

Academic Stress and Associated Health Complaints Among Students During Online Education

Shagufta Perveen¹

Haram Nazir²

Sehrish Khan³

Abstract

The current study was carried out to explore the role of academic stress with health complaints among students experiencing online education and find out the demographic difference in these variables. In the present study along with the demographic sheet three instruments, Academic Stress Scale (Bedewy & Gabriel, 2015), and the Chinese Health Questioner (Fong, Yip, & Ho, 2021), were administered to a sample of 200 students experiencing online education. Results of the study revealed that academic stress has a significant negative association with the health complaints of the student. The results also showed that gender has significant differences in academic stress and health complaints whereas age has a non-significant negative relationship with academic stress and a significant positive relationship with health complaints. The result also demonstrated significant academic discipline and mode of instruction-based differences in academic stress and health complaints among students.

Keywords: *Academic stress, health complaints, online education, COVID-19*

¹ Assistant Professor Psychology Department Hazara University Mansehra Pakistan. Email: shaguftak27@gmail.com

² Department Hazara University Mansehra Pakistan.
Email: nav11649@yahoo.com

³ Lecturer Department of Humanities, COMSAT University Islamabad, Abbottabad.
Campus. Email: sehriskhan@cuiatd.edu.pk

Introduction

The newly recognized novel coronavirus, COVID-19 was first reported in the city of China, Wuhan. This virus rapidly spread from one affected person to other and results in multiple deaths (Zhu, Wei, & Niu, 2020). In 2019 WHO declared this virus a pandemic. COVID-19 pandemic affects every country around the world, creating a panic situation. Only social distance was its solution. In November 2020 the second wave was reported, and the situation was the same as the first wave, now the third wave of COVID-19 emerged. China first made the Vaccine for COVID-19. Now a vaccine is an available but still preventive measure for COVID-19 is social distancing and putting the mask on the face.

Like other countries Pakistan also suffered from the intense effects of COVID-19. First case of COVID-19 was reported in February 2020, in Karachi. As Pakistan is a developing country, Pakistan could not go toward complete lockdown so the Smart Lockdown term has introduced by Prime Minister Khan, in which only educational institutes, hotels, and shopping malls were closed (Nadia, 2020).

COVID-19 introduced new trends around the world. New techniques were adopted in hospitals and educational institutes. People managed to do work from home. Educational institutes have also shifted to the online system. The study process was conducted from their homes so that students' educational year could not waste. Along with developing countries, for developed countries also this was a tough situation. The online study was conducted through Zoom meeting room, MS Office, and Moodle app. In Pakistan, many educational institutes did not have enough resources to facilitate online teaching with immediate effects. Also, many students did not have access to laptops and the internet.

Because of the increasing deaths and the spread of the COVID-19 pandemic, many universities postponed their activities like workshops, conferences, sports, and classes. To prevent the students and teachers from the intense effects of infectious disease, educational institutes took many preventive measures. They rapidly moved from face-to-face classes to online classes. As it was a new mode of studying therefore in few educational institutes training was given to teachers to conduct online classes (Abdur Rehman, Soroya, Abbas, Mirza, & Mahmood, 2021).

COVID-19 paralyzed the whole system across the world. It disturbs social life, economy of countries, and mental health of people around the world. Depression, loneliness, feelings of rejection, and fear of death were common mental health problems. Like other populations students also suffer from health problems. A tough schedule, complicated assessment methods, and strict time management were the factors that disturbed the

students over academic and psychosocial performance. Such stressful situations lead to unfavorable effects on learning, among students subjective feelings of anxiety, lack of confidence, and stress were the heavily reported problems (Kumar, Malla, & Dubey, 2020).

The coronavirus COVID-19 pandemic seriously disturbed life around the world in 2020. Like any other field of life COVID-19 pandemic negatively affected the education system as well. The face-to-face teaching-learning processes in many countries were suspended. As substitutes different e-learning platforms enabled online communication between teachers and students. Similarly, in some cases, educational transmission such as PTV telegram on Pakistan national television was used to broadcast tutorial lectures for students (Zalat, Hamed, & Bolbol, 2021).

