

Original Research Article

Investigating association of residential status with depression, anxiety and stress levels among undergraduate medical students: a comparative cross-sectional study

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ABSTRACT

Background: The study was done to compare the prevalence of depression, anxiety, and stress between hosteller and non-hosteller medical students and to determine the association between type of residence and scores on the depression anxiety stress scale-21 (DASS-21).

Methods: The study included 219 MBBS students selected through convenience sampling. A structured questionnaire consisting of demographic details and the DASS-21 scale was used to collect data. The data was entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 27.0. The Mann-Whitney U test was applied to compare DASS-21 scores between hostellers and non-hostellers, while the Chi-square test assessed the association between residential status and categorical severity levels.

Results: Out of 219 participants, 111 were non-hostellers, and 108 were hostellers. Descriptive analysis indicated a higher prevalence of extremely severe depression, anxiety, and stress among non-hostellers. However, no statistically significant difference was observed between the two groups in depression ($p=0.272$), anxiety ($p=0.290$), or stress ($p=0.706$). Similarly, no significant association was found between residential status and categorical severity levels of depression ($p=0.781$), anxiety ($p=0.812$), or stress ($p=0.665$).

Conclusions: Residential status was not significantly associated with depression, anxiety, or stress among medical students. However, higher prevalence among non-hostellers suggests that additional factors may contribute to psychological distress among medical students in Pakistan. Institutional-based mental health support programs and policy interventions are urgently needed to address this issue.

Keywords: Anxiety, DASS-21, Depression, Residential status, Stress

INTRODUCTION

Stress, according to the WHO, is a state of worry or mental tension caused by a difficult situation. WHO defines anxiety as the state of excessive fear and worry, while depression is characterized by a low mood or loss of pleasure or interest in activities for long periods of time.¹⁻³

Just like other mental health disorders, the assessment of stress, anxiety, and depression levels has been an important area of study because of the unavailability of a complete and perfect tool initially to evaluate mental health disorders. In terms of experimental techniques of evaluating mental health disorders, including stress, biochemical markers like blood pressure and heart rate have been used, despite their lack of validity.⁴ However, in non-experimental techniques for evaluation of mental health disorders, the depression anxiety stress scale

(DASS) has been frequently used, as in Ali et al and Elbay et al.^{5,6} The DASS has been assessed for its validity worldwide in studies such as those by Zanon et al and Akhtar et al.^{7,8}

In today's world, it's fair to say that people are more stressed than people who lived a few years or decades ago. A large number of people exposed to stress are students. Studies are known to contribute to stress in a person's life, which decreases their overall well-being, as concluded by Li et al, who reported that low stress levels lead to better well-being.⁹ Another study by Emmerton et al, conducted among 820 university students, showed that, compared to previous years, stress levels and their severity increased among university students due to academics, poor sleep quality, and pressure to succeed.¹⁰ Medical studies are considered among the toughest in the world. Thus, medical students tend to experience more stress than non-medical students, as established in a study by Seedhom et al in Egypt.¹¹ Apart from these factors, a student's residence also seems to play a major role in their overall stress levels, as demonstrated in a study by Narang et al, which showed that stress levels differed significantly between hostellers and non-hostellers.¹²

In South Asia, some work has been done on medical studies and stress. Chauhan et al established that the extensive medical curriculum, frequent exams, high parental expectations, and homesickness were the major factors causing stress among medical students.¹³ In Aghajani et al, a 42-question version of DASS was used on medical students of Islamic Azad University in Tehran, and the results showed more than 35% prevalence for all three components (depression, anxiety, stress).¹⁴

In Pakistan, multiple prevalence studies have examined stress levels among medical students, including Tariq et al and Umbrin et al.^{15,16} A comparative study of medical and non-medical students in KPK, Pakistan, conducted by Bibi S et al found that medical students experienced more stress than their non-medical counterparts.¹⁷

In the study that we conducted, the objectives were as follows: to compare the prevalence of depression, anxiety, and stress levels between medical students residing in a hostel vs non-hostellers, and to determine the association between the type of residence and the score on the depression anxiety stress scale-21.

METHODS

This comparative cross-sectional study was conducted among MBBS students at Al Nafees Medical College and Hospital, Islamabad, from January 2025 to March 2025. A total of 219 students were selected using the Raosoft sample size calculator with a 95% confidence level and a 5% margin of error. MBBS students who gave consent were included in the study. Of these, the following students were excluded per our study's exclusion criteria:

students diagnosed with any chronic illness and/or taking medications; students diagnosed with any mental health disorder before joining MBBS; and students residing away from home (those living with relatives).

A non-probability convenience sampling technique was used. Data were collected simultaneously from students across five academic years, from the first to the final year, using a self-administered, pre-tested DASS-21 questionnaire. Pre-testing was conducted as a pilot study with 10 participants, and their data were excluded from the results. The questionnaire collected demographic information, including participants' roll numbers, ages, genders, academic years, and types of residence. DASS-21 followed this. Written informed consent was received on each questionnaire.

