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Assessment of Self-Reported Metabolic Parameters Among Pakistani Doctors

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Author`s Contribution

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ABSTRACT

Objective: To determine the frequency of self-reported metabolic syndrome (MetS) and its components in Pakistani.

Methodology: This cross-sectional, descriptive study was conducted at Shifa International Hospital, Islamabad from August to November 2025. 360 licensed doctors (house officers, post graduate trainees, medical officers, and consultants) aged between 25 to 65 years of age completed a self-reported questionnaire on anthropometric measurements, blood pressure, fasting glucose, lipid profile, and lifestyle factors; cut-off values provided by the AHA/NHLBI for the definition of MetS were applied using ethnic and age-specific cut-off values for the Asian population. Descriptive statistics and chi-square tests were performed to evaluate associations.

Results: The participants had a mean age of 28.9±5.4 years, and 60.6% of the participants were male. The mean BMI for the sample was 27.3±4.2 kg/m^2; 66.1% of the participants were classified as overweight, and 7.8% were classified as obese according to BMI. From the total sample, 26.1% of the participants self-reported having MetS; the percentage of males (29.4%) was higher than that of females (21.1%); the percentage of subjects with MetS increased with age (> 30 = 38.3% vs. ≤ 30 = 20%). Poor physical activity levels (33% vs. 18.1%) and current smoking status (34.2% vs. 23.9%) were both associated with a greater incidence of MetS.

Conclusion: Many Pakistani doctors having self-reported metabolic syndrome and its associated components. The MetS is typified by central obesity, dyslipidemia, and hypertension. The prevalence of lifestyle variables and the risk of developing metabolic diseases (lack of exercise and smoking) highlight the importance of screening and prevention among this cohort.

Keywords: Body Mass Index; Dyslipidemias; Exercise; Health Personnel; Hyperglycemia; Hypertension; Life Style; Metabolic Syndrome; Obesity; Physicians; Smoking; Waist Circumference.

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Introduction

Metabolic syndrome (MetS) is comprised of interconnected cardiometabolic risk components (excess body fat localized in the abdomen, high blood pressure, dyslipidemia, and impaired glucose metabolism) that increase a person's chances of developing coronary artery disease (CAD) and developing type 2 diabetes (T2DM).[1,2] MetS represents a major challenge to global public health with an estimated 20-25 percent of adults worldwide affected and rising incidence rates in low- and middle-income countries (LMICs).[3] In South Asia, the burden is especially high because of genetic predisposition, urbanization, and sedentary lifestyles. The reported prevalence is between 25% and 40%.[4] Recent studies in Pakistan indicate that MetS impacts approximately one-third of the adult population, with a rising prevalence among healthcare professionals attributed to occupational stress and lifestyle factors.[5,6]

The pathophysiology of MetS is intricate and multifactorial, with insulin resistance as the principal underlying mechanism. Excess visceral fat causes more free fatty acids to flow, chronic low-grade inflammation, and problems with adipokines, which leads to endothelial dysfunction, high blood pressure, and atherogenic dyslipidemia.[7,8] Physicians are also more likely to have chronic stress, sleep problems, and bad eating habits, which make metabolic dysregulation even worse.[9]

People often think that healthcare professionals, especially doctors, know more about health. But, ironically, they may not take care of their own health as well as they should because they have busy work schedules.[10] Studies from various countries indicates a notable prevalence of metabolic disorders among physicians, encompassing undiagnosed hypertension, obesity, and dysglycemia.[11,12] In Pakistan, there is a lack of comprehensive data concerning the self-assessment and reporting of metabolic parameters among physicians, which may diverge from clinically obtained measurements and affect early detection and intervention strategies.

Self-reporting health status can provide valuable information about how aware individuals are of MetS, how they perceive their risk for developing MetS, and if they under-report or misestimate their risk for developing MetS, particularly in more medically knowledgeable individuals. The difference between self-reported values versus actual values indicates that some people may need to assess their risk factors for MetS and take corrective measures more effectively.[12]

Given the increasing burden of MetS worldwide, especially in LMICs, there is very little data regarding healthcare providers in Pakistan; thus, this study is assessed the prevalence of self-reported components of MetS among Pakistani doctors. This study is also explored potential gaps in self-assessing MetS and provide recommendations/assistance in creating strategies for early prevention and timely treatment of MetS.