Advancements in science and technology provided a wide range of modern tools. To face the challenge of COVID-19 pandemic-imposed distance learning these tools were heavily used (Zalat et al., 2021). Through these tools, the modification of contents that were previously taught in regular classes was easily conveyed. There are however other important tasks in the learning process, such as assessment or independent learning, that can still be challenging without the direct command of instructor. During this phase due to cheating in online exams or with changes in the format of the evaluation tools student achieve higher scores than in previous years. Whereas a change in evaluation format and less effective teaching methods in which some students secured lower grades causing anxiety and stress among students. Academic stress is explained as the emotional response to academic environment related strains effecting the students' capability. Most reported stressors in the academic setting are related to verbal presentations, assignment deadlines, and time management has shown that academic stress makes significant hormonal changes which result in an increment of stress hormones which causes many physiological symptoms (Abbasi, Ayoob, Malik, & Memon, 2020).

Academic stress is regarded as academic challenges or failure to achieve goals which may result in the development of psychopathology. Stress among undergraduate and graduate students is multifactorial, which may result from both academic and non-academic factors. Out of physical, social, and emotional factors, the academic factors were proved to be the main cause of experienced levels of stress in most students. Students mostly complain about stress mainly triggered by low self-esteem (Aboalshamat et al., 2017) and associated stress with poor academic performance (Sohail, 2013).

Several studies have reported that assessment and evaluation stage, extensive course loads, and lack of physical exercise, significantly relates with stress and anxiety and is considered as the major contributing factors to psychological burden among students (Harikiran, Srinagesh, Nagesh, & Sajudeen, 2012). Extra course load and long duration of assessment was also found to be the most important sources of anxiety among students (Divaris, Polychronopoulou, Taoufik, Katsaros, & Eliades, 2012).

With context to Pakistani culture, only few researches have focused and have concluded that academic stress among Pakistani students is relatively higher as the expectation of parents from their children to accomplish high goals in every area of life, specifically with reference to academic performance high expectations cause psychological burden among students (Waqas, Khan, Sharif, Khalid, & Ali, 2015). Exploring the perception of e-learning among students during covid 19, it was reported that the majority of students experienced e-learning-related problems during the lockdown situation (Abbasi et al., 2020). The highest barriers to e-learning were insufficient/ unstable internet connectivity, inadequate computer labs, lack of computers/ laptops, and other technical problems (Zalat et al., 2021). Rukhsana (2010) has reported that the academic workload is having a positive association with the perceived amount of stress. The result of the study conducted by Nudrat (2013) indicates that substandard academic performance is related to the higher level of academic stress faced by the students.

The pandemic has caused a negative impact in terms of community-wide social distancing measures, and unexpected adjourned academic activities have affected the psychological health of students all over the world. This study, hence, aims to find the perceived academic stress and associated health complaints among students during online education. With context to online learning research data on the academic stress among students facing the COVID, endemic has not been published yet in Pakistan. This will help, not only infill the gap in the available data but also, will help in making effective and targeted policies for initiating and implementing well-timed preventive measures for our student's treasured future healthcare force.

In Pakistan, many research studies is available on academic stress and health complaints of students (Akhter & Iqbal, 2021). But the current study is about academic stress that students perceived in Covid-19 during online education. It is the solid reason to conduct current research in Pakistani culture. The findings of the present study have very sound implications in the practical field of life.

Literature Review

The first diagnosed case of COVID of in Pakistan appeared in February 2020 and as a result to keep social distancing all the education institutes were closed (Zahra-Malik,). To carry on educational activities the regular teacher student interaction-based education system was substituted with online education. This abrupt transaction in teaching learning environment caused number of adjustment problems for both the learners and teachers. While dealing the multiple problems, the pandemic of Coronavirus significantly affected the educational system of Pakistan. With this pandemic, both students and teachers experienced challenges regarding self-regulation, usage of smart phone, electronic devices, and comprehension of learning resources in the physical absence of teacher (Stevens & Borup, 2015). Likewise, Owusu-Fordjour, Koomson and Hanson (2020) discussed the possible effect of distanced learning on education system. The findings revealed that students faced problems and experienced academic stress. It was concluded that COVID-19 induced online education caused students learning problems and other related psychological issues. Moreover, majority of the students had limited internet access and technological awareness.

