Available online at: <http://theheartsoul.com/mental-health-risks-of-social-media/> (accessed March 10, 2022).
43. Maajida Aafreen M, Vishnu Priya V, Gayathri R. Effect of stress on academic performance of students in different streams. *Drug Invent Today*. (2018) 10:1776–80.
44. Abbas J. Service quality in higher education institutions: qualitative evidence from the students' perspectives using maslow's hierarchy of needs. *Int J Qual Serv Sci*. (2020) 12:371–84. doi: 10.1108/IJQSS-02-2020-0016
45. Hünefeld L, Gerstenberg S, Hüffmeier J. Job satisfaction and mental health of temporary agency workers in Europe: a systematic review and research agenda. *Work Stress*. (2020) 34:82–110. doi: 10.1080/02678373.2019.1567619
46. Lörz M, Netz N, Quast H. Why do students from underprivileged families less often intend to study abroad? *High Educ*. (2016) 72:153–74. doi: 10.1007/s10734-015-9943-1
47. Topuzoglu A, Binbay T, Ulaş H, Elbi H, Tanik FA, Zagli N, et al. The epidemiology of major depressive disorder and subthreshold depression in Izmir, Turkey: Prevalence, socioeconomic differences, impairment and help-seeking. *J Affect Disord*. (2015) 181:78–86. doi: 10.1016/j.jad.2015.04.017
48. Ji X, Chen X, Mirza N, Umar M. Sustainable energy goals and investment premium: evidence from renewable and conventional equity mutual funds in the Euro zone. *Resour Policy*. (2021) 74:102387. doi: 10.1016/j.resourpol.2021.102387
49. *Frontiers | Does Economic Overheating Provide Positive Feedback on Population Health? Evidence From BRICS and ASEAN Countries | Public Health*. Available online at: <https://internal-journal.frontiersin.org/articles/10.3389/fpubh.2021.661279/full> (accessed January 25, 2022).
50. Wahid SS, Ottman K, Hudhud R, Gautam K, Fisher HL, Kieling C, et al. Identifying risk factors and detection strategies for adolescent depression in diverse global settings: a Delphi consensus study. *J Affect Disord*. (2021) 279:66–74. doi: 10.1016/j.jad.2020.09.098
51. Abbas J, Mahmood HK, Hussain F. Information security management for small and medium size enterprises. *Sci Int-Lahore*. (2015) 27:2393–8.
52. Mirza AA, Baig M, Beyari GM, Halawani MA, Mirza AA. Depression and anxiety among medical students: a brief overview. *Adv Med Educ Pract*. (2021) 12:393. doi: 10.2147/AMEP.S302897
53. Zheng R, Zhou Y, Fu Y, Xiang Q, Cheng F, Chen H, et al. Prevalence and associated factors of depression and anxiety among nurses during the outbreak of COVID-19 in China: a cross-sectional study. *Int J Nurs Stud*. (2021) 114:103809. doi: 10.1016/j.ijnurstu.2020.103809
54. Halonen JI, Erhola M, Furman E, Hahtela T, Jousilahti P, Barouki R, et al. call for urgent action to safeguard our planet and our health in line with the helsinki declaration. *Environ Res*. (2021) 193:110600. doi: 10.1016/j.envres.2020.110600
55. Halonen J, Hakko H, Riala K, Riipinen P. Familial risk factors in relation to recurrent depression among former adolescent psychiatric inpatients. *Child Psychiatry Hum Dev*. (2021). doi: 10.1007/s10578-021-01146-1. [Epub ahead of print].
56. Sparks JA, Malspeis S, Hahn J, Wang J, Roberts AL, Kubzansky LD, et al. Depression and subsequent risk for incident rheumatoid arthritis among women. *Arthritis Care Res*. (2021) 73:78–89. doi: 10.1002/acr.24441
57. Alhussain T, Al-Rahmi WM, Othman MS. Students' perceptions of social networks platforms use in higher education: a qualitative research. *Int J Adv Trends Comput Sci Eng*. (2020) 9. doi: 10.30534/ijatcse/2020/16932020
58. Sundaram A, Varghese IK. The mediating role of emotional intelligence between transformational leadership and organizational citizenship behavior. *Solid State Technol*. (2021) 64:8155–68. Available online at: <http://solidstatetechnology.us/index.php/JSST/article/view/11216>
59. Bantha T, Sahni SP. The relation of servant leadership with followers' organizational citizenship behaviour (OCB): mediating role of generalized self-efficacy (GSE) and organization-based self-esteem (OBSE). *Ind Commer Train*. (2021) 53:331–42. doi: 10.1108/ICT-02-2020-0024
60. Veenhoven R. Healthy happiness: Effects of happiness on physical health and the consequences for preventive health care. *J Happiness Stud*. (2008) 9:449–69. doi: 10.1007/s10902-006-9042-1
61. Abror A, Patrisia D. Psychological safety and organisational performance: a systematic literature review. *Personal Soc Psychol Rev*. (2020) 16:7–21. Available online at: [https://www.researchgate.net/profile/Abror-Abror-2/publication/340998351\\_Psychological\\_Safety\\_and\\_Organisational\\_Performance\\_A\\_Systematic\\_Literature\\_Review/links/5ea90370299bf18b9584579b/Psychological-Safety-and-Organisational-Performance-A-Systematic-Literature-Review.pdf](https://www.researchgate.net/profile/Abror-Abror-2/publication/340998351_Psychological_Safety_and_Organisational_Performance_A_Systematic_Literature_Review/links/5ea90370299bf18b9584579b/Psychological-Safety-and-Organisational-Performance-A-Systematic-Literature-Review.pdf)
62. Fornell C, Larcker DF. *Structural Equation Models With Unobservable Variables and Measurement Error: Algebra and Statistics*. Los Angeles, CA: Sage Publications Sage CA (1981).
63. Hair JE, Ortinau DJ, Harrison DE. *Essentials of Marketing Research*. New York, NY: McGraw-Hill/Irwin (2010).
64. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *J Acad Mark Sci*. (1988) 16:74–94. doi: 10.1007/BF02723327
65. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. *Psychol Bull*. (1980) 88:588–606. doi: 10.1037/0033-2909.88.3.588

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