SMOKING AND ADDICTION AMONG HYPERTENSIVE PATIENTS WITH KNOWN DIABETES MELLITUS IN SINDH PAKISTAN

Original Article

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ABSTRACT

Background: Hypertension (HTN) and diabetes mellitus (DM) are among the most widespread chronic conditions globally, with a notable rise in prevalence in Pakistan, particularly in Sindh. Smoking and addiction are known to significantly worsen these conditions, contributing to higher rates of morbidity and complications. This study examines the prevalence and effects of smoking and addiction among hypertensive patients with known diabetes mellitus in Sindh, Pakistan, aiming to inform targeted intervention strategies.

Objective: To explore the prevalence and impact of smoking and addiction among hypertensive patients with diabetes mellitus in Sindh, Pakistan, in order to identify areas for improved management and intervention.

Methods: A cross-sectional study design was utilized, involving 381 participants from cities in Sindh, selected through convenience sampling. Data were collected via a structured questionnaire and analyzed using SPSS version 21. Continuous variables were examined using frequency, mean, and standard deviation, with significance set at a P-value of 0.05.

Results: The study's 381 participants included 50.39% females and 49.61% males, with a mean age of 51.75 years, showing a concentration of middle-aged and older adults. Smoking was prevalent in 70% of participants, while 30% were non-smokers. Addiction beyond smoking was reported by 28% of participants, whereas 72% reported no addiction. Socioeconomically, 69.29% of participants were in the middle class, 17.59% in the upper class, and 13.42% in the lower class.

Conclusion: The high prevalence of smoking among hypertensive diabetic patients in Sindh, Pakistan, highlights an urgent need for targeted smoking cessation programs. Although other forms of addiction were less common, prioritizing smoking cessation could be crucial for reducing complications and improving health outcomes in this population.

Keywords: Addiction, Diabetes Mellitus, Hypertension, Morbidity, Prevalence, Smoking, Socioeconomic Factors.

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INTRODUCTION

Hypertension (HTN) and diabetes mellitus (DM) are among the most prevalent chronic conditions worldwide, both posing serious public health challenges. Separately, each condition increases morbidity and mortality; together, their coexistence compounds the healthcare burden for patients and communities (1,2,3). This is particularly concerning in developing nations like Pakistan, where the prevalence of both hypertension and diabetes mellitus is steadily increasing, driven by rapid urbanization, lifestyle changes, and demographic transitions (4). Smoking, a well-documented health risk, is another major factor contributing to the development and aggravation of both hypertension and diabetes. The intersection of smoking and addiction within hypertensive diabetic populations presents an area of critical concern, especially in regions with limited healthcare resources and heightened risk factors. Global statistics underscore the prevalence of hypertension and diabetes at epidemic proportions, with over 1.4 billion adults living with hypertension and more than 463 million people affected by diabetes as of 2019 (10). Within Pakistan, hypertension impacts an estimated 26% of the adult population, while diabetes affects approximately 17%, figures that mirror the gravity of the global public health crisis (Basit et al., 2018). In Sindh, Pakistan, a province with a notably high prevalence of these conditions, socioeconomic factors, restricted healthcare access, and lifestyle challenges contribute to the rising tide of these diseases (11,12,13,14). This coexistence of hypertension and diabetes among patients escalates the risk of cardiovascular events, kidney failure, and other life-threatening complications, often necessitating a comprehensive approach to management that includes consideration of interconnected lifestyle factors (15,16).

In patients with diabetes, smoking further complicates glycemic control and exacerbates insulin resistance, making diabetes management more difficult and increasing the likelihood of complications such as nephropathy, retinopathy, neuropathy, and cardiovascular diseases (17,18). Hypertensive diabetic patients who smoke experience an intensified interplay of risk factors, as each condition magnifies the adverse effects of the others, establishing a cycle of increased disease burden and elevated risk of morbidity and mortality (19). Nicotine dependence, influenced by genetic, behavioral, and environmental factors, adds complexity to managing these patients. The addictive nature of nicotine poses a significant barrier to smoking cessation, particularly in regions where awareness of health risks and access to cessation programs are limited (17). Despite the known health hazards, smoking persists among hypertensive and diabetic populations, often due to socioeconomic challenges, limited awareness, and insufficient access to smoking cessation resources (11). These factors underscore the need for targeted interventions to address smoking addiction within this vulnerable demographic, especially in regions like Sindh, Pakistan, where smoking prevalence remains high and healthcare infrastructure may be inadequate to fully support lifestyle modification efforts. The objective of this study is to examine the prevalence and impact of smoking and addiction among hypertensive patients with known diabetes mellitus in Sindh, Pakistan, aiming to inform and support the development of more effective interventions to mitigate the health burden associated with these comorbid conditions.