According to Pakistan Telecommunications Authority only limited number of students had regular access to the digital devices or internet (Alghamdy, 2019). Khan (1997) reported significant gender-based difference on the web-based instruction among students. While exploring gender differences focusing on web-based instruction it was revealed that while experiencing e-classes male students of pure sciences group successfully coped and adjusted with academic stressors than female students. Similarly, Cyr and Bonanni (2005) reported gender base differences regarding the expressed comprehension and concept grasping quality of internet based provided information. It was further reported that females displayed more confusion and unclarity about knowledge and information provided via internet service than males (Olson & Wisher, 2002).

Theoretical Framework

Previous research has reviewed the nature of online learning and learning models (Petretto et al., 2021). Their work presented a rigorous analysis of the nature of online learning. Online, learning is considered an effective substitute for instructional media of instruction. the significant impact of online learning on participant's learning has been well documented (Huckins et al., 2020) . Media theory suggests that for a successful teaching-learning process as per the nature of the learners, learner age, attention span, motivation, and confidence to use technologies

appropriate selection of media for distance education is necessary. Studies have proved the adverse impact of online learning experiences on learners' physical and psycho-social well-being. As it is reported that during Covid epidemic the transaction of instructional media has negatively affected the health of students causing anxiety, depression, and stress (Huckins et al., 2020; Lister, Seale, & Douce, 2021)

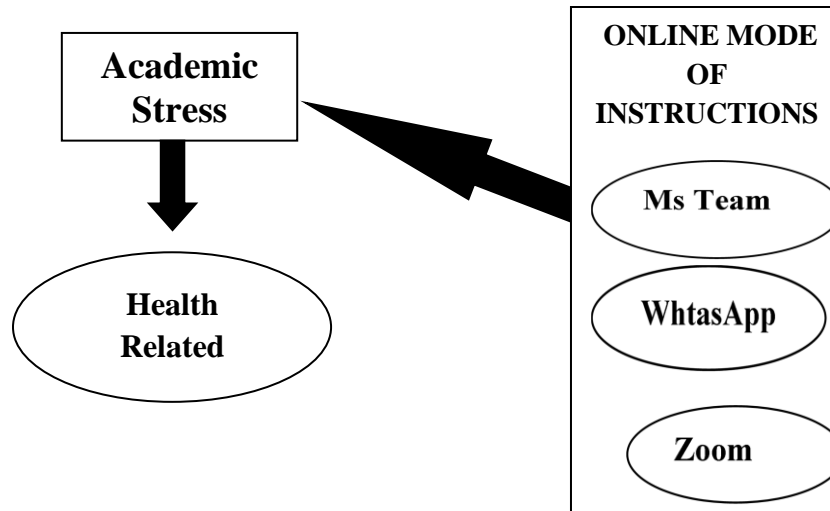


Figure 01. Conceptual framework of the study.

Objectives of the Study

The following objectives were formulated for this study.

1. To examine the relationship between academic stress and health complaints among students.
2. To explore the frequency of health complaints among students by perceived academic stress level with online education.
3. To explore the demographic differences (i.e., gender, academic discipline, and medium of instruction) in academic stress and health complaints among students.

Hypotheses

The hypotheses of the study were:

- Ha1 Academic stress is positively related with health complaints among students experiencing online education during Covid-19 pandemic.
- Ha2 Female students display more academic stress and health complaints than male students.

- Ha3 Students of the pure sciences group experience more academic stress and health complaints than students of the behavioral sciences group.
- Ha4 Regarding the medium of instruction (WhatsApp, Zoom, and MS team), significant differences exist with reference to experienced academic stress and reported health-related issues among students.

Research Methodology

Research Design. Quantitative research approach was implemented in this study. The research design of the current study is quantitative based on co relational research design was used to find out the relationship between academic stress and associated health complaints and among students during online education.

Population. All college students of Abbottabad, Mansehra, Haripur Mardan Peshawar and Shilnkaiyrai i.e., were the population of the study.

