

CORRELATION BETWEEN SMOKING AND ERECTILE DYSFUNCTION: A CROSS-SECTIONAL STUDY FROM BALOCHISTAN, PAKISTAN

Shahzaman Khan¹, Abdul Razzaq Nasir^{*2}, Naimatullah Tareen³, Jamil Kakar⁴,

^{1 2 3}Department of Urology, Bolan Medical Complex, Quetta

⁴Department of Urology, Post Graduate Medical Institute, Quetta

¹shahzamanpanhwar1@gmail.com, ²razzaq.nasir@gmail.com, ³tareensn@gmail.com,
⁴jamilahmedkhann@gmail.com

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Corresponding Author: *

Abdul Razzaq Nasir

Abstract

Background: Smoking is a known risk factor for erectile dysfunction (ED), yet its correlation with ED severity and duration-dependent effects remains understudied in Pakistan. This study investigated the correlation between smoking and ED among men in Balochistan, Pakistan, focusing on prevalence, severity, and the impact of smoking duration.

Methods: A cross-sectional, questionnaire-based study was conducted at Bolan Medical Complex Hospital and Doctor Hospital Quetta, from November 2024 to April 2025. A total of 104 sexually active male participants (52 smokers and 52 non-smokers), aged 21 years or older, were included. The Sexual Health Inventory for Men (SHIM) questionnaire was used to evaluate ED. Individuals with diabetes, cardiovascular diseases, psychiatric disorders, or medication-induced ED were excluded. Data were analyzed for ED prevalence, severity (mild, mild-moderate, moderate, severe), and smoking duration.

Results: ED prevalence was 57.7% (n=30) among smokers, compared to 17.3% (n=9) in non-smokers ($p<0.001$). Among smokers with ED, 60% had severe symptoms, compared to 11.1% among non-smokers. A dose-response relationship was observed: 60% of smokers with ED had smoked for over 10 years. Age-adjusted analysis confirmed smoking as an independent risk factor, with 10% of smokers aged 21–30 affected, while no ED cases were reported in non-smokers of the same age group.

Conclusion: Smoking significantly increases ED risk and severity, particularly with long-term use. The dose-dependent trend and early-onset ED among young smokers highlight smoking as an independent risk factor. Public health interventions targeting smoking cessation are urgently needed to mitigate the ED burden in Pakistan.

Introduction

Erectile dysfunction is characterized by a persistent or recurrent inability to achieve or sustain an erection adequate for satisfactory sexual performance (1). It represents a significant medical

concern, often leading to considerable emotional distress for both the individual and their partner, and negatively impacting overall quality of life (2, 3). The causes of ED include neurological, hormonal, vascular, and psychological issues.

Smoking is one of the most controllable causes. Tobacco toxins hamper penile blood flow because they harm blood vessels, lower nitric oxide production, and accelerate atherosclerosis. Smoking contributes to ED by raising inflammation and oxidative stress (2, 4-6).

Although ED is generally more prevalent among older men, recent trends indicate a rising prevalence among younger men, with profound implications for their quality of life (7). Recent studies indicate that among newly diagnosed cases, about 25% involve men under the age of 40, with nearly half of them experiencing severe symptoms. In Italy, one out of every four men seeking treatment for ED is under 40 (8, 9). Since 2011, there has been a noticeable rise in the number of younger men seeking medical help for ED (10). Between 2010 and 2015, the number of young male patients visiting clinics for ED treatment rose from 5% to over 15%. Some researchers suggest that the overall prevalence of ED in younger populations may be nearing 30% (9, 11).

In Pakistan, similar trends are emerging, with a growing number of men, particularly those under 40, reporting erectile difficulties (12, 13). Despite its increasing prevalence, ED remains a stigmatized and under-discussed topic in many Asian societies, including Pakistan, where cultural norms often discourage open dialogue about sexual health. In