METHODS

This cross-sectional study was conducted on a sample of 381 diagnosed diabetes mellitus patients residing in various cities within Sindh, including Naushahro Feroze, Sukkur, Larkana, Hyderabad, Nawabshah, and Kashmore. The participants were selected through convenience sampling, with the exclusion criteria of additional comorbidities, specifically renal and pancreatic disorders, to maintain a focus on patients with diabetes and hypertension alone. Data collection was carried out using a meticulously designed and structured questionnaire, which ensured the systematic capture of relevant information for each participant. Prior to commencing data collection, ethical approval was obtained from the respective Ethical Review Committee to ensure adherence to ethical research standards. Blood pressure for each participant was measured using a standard sphygmomanometer, facilitating accurate and consistent blood pressure readings across the study sample. All data collected were subsequently processed and analyzed using SPSS software for Windows, version 21, which allowed for rigorous statistical assessment. Continuous variables were evaluated in terms of frequency, mean, and standard deviation, ensuring a robust description of the data. A 95% confidence interval was applied, with statistical significance determined by a P-value threshold of 0.05.

RESULTS

The study included 381 participants with known diabetes mellitus and hypertension from Sindh, Pakistan, to assess medication compliance. The mean age of participants was 51.75 years, with a mode of 60 years, indicating a significant proportion were around this
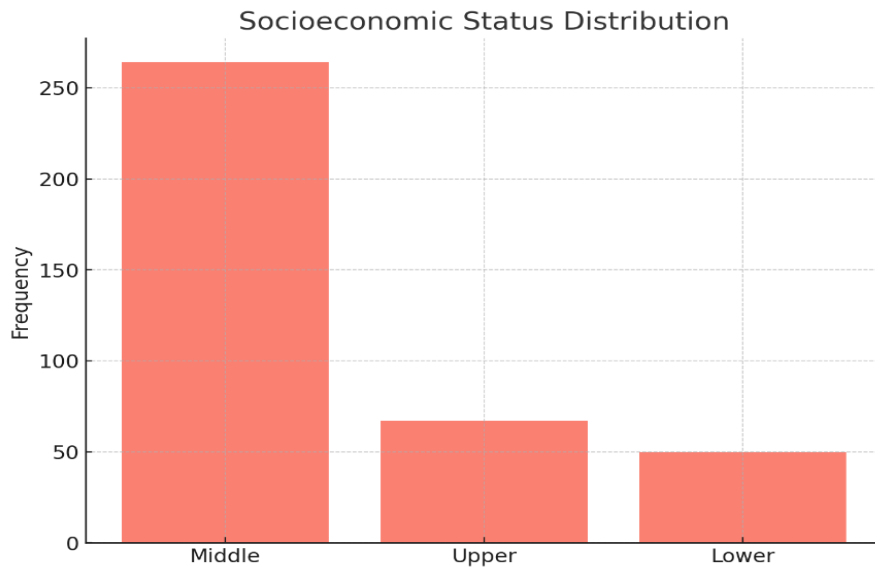
age. The standard deviation of 12.59 suggests moderate variability in age distribution, with most participants being in their early to mid-fifties.