Sampling Strategy and Sample. Using the Google online calculator, the sample size of the current study with 95% confidence interval and 5% margin of error was computed as 377. So, to get the desirable sample, using a convenient sample technique 377 students were initially approached from different colleges of Abbottabad, Mansehra, Haripur, Mardan, Peshawar, and Shinkiyari cities. Out of which only 200 students gave consent to take participation in the current study. The sample was further divided regarding demographics (i.e., gender, academic discipline, and mode of instruction).

Table 01
Demographics of participating students (n=200)

Variables	F	Percentage (%)
Gender		
Male	90	44.8
Female	110	55.2
Academic Discipline		
Pure Sciences	103	51.7
Behavioral	97	48.3
Sciences		
Medium of Communication		
MS team	97	48.5
WhatsApp	41	20.2
Zoom	62	31.3

Research Instrument

Demographic Sheet (DS). A demographic sheet was used for taking basic information on gender, academic discipline, and medium of instruction.

Perception of Academic Stress Scale (PAS). The perceived academic stress scale contains 18 items with three subscales (1) the academic expectations subscale (four items), (2) the workload and examinations subscale (eight items), and (3) the students' academic self-perceptions sub-scale (six items) (Bedewy & Gabriel, 2015). Response category ranges from five-point Likert scale (1 = Strongly Disagree; 2 = little Disagree; 3 = neither disagree nor agree; 4 = little Agree; 5 = Strongly Agree. High scores indicate a high level of academic stress where the high score is 90 and the lowest score is 18. For the current study, the reported reliability was good with Cronbach's alpha value .70. In previous study, the PASS has been validated for Pakistani population with Cronbach's alpha co-efficient internal consistency of 0.85 and test-retest reliability during a short retest interval of 0.85 (Tariq, Tariq, Tariq, & Jawed, 2020).

General Health Questionnaire (GHQ). General Health Questionnaire (12 items- English version) was used to measure physical and psychological health issues (Fong et al., 2021). Response category ranges from 1-4 (1 = not at all, 4 = more than usual). The scale has three main components naming: somatic symptoms (items no 1, 2, 3, 4, and 5), depression/poor family relations (items no =8 and 7), anxiety, and worrying (items no =6 and 9). A higher score represents high health issues. Cronbach's α value for current research study is .89. For Pakistani population, Anwar, Ishak, Khan, and Suhail (2013) have reported item-total Correlations and Cronbach's Alpha Coefficients of GHQ with the mean correlation value 0.75, whereas mean Alpha is 0.90, which is proving that the scale has good internal consistency.

Data Collection and Analysis

For the data collection, process permission was obtained from the authorities/ heads of different colleges of Abbottabad, Mansehra, Haripur, Mardan, Peshawar, and Shinkiyari cities. The potential subjects of the study were briefed about the study objectives. They were ensured about the confidentiality of the data. After obtaining informed consent along with clear instructions, questionnaires were distributed with a request to fill the questionnaires according to the instructions. The data were analyzed to report the results of the study.

Results and Discussion

For the data analysis of the study, correlation analysis, t-test analysis, and regression analysis were conducted on the study variables.

Table 02

Correlation Coefficient of Academic Stress Scale, Chinese health questionnaire, and age (n=200)

	Scales	1	2	3	M	SD
1	Age	-	-.110	.318**	24.64	3.896
2	PASS	-	-	.174*	83.025	10.335
3	CHQ	-	-	-	28.790	5.427

Note: Perceived Academic Stress Scale; CHQ = Chinese Health Questioner

*P < .05, **P < .01.

Table 02 indicated that age has a non-significant negative relationship with perceived academic stress and a significant positive relationship with Chinese health questionnaire. The academic stress scale has a significant positive relationship with Chinese health questionnaire. That means that if students experience a high level of academic stress, they will exhibit more health-related complaints as well.

Table 03

Mean Comparison of male and female students on Perceived Academic Stress Scale, and CHQ (n=200)

Variable	Male (n=90)		Female (n=110)		t(198) p	95% CI		Cohen's D
	M	SD	M	SD		LL	UL	
PASS	78.6	11.8	86.6	7.1	5.84	0	2	0.81
CHQ	27.0	5.14	30.9	4.9	5.49	0	1	0.78

Note: ASS=Perceived Academic Stress; CHQ=Chinese Health Questionnaire.

