

Research Article

Gender and Class-wise Comparison of Stressors and Perceived Levels of Depression, Anxiety and Stress among the 2nd Versus 5th Year Medical Students: A Concurrent Mixed Method Study

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Abstract

Background: Medical profession is being dominated by female students, but little attention is being paid on making them emotionally and physically competent to match their corresponding gender with whom they have to work in parallel in the near future. Research is crucial in this area to identify their needs and provide solutions.

Objectives: To identify female and male gender-related depression, anxiety and stress (DAS) among the undergraduate medical students enrolled in the second versus final year of University College of Medicine and Dentistry (UCMD), The University of Lahore (UOL) and highlight the intricate web of stressors that these medical students encounter.

Method: A concurrent mixed method study was conducted on a random sample of 200 medical students of 2nd and 5th year with equal gender distribution. DASS21 scale was used to assess Depression, Anxiety and Stress. Qualitative and quantitative data were collected on Google forms. Quantitative data were analyzed descriptively and the qualitative data by manual thematic analysis

Results: The 2nd year female students had significantly higher stress than their male counterparts. No statistically significant difference was appreciated within the 5th year gender wise though the females had relatively higher DASS levels. No significant difference on DASS21 was observed within the same gender between the two academic years. The female and male students reported fear of failure and less preparation time versus syllabus load as their major stressors respectively.

Conclusion: The study has identified the stressors that influence the wellbeing of medical students and presented their depression, anxiety and stress comparison with respect to their gender and seniority. It has indicated the need to empower females emotionally at the level of their upbringing to formative medical years. Furthermore, male students must learn to manage time and be responsible doctors.

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Keywords | Depression, Anxiety, Stress, Stressors, Gender, Medical students



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Introduction

The medical curriculum of UCMD, UOL, has been developed to provide qualified, skilled and strong willed graduates to the community. The curriculum is

run as a theme based modular system with both vertical and horizontal integration.

Medical education is considered as one of the most stressful of all fields of education due to its evolving curricular challenges across the world.¹ Depression is a state of mental disorder that involves a decreased self-image which affects mood, interest, energy, sleep and appetite. Anxiety is an outcome of the trouble anticipation by human mind that gives a feeling of dis-ease. On the contrary, the reaction to a challenge in terms of tension, irritable behavior or loss of concentration is referred to as stress. These conditions have their influence on the mental health.² Despite the fact that only 50% of Pakistani women are literate, around 70% women are able to occupy the merit seats in Pakistani medical schools.³ This gender disproportion poses its own challenges and stressors. For senior female students, the clerkship year (5th year) may have an integral role in exposing them to an elevated level of stress, but; the South-Asian culture norms pressurize the female medical students to seek good proposals in the final year besides passing the exam due to preference of doctor brides, even against their personal choice.⁴ With such a challenging situation, it becomes imperative to make sure that every student, male and female; is harnessed with compulsory skills to navigate the intricate web of stressors that comes with the dimension of healthcare. Provision of mental health consultation especially to female medical students has been reiterated in a Syrian study.⁵ The purpose is to foster a conducive learning environment for the personal and professional growth of the future doctors and mothers who are responsible for upbringing of the society.⁶ It has already been established that medical students have a relatively higher risk to depression, anxiety and stress than non-medical students.⁷

Our earlier study at a Pakistani medical school established higher stress on perceived stress scale among female medical students in comparison with male students but did not measure depression or anxiety.⁸ Stress originating from emotional factors has been shown to dominate over that induced by environmental factors in a Pakistani medical school but with no difference among gender among hostel residents sharing similar environment.⁸ Likewise, another study in the current institute conducted on female students exposed to traditional curriculum revealed significant association of pre-exam depression, anxiety and stress with sleeping pulse

and total Leucocyte count (TLC) Levels but did not compare with male gender.²

Gender-related stress in medical students is becoming a significant area of research interest.¹¹ However, there is paucity of literature on its association with different levels of curriculum (second year/final year), especially at institutes with the additional challenge of vertically and horizontally integrated modular curriculum; where students, in addition to collaborating different subjects of same year are exposed to hospital environment and patients from first year that can lead to increase in stress levels. The current study digs into the complex crescendo of gender-related stress experienced by students, with a specific focus on the disparities between senior and junior female students and their male counterparts exposed to modern integrated modular curriculum in Pakistani cultural context instead of mentoring and well-being support system. Furthermore, the present study's qualitative parameter identifies the themes out of the sources of stress and suggests reformative action.