Table 1: Age Distribution

Statistic	Mean	Mode	SD
Mean	51.75	60	12.59

Age Distribution Statistics

Sex Distribution of Study Participants
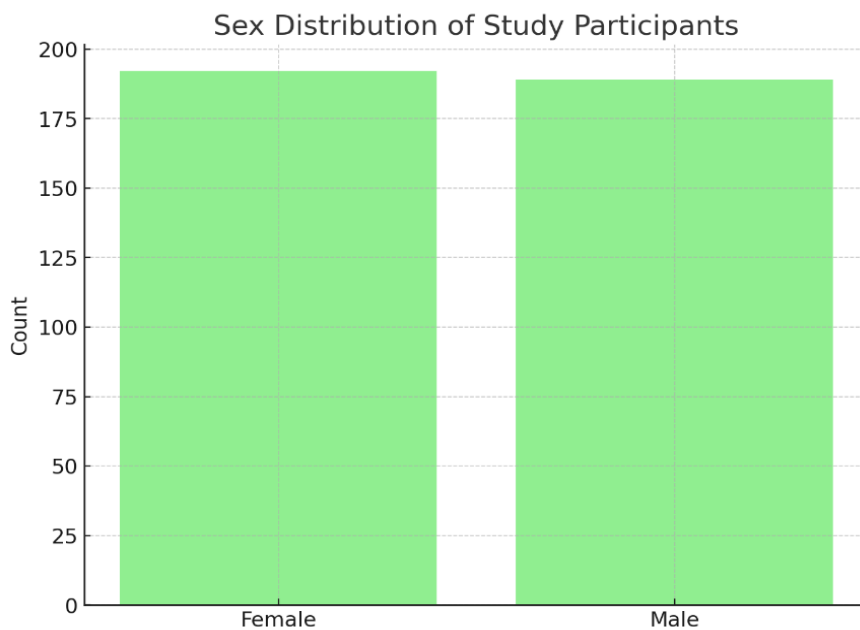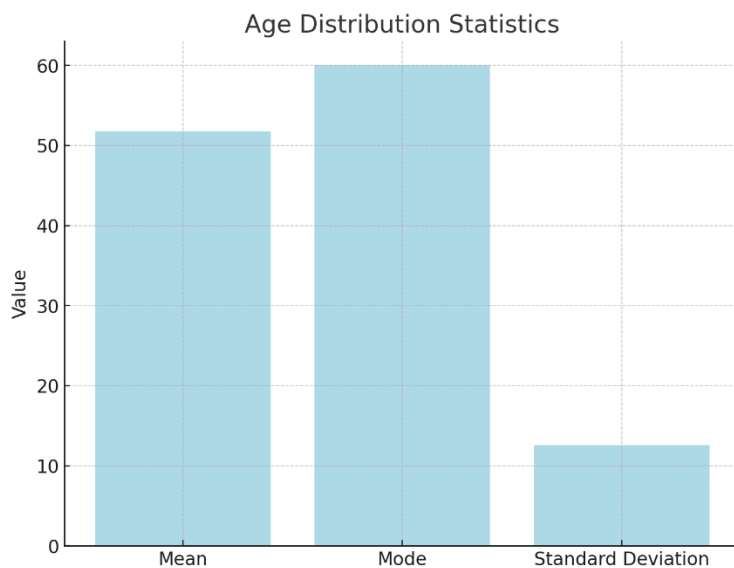
The sex distribution among participants was nearly balanced, with 192 females (50.39%) and 189 males (49.61%), ensuring a comprehensive analysis of compliance across genders. Socioeconomic status varied, with the majority of participants (69.29%) falling into the middle socioeconomic class, followed by 17.59% in the upper class, and 13.42% in the lower class. This distribution implies that most participants belong to a socioeconomic tier that may affect access to healthcare and adherence to medication regimes.

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Socioeconomic Status Distribution

In terms of smoking status, 269 participants (70%) were identified as smokers, whereas 112 (30%) were non-smokers. This high smoking prevalence in the diabetic hypertensive population underscores the significance of smoking as a common behavior or risk factor among these individuals, pointing to a need for targeted smoking cessation initiatives within this demographic.

Table 2: Socioeconomic, Smoking, and Addiction Status Distribution in Individuals with Hypertension and Diabetes Mellitus

Status	Frequency (%age)
Socioeconomic Status	
Middle	264 (69.29%)
Upper	67 (17.59%)
Lower	50 (13.42%)
Smoking Status	
Smokers with Hypertension and Diabetes Mellitus	269 (70%)
Non-Smokers with Hypertension and Diabetes Mellitus	112 (30%)
Addiction Status	
Addiction with Hypertension and Diabetes Mellitus	106 (28%)
No-Addiction with Hypertension and Diabetes Mellitus	275 (72%)
Total	381 (100%)

Regarding addiction, 106 participants (28%) had some form of addiction beyond smoking, while the majority, 275 (72%), did not report additional addictive behaviors. This lower rate of addiction suggests that while smoking remains a significant issue, other addictive behaviors may be less common within this group.

