HEALTH RELATED CONCERNS IN MEDICAL STUDENTS: STRESS, ANXIETY, AND CONTAMINATION FEAR

Rabbia Akhtar[1], Areeba Fatima[2], Dr. Shahnila Tariq[*3], Dr. Beenish Mubeen[4]

[1,2]Department of Applied Psychology, School of Professional Psychology University of Management and Technology, Lahore Pakistan
[3]Associate Professor, Department of Applied Psychology, School of Professional Psychology, University of Management and Technology, Lahore Pakistan
[4]Assistant Professor, Department of Applied Psychology, School of Professional Psychology, University of Management and Technology, Lahore Pakistan

[*1]f2021141073@umt.edu.pk, [3]Shahnila.tariq@umt.edu.pk, [4]beenish.mubeen@umt.edu.pk

DOI: https://doi.org/10.5281/zenodo.17731130

Keywords
Academic stress, health anxiety, fear of contamination, medical students, mental health

Article History
Received: 06 October 2025
Accepted: 14 November 2025
Published: 27 November 2025

Corresponding Author: *
Dr. Shahnila Tariq

Abstract
The aim of the present study was to investigate the association between academic stress, health anxiety, and fear of contamination in the context of MBBS students in Pakistan. Quantitative correlational research design was used. The data were obtained using self-report questionnaires of standardized format, which were given to a sample of MBBS students at various years. The prevalence of these psychological factors and the relationships between them was assessed using statistical analyses. The results have shown that academic stress is positively correlated with the level of health anxiety and contamination phobia, which implies that academic pressures can contribute to the risk of becoming vulnerable to the anxiety-related conditions among medical students. The findings indicate the necessity to introduce specific interventions, including stress management and mental health counseling and psychoeducational workshops, to reduce these problems and facilitate psychological well-being among medical education participants. This research plays a role in the rising literature on mental health concerns among medical students and highlights the importance of institutional measures to address the demands of the struggling students who have academic and psychological problems.

INTRODUCTION

Academic stress is referred to as the pressure which appears due to academic aspects like examination, work, competition and performance expectations (Córdova Olivera et al., 2023; Saqib et al., 2023). Health anxiety is an exaggerated concern about health, misidentification of physical feelings and continued worrying about sickness (Csabai, 2025; Deng et al., 2023; Dennis et al., 2021). Excessive worries of germs or infection or environmental pollutants are also considered as fear of contamination, which is normally linked to the symptoms of obsessive-compulsive disorder.

These mental strains were exacerbated by the COVID-19 pandemic. Clinical rotations were interrupted, medical students were afraid of infecting family members and were exposed more to information related to illness, which increased the health anxiety and contamination fear (Herlitz et al., 2025). The aim of this study is to investigate the relation between these factors on Pakistani medical students as well as determining factors that predict contamination fear.

Literature Review

A prospective multisite survey of clinical-year US medical students found that 84 percent reported worsened stress, 34 percent moderate, and 9.5 percent severe anxiety on GAD-7; 25 percent were at risk of PTSD (Lee et al., 2021) with significant gender differences in developing fear leading to phobia (Asmundson et al., 2024; Lin et al., 2024; McKay et al., 2021).

According to a 2023 qualitative study of UK medical students with prior mental health issues, who are now affected by the pandemic, academic stress, support disruption, and avoidance and reassurance-seeking became more pronounced by the pandemic (Rich et al., 2023). In one of the longitudinal studies of medical students found that 1 in 5 intended to drop out, and mental ill-health was central to attrition intention- highlighting the role of academic stress and anxiety as mediating factors between stress and anxiety and critical outcomes (Medisauskaite et al., 2025; Thorsen et al., 2022).

In 2020, US sample data demonstrated that masks, disinfectant, avoidance, contamination-prevention behaviors were related to contamination obsessions/phobia and OC symptoms, despite exposure risk having been adjusted (McKay et al., 2021).