Table 03 shows that a significant difference exists between males and female students on the perceived academic stress scale. Female students experienced a higher level of academic stress and reported more health-related issues than male students.

Table 04
Mean Comparison of pure sciences and social sciences on Perceived Academic Stress Scale, and CHQ (N=200)

Variable	Pure (n=103)		Social (n=97)		<i>t</i> (198)	<i>p</i>	95% CI		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
PASS	80.9	11.06	85.20	9.05	2.95	.004	-7.06	-1.40	0.41
CHQ	29.06	6.24	28.49	4.41	.746	.457	-.942	2.07	0.10

Note. ASS = Perceived Academic Stress; CHQ = Chinese Health Questioner.

Table 04 indicates a significant difference exists on the perceived academic stress scale among the pure sciences and social sciences groups. The study result suggests that students of the social sciences group experience more academic stress while reporting fewer health-related complaints than students of pure sciences.

Table 05
One Way Analysis of Variance for the difference of PASS and CHQ on the mode of online education (n =200)

Scale	WhatsApp (n=67)		MS Team (n= 79)		Zoom (n= 54)		<i>F</i>	<i>P</i>	<i>Tukey</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
ASS	85.08	8.06	83.29	10.95	80.00	10.31	2.74**	.009	3>2>1
CHQ	30.34	4.50	29.50	5.146	25.57	5.17	11.6**	.000	3>2>1

Note. Academic Stress; CHQ = Chinese Health Questionnaire

Table 05 shows that regarding the medium of instruction, significant differences exist in academic stress and health-related complaint among students. Further analysis by *Tukey* (Post-Hoc) revealed students being taught via what's app experienced the highest level of academic stress $F, (2, 97) = 2.74, p < .05$, and reported health-related complaints than by MS team and zoom software $F (2, 97) = 11.6, p < .05$.

Discussion

To face the academic challenges raised by distance learning during COVID-19 pandemic, number of tools were heavily used. These tools in turn caused major change in the traditional teaching-learning process. During this phase along with other challenges students also reported e-learning-related academic performance related issues (Abbasi et al., 2020).

The data analysis revealed that the academic stress has a significant positive relationship between academic stress and health complaints among students experiencing online education during covid 19 epidemics (see Table 2), These results are supported by the finding of previous research by Kumar et al. (2020) while exploring the possible relationship between academic stress and health complaint. Study results indicated that academic stress has a significant negative relationship with a health complaint. Similarly, Elsalem et al. (2020) also concluded that students reported test and exam-related stress along with other general health-related issues. Results from the study indicated that academic stress had a significant positive relation with health complaints and proved to be a significant predictor of psychosomatic complaints among students during the assessment phase of academic life. Nadia (2020) stated that academic stress inversely affects the health condition suggesting that students with low control and social support experienced more academic stress and also scored high on health complaints scale (Rawson, 2021; Smith 2021). Selvaraj, Radhin, Ka, Benson, and Mathew (2021) studied the effect of academic stress and health complaints regarding age and found a non-significant negative effect of academic stress and a significant positive effect on health complaints on student's experiences and outcomes.

Exploring gender base differences (Table 03) shows that female students scored higher on the academic stress and health compliant scale than male students. These results are aligned with the findings of previous research. Concerning the sense of coherence on gender significant differences was found in perceived academic stress among students. Yahya (2013) reported that females face more test anxiety than male students. Regitz-Zagrosek (2012) investigated the gender differences on the health complaint scale in career decisions. The result of the study indicated that females are more conscious of their health and academic activities than males. It is suggested that there are significant differences in academic stress with gender. Yu (2021) conducted a study to find out the gender differences in health complaints and found significant differences in rated online teaching effectiveness among the teaching staff of different ages and genders. Butt and Akram (2013) elaborated that female student face more academic stress than male students.

Study results further indicate significant differences in academic stress scale among pure science students and social sciences students (see Table 4). Comparing the mean difference study results suggest that pure science students experienced a higher level of academic stress than behavior science students. These results align with the findings of previous research i.e., suggesting that students of pure science students are more prone to

experience stress (Carrasco-Carballo et al., 2021). The result of this study supported the idea that students of pure science experience significantly higher levels of anxiety than students of social science (Yahya, 2013). The results of the current study are also supported by another research exploring academic anxiety among students suggested that students of pure sciences encounter a significantly higher level of academic stress than students of social sciences (Butt & Akram, 2013).

