Original Article

Beyond Anxiety: Unveiling the Power of Self-Efficacy in Shaping Academic Performance among Medical Students

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Abstract

Objective: The aim of the study was to explore the relationship between anxiety and academic performance and discusses a key boundary condition i.e., self-efficacy as a strategy to manage anxiety in the academic setting.

Methodology: Quantitative survey design was used employing a cross-sectional time frame. Public sector medical colleges of Lahore affiliated with the University of Health Sciences (UHS) were selected such as Allama Iqbal Medical College, Ameer-ud-Din (PGMI) Medical College, Services Institute of Medical Sciences, and Shaikh Khalifa Bin Zayed Al-Nahyan Medical & Dental College. The duration of the study was from June 2021 to January 2022. A convenience sampling technique was used to collect data from 259 medical students through self-administered questionnaires. The inclusion criteria applied were that the medical institution needs to be recognized by UHS and should be located in Lahore. Medical students included belonged to second to final year MBBS. First-year students were not included as they had not taken their professional examinations.

Results: Hayes PROCESS Macro analysis in SPSS showed that social media overload and academic performance were related to one another (B=-0.198, $p<0.05$) which had a significance in terms of statistics.

Conclusion: Study findings showed a significant moderating role of self-efficacy in the relationship between anxiety and academic performance. Our results stated that when medical students faced anxiety which occurs as a result of social overload their academic performance was decreased however this did not apply to medical students with high self-efficacy. Medical students with low self-efficacy who see themselves as incompetent, lost motivation easily when they tried to attempt tough tasks and focus too much on potential failure.

Key Words: Anxiety, Self-efficacy, Academic Performance, Medical Students

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Introduction

Given the continuous performance pressure students face, identifying and enhancing the key factors that significantly impact academic performance is a crucial concern for educators and researchers. Apart from cognitive capabilities, self-efficacy and anxiety have emerged as significant contributors to academic

achievement.[1] (Richardson, Abraham, & Bond, 2012). The concept of self-efficacy was first introduced by Bandura[2] as one's self-confidence in accomplishing and performing tasks and skills. Self-efficacy means having faith in self-regulatory approaches to the completion of tasks. In medical education, self-efficacy can be crucial for students to succeed academically and cope with the challenges of medical training that often induce anxiety. The current study explores the relationship between anxiety and academic performance and discusses a key boundary condition i.e., self-efficacy as a strategy to manage anxiety in the academic setting.

Anxiety being a natural human response to stress affects individuals in different ways. In the academic setting, anxiety can arise due to a range of factors, including fear of failure, pressure to perform, and difficulty managing workload.[3] Previous research has shown that anxiety and academic performance have a negative relationship.[4] Anxiety can negatively impact cognitive functioning, attention, and memory, leading to poor academic performance. This further exacerbates anxiety levels, creating a vicious cycle that can be difficult to break. Due to poor concentration, anxiety drains energy and students stray away from learning, which is important for securing good grades.[5] Students suffering from anxiety disorders fail to meet their learning goals, as they are unable to balance time spent on extra-curricular activities and the time required for education. Medical students experiencing high levels of anxiety can lead to decreased academic performance, including poorer grades, reduced clinical performance, and increased risk of burnout.[6] From an academic perspective, it can be deduced that anxiety reduces academic performance as students face concentration issues as a result of it. [7]

Worrying and being emotional are two mechanisms by which the body shows a natural response to anxiety. However, students with high levels of self-efficacy can better cope with anxiety and manage stress, which improves their academic performance.[8] Such students are more likely to view challenges as opportunities for growth and have a greater sense of control over their academic success. Additionally, self-efficacy helps students persist through difficult tasks and setbacks, leading to better academic outcomes in the long run.[9] Self-efficacy exerts an influence on the beliefs individuals have concerning their capabilities. This belief enhances the academic performance of students.[10] Students affected by anxiety face distraction from various tasks as a result of being overburdened with stressors.[11] Students rich in self-efficacy are less anxious when it comes to academic performance.[12] inquired 610 adult male participants to go through experimentation to test and deduce the effect of anxiety and self-efficacy. Master degree students performed better than undergraduate students as they had greater belief in their activities. Anxiety is the body's emotional response for which the autonomic nervous system is responsible. The system elevated heart rate as well as sweating in the event of a major stress-like examination[11,12] Students possessing greater self-efficacy and belief in their skill set can prevent these physiological responses from hurting themselves[2]. Moreover, students with high self-efficacy make a mental picture of themselves succeeding and are more trustful of their skills and abilities.[2]

In contrast, medical students who view themselves as incompetent become demotivated while attempting difficult tasks and tended to focus on the possibility of negative results. Medical students with low self-efficacy shy away from gaining required knowledge which could greatly increase their probability of being successful.[9] Such students view themselves as less intelligent or incapable of completing a task when handed one. Students with unsatisfactory performance view tough tasks as threatening and blame their internal negative traits as being respon-

sible for failure. This negative perception of themselves elevates test anxiety and rapidly decreases their performance[13]. Therefore, developing self-efficacy should be a key priority for medical students. Self-efficacy can be achieved through various means, such as providing opportunities for students to practice and receive feedback on their skills, setting realistic goals, and offering support and mentorship.[14] By promoting self-efficacy, medical schools can help students build the resilience to succeed in their studies and careers.