The medical colleges in Pakistan shifted to online delivery with fluctuating infrastructure at the onset of COVID-19. The anxiety measurements included repeated-measures that registered anxiety levels before, during, and after testing in the month of April-May 2020 and correlated the test-anxiety dynamics to formative performance. Academic stressors of technological uncertainty, perceived unfairness, and lower exam self-efficacy clustered with students reporting high levels of anticipatory and state anxiety during remote transitions with respect to computer-based testing (Arora et al., 2021).

In another study (Khalid et al., 2021), a great deal of anxiety and depressive symptoms, sleep disturbance, and minimum physical activity were found among medical students. They also reported extensive changes in their behaviors and derived that the fear-of-infection and academic instability were comorbid with mental-health symptoms (Hassan et al., 2025; Khalid et al., 2021; Khan et al., 2022) and cyberchondria were associated with health anxiety and that the association was mitigated by health literacy in Pakistan (Fang & Mushtaque, 2024).

Rationale

It is widely acknowledged that medical education is one of the strictest and most challenging educational paths in the world. Academic loads, competitive nature and extended periods of training often expose the medical students to mental health issues that include stress, anxiety and burnouts. In Pakistan, these difficulties are also exacerbated by distinct sociocultural issues, such as institutional resource scramble, family pressures and the social stigma of mental illness. Medical students are increasingly known to be affected by the fear of contamination leading to the obsessive-compulsive symptom (OCS). Fear of contamination was relatively adaptive during the COVID-19, as the infection-preventive behaviors were promoted, but it is observed that the fear of contamination still prevails in medical students. Therefore, the purpose of this study was to find out the relationship between academic stress, health anxiety and fear of contamination in medical students.

Hypothesis

- There will be significant correlation between academic stress, health anxiety, and fear of contamination among medical students.
- Academic stress and health anxiety will likely to predict fear of contamination in medical students

Method

Research Design

Correlational research design was used to study the relationship between academic stress, health anxiety and fear of contamination among medical students.

The purposive sampling method was used to select (N=200) participants as a sample, enrolled in MBBS, with age range 18-23 years (M=20.9; SD=1.79) including both genders. The students with any physical disability were not included.

Sample and sampling strategy

Table 1

Descriptive Statistics of Demographic Variables (N = 200)

Variables	f	%
Gender		
Male	65	32.5
Female	135	67.5
Institute		
Government	110	55.0
Private	90	45.0
Study Year		
1st year	91	45.5
2nd Year	37	18.5
3rd Year	16	8.0
4th Year	33	16.5
5th Year	23	11.5
Family System		
Joint	67	33.5
Nuclear	133	66.5
Birth Order		
First	70	35.0
Middle	94	47.0
Last	28	14.0
Only	8	4.0
Father's Profession		
Businessman	52	26.0
Job	137	68.5
Late	11	5.5
Mother's Profession		
Working	58	29.0
Non-Working	142	71.0

Note. f= Frequency, %= Percentage.

Assessment measures
Consent form to take written consent from the participants

Demographic information sheet including information as gender, age, family system, year of study, working status of mother and father, birth order etc.

Academic Stress Scale (Kohn & Frazer, 1986) comprising 35 items, measuring response on 5-point Likert scale from 1= never and 5= always. Greater scores connote the greater level of academic stress. Cronbach's alpha of the scale was .89.
Short Health Anxiety Inventory (Salkovskis et al., 2002) has 18 item scale that measures worry about health, illness fear and lack of understanding of body symptoms. All the responses are measured using a 4-point Likert scale where higher the score the more health anxiety. SHAI has good psychometric properties and the Cronbach's alpha is 0.87.

Padua Inventory-Contamination Fear Subscale (Burns et al., 1996) 10 items measuring concerns about dirt, germs and contagion are included. The response was given on 5-point Likert scale of 1=not at all to 5=very much. The higher scores show more fear of contamination. The scale has Cronbach's alpha of .88.