Methods

This research employed a concurrent mixed-method study design. Ethical approval was obtained from the institutional review board (ERC/47/23/04). Participant confidentiality, informed consent and adherence to ethical guidelines were ensured. The inclusion criteria involved males and females, Second and Fifth-year medical students of batches inducted in 2021 and 2019 respectively at UCMD, Lahore. The study was conducted between August 2023 to October 2023 after receiving ethical approval. The aim was to evaluate the entering versus exiting students of the medical college. However, being apprehensive that the freshmen facing a new curriculum from diverse backgrounds could act as a confounding factor, we decided to enroll the second year students as our starting point when the students become familiar enough to embrace the change. Third year and fourth year students were not included in the study as we did not expect a quick shift in DASS levels over a short period of time. We rather inducted the final year students as our exiting students and compared their DASS score and stressors with the second year students, gender-wise.

The quantitative data was collected using Depression, Anxiety and stress scale with 21 items (DASS-21). DASS-21 is a widely published self-reporting questionnaire, having three subsets each dedicated to depression, Anxiety and stress respectively. The participants rated

the extent to which each statement applied to them on a Likert scale. The data regarding sources of stress was collected by adding a question at the end of the questionnaire. Data was collected on a Google form within a week before the combined block assessment (CBA) and serial order was given to data set on excel sheet for anonymity. Furthermore, the CBA of both the classes was taking places at the same point in time, thus providing the opportunity for cross-sectional data collection making it feasible to conduct a comparative research on the students of 2nd and 5th years. The link of the consent and subject information form was circulated in the official WhatsApp groups of both the 2nd year and 5th year medical students with a total of 150 students in each group. Out of the total study population of 300 students, a sample size of 169 was calculated using OpenEpi, version 3 using the formula:

Sample size $n = [DEFF * Np(1-p)] / [(d2/Z21-\alpha/2*(N-1)+p*(1-p)]$, for 95% confidence interval.

We randomly incorporated 220 responses instead of 169 in anticipation of 10-15% attrition. Out of them subgroups of 50 males and 50 females from each class were selected by stratified random sampling to cater each gender category (Table 1). The quantitative data provided numerical indicators of stress levels, facilitating comparison and statistical analysis on chi-square test using SPSS version 25. The qualitative data on the sources of stress were subjected to manual thematic analysis⁽¹¹⁾, identifying recurring themes, patterns, and perspectives related to gender-related stress in subjects of both the academic years.

Results

The results are represented in the following charts and tables.

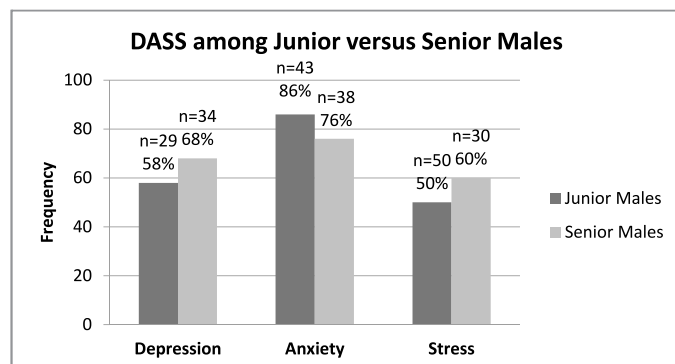


Figure 1. Overall frequency of depression, anxiety and stress among the junior versus senior male students with no significant difference in depression (p value 1.00), slightly significant in anxiety (p value 0.05*)

and no significant difference in stress (p value 0.32)