Methodology

This study was conducted as a cross-sectional descriptive study from August to November 2025 at Shifa International Hospital, Islamabad. A total of 360 licensed doctors actively practicing in the hospital setting were selected to participate. All doctors were practicing as house officers, post graduate trainees, medical officers and consultants ages 25-65 years, and all doctors provided written informed consent prior to study participation.

The sample excluded doctors who were not working at the time of study or were retired. Individual with health issues that changed metabolic measurements or affect the ability of individual to give their own self-reported data were excluded. Individuals with the following issues; significant surgical operation within the last 6 months, history of bariatric surgery, taking medications to reduce weight (anti-obesity drugs) or to keep them from getting long periods of time on medication (corticosteroids), known endocrinological diseases (hypothyroidism), pregnant, or were cognitively impaired were also excluded.

The WHO sample size calculator was used to determine the sample size. It used a 95% confidence interval, an expected prevalence of 37.4% based on previous study, and a 5% margin of error.[5] Based on these parameters, a total of 360 participants were included. A non-probability consecutive sampling method was utilized, for participants recruitment.

We used a structured, pre-made questionnaire to collect the data. The participants provided all information about their metabolic parameters through self-reporting. These included waist circumference, blood pressure status, fasting blood glucose levels, lipid profile components (triglycerides and HDL cholesterol), and a history of related medical conditions and medication use. Participants were instructed to disclose their most recent known values or physician-diagnosed conditions. No laboratory tests or physical measurements were conducted by the researchers, and all information was based entirely on self-reported data of participants.

The American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI) criteria were used to define metabolic syndrome, with cut-off values that were changed to fit the Asian population.[13] If an individual met three or more of the following criteria, they were said to have MetS: a waist circumference of 90 cm or more in men and 80 cm or more in women; triglycerides of 150 mg/dL or more (or treatment); HDL cholesterol of 40 mg/dL or less in men and 50 mg/dL or less in women (or treatment); fasting blood glucose of 100 mg/dL or more (or known diabetes); and systolic blood pressure of 130 mmHg or more and diastolic of 85 mmHg or more (on antihypertensive treatment).

The main outcome of this study was to determine how common self-reported MetS and its individual

components were among doctors. In addition, the study also explored how these metabolic parameters varied across different professional category, including house officers, postgraduate trainees, medical officers, and consultants, as well as across demographic factors such as age and gender.

Data were analyzed using SPSS version 26. Continuous variables, i.e., age, was expressed as mean and SD; categorical variables, i.e., gender, occupational category and metabolic parameters, use frequencies and percentages. The prevalence (percentage) of MetS is presented as the proportion of the total number of individuals in the study. The data were also analyzed according to possible confounding variables (age, gender and professional category). The chi-square test was applied to assess associations between categorical variables. A p-value of ≤0.05 was considered statistically significant.

Ethical approval for the study was obtained from the Institutional Review Board of Shifa International Hospital, Islamabad (IRB # 085-25, dated: 25 February 2025).

Results

A total of 360 doctors participated in the study. The mean age of the participants was 28.9±5.4 years. Male participants constituted 60.6% of the sample. The mean height and weight were 167.8±3.6 cm and 65.6± 7.7 kg, respectively, with an average body mass index (BMI) of 27.3±4.2 kg/m². The majority of participants were married (71.6%) and non-smokers (78.9%). More than half of the participants (53.8%) reported not engaging in regular physical exercise. Among those who exercised, the mean frequency was 3.3±1.3 days per week. The mean duration of professional practice was 8.9±5.4 years (Table 1). The distribution of participants according to professional category is presented in Table I.

The prevalence of self-reported MetS and its components for study participants is shown in Table II. Table III provides the number of components of MetS present for each individual to help demonstrate that a large number of individuals have one or two risk factors; however, they do not have the complete definition of MetS.

Lower HDL cholesterol and high waist circumference were among the most commonly reported abnormalities. Participants were also grouped into standard BMI categories for further analysis (Table IV).