During COVID-19, both teachers and learners faced several technical, academic, and communication related challenges. Previous studies have proved that a lack of the experience and confidence to learn online using a new medium resulted in psychological stress and extreme cases depression among students (Mahyoob, 2020; Selvaraj et al., 2021). Similarly other studies have reported that most of the students found regular classes more comfortable than online classes (Radu, Schnakovszky, Herghelegiu, Ciubotariu, & Cristea, 2020).

Modes of online teaching-learning have a significant effect on the psychological health of both teachers and learners. As it was concluded that improving the mental health of students and teachers significantly links with the technical preparedness for online education (Gaber, Shehata, & Amin, 2020; Hind Al Faddaa, 2020). Most of the students have reported that specifically WhatsApp as the medium of e-learning triggers several problems. Technical difficulties such as many students who did not possess a smartphone, the circulation of messages and language hazards, and the students' expectation that their teachers should respond to them on a 24/7 basis were few among the most reported experienced problems among students (Dan, 2014).

This study is the first of its kind which reflects the online education-related experienced psychological problems among students in Pakistan. The study addresses the students' compliments and grievances about online education. This further enlightens how to improve the technologies to make them use more efficiently. Besides, this study gives a proper framework to improve or create educational policies, laws, and schemes for the healthy adjustment of students to ongoing changes in educational policies.

Conclusion

It may be concluded that during Covid-19 lock down, academic stress was faced by every third student of our society, and negatively affected physical and psychological health of students. This study highlights the subjective experiences of Pakistani students in online learning during Covid-19. It is safe to conclude that during this phase in the context of e-

classes, Pakistani students faced several problems. Majority of students complained about the ineffectiveness of online learning. It was reported that due to inaccessibility of class fellows and mainly the absence of the teacher, learning process was uncomfortable. Similarly, attending e-classes, the connectivity issues and the inability to handle smart phone and other electronic devices created number of problems. An interesting finding of the study was that gender and academic discipline have also an important relation with academic stress. Further study result concluded that mode of instruction within which students gets maximum opportunity to observe and analyze teacher such as in Zoom meeting was more effective and less trouble causing.

This study has provided us with facts and findings results which could be used for future research but if it was conducted on a larger scale, the result could have yielded more authentic and generalizable results. Wide-ranged research could have provided in-depth information and the authenticity of the student's response could be counter checked if parents and teachers' perspective could be highlighted.

It came to light that COVID pandemic imposed e-learning sessions has negatively affected students' overall health. However, many measures could be considered to improve the prescribed set-up of online learning. Future research can establish new goals for online learning mainly focusing on the ways through which technology and education can be well integrated. Teacher could be trained for providing proper assistance and encouragement to the students so they can learn independently. Parental and guardians should also be suggested to provide help, motivation, and assistance to their child in healthy coping and adjustment with such major transaction of learning system. This study would help policy makers in drafting effective education policy for getting long lasting and effective education system and to overcome the challenges faced by educational institutions. Educational institutions need to improve syllabus and other activities so students can experience other than tradition teaching learning environment. Conclusively, the educational institutes must improve their teaching strategies along with taking all possible measure to overcome health related issues among students.

The present study was based only on the perspectives of the college students of KP. Future studies should also focus on the students of primary educational institutions in Pakistan. The small size of the sample, limited area coverage and non-random selection of participants were also some of the major limitations of the present study.