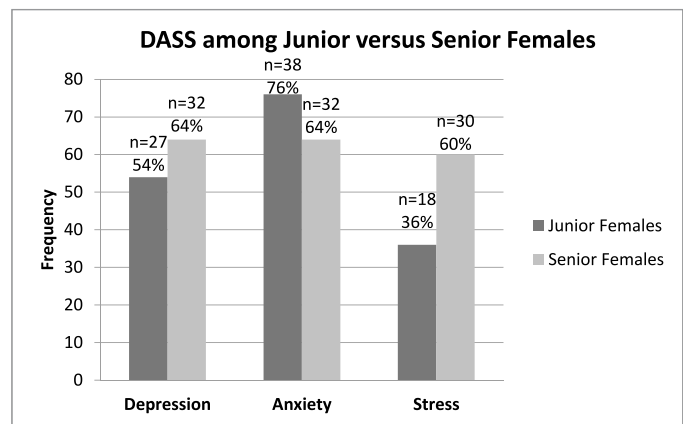


Figure 2. Overall frequency of depression, anxiety and stress among the junior versus senior female students with no significant difference in depression (p value 0.3), anxiety (p value 0.2) and stress (p value 0.42)

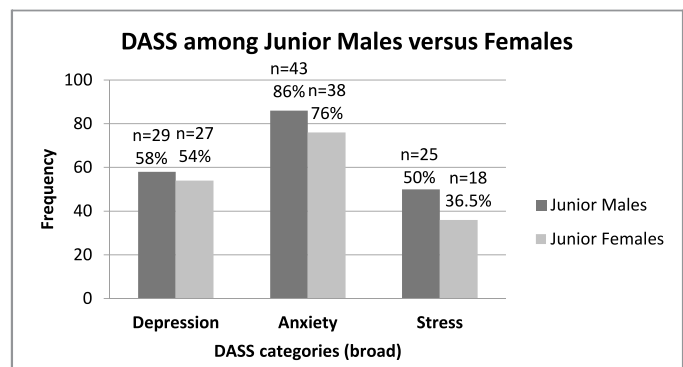


Figure 3. Overall frequency of depression, anxiety and stress among the junior male versus female students with no significant difference in depression (p value 0.53), anxiety (p value 0.42) and stress (p value 0.84)

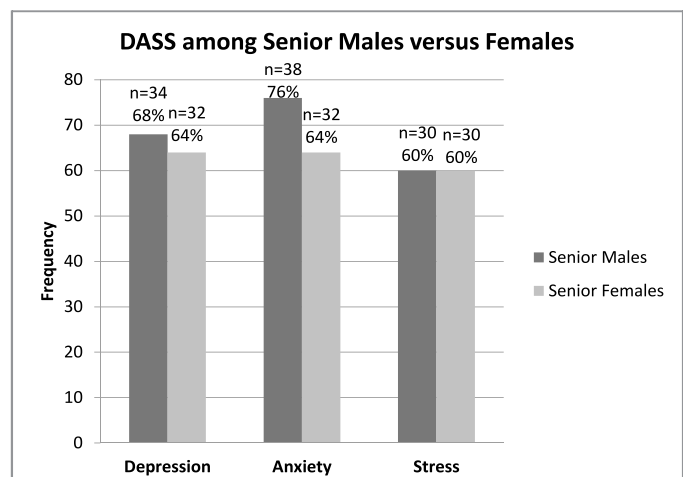


Figure 4. Overall frequency of depression, anxiety and stress among the senior male versus female students with no significant difference in depression (p value

0.10), highly significant difference in anxiety (p value 0.001) and no significant difference in stress (p value 1.0)

The top qualitative themes that were extracted manually in each class included poor self-esteem and fear of failure, revision time versus syllabus, procrastination and time management and sleep issues. Whereas personal/health issue was restricted to second year class only and appetite versus physical activity imbalance was identified

only from final year class (Table 2).

Major concern among the females of junior as well as senior class was poor self-esteem/fear of failure. On the other hand, less revision time versus syllabus load for revision in combined block exam's preparation leaves was the major stressor for junior as well as senior boys (Table 2).

The latent themes among females seem to be parental

Table 1: Demography along with Depression, Anxiety and Stress category among the senior versus junior students within the same gender.