Table I: Self-Reported MetS baseline characteristics of participants. (n = 360)

Variable	Mean ± SD / n (%)
Age (years)	28.9±5.4
Gender	
→ Male	218 (60.6%)
→ Female	142 (39.4%)
Height (cm)	167.8±3.6
Weight (kg)	65.6±7.7
BMI (kg/m²)	27.3±4.2
Marital Status	
→ Married	258 (71.6%)
→ Unmarried	102 (28.4%)
Smoking Status	
→ Smoker	76 (21.1%)
→ Non-smoker	284 (78.9%)
Regular Exercise	
→ Yes	166 (46.2%)
→ No	194 (53.8%)
Professional Category	
→ House officers	110 (30.6%)
→ PGTs	130 (36.1%)
→ Medical officers	70 (19.4%)
→ Consultants	50 (13.9%)
Exercise Frequency (days/week)	3.3±1.3
Duration of Practice (years)	8.9±5.4

Table II: Frequency of self-reported MetS components (n = 360)

Variable	n (%)
Elevated Waist Circumference	118 (32.8%)
Elevated Blood Pressure	96 (26.7%)
Elevated Fasting Blood Glucose	82 (22.8%)
Elevated Triglycerides	104 (28.9%)
Reduced HDL Cholesterol	126 (35%)
Metabolic Syndrome (≥3 components)	94 (26.1%)

Table III: Distribution of metabolic syndrome components. (n = 360)

Number of Components	n (%)
0	82 (22.8%)
1	104 (28.9%)
2	80 (22.2%)
≥3 (MetS)	94 (26.1%)

Table IV: BMI categories of study participants. (n = 360)

BMI Category	n (%)
Underweight (<18.5)	22 (6.1%)
Normal (18.5–24.9)	72 (20%)
Overweight (25–29.9)	238 (66.1%)
Obese (≥30)	28 (7.8%)

Stratification analysis demonstrated significant associations between metabolic syndrome and age as well as professional category, while gender showed a comparatively weaker association (Table V).

Table V: Stratification of metabolic syndrome by demographic variables.

Variable	MetS Present n (%)	MetS Absent n (%)	p-value
Gender			
→ Male (n=218)	64 (29.4)	154 (70.6)	0.041
→ Female (n=142)	30 (21.1)	112 (78.9)	—
Age Group			
→ ≤30 years (n=240)	48 (20.0)	192 (80.0)	0.002
→ >30 years (n=120)	46 (38.3)	74 (61.7)	—
Professional Category			
→ House officers (n=110)	18 (16.4)	92 (83.6)	0.008
→ PGTs (n=130)	30 (23.1)	100 (76.9)	—
→ Medical officers (n=70)	24 (34.3)	46 (65.7)	—
→ Consultants (n=50)	22 (44.0)	28 (56.0)	—

Lifestyle factors were also evaluated. Participants who reported a lack of regular physical activity had a higher proportion of metabolic syndrome compared to those who exercised regularly. Similarly, smokers showed a relatively higher frequency of metabolic abnormalities compared to non-smokers (Table VI).

Table VI: Association of lifestyle factors with metabolic syndrome.

Variable	MetS Present n (%)	MetS Absent n (%)	p-value
Exercise			
→ Yes (n=166)	30 (18.1)	136 (81.9)	0.012
→ No (n=194)	64 (33.0)	130 (67.0)	—
Smoking			
→ Yes (n=76)	26 (34.2)	50 (65.8)	0.048
→ No (n=284)	68 (23.9)	216 (76.1)	—

Discussion

In this study, the prevalence of self-reported metabolic syndrome (MetS) was 26.1% among doctors, with individual components distributed as abdominal obesity (32.8%), elevated blood pressure (26.7%), elevated fasting glucose (22.8%), elevated triglycerides (28.9%), and reduced HDL cholesterol (35.0%). Stratified analysis demonstrated that MetS was more common in males than females, and increased with age and professional seniority. BMI category analysis showed that 66.1% were overweight and 7.8% obese. Lifestyle patterns revealed that physical inactivity was associated with higher MetS prevalence (33% vs 18.1%) and smoking also showed a trend toward higher metabolic risk. Moreover, MetS components showed that 26.1% of participants met ≥3 criteria, while 22.2% had two and 28.9% had one component, indicating a significant burden of metabolic risk even in a health-educated cohort.