SPSS version 27 was used for data entry and analysis. Descriptive statistics were computed, after which analytical tests were conducted to assess the correlation between a participant's residence type and their DASS-21 score and category for each subscale (depression, anxiety, and stress). The institutional review committee granted the study ethical approval.

RESULTS

A total of 219 medical students participated in the study, comprising 111 non-hostellers (50.7%) and 108 hostellers (49.3%). The sample included 110 males (50.2%) and 109 females (49.8%), with students enrolled across all five academic years. The demographic profile of the participants is presented in Table 1.

Table 1: Demographic profile of study participants (n=219).

Variables	Category	N (%)
Gender	Male	110 (50.2)
	Female	109 (49.8)
Age group (years)	18-19	22 (10.0)
	20-21	73 (33.3)
	22-23	88 (40.2)
	24-25	35 (16.0)
	>25	1 (0.5)
Academic year	1 st year	50 (22.8)
	2 nd year	40 (18.3)
	3 rd year	42 (19.2)
	4 th year	50 (22.8)
	5 th year	37 (16.9)
Residence type	Non-hostellers	111 (50.7)
	Hostellers	108 (49.3)

The Shapiro-Wilk and Kolmogorov-Smirnov tests were conducted to assess the normality of depression, anxiety, and stress scores. All three variables showed significant deviations from normal distribution ($p < 0.05$), indicating the need for non-parametric tests for further analysis. Descriptive analysis of psychological status using the

DASS-21 scale revealed that for depression, 30.1% of students were in the normal category, 10% mild, 21% moderate, 16.4% severe, and 22.4% extremely severe. For anxiety, 18.7% were in the normal category, 8.2% mild, 21.9% moderate, 14.6% severe, and 36.5% extremely severe. In terms of stress, 37% were in the normal range, 14.2% in the mild range, 27.4% in the moderate range, 11% in the severe range, and 10.5% in the extremely severe range. The Mann-Whitney U test was applied to compare psychological outcomes between non-hostellers and hostellers. Non-hostellers had relatively higher mean ranks compared to hostellers across all three domains- depression (114.63 versus 105.25), anxiety (114.45 versus 105.43), and stress (111.59 versus 108.37), depicting that non-hostellers were more exposed- but these differences were not statistically significant, with *p* values of 0.272, 0.290, and 0.706, respectively. Further, Chi-square tests revealed no significant association between type of residence and the categorized levels of depression ($\chi^2=3.509$, *df*=4, *p*=0.477, Cramer's *V*=0.127), anxiety ($\chi^2=3.994$, *df*=4, *p*=0.407, Cramer's *V*=0.135), or stress ($\chi^2=1.622$, *df*=4, *p*=0.904, Cramer's *V*=0.086). These findings indicate that there is no statistically significant difference in depression, anxiety, or stress levels between non-hostellers and hostellers in this sample of medical students (as presented in Figure 1).

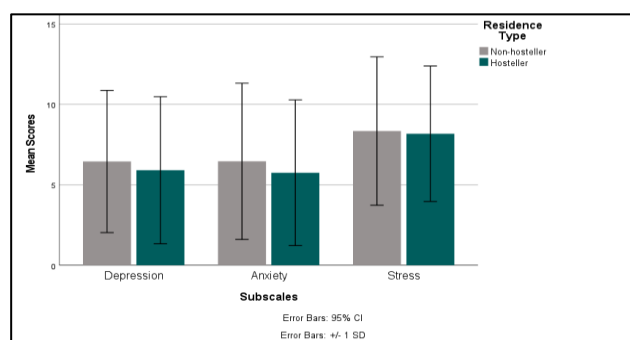


Figure 1: Mean DASS-21 scores for depression, anxiety, and stress subscales among the participants, grouped by residence type.

To assess whether academic year influenced depression, anxiety, or stress levels, Kruskal-Wallis tests were performed across five academic year groups. The results indicated no statistically significant differences in total depression scores (*H*=1.219, *p*=0.875), anxiety scores (*H*=0.604, *p*=0.963), or stress scores (*H*=5.178, *p*=0.270) between students of different academic years. This suggests that the academic year did not significantly impact the psychological distress levels and was unlikely to confound the primary association between type of residence and mental health outcomes.

DISCUSSION

Depression, anxiety, and stress have become common psychiatric disorders globally among students in any

field.¹⁸ Out of these, medical students are more exposed to these psychiatric disorders than non-medical students. An extensive curriculum, difficult examinations, financial strains, and high competition in the medical field are the main causes. In addition to academics, residing away from family, lack of emotional support, irregular sleep patterns, high social expectations, and other factors can all lead to these disorders. According to this study, a significant percentage of medical students reported extremely severe depression (22.4%), extremely severe anxiety (36.5%), and severe-to-extremely severe stress levels (10.5%) through descriptive analysis. This highlights that the presence of mental health issues is still common among medical students of Pakistan, requiring interventions on a national level to safeguard the mental health of medical students.