Procedure
After the approval of topic and synopsis from the faculty, data collection started. Purposive sampling was used to recruit participants in medical colleges whereby the academic networks and personal contacts with students pursuing MBBS were used. The recruitment was done by paying a physical visit to the classrooms and hostels besides calling the interested students over the phone. In these interactions, the purpose and the scope of the study were described succinctly. Students were assured that their involvement was on a voluntary basis, data provided would be kept strictly confidential and any responses would be utilized only based on academic research. Participation was informed. Every participant received a booklet of the questionnaire that contained a demographic information sheet and standardized measures. Respondents were asked to fill the questionnaires in a calm classroom environment in the presence of the researcher to facilitate normal conditions of administration. We conducted the research according to APA declaration on research ethics and, we consider all the ethical points to ensure the originality of the research.

Ethical considerations
All ethical issues related to research were catered:
- All participants were informed and gave consent to participate in data collection.
- Participation was voluntary and it could be withdrawn at any time without penalty.
- No participants were named or identified for maintaining privacy and confidentiality.
- All data was kept safely and was shared only with supervisor for analysis of the research.

Results
Table 2
Psychometric Properties of the Academic Stress, Health Anxiety and Fear of Contamination in Medical Students(N=200).

Scale	M	SD	Range	α
ASS	18.5	4.87	35-175	.86
HAS	2.84	4.39	10-50	.76
FCS	2.53	5.10	18-72	.86

Note. M= Mean, SD= Standard Deviation, α = Cronbach Alpha, ASS= Academic Stress, HAS= Health Anxiety Scale, FCS= Fear Contamination Scale

All the scales showed good reliability.

Table 3
Correlation Coefficient of Academic Stress, Health Anxiety and Fear of Contamination in Medical Students(N=200)

Variables	M	SD	SPS	AIUS	BDEFS
ASS	18.59	4.87	-	.39**	.27**
HAS	14.20	4.39	-	-	.43***
FCS	12.69	5.10	-	-	-

*p < .05, **p < .01, ***p < .001

The findings showed high positive relationships between academic stress, health anxiety, and contamination fear.

Table 4
Multiple Linear Regression for Predictors of Fear of Contamination in Medical Students(N=200).

Variables	B	95%CI for B		SEB	β	R^2	ΔR^2
		LL	UL				
Step1						.260	.058***
Age	-.327	-.719	.065	.199	-.115**		
Gender	2.577	.974	4.181	.0813	.237***		
Institute	–.234	-1.736	1.26	.761	.023		
Study Year	-2.157	-4.598	.283	-.105	-.105		
Step 2						.292	.047***
Family System	.261	-1.248	1.561	.712	.014		
Doctor in family	.255	–1.145	.492	.235	.076		
Currently enrolled in	.715	-.207	7.17	.715	-.035		
Admission decision taken by	-.313	-1.789	1.031	.440			
Step 3						.497	.207***
ASS Total	.081	.067	.230	.075	.078**		
HAS Total	.454	.289	.618	.083	.390***		

Note. CI=Confidence Interval; LL=Lower Limit; UL=Upper Limit; ASS= Academic Stress, HAS= Health Anxiety Scale; *p<.05, **p<.01, ***p<.001

The multiple regression analysis indicated that academic stresses and health anxiety were important predictors of fear of contamination (p < .001) with a significant percentage of variance in the scores of contamination fear.

The demographic factors that were tested, included gender and year of study had slight but non-significant differences. The level of anxiety among female students was found to be a bit higher as compared to male students.

Discussion

The current research investigated the relationship between academic stress and health anxiety and fear of contamination among Pakistani medical students. The results are in keeping with the Stress and Coping Model of Lazarus and Folkman (1984), which holds that academic stress is a cause of maladaptive emotional reactions like health anxiety. Being informed about medical matters can increase vigilance and disastrous interpretations, which are part of contamination fears- a trend that has been observed with cognitive-behavioral models of health anxiety (Salkovskis & Warwick, 1986) and contamination fear (Rachman, 2004).