Parameter		Frequency	Percentage		
Gender	Male	100	50%		
	Female	100	50%		
Education Level	Second Year	100	50%		
	Final Year	100	50%		
Age (Second Year)	Mean \pm SD	20.9 \pm 9.3			
Age (Final Year)	Mean \pm SD	24.6 \pm 11.2			
DASS Parameter	DASS interpretation	Junior Males	Senior Males	Chi square	p value
Depression	Normal (0-9)	21(56.8%)	16(43.2%)	3	1.00
	Mild (10-13)	8(50%)	8(50%)		
	Moderate (14-20)	8(38.1%)	13(61.9%)		
	Severe (21-27)	5(41.7%)	7(58.3%)		
	Extremely Severe (≥ 28)	8(57.1%)	6(42.9%)		
Anxiety	Normal (0-7)	7(36.8%)	12(63.2%)	1.40	0.05*
	Mild (8-9)	4(66.7%)	2(33.3%)		
	Moderate (10-14)	14(56%)	11(44%)		
	Severe (15-19)	6(40%)	9(60%)		
	Extremely Severe (≥ 20)	19(52.9%)	16(47.1%)		
Stress	Normal (0-14)	24(54.5%)	20(45.5%)	5.60	0.32
	Mild (15-18)	3(30%)	7(70%)		
	Moderate (19-25)	10(47.6%)	11(52.4%)		
	Severe (26-33)	7(43.8%)	9(56.3%)		
	Extremely Severe (≥ 34)	5(63.5%)	3(37.5%)		
DASS Parameter	DASS interpretation	Junior Females	Senior Females	Chi square	p value
Depression	Normal (0-9)	23(56.1%)	18(43.9%)	1.2	0.3
	Mild (10-13)	9(56.3%)	7(43.8%)		
	Moderate (14-20)	9(52.9%)	8(47.1%)		
	Severe (21-27)	5(38.5%)	8(61.5%)		
	Extremely Severe (≥ 28)	4(30.8%)	9(69.2%)		
Anxiety	Normal (0-7)	12(40%)	18(60%)	3.4	0.2
	Mild (8-9)	6(50%)	6(50%)		
	Moderate (10-14)	12(66.7%)	6(33.3%)		
	Severe (15-19)	7(58.3%)	5(41.7%)		
	Extremely Severe (≥ 20)	13(46.4%)	15(53.6%)		
Stress	Normal (0-14)	32(61.5%)	20(38.5%)	0.01	0.42
	Mild (15-18)	4(25%)	12(75%)		
	Moderate (19-25)	8(61.5%)	5(38.5%)		
	Severe (26-33)	5(38.5%)	8(61.5%)		
	Extremely Severe (≥ 34)	1(16.7%)	5(83.3%)		

and peer pressure that they care about a lot. Furthermore, over-expectation and over-imagination along with lack of self-confidence and resilience among female students irrespective of their academic standard can be read in between the lines. The latent themes among male gender appeared to be irresponsible behavior and over-confidence.

The final year students in general are more concerned about their physical health due to their busy and stressful routine of running between university to hospital to hostel resulting into no protected time for physical activity instead of on-campus sports grounds, gyms and swimming pool. Furthermore, they are also sensitive to the way they are evaluated by their teachers and mentors. On the contrary, the second-year students are more bothered about their mental health but not finding the confidence to report to the well-being committee.

Discussion

The medical curricula are developed with focus on

provision of knowledgeable, skilled and resilient doctors to the community. However, the psychological well-being of future doctors appears as a crucial, proliferating and alarming issue of Public Health affairs.¹² Support strategies such as Mentoring and Well-being programs to equip medical students with the knowledge and abilities to identify their own stress and anxiety and call for help when required is critical to foster competence.¹³ Medicine is a field where both genders are required to work shoulder to shoulder. There may be detrimental effects on the patients' well-being as well as medical students' professional growth by the perpetuation of dominant gender prejudices in the healthcare settings.¹⁴

In the course of our research, a unique finding is that the senior males (n=38; 76%) had significantly higher anxiety (p value 0.001) than the senior females (n=32; 64%) as indicated in figure 4. Likewise, the levels of anxiety were comparatively higher among junior male students (n=43; 86%) when compared to their female counterparts (n=38; 76%) though the difference was insignificant (p value 0.42) as given in figure 3. The