Some previous studies, like Rizwan et al and Jawed et al, showed that residence does play an important role, and that hostellers experience significantly more stress and anxiety than non-hostellers.^{19,20} However, according to the Mann-Whitney U test or Chi-square analysis, our study found no statistically significant difference in DASS-21 scores between the two groups (*p*>0.05), which is supported by other published studies like Totuka et al and Munir et al.^{21,22} Various reasons could explain the lack of significant differences between hostellers and non-hostellers in our study. Firstly, both groups experience similar academic pressures, such as heavy coursework, frequent tests, extended study hours, and the need to perform well, which may diminish the impact of their residence. Secondly, modern hostile environments and students' preference for residing in shared flats with peers might offer better social support, enhanced facilities, and opportunities for friendship, which can alleviate the stress usually associated with hostel living. Lastly, non-hostellers might face unique stressors that hostellers do not, such as long travel times, family obligations, and household distractions. These factors may equalize the psychological stress between the two groups, leading to similar levels of distress.

In addition, Pakistan's cultural and social context is another problem. Students may be discouraged from promptly seeking professional psychological care due to the persistent stigma associated with mental illness. Because of this, anxiety and depression symptoms could go untreated and possibly worsen. The study's overall high prevalence of depression, anxiety, and stress definitely warrants attention and suggestions to adopt different strategies, either by medical institutions or by students themselves. Medical colleges in Pakistan should implement multifaceted support strategies that integrate individual, educational, and institutional interventions to address these psychological problems promptly.

Evidence suggests that structured mental health programs, including stress management workshops and mindfulness-based interventions can effectively reduce stress, anxiety, and depressive symptoms. Programs for

peer support and mentorship can promote a feeling of community, normalize seeking help, and lessen stigma, which is a major hurdle in receiving quality mental health care in medical institutions. The literature also highlights the significance of resilience development, coping skills training, and psychoeducation. Additionally, digital tools, including mobile and web-based platforms, can raise awareness of various coping mechanisms for these psychiatric disorders. Lastly, mental health screening, confidential counselling sessions, and active participation of academic policymakers are essential to protect the psychological well-being of medical students of Pakistan.

Our study also revealed no notable differences among academic years, as indicated by the Kruskal-Wallis analysis, similar to the study by Fitri et al.²³ Conversely, this differs from certain studies, including Sungoh et al, that propose that stress is highest in the initial and final years of medical students due to adjustment difficulties and exam-related pressures.²⁴ The consistency in our results suggests that academic stressors may be evenly distributed across all years at this institution, or that the college environment exerts a uniform psychological effect on students regardless of year of study.

Hence, this study established that residential status might not be a single factor determining the depression, anxiety, and stress levels, but also that these psychiatric disorders cannot be ignored among medical students. This highlights the importance of addressing common academic and personal stressors and exploring other causes to improve mental health support for medical students in Pakistan.

This study offers valuable insights into the mental health status of undergraduate medical students by comparing depression, anxiety, and stress levels between hostellers and non-hostellers using the validated DASS-21 scale. A notable strength of the study is its balanced sample size and nearly equal representation of both residential groups, enhancing the reliability of the comparative analysis. Furthermore, the use of both categorical and continuous data analyses, with Chi-square and Mann-Whitney U tests, enabled a comprehensive evaluation of group differences.

However, certain limitations should be acknowledged. First, the cross-sectional nature of the study limits the ability to draw causal inferences about the relationship between residential status and psychological outcomes. Second, the study was conducted in a single institution, which may limit the generalizability of findings to other medical colleges with different environments and stressors. Third, reliance on self-reported data introduces the possibility of reporting and recall bias. Lastly, the study did not account for other confounding variables such as academic pressure, family issues, financial concerns, or personal coping strategies, which may significantly influence mental health outcomes.

CONCLUSION

This analytical cross-sectional study using the DASS-21 tool found no statistically significant differences in depression, anxiety, or stress levels between hostellers and non-hostellers among medical students. Although non-hostellers had slightly higher mean ranks across all three psychological outcomes, these differences were not statistically significant in either the Mann-Whitney U test or the Chi-square test. In contrast, descriptive analysis showed an overall higher prevalence of depression, anxiety, and stress in non-hostellers. The results suggest that residential status alone does not have a substantial impact on the mental health status of medical students. These findings underscore the importance of considering a broader range of factors- such as academic workload, personal coping mechanisms, social support systems, and individual resilience- when addressing psychological well-being in medical education settings of Pakistan.

Recommendations

Future research should address these variables and consider longitudinal designs to understand better the evolving psychological status of medical students in Pakistan.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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