The findings showed that there is a strong positive correlation among all the three variables, as the level of academic stress is correlated to an increase in health anxiety and contamination fear. Furthermore, regression analysis showed that academic stress and health anxiety are also strong predictors of fear of contamination.

These results are in line with the previous literature that have characterized medical education as one of the most challenging learning environments (Almansour & Almoayad, 2024; Aryuwat et al., 2024; Wang & Ji, 2021; Mohammad et al., 2024). It is not only that medical students are under excessive workload, must dedicate a long time studying, but also that the material they learn is related to illnesses, which makes them more susceptible to anxiety and fears of contamination. This can be attributed to the fact that the Stress and Coping Model developed by Lazarus and Folkman (1984) explains that psychological stress and anxiety are witnessed when the individual feels that the demands of an academic task are beyond his ability to handle.

This relationship between health anxiety and fear of contamination is congruent with the cognitive-behavioral model of health anxiety by Salkovskis and Warwick (1986), which outlines that the persistence of anxiety and fear is possible because of a misinterpreting reaction to body sensations or illness-related sensations. Such misinterpretations can be reinforced by medical students dealing with medical information and patients on a daily basis. Rachman (2006) explained fear of contamination as a firm and persistent belief of being contaminated with a disease-causing agent or dirt, which may lead to over-washing or evading behaviors- symptoms also commonly displayed in high-stress health-related settings (Yang et al., 2021).

These results confirm the fact that academic stress is not a solitary factor. It combines with the cognitive and emotional processes to form health anxiety and contamination fears patterns (Dennis et al., 2021). Students who are under constant stress and pressure to perform better tend to be affected by maladaptive coping behaviors to avoid or be obsessive health check. The same psychological effects were observed by Attiya et al. (2022), who added that medical students in North America are not only subject to the impact of chronic stress on their academic achievements, but also on their emotional well-being (Qi et al., 2025).

In his Protection Motivation Theory, Rogers (1975) states that fear-based behaviors are manifested when people reflect high threat and low control over the threat. The perceived risk of infection or failure at school may lead to the same reaction in the medical environment, such as contamination anxieties. This can be sustained by the constant exposure to illness related cues, which together with the perpetuated exposure to cues associated with anxiety leading to health anxiety may continue to fuel the anxiety in medical students (Farris et al., 2025).

In addition, Diathesis-Stress Model by Ingram and Luxton (2005) implies that some personality traits or weaknesses of an individual respond to stressors to generate psychological disorders. There is a possibility that perfectionism and high achievement orientation, which are common among medical students, interact with academic pressures to give rise to anxiety related symptoms (Rezaei-Gazki et al., 2024; Zang et al., 2025).

Conclusion

Academic stress, health anxiety, and fear of contamination are significantly interrelated among

Pakistani medical students. Academic pressure and health anxiety serve as strong predictors of contamination fears, indicating that mental health risks extend beyond academic performance to personal well-being. The study emphasizes the importance of integrating mental health services, stress management training, and preventive interventions within medical curricula.

Limitations and suggestions

- The research was cross-sectional, and it did not allow concluding about cause-and-effect relations, therefore cause and effect relationship should also be studied.
- The use of self-report questionnaires could have been a source of social-desirability bias, therefore different methods and sources should be used to reduce social desirability bias.
- Quantitative method was used which did not provided in-depth reasons and causes of contamination fear. Qualitative interviews need to be conducted with the participants who scored high on stress, anxiety and contamination fear.

Implications

- The findings can be shared with medical college administration for developing mental-health programs and stress-coping resources in the institutions and to enhance academic motivation in students.
- The findings also suggest a proper counselor and Cognitive Behavior Therapist need to be appointed in every educational institute, especially medical colleges, in order to rectify the maladaptive illness beliefs and alleviate fears of contamination.
- The increase in health anxiety and academic stress awareness can also promote the necessary changes in the family and the society to be more compassionate and not judgmental of the student experiencing any psychological issues.

REFERENCES

Almansour, M., & Almoayad, F. (2024). Exploring challenges and perceptions in the learning environment: an online qualitative study of medical students. BMC medical education, 24(1), 147.