DISCUSSION

The findings from this cross-sectional study on smoking and addiction among hypertensive patients with known diabetes mellitus in Sindh, Pakistan, underscore the intricate relationship between lifestyle factors and chronic disease management in this population. A key insight is the high prevalence of smoking, with 70% of participants identified as smokers, reflecting a concerning trend that aligns with established literature highlighting smoking as a substantial risk factor for both hypertension and diabetes [20]. Smoking in diabetic individuals not only worsens glycemic control and insulin resistance but also heightens the risk of cardiovascular complications and further exacerbates these comorbid conditions. Mechanisms such as endothelial dysfunction, oxidative stress, and inflammation related

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to smoking contribute to increased blood pressure, complicating effective diabetes management. This notable prevalence of smoking points to the urgent need for targeted smoking cessation programs, which, if implemented effectively, could significantly reduce the complications and improve health outcomes for hypertensive diabetic patients. The 30% of participants who were non-smokers present a contrasting profile, suggesting that factors beyond smoking also influence health outcomes in this group. Identifying protective lifestyle factors or behaviors within this non-smoking population could offer valuable insights for developing intervention strategies that support healthy choices and preventive behaviors among hypertensive diabetic patients (21).

Regarding addiction, the study observed that only 28% of participants had other forms of addiction, while the majority (72%) did not report any additional addictive behaviors. This lower rate of addiction, compared to the high prevalence of smoking, indicates that while smoking remains a significant issue, other forms of addiction are less prevalent among hypertensive diabetic patients. The limited presence of other addictions may reflect cultural influences, socioeconomic factors, or heightened awareness within this population. However, given that nearly one-third of the population does engage in addictive behaviors, addressing addiction as part of an integrated approach to managing these chronic conditions remains critical. Research has consistently associated addictive behaviors with reduced medication adherence, lower quality of life, and higher healthcare costs, underscoring the value of interventions that target both smoking and other addictive behaviors (22). The age distribution of the participants, with a mean of 51.75 years and a mode of 60, aligns with global trends showing increased prevalence of hypertension and diabetes in middle-aged and older populations. The variability in age within the study indicates that these chronic conditions affect a broad age range, emphasizing the necessity of age-specific preventive and management strategies for hypertensive and diabetic patients in Sindh (23). Socioeconomic factors also played a role, with the majority of participants belonging to the middle socioeconomic class (69.29%), followed by the upper (17.59%) and lower classes (13.42%). This distribution suggests that socioeconomic status, which influences healthcare access, medication adherence, and lifestyle choices, is an important determinant of health outcomes in this population. The predominance of the middle class may indicate fewer financial barriers to healthcare access for this group, though additional socioeconomic challenges likely persist in healthcare affordability and availability.

The high smoking prevalence among participants calls for the implementation of culturally tailored smoking cessation programs as part of standard healthcare practices for hypertensive diabetic patients. Training healthcare providers to identify and address addictive behaviors, providing patient education, and promoting lifestyle changes could contribute to improved disease management, reduced complications, and potential cost savings within the healthcare system. While this study provides valuable insights, it is essential to acknowledge its limitations. The cross-sectional design restricts the ability to infer causality between smoking, addiction, and the worsening of hypertension and diabetes mellitus. Additionally, the convenience sampling approach may introduce selection bias, potentially limiting the generalizability of findings to the broader population in Sindh. Future research using longitudinal designs and more representative sampling methods would enhance the understanding of the complex relationship between smoking, addiction, and chronic disease progression in this demographic, thereby informing more effective preventive and management strategies.

CONCLUSION

The study highlights a significant prevalence of smoking among hypertensive patients with diabetes mellitus in Sindh, Pakistan, underscoring an urgent need for targeted smoking cessation efforts within this population. While other addictive behaviors were less common, prioritizing smoking cessation as part of a comprehensive management strategy is crucial to mitigate complications and enhance health outcomes for these patients. Addressing smoking behavior in conjunction with standard care for hypertension and diabetes could play a pivotal role in reducing the broader health burden associated with these comorbidities.

Author	Contribution
Parus Saleem	Conceptualization, Methodology, Formal Analysis, Writing - Original Draft, Validation, Supervision
Aqsa Kalhoro	Methodology, Investigation, Data Curation, Writing - Review & Editing
Hira	Investigation, Data Curation, Formal Analysis, Software
Monika	Software, Validation, Writing - Original Draft

Bushra	Formal Analysis, Writing - Review & Editing
Yusra Abro	Writing - Review & Editing, Assistance with Data Curation
Diksha	Software, Validation, Writing - Original Draft
Anum Mallah	Formal Analysis, Writing - Review & Editing
Abdul Razzaque Nohri	Writing - Review & Editing, Assistance with Data Curation

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