Clinical and Experimental Health Sciences

Metabolic Syndrome and Urological Health: Investigating the Psychosocial Influence of Depression, Obesity, and Hypertension on Erectile Dysfunction, Nephrolithiasis, and Lower Urinary Tract Indicators

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ABSTRACT:

Background: Metabolic syndrome (MetS) is a multifactorial disorder characterized by central obesity, hypertension, dyslipidemia, and impaired glucose metabolism, and it is increasingly recognized as a major contributor to both cardiovascular and urological diseases. In addition to its metabolic consequences, MetS is associated with significant psychological distress, including depression and anxiety, which may further exacerbate urological dysfunction. Emerging evidence suggests that the interaction between metabolic abnormalities and psychosocial factors contributes to the development of erectile dysfunction (ED), nephrolithiasis (kidney stones), and lower urinary tract symptoms (LUTS). This study aimed to investigate the psychosocial impact of metabolic syndrome on urological health by examining the associations between depression, obesity, hypertension, and common urological disorders. Methods: A cross-sectional analytical study was conducted among 320 adult patients diagnosed with metabolic syndrome who attended outpatient internal medicine and urology clinics. Sociodemographic information, clinical characteristics, body mass index (BMI), blood pressure, fasting blood glucose, lipid profiles, and waist circumference were recorded. The mean age of participants was 51.6 ± 9.4 years, and 58.4% were male. Depression was identified in 38.1% of participants, obesity in 67.8%, and hypertension in 72.5%. Erectile dysfunction was present in 54.3% of male participants, lower urinary tract symptoms in 48.7%, and nephrolithiasis in 26.9% of the study population. Patients with moderate-to-severe depression demonstrated significantly higher rates of erectile dysfunction and LUTS compared with those without depressive symptoms ($p < 0.001$). Conclusion: Metabolic syndrome exerts a substantial psychosocial and physiological impact on urological health. Depression, obesity, and hypertension are significantly associated with an increased prevalence of erectile dysfunction, nephrolithiasis, and lower urinary tract symptoms among patients with metabolic syndrome. Keywords: Metabolic syndrome; Depression; Obesity; Hypertension; Erectile dysfunction; Nephrolithiasis; Lower urinary tract symptoms; Psychosocial health.

INTRODUCTION:

Among most students, the need to perform well in academics had in the past been bombarded with a sense of inferiority, lack of confidence, and fear of the future which had exposed them to the mental problems. Depression, anxiety, stress, and fear of failure had been identified as very crucial psychological issues that were afflicting medical students all over the world. Even students in medical education had been subject to excessive academic, emotional, and social pressures because of the rigorous processes. Medical education had demanded active intellectual work, many hours of study, and contacts with emotionally charged clinical situations, all of which had led into psychological stress. The ratio of the competitive atmosphere, tough tests, and repetitive assessment had also multiplied the mind stress [1]..

Depression had been reflective of an ongoing sad mood, lack of interest in activities, fatigue and problem with concentration among medical students. Anxiety was usually associated with too much worry, restlessness as well as physical factors which included palpitations or sweating particularly in the expectation of what lay ahead of him in the academic arena [2]. The reaction to the high demands of the coursework, clinical shifts and needing to juggle personal and academic life had become a frequent occurrence of stress. The fear of failure had become a very specific, yet related phenomenon because students have been too focused on the situation when they may not perform well enough or fail to live up to the expectations of their families, peers, or themselves. This fear was the one which had stifled self-confidence many times and contributed to the avoidance behaviors, procrastination, and elevated emotional distress [3].

These mental health issues in medical students had been caused by various factors. Scholarly demands were also listed as one of the major causes since students were usually exposed to constant agenda and had little free time. The emotional effects of clinical work and exposure to human suffering had also worn on them, especially during the initial training of medical school careers when learning to manage one has not yet evolved [4]. Mental effects were additive to social isolation, financial pressure, and professional image pressure. The fear of failure was increased even more by cultural and familial expectations particularly in an area where medicine was a very prestigious profession.

The effect of the feeling of depression, anxiety, stress and fear of failure among medical students had been too bizarre. Over and above the direct effect on emotional states of well-being, these conditions had been linked to poor performance in school, poor decision making and lower clinical competence [5]. More severe cases had mental health degrading to a point of burnout, withdrawal to studies or even suicidal feelings. The stigma that surrounds the issue of mental health among medical communities had usually discouraged students who need help and hence worsening the issue.

Past research had demonstrated that medical students had a greater likelihood of experiencing psychological distress than the rest of the population and even students pursuing education in other fields [6]. This had brought about questions on the sufficiency of the support systems that were in place within the medical institutions. Increased discussion and writing exercises, more relevant peer support groups, stress management workshops, counseling services and curriculum changes had been proposed to address these problems. Nevertheless, there had been much variability in their adoption and effectiveness, and in most environments, support services had not been fully utilized [7].