Arora, S., Chaudhary, P., & Singh, R. K. (2021). Impact of coronavirus and online exam anxiety on self-efficacy: the moderating role of coping strategy. Interactive Technology and Smart Education, 18(3), 475-492.

Aryuwat, P., Holmgren, J., Asp, M., Radabutr, M., & Lövenmark, A. (2024). Experiences of nursing students regarding challenges and Support for Resilience during Clinical Education: a qualitative study. Nursing Reports, 14(3), 1604-1620.

Asmundson, G. J. G., Taylor, S., Landry, C. A., & McKay, D. (2024). Is there evidence for factorial invariance of the COVID Stress Scales? An analysis of North American and cross-cultural populations. Frontiers in Psychiatry, 15, 1381124. https://doi.org/10.3389/fpsyt.2024.1381124

Attia, M., Ibrahim, F. A., Elsady, M. A. E., Khorkhash, M. K., Rizk, M. A., Shah, J., & Amer, S. A. (2022). Cognitive, emotional, physical, and behavioral stress-related symptoms and coping strategies among university students during the third wave of COVID-19 pandemic. Frontiers in psychiatry, 13, 933981.

Burns, G. L., Keortge, S. G., Formea, G. M., & Sternberger, L. G. (1996). Revision of the Padua Inventory of obsessive–compulsive disorder symptoms. Behaviour Research and Therapy, 34(2), 163–173.

Córdova Olivera, P., Gasser Gordillo, P., Naranjo Mejía, H., La Fuente Taborga, I., Grajeda Chacón, A., & Sanjinés Unzueta, A. (2023). Academic stress as a predictor of mental health in university students. Cogent Education, 10(2), 2232686.

Csabai, M. (2025). Health Anxiety and the Quest for Safety: Interdisciplinary and Critical Perspectives. Taylor & Francis.

Deng, Z., Deng, Z., Fan, G., Wang, B., Fan, W., & Liu, S. (2023). More is better? Understanding the effects of online interactions on patients' health anxiety. Journal of the Association for Information Science and Technology, 74(11), 1243-1264.

Dennis, D., Radnitz, C., & Wheaton, M. G. (2021). A perfect storm? Health anxiety, contamination fears, and COVID-19: lessons learned from past pandemics and current challenges. International Journal of Cognitive Therapy, 14(3), 497-513.

Fang, S., & Mushtaque, I. (2024). The moderating role of health literacy and health promoting behavior in the relationship among health anxiety, emotional regulation, and cyberchondria. Psychology Research and Behavior Management, 51-62.

Farris, S. G., Derby, L., & Kibbey, M. M. (2025). Getting comfortable with physical discomfort: A scoping review of interoceptive exposure in physical and mental health conditions. Psychological Bulletin, 151(2), 131.

Hassan, S., Ahmad, T., & Saleem, M. (2025). Causes of academic stress and coping strategies among university students: Implications for medical education. Journal of the College of Physicians and Surgeons Pakistan, 35(3), ePub ahead of print. https://www.jcpsp.pk/oas/mpdf/generate_pdf.php?string=U3FiUG5UN0NIYWFrVEphMXpWaUJiZz09

Herlitz, J., Pohl, A., & Gerlach, A. L. (2025). Googling as avoidance: anxiety responses to online health information about long COVID. Anxiety, Stress, & Coping, 1-15.

Khalid, F., Raza, A., & Khan, M. (2021). The hidden crisis: COVID-19 and impact on mental health of medical students in Pakistan. Middle East Current Psychiatry, 28, 59. https://doi.org/10.1186/s43045-021-00123-7

Khan, S., Javed, H., & Akhtar, R. (2022). A study to evaluate the impact of COVID-19 on lifestyle of medical students. Pakistan Journal of Medical Sciences, 38(8), 2111–2117. https://www.pjms.org.pk/index.php/pjms/article/view/6031

Kohn, J. P., & Frazer, G. H. (1986). An academic stress scale: Identification and rated importance of academic stressors. Psychological Reports, 59(2), 415–426.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer.