The prevalence of MetS among these doctors is broadly consistent with data from Pakistani and regional adult populations. A meta-analysis of healthy Pakistani adults reported a pooled MetS prevalence of 28.8% (95% CI: 17.8–39.7%), with central obesity (37.1%), low HDL (48.2%), and high triglycerides (35.8%) being common components, which closely aligns with current study findings of dyslipidemia and central adiposity as prominent abnormalities.[6] Compared to this general population estimate, this study participants of doctors demonstrated slightly lower overall MetS prevalence but a similar pattern of individual components.

Specific to healthcare workers in Pakistan, a large cross-sectional study of HCWs reported a 37.4% prevalence of MetS, with low HDL (81%) and elevated waist circumference (58%) being the most frequent components.[5] The current study's estimated prevalence (26.1%) was lower than that of the previous study; however, the significance of low HDL and central obesity as primary factors indicates a comparable cardiometabolic risk profile in medically trained populations. These discrepancies may arise from variations in sample characteristics, workplace stress, and the distinction between self-reported and measured data.

The prevalence of MetS has varied significantly in other populations. A nationwide community-based adult study in Malaysia indicated a prevalence of 35.9%, with central obesity (52.8%) and low HDL (44.6%) being particularly common.[14] A meta-analysis conducted in Iran revealed an overall pooled prevalence of 31% (95% CI: 28–34%), suggesting comparable regional burdens in South Asia and adjacent areas.[17] In South India, the prevalence of MetS among adults was 31.6%, with urban participants demonstrating higher rates compared to their rural counterparts.[15] These regional comparisons validate that the prevalence of MetS among adults in Asia remains consistently elevated across populations, influenced by urban lifestyle, dietary habits, and sedentary behavior.

The BMI distribution in this study (overweight 66.1%, obesity 6.1%) aligns with other findings; for instance, in a cohort of Pakistani tertiary healthcare professionals, central obesity was observed in 74.8%, and reduced HDL levels in 65.2%, although that study concentrated on older participants and employed different criteria for defining MetS.[16] Although our younger physician cohort exhibited a reduced prevalence of obesity, the presence of

over 66.1% classified as overweight highlights the initiation of cardiometabolic risk at an early stage, even among health-educated individuals.

Lifestyle behaviors have been consistent with literature. Inactivity has been shown many times to have a higher prevalence of MetS, and lifestyle risk factor scores have significantly influenced MetS incidence in cohort studies.[6] Additionally, smoking has become a known risk factor for lipid imbalances and clustering of MetS in multiple population studies, which align with this study's findings of a higher prevalence of MetS with smokers, regardless of statistical significance.[17-19]

The findings of this study indicate that there is a moderate but concerning prevalence of MetS and its components in Pakistani doctors; this also reflects trends seen at a national and community level. Dominant components of MetS included central obesity, dyslipidemia, and hypertension, which were also consistent with findings from large population-based studies. The association of factors such as age, gender, lifestyle behaviors and types of profession further support the literature related to the multifactorial nature of cardiometabolic risk and health care professionals even being aware of their higher risks for certain diseases.

LIMITATIONS: This study has some limitations, including self-reported metabolic parameters that may introduce recall bias and misclassification due to lack of laboratory or clinical measurements. Because of the cross-sectional design, it is impossible to establish any causal relationships between lifestyle factors and MetS. The fact that all participant sites were recruited from only one hospital limits the generalizability of results to all Pakistani physicians. The inclusion of non-assessment of key indicators of cardiovascular risk (e.g. HbA1c; insulin resistance; full lipid profile) and lifestyle measurements that were not assessed (diet, stress level, sleep, sedentary behaviors) represents additional limitations.

Conclusion

The findings of this study demonstrate that there is a moderate but significant prevalence of self-reported MetS (as well as its individual components) among Pakistani doctors i.e., the most common identified health issues were central obesity, dyslipidemia, and hypertension. Additionally, there was a noticeable association between the presence of certain lifestyle behaviors (e.g., physical inactivity and smoking) and an increased risk for having a higher MetS score. Although physicians are expected to have an adequate understanding of risks associated with cardiometabolic diseases due to their health profession background, physicians themselves are susceptible to having elevated cardiometabolic risk factors; therefore, the need for early screening and health promotion strategies within this population is necessary. The findings from this study highlight the importance of focused lifestyle modification programs and initiatives to raise awareness among healthcare professionals in Pakistan about reducing future waves of cardiovascular diseases and metabolic diseases.

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