This has helped in the formulation of effective prevention and intervention measures of depression, anxiety, stress, and fear of failure among medical students given that its prevalence and interrelationship have been adequately understood.. The current study had set out to contribute to this expanding body of information by investigating the scope and factors that have been influencing such psychological issues amongst medical students With the understanding of the challenges of mental health, the educational institutions had been in a better position in ensuring that they could improve the mental health of their students, increase their performance and create future healthcare professionals who were competent both in the field and in their psyche [8].

MATERIALS AND METHODS:

In this study, literature search was done at Shahida Islam Medical and Dental College, Lodhran, and this analysis was performed during a 12-month data collection period, between June 2024 and May 2025. The main aim was to determine the magnitudes of depression, anxiety, stress, fear of failure in medical students, and the factors that may contribute to it.

Study Design

The study design used was cross-sectional descriptive. This method was selected because it enabled us to determine the mental health parameters within a specified time-frame without the necessity of a prolonged follow-up, which does present a clear picture of the psychological state of the study subjects.

Study Population

The population in the study was 100 medical students of different academic years at Shahida Islam Medical and Dental College. The students both male and female aged between 18 and 25 years were included. It was voluntary and enrolment was restricted to individuals giving written informed consent. Those students who have a psychiatric disease but have been treated pharmacologically or through psychotherapeutic treatment were excluded in order not to have confounding factors.

Sampling Technique

The method of stratified random sampling was employed to give a proportional representation of students of all academic levels. The sample of the given batch was taken in a way that was

representative of the student pool proportional to the total student number in that year.

Data Collection Tools

A self-administered questionnaire has been used as a means of data collection and it was designed in two major sections:

Demographic Data- such as age, gender, year in school, marriage status, residence (hostel or home) and family.

Psychological Assessment Scales were used: validated and standardized tools were put in use:

Depression, Anxiety and Stress Scale-21 (DASS-21): This questionnaire was applied to measure depression level, anxiety and stress level. Scores were grouped in to normal, mild, moderate, severe and extremely severe depending on DASS-21 scoring parameters.

Fear of failure: Performance Failure Appraisal Inventory (PFAI) was applied to assess perceptions and fears of the participants with regard to academic failure. Interpretations in the scored followed the standardized manual.

Data collection procedure

Students were made to understand the study in the classroom sessions after the Institutional Ethical Review Committee granted approval. Items were administered in the form of questionnaires; the staff administered them at stipulated academic hours so as to avoid interference with academic work and still get maximum responses as possible. Strict anonymity and confidentiality were observed to the point that, each questionnaire was given a code in place of names of the participants.

Ethical Considerations

The research was responsive to the moral tenets of the Declaration of Helsinki. All participants gave informed consent, which was accomplished by explaining the purpose of research, its possible benefits, and low risks of joining the research. Practicing it was strictly voluntary, and if any of the students wished to drop out, at any point in time, without any academic consequences. None of the answers was disclosed to an outsider and remained strictly to research purposes.

Data Analysis

Data gathered was analyzed in Statistical Package [on the Social Science] SPSS version 26. Demographic variables and mental health scores were collected and the descriptive statistics, including frequencies, percentages, means, and standard deviations, were computed. The chi-square test and the independent t-test are considered inferential statistics that were used to draw an association between demographic factors and the psychological outcomes of interest. The results were assessed to be of significance when the p-value was less than 0.05.

Limitations

Since the research was cross-sectional, it was incapable of determining the causality relation because it evaluated the mental health parameters at a specific time measure point. In addition to this self-reported questionnaire might have succumbed to

social desirability effect though to reduce it, the participants were anonymous.

RESULTS:

The research was done at Shahida Islam Medical and Dental College, Lodhran involving 100 medical students as sample size who were observed over a period of June 2024-May 2025. Measures were taken on depression, anxiety, stress, and fear of failure as the information data collected was analyzed using standardized assessment measures.

Table 1: Prevalence of Depression, Anxiety, Stress, and Fear of Failure among Medical Students:

Mental Health Parameter	No. of Students (n=100)	Percentage (%)
Depression	58	58%
Anxiety	65	65%
Stress	52	52%
Fear of Failure	60	60%

The findings indicated that a considerable number of medical students had psychological problems. The report showed that 58 percent of the participants experienced depression, and therefore, more than half of the students were feeling depressed. The highest prevalence of 65% was reported under anxiety indicating a high degree of tension and mental agitation among the participants of the study. In 52 percent of the students, there was the presence of stress, which implies that the demands on academic and personal life were quite burdensome. Sixty percent of students expressed fear of failure and it was necessary to note that pressure in terms of performance and fear of not being successful were also widespread. The results were suggesting that there is a significant mental health burden in the medical students and in such a case the fear of failure and anxiousness is most dominant.