Keeping in view the above literature, it can be hypothesized that greater levels of self-efficacy and decreased anxiety can lead to improved academic performance. Effects of anxiety and less self-efficacy can be managed by the examination of short-term scenarios. Both self-efficacy and anxiety play a major role in students' academic performance. Increased anxiety can potentially decrease academic performance but as self-efficacy builds up greater self-confidence and self-belief, academic performance can be improved. Therefore, we postulate:

H1: *Self-efficacy will moderate the negative relationship between anxiety and academic performance such that the effect between anxiety and academic performance will be much stronger(weaker) when self-efficacy is high (low).*

Methodology

The research employed a quantitative design to investigate the factors influencing academic performance among medical students. The study adopted a cross-sectional time frame and utilized a survey with a structured questionnaire as the primary data collection method. The unit of analysis for this study comprised medical students enrolled in public sector medical colleges affiliated with the University of Health Sciences (UHS) in Lahore. The public medical colleges inclu-ded in this study were Allama Iqbal Medical College, Ameer-ud-Din (PGMI) Medical College, Services Institute of Medical Sciences, and Shaikh Khalifa Bin Zayed Al-Nahyan Medical & Dental College. The Study conducted after taking ethical approval from these institutes. (Ref no. SZMC/IRB/161/2021), (Ref no. IRB/2021/881/SIMS), (Ref no. 117/05/08/2021/-S2ERB), (Ref no. 7389/PGMI/AMC). The target population encompassed all medical students within these colleges. Convenience sampling was employed to collect data from medical students meeting the inclusion criteria, which required their medical institution to be recognized by UHS, located in Lahore, and be studying in the 2nd to final year of MBBS. First-year students were excluded as they had not yet taken their professional examination, making academic scores unavailable.

In a previous study conducted by Zhang X et al.[1] a negative correlation of -0.2 was found bet-ween anxiety levels and academic performance among medical students. Based on this existing literature, and considering a significance level of 5% and a power of 90%, we determined the necessary sample size using the formula $N=[(Z\alpha + Z1\text{-}\beta) / r]^2$. By substituting the respective values ($Z\alpha = 1.96$, $Z1\text{-}\beta = 1.28$, $r = -0.2$), we calculated the required sample size to be 259 medical students.

For the present study, a researcher-administered closed-ended questionnaire was utilized to collect responses from medical students. Ethical approvals from the institutional review board of all medical colleges were taken. Care was taken to ensure that participants were provided with informed consent and that the questionnaire minimized researcher bias. Moreover, respondents were not coerced into providing socially desirable responses, thereby promoting the collection of genuine and unbiased data.

To measure academic performance, we employed two methods. Firstly, marks in the form of percentages from the previous professional examination were observed. We categorized marks into six groups

Table 1: *Demographic Characteristics of Sample Respondents*

Demographic Characteristics	N	Percentage %
Gender		
Female	155	59.8
Male	104	40.2
Education Background		
MBBS 2nd Year	65	25.1
MBBS 3rd Year	65	25.1
MBBS 4th Year	65	25.1
MBBS Final Year	64	24.7
Previous Professional Exam Marks		
Less Than 60% of Marks	52	20.1
60-70% Marks	136	52.5
70-80% Marks	68	26.3
80-90% Marks	3	1.2

(<60%, 60-70%, 70-80%, 80-90%, and >90% marks). Secondly, an academic performance scale developed by (Yu et al., 2018)[16] was used. Items for measuring PROMIS anxiety were adopted from (Pilkonis et al., 2011),[17] and for self-efficacy, Schwarzer and Jerusalem[18] scale was used.

Results

Table 2: *Descriptive and Correlational Analysis.*

Variables	Mean	S.D	1	2	3	4
Anxiety	3.89	.667	1	0.828		
Academic Performance	2.15	.816	-.311**	1	0.817	
Self-Efficacy	3.67	.528	-.451**	.200**	1	0.606

Note: ***P < 0.05, Values in diagonal and red are the Cronbach alpha values depicting reliabilities of the scales.*

Table 3: *Model Testing Results for Moderation Analysis.*

Variables	B	P-Value	LLCI	ULCI
Constant	.4784	.7972	-3.184	4.140
Anxiety	.5345	.2595	-.3969	1.853
Self-Efficacy	.8350	.1077	-.1837	.1.853
Interaction Term	-.2405**	.0519	-.4930	-.0121

Outcome Variable: Academic Performance
Note: *B= Standardized Regression Weights. Values in parentheses are standard errors. LLCI (lower-level confidence interval) and ULCI (upper-level confidence level). Interaction Term: Anxiety * self-efficacy **p< 0.05*