References

- Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding e-learning during Covid-19 at a private medical college. *Pak J Med Sci*, 36(Covid19-s4), S57-s61. doi:10.12669/pjms.36.COVID19-S4.2766
- Abdur Rehman, M., Soroya, S. H., Abbas, Z., Mirza, F., & Mahmood, K. (2021). Understanding the challenges of e-learning during the global pandemic emergency: The students' perspective. *Quality Assurance in Education*, 29(2/3), 259-276. doi:10.1108/QAE-02-2021-0025
- Aboalshamat, K., Jawhari, A., Alotibi, S., Alzahrani, K., Al-Mohimeed, H., Alzahrani, M., & Rashedi, H. (2017). Relationship of self-esteem with depression, anxiety, and stress among dental and medical students in Jeddah, Saudi Arabia. *Journal of International Medicine and Dentistry*, 4, 61-68. doi:10.18320/JIMD/201704.0261
- Akhter, F., & Iqbal, S. (2021). Student's performance and academic stress: A study of higher education institution of Pakistan. *Journal of Social Sciences and Humanities*, 60(1), 63-79. doi:10.46568/jssh.v60i1.483
- Alghamdy, R. Z. (2019). The impact of mobile language learning (WhatsApp) on EFL context: Outcomes and perceptions. *International Journal of English Linguistics*, 9(2), 128-135.
- Anwar, K., Ishak, M., Khan, F., & Suhail, S. (2013). Reliability and validity assessment of 12 items General Health Questionnaire (GHQ: 12) among Pakistani university teachers. *World Applied Sciences Journal*, 24, 603-608. doi:10.5829/idosi.wasj.2013.24.05.13212
- Bedewy, D., & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The Perception of Academic Stress Scale. *Health Psychology Open*, 2. doi:10.1177/2055102915596714
- Butt, M. M., & Akram, O. (2013). Test anxiety among students of pure science and social science. *Research on humanities and social sciences*, 3, 30-37.

- Carrasco-Carballo, A., Luna-Centeno, L. D., Rojas-Morales, A., Alatraste, V., Martínez, I., Martínez, L., Luna, F. (2021). Anxiety and depression among exact and natural science college students of BUAP-Mexico under COVID-19 lockdown. *Open Journal of Depression, 10*(03), 103-120. doi:10.4236/ojd.2021.103007
- Dan, B., & Mor, Deshen. (2014). WhatsApp Goes to School: Mobile instant messaging between teachers and students. *Journal of Information Technology Education: Research, 13*, 217-231.
- Divaris, K., Polychronopoulou, A., Taoufik, K., Katsaros, C., & Eliades, T. (2012). Stress and burnout in postgraduate dental education. *European Journal of Dental Education, 16*(1), 35-42. doi:https://doi.org/10.1111/j.1600-0579.2011.00715.x
- Elsalem, L., Al-Azzam, N., Jum'ah, A. A., Obeidat, N., Sindiani, A. M., & Kheirallah, K. A. (2020). Stress and behavioral changes with remote e-exams during the Covid-19 pandemic: A cross-sectional study among undergraduates of medical sciences. *Annals of Medicine and Surgery, 60*, 271-279. doi:10.1016/j.amsu.2020.10.058
- Fong, T. C. T., Yip, P. S. F., & Ho, R. T. H. (2021). Psychometric validation of the Chinese Health Questionnaire among young people in Hong Kong across 2018 and 2019. *Psychological Assessment, 34*(3), 261–270. doi:10.1037/pas0001079
- Gaber, D., Shehata, M., & Amin, H. A. (2020). Online team- based learning sessions as interactive methodologies during the pandemic. *Medical Education, 54*(7), 666-667. doi:10.1111/medu.14198
- Harikiran, A. G., Srinagesh, J., Nagesh, K. S., & Sajudeen, N. (2012). Perceived sources of stress amongst final year dental under graduate students in a dental teaching institution at Bangalore, India: a cross sectional study. *Indian J Dent Res, 23*(3), 331-336. doi:10.4103/0970-9290.102218
- Hind Al Faddaa, R. O., Ahmed Sayed M. Metwallyc. (2020). Using whatsapp in coordination with zoom and microsoft teams to enhance online learning during COVID -19 lockdown. *Revista Argentina de*