Table 2: Manual Thematic Analysis of 2nd year versus 5th year Medical Students

Top Extracted Themes	Yr. (2nd/5th)	Gender	Code	Sources of Stress as perceived by participant students
Poor self-esteem & Fear of failure	2nd	F	MZ	"I spend a lot of time thinking about failing the exam than actually studying for it"
	2nd	M	BR	"I do not want to embrace my professors in viva as they expect from me."
	5th	F	SF	"I may fail due to constant fear of not acing as per my parents expectations."
	5th	M	WS	"I am stressed about performance but I am also confident."
Revision time vs Syllabus	2nd	M	MA A	"Less time was given to revise, which I am managing by sacrificing other activities".
	2nd	F	MR	"Extensive syllabus, less time and peer pressure to perform well is very stressful."
	5th	M	AA	"Hectic date sheet of combined block assessment is stressful."
Procrastination & Time management	5th	F	HM	"There are back to back exams with no break and syllabus is too much."
	2nd	F	RF	"Not enough time in combined block assessment to study things from scratch."
	2nd	M	BR	"I had six months to prepare for CBA, why did not study?"
	5th	M	HM	"Time management is important but I failed to, so now I feel exhausted and tired."
Personal/Health Sleep issues	5th	F	FW	"My performance is affected as I procrastinate a lot leading to peak anxiety in exam."
	2nd	F	AA	"I have missed my period due to stress and I am having acne and hairloss".
	2nd	M	KI	"I have mild headache and dizziness in exam season."
	2nd	F	FT	"I cannot sleep due to the stress of less time to prepare."
	2nd	M	MA	"I am having a bad sleeping pattern during prep leaves."
Appetite vs Physical activity	5th	F	IQ	"I am unable to sleep due to pounding heart and backache."
	5th	M	TH	"Having disturbed sleep-wake cycle."
	5th	F	FA	"I am binge eating and gaining weight these days."
	5th	M	TH	"No time for physical or mental health."

severity of anxiety reported by junior male participants (n=43; 86%) was only slightly greater than that of the senior males (n=38; 76%). However, the difference between the two was only slightly significant (p value 0.05) as shown in Table 1 and figure 1. These results are contrary to a study in which American female students reported higher distress than males.¹⁵ Similarly, more female midwifery students from Zimbabwe reported severe stress than the male students due to psychosocial and health related issues.¹⁶ Female students from Italy and New York (USA) experiencing higher stress levels than their male counterparts have been reported by allopathic and podiatric domains as well.¹⁷ However, our above results are complemented by the observation on thematic analysis, which reveals under-confidence among our female students in comparison with over-confident but irresponsible attitude among their male counterparts. Gender discrimination in Pakistani society includes less freedom for females in decision making for family or themselves, which is apparently shaking the confidence of females in their ability to outperform the males.¹⁸ This may shape them into hardworking and resilient individuals.

On the other hand, male and female final-year students perceived equal levels of stress (figure 4). While several published studies have indicated statistically significant gender differences in perception of stress,¹⁹ others have not been able to identify statistically significant difference.²⁰ The identical level of stress among final year male and female students in our study may be due to our modular curriculum, where our final year students attend Clerkship module and are exposed to real patients and problems of the community. They have to work and study in the hospital environment rather than the safe environment of lecture theatre and labs. This challenge takes a toll on both male and female students. The most common stressor among junior as well as senior female students was fear of failure whereas among their male class-fellows it was less revision time versus more syllabus load. This gender-based difference regardless of the level of curriculum may be attributed to the differential cultural mindset in the upbringing of girls versus boys. The Pakistani girls are raised in an over-protected environment and are more used to with bearing cognitive pressure and parental decisions, so they develop a relatively low self-esteem. On the contrary, Pakistani boys are nurtured with overconfidence so they hardly

commit that they are under stress, yet they adopt poor attitude towards learning, being egoistic.¹⁸