Descriptive and Correlational Analysis

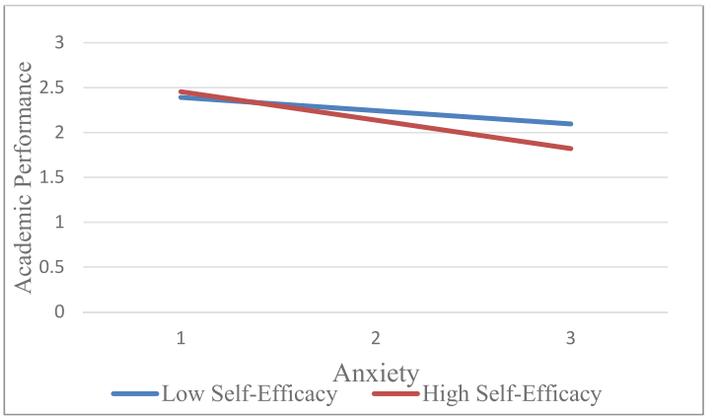
The data revealed that the medical students stated poor levels of academic performance (M= 2.15, SD=0.816). The finding reveals that medical students reported higher levels of anxiety with (Mean of 3.89, Standard Deviation of .667) which means they often felt anxious due to social media overload. Medical students depicted moderate levels of self-efficacy (Mean of 3.67, Standard Deviation of .528).

A Pearson correlation test was conducted which revealed that anxiety had a positive significant correlation with academic performance among medical students ($r = -0.311$, $P < 0.05$). This means that when medical students are anxious their academic performance tends to suffer. The results also indicate that self-efficacy and anxiety had a negative significant correlation ($r = -0.451$, $P < 0.05$). This means that the more medical students have self-efficacy the less anxious they are. Careful tabulation of facts and figures generated the correlation matrix shown in Table 2.

Model Testing for Moderation Analysis

The moderation effect of self-efficacy in the relationship between anxiety and academic performance was examined through PROCESS Macro Model[1]. The results in Table 3 indicate that moderating role of self-efficacy in the relationship between anxiety and academic performance was significant (Interaction Term=-.2405, p<0.05), thus supporting hypothesis[1]. Results showed that the interaction between anxiety and self-efficacy was negatively related to academic performance. The interaction effects were plotted using Stone and Hollenbeck's (1989) procedure. Specifically, we computed the slopes using one standard deviation below and above the mean of the moderating variable self-efficacy. Figure 1

shows that anxiety was more negatively (strongly) related to academic performance when self-efficacy was high (Effect= -.4759, $p < 0.05$, CI [-.6902 to -.2616]). Moreover, anxiety was less negatively (weakly) related to academic performance when self-efficacy was low (Effect = -.2221, $p < 0.05$, CI [-.4234 to -.0208]).



Thus, Hypothesis 1 was also supported.

Figure 1: *Moderation Effect of Self-Efficacy*

Discussion

Study findings show a significant moderating role of self-efficacy in the relationship between anxiety and academic performance. Our results state that when medical students face anxiety which occurs as a result of social overload their academic performance is decreased however this does not apply to medical students with high self-efficacy. Medical students with low self-efficacy who see themselves as incompetent, easily lose motivation when they try to attempt tough tasks and focus too much on potential failure. They keep thinking about how they can fail which can negatively impact their lives. They fail to gain knowledge as a result which could have enhanced their chances of gaining success. Such students see themselves as unintelligent and less capable of task completion. Medical students who perform poorly see difficult tasks as a threat and place responsibility on their internal negative traits as causes of failure. This negativity enhances anxiety and deteriorates their performance. Greater levels of self-efficacy have a different effect. Medical students with high self-efficacy picture themselves as being successful in their minds and trust their academic skills more when affected by anxiety[10]. The relationship that exists between self-efficacy and anxiety as well as academic performance in various academic fields is supported by empirical evidence. Eakman et al.[19] discovered that self-efficacy has a positive relation with academic performance with anxiety having a negative relation to academic performance. When self-efficacy tools were taught to science students along with anxiety management their academic performance vastly improved compared to students who were taught regularly. [20]

The study employed a cross-sectional design, collecting data at a single point in time, which limited the ability to establish causal relationships or determine interconnections among variables. The findings may not be generalized as they were based only on a sample of 259 medical students from Lahore. Future research should consider longitudinal data and include public medical colleges from other cities in Pakistan and private medical colleges. Self-reporting may have introduced the possibility of common method bias, and future studies could mitigate this by employing alternative data collection techniques.

Conclusion

The study results have shown that anxiety can have a negative impact on academic performance. However, having a high level of self-efficacy can buffer this negative relationship. Medical students with high self-efficacy believe they can cope with the demands of medical school and are less likely to experience anxiety in response to academic stressors. Additionally, these students are more likely to seek out resources and support when needed, further enhancing their ability to succeed academically.

Limitations

1. The use of cross-sectional study design might prevent the capacity to conclude causality as data was gathered at a single point in time.
2. By using the data that was self-reported a response bias may occur.
3. The results may not be generalized because the students surveyed belong only to one city.

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Authors Contribution

MAA: Conceptualization of Study
HS: Literature Search
HS: Statistical Analysis
MAA: Data Collection and Analysis
MAA: Writing of Manuscript
SQB: Drafting, Revision

All authors are equally accountable for accuracy, integrity of all aspects of the research work.