Clínica Psicológica, Vol. XXIX,(N°5), 1024-1035. doi:10.24205/03276716.2020.1098

- Huckins, J. F., daSilva, A. W., Wang, W., Hedlund, E., Rogers, C., Nepal, S. K., Campbell, A. T. (2020). Mental health and behavior of college students during the early phases of the COVID-19 pandemic: Longitudinal Smartphone and ecological momentary assessment study. *J Med Internet Res*, 22(6), e20185. doi:10.2196/20185
- Khan, B. H. (1997). *Web-based Instruction*. Englewood Cliffs: Educational Technology Publications.
- Kumar, A., Malla, M. A., & Dubey, A. (2020). With Corona outbreak: Nature started hitting the reset button globally. *Frontiers in Public Health*, 8, 1-10. doi:10.3389/fpubh.2020.569353
- Lister, K., Seale, J., & Douce, C. (2021). Mental health in distance learning: A taxonomy of barriers and enablers to student mental wellbeing. *Open Learning: The Journal of Open, Distance and e-Learning*, 1-15. doi:10.1080/02680513.2021.1899907
- Mahyoob, M. (2020). Challenges of e-learning during the COVID-19 pandemic experienced by EFL learners. *Arab World English Journal*, 11(4), 351-362. doi:10.24093/awej/vol11no4.23
- Nadia, N. S., Dil.,Saeed, Ullah Khan Niazi, Irum, Naveed, Naveed, Ullah Khan, Farida Khudaidad Khan, Shehla, Tabbasum, Deepak, Kumar. (2020). COVID 19 pandemic & Pakistan: Limitations and gaps. *Global Biosecurity*, 2(1). Retrived from <https://jglobalbiosecurity.com/articles/10.31646/gbio.63/>
- Nudrat, S. (2013). Stress and academic performance among medical students. *Journal of the College of Physicians and Surgeons Pakistan*, 23(1), 67-71.
- Petretto, D. R., Carta, S. M., Cataudella, S., Masala, I., Mascia, M. L., Penna, M. P., Masala, C. (2021). The use of distance learning and e-learning in students with learning disabilities: A review on the effects and some hint of analysis on the use during COVID-19

outbreak. *Clin Pract Epidemiol Ment Health*, 17, 92-102. doi:10.2174/1745017902117010092

Radu, M.-C., Schnakovszky, C., Herghelegiu, E., Ciubotariu, V.-A., & Cristea, I. (2020). The impact of the COVID-19 pandemic on the quality of educational process: A student survey. *International Journal of Environmental Research and Public Health*, 17(21), 7770. doi:10.3390/ijerph17217770

Regitz-Zagrosek, V. (2012). Sex and gender differences in health. Science & society series on sex and science. *EMBO reports*, 13(7), 596-603. doi:10.1038/embor.2012.87

Rukhsana, K. (2010). Perceived stress, academic workloads and use of coping strategies by university students. *Journal of Behavioural Sciences*, 20, 31-45.

Selvaraj, A., Radhin, V., Ka, N., Benson, N., & Mathew, A. J. (2021). Effect of pandemic based online education on teaching and learning system. *International Journal of Educational Development*, 85, 102444-102444. doi:10.1016/j.ijedudev.2021.102444

Tariq, S., Tariq, S., Tariq, S., & Jawed, S. (2020). Perceived stress, severity and sources of stress among female medical students in a private medical college in Pakistan. *J Pak Med Assoc*, 70(1), 162-167. doi:10.5455/jpma.2153

Waqas, A., Khan, S., Sharif, W., Khalid, U., & Ali, A. (2015). Association of academic stress with sleeping difficulties in medical students of a Pakistani medical school: A cross sectional survey. *PeerJ*, 3, e840-e840. doi:10.7717/peerj.840

Yahya, F. (2013). Test anxiety among students of pure science and social science. *Research on Humanities and Social Sciences*, 3(3), 30-37.

Yu, Z. (2021). The effects of gender, educational level, and personality on online learning outcomes during the COVID-19 pandemic. *International Journal of Educational Technology in Higher Education*, 18(1), 1-17. doi:10.1186/s41239-021-00252-3

Zalat, M. M., Hamed, M. S., & Bolbol, S. A. (2021). The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff. *PloS one*, *16*(3), e0248758. doi:10.1371/journal.pone.0248758

Zhu, H., Wei, L., & Niu, P. (2020). The novel coronavirus outbreak in Wuhan, China. *Global Health Research and Policy*, *5*(1), 6. doi:10.1186/s41256-020-00135-6

Perveen, S., Nazir, H. & Khan, S. (2022). Academic stress and associated health complaints among students during online education. *Pakistan Journal of Distance and Online Learning*, *8*(1), 89–106.