Lee, C. M., Juarez, M., Rae, G., Jones, L., Rodriguez, R. M., Davis, J. A., … Hauer, K. (2021). Anxiety, PTSD, and stressors in medical students during the initial peak of the COVID-19 pandemic. PLOS ONE, 16(7), e0255013. https://doi.org/10.1371/journal.pone.0255013

Lin, Y.-K., Saragih, I. D., Lin, C.-J., Liu, H.-L., Chen, C.-W., … Yeh, Y.-S. (2024). Global prevalence of anxiety and depression among medical students during the COVID-19 pandemic: A systematic review and meta-analysis. BMC Psychology, 12, 338. https://doi.org/10.1186/s40359-024-01838-y

McKay, D., Minaya, E., & Storch, E. (2021). Contamination-related behaviors, obsessions, and compulsions during the COVID-19 pandemic in a United States population sample. Psychiatry Research, 297, 113713. https://doi.org/10.1016/j.psychres.2021.113713

Medisauskaite, A., Silkens, M., Lagisetty, N., & Rich, A. (2025). UK medical students' mental health and their intention to drop out: a longitudinal study. BMJ open, 15(2), e094058.

Mohammed, A. B., Zegeye, R. T., Dawed, H. A., & Tessema, Y. M. (2024). Implementation of problem-based learning in undergraduate medical education in Ethiopia: An exploratory qualitative study. Advances in medical education and practice, 105-119.

Qi, Y., Manchuk, V., Korylchuk, N., Kabitska, O., & Sydorovych, O. (2025). Students' Coping Strategies in Response to Academic Stress: A Study of Psychological Mechanisms and Their Effects on Adaptation. Futurity of Social Sciences, 3(3), 24-45.

Rachman, S. (2004). Fear of contamination. Behaviour Research and Therapy, 42, 1227–1255.

Rezaei-Gazki, P., Ilaghi, M., & Masoumian, N. (2024). The triangle of anxiety, perfectionism, and academic procrastination: exploring the correlates in medical and dental students. BMC Medical Education, 24(1), 181.

Rich, A., & colleagues. (2023). UK medical students' mental health during the COVID-19 pandemic: A qualitative study. BMJ Open, 13(4), e070528. https://doi.org/10.1136/bmjopen-2022-070528

Salkovskis, P. M., & Warwick, H. M. (1986). Morbid preoccupations, health anxiety and reassurance: a cognitive-behavioural approach to hypochondriasis. Behaviour research and therapy, 24(5), 597-602.

Salkovskis, P. M., Rimes, K., Warwick, H. M., & Clark, D. M. (2002). The Health Anxiety Inventory: Development and psychometric properties. Psychological Medicine, 32(5), 843–853.

Saqib, M., Hisham-Ul-Hassan, K., Shadab, I., & Mehmood, N. (2023). Impact of Academic Stress on Secondary School Student's Performance: A Qualitative Exploration. Journal of Asian Development Studies, 12(4), 1068-1079.

Thorsen, A. L., & colleagues. (2022). Changes in contamination-related obsessions and compulsions during the COVID-19 pandemic in the Norwegian public. Comprehensive Psychiatry, 117, 152322. https://doi.org/10.1016/j.comppsych.2022.152322

Wang, Y., & Ji, Y. (2021). How do they learn: types and characteristics of medical and healthcare student engagement in a simulation-based learning environment. BMC medical education, 21(1), 420.

Yang, C., Chen, A., & Chen, Y. (2021). College students' stress and health in the COVID-19 pandemic: The role of academic workload, separation from school, and fears of contagion. PloS one, 16(2), e0246676.

Zhang, D., Mushtaque, I., & Hanif, M. W. (2025). Exploring the role of perfectionism and psychological capital in the relationship between academic procrastination, test anxiety and suicidal ideation among pre-medical students. Acta Psychologica, 252, 104662.