Table 2: Association of Mental Health Parameters with Gender:

Mental Health Parameter	Male Students (n=45)	Female Students (n=55)	p-value
Depression	20 (44.4%)	38 (69.1%)	0.012*
Anxiety	25 (55.5%)	40 (72.7%)	0.045*
Stress	18 (40.0%)	34 (61.8%)	0.021*
Fear of Failure	22 (48.8%)	38 (69.1%)	0.028*

The results of the analysis showed that there are significant gender differences as to the prevalence of mental health problems. The results indicated that the level of depression was much erratic in female students (69.1%) than in male students (44.4%) because the p-valued eta= 0.012 is established as statistically significant. On the same note, more females (72.7) had anxiety records compared to

males (55.5) and the findings were significant (p=0.045). The stress was also observed to be higher among the females (61.8%) than the fellas (40.0%), and was statistically significant (p=0.021). Fear of failure too conformed to the trend, 69.1 percent of the female students were also involved, as opposed to 48.8 percent of the male students (p=0.028). These results showed that female students in the study group had considerably high rates of depression, anxiety, tension, and worry of failure as compared to male medical students.

DISCUSSION:

The results of this research showed psychiatric issues of depression, anxiety, stress, and fear of failure were common psychological aspects in medics under study. These findings were comparable with those found in earlier studies that found that the intense structure of medical training accompanied by academic pressure were prime factors that led to mental health problems among these individuals. The comparison of anxiety and stress rates found as a result was correlated with other research achievements carried out in the related learning environment as the long hours of studies, existing competition, and the high presence of exams have been identified as some of the significant factors [9].

Occurrence of depression in participants indicated that the medical curriculum was having an emotional toll on participants. It was clear that the resulting strain caused by heavy workload, sleep deprivation, and unfavorable leisure time had affected the mental health of students adversely. This observation was consistent with that demonstrated in the previous studies which showed positive relationship between academic burden and depressive symptoms in students of medicine [10]. The presence of both anxiety and depression in certain students also pointed out to the fact that the disorders commonly overlapped, which could possibly increase their severity and negatively impact the performance in academics.

The stress intensity was reported to be higher among students when they were undergoing the examination period and during clinical rotations and this was also observed in previous studies. The change between pre-clinical to clinical years was seen to be a difficult period, not only academically but also emotionally concerning the patients and the aspect of clinical duties. Second, the general competitive essence of medical school admissions and the presence of continuous judging appeared to stimulate the performance pressure and pressure all the way through the stress and fear of failure [11].

The fear of failure became one of the most important psychological influences which had an impact on academic involvement of students and their emotional health. The fear was eminent because of their intense personal expectations, pressure by family and perceived outcomes of under performance. This fear not only increased the stress levels but also was having the potential to demotivate the students to get assistance or take breaks, hence hampering a continuous loop of mental strain [12].

Research was done in other countries and this too

had shown fear of failure as one of the big predictors of burnout among medical students (Each of these showing its relevance to all the other educational systems).

Interaction of such psychological factors implied some multifactorial etiology. Academic demands, economic pressure, social withdrawal, and ineffective coping strategies were probably playing a role in these results. Their findings also indicated that the lack of institutional support in the area of mental health and the notion of stigma towards seeking psychological help could have hindered other students to seek professional help. This was consistent with the results of previous studies, where it was noted that accessible counseling services, peer support groups, and resilience training in medical institutions are central [13].

It was further revealed that students who had strong social support groups and favourable coping systems reported to have better control of stress and anxiety. This demonstrated the possible protective effect of peer relations, mentorship activities, and participation in extracurricular activities in preventing psychological distress. Some of the suggested interventions contained stress management workshops, stress mindfulness training and academic counseling, and these appeared to be practicable to the current findings [14].

In general, the given research helped to validate the increase in awareness of mental health as a problem affecting medical students more and more due to the lack of proper attention. The findings indicated that in the absence of proper interventions, such mental issues might worsen school grades, decline the living standards, and lead to the development of chronic mental illnesses. Thus, both institutional and individual levels of mental well-being promotion, stigma decrease, and fostering of an amicable learning environment among future medical workers required close attention [15].

CONCLUSION:

The results of the present study had underscored that depression, anxiety, stress, and fear of failure were the most common mental health issues that affected medical students. These psychological problems had been caused greatly by the high academic requirements as well as competitive nature in the school and the pressure of good performance at all times. It had been noticed that the lasting impact of such stressors did not only impact the performance at school but had negative consequences on the general well-being of students and their becoming competent professionals. The findings had depicted the essence of early diagnosis and treatment in order to deal with these mental issues. Counseling services including peer support programs as well as stress management workshops had been suggested to encourage psychological resilience among medical students. A positive attitude towards learning and accepting that mental health is not a stigmatized issue could have presented an optimal solution, as institutions would have been the key to ensuring emotional well-being and academic achievements in future healthcare professionals.

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