Published literature displays diverse expressions of depression, anxiety and stress across the academic years. As for depression, a study reveals low depressive symptoms in the first year, which increased over the academic years and became highest in the final year.²¹ However, high levels of depression are also reported in early academic years.²² Our study indicated comparatively higher levels of depression and stress among senior versus junior males. Likewise, same was the case among senior versus junior females. Although this difference was non-significant. This might have its roots in the spiral nature of curriculum with increasing complexity at higher levels.²³ A study demonstrated higher anxiety in final-year students compared to junior-students.²⁴ Another study uncovered a fluctuating pattern of anxiety with highest levels in final-year students followed by first-year and third-year students respectively.²⁵ Our study found higher levels of anxiety in junior-males and junior-females versus their senior counterparts. This is in line with a study in Saudi-population that reveals higher stress among junior males as well as females in comparison with their seniors.²⁶ This difference may be due to the similar cultural and religious values. The higher levels of anxiety among novice males and females may be due to the challenging new learning environment, academic competition, change in eating and sleeping habits along with home sickness in case of living in hostels and lack of coping mechanisms. Studies have reported a fluctuating pattern of perceived stress among medical-students across the academic-years. Literature has reported higher levels of stress among the first-year medical students.^{27,28} Contrarily, the current study indicated higher levels of stress among senior medical students (males and females). This stress in our students is multifactorial. Females experience different stressors in comparison with the male-peers sharing the same academic-environment which might build resilience in the long run. This explains the highly significant anxiety among senior males in comparison with senior females. The learning atmosphere in healthcare-settings is competitive instead of collaborative,²⁹ especially for females due to societal pressures.¹⁹ Fear of failure, being the predominant theme from females of both groups might have its roots in our traditional male dominated society. Females who aim for the medical

career, face the challenge of learning to thrive in male-dominated domains. Around 48-60% of female-learners suffer from sexual-harassment or gender-discrimination during training.¹⁴ This leads to self-doubts and low self-esteem among female-students. The fear of failure in our male students is more related to the expectations of family and friends and difficulty in seeking a good position in future. Similar results are published in a study at Saudi-Arabia.³⁰

The most prominent stressor in male-students appeared to be less revision-time versus syllabus overload. This stressor was reported second in line by female students. The medical curriculum has been shown to be stressful, with syllabus load and assessment frequency.³¹

Procrastination and time-management was reported to be the third important stressor by both senior and junior males and females in the current study. Ineffective time-management leads to higher levels of stress among medical students.³² Time management is a skill of using time smartly and efficiently. Studies indicate that over 70% of students confess academic procrastination.³³ The skill of time management should be inculcated among medical-students to equip them for emergency situations they are going to face in future as practicing doctors.

Personal/health and sleep issues existed down the line of stressors in the current study, which may be a consequence of lack of participation in physical activity and clubs which balance the personality. These factors as stressors have been highlighted in a previous study⁽³⁴⁾.

A longitudinal study could not be conducted to follow the same students across all academic years along with incorporation of the stress coping skills adopted by students through mentoring and wellbeing programs offered to them. However, we plan to take this up.

Conclusion

The female students have been identified as the vulnerable group with lack of confidence to face exam due to fear of failure. Contrarily, procrastination and time-management issue are predominant among males-students. It may be attributed to overprotection and higher parental-pressure on females in our society to perform well in academics. However, the males in our society are encouraged to be outgoing and confident. They might be egoistic to accept their stress due to cultural norms.

They therefore suffer from poor time management due to an irresponsible attitude towards academics. This study opens the eyes of the Pakistani culture that relates with the South-Asian societies, to provide equity and at least equality to the female gender in their upbringing with their male-siblings. We also feel responsible as medical-teachers to encourage the female-students and take care of their mental-health and psychological development so that they are enabled to conduct their responsibilities at par with their male professional colleagues.

Ethical Approval: The Ethical review board approved the study vide letter No. Ref: ERC/ 47/ 23/ 04

Conflict of Interest: The authors declare no conflict of interest.

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Authors' Contribution:

SM: conceived the idea, defended the ethical approval, supervised all steps, data acquisition and interpretation, manuscript writing and final approval of the draft

JU: Acquisition of data, manuscript writing and critical review of the article

SA: Ethical approval writing, initial draft of manuscript and final approval

TF: Data interpretation, manuscript writing and approval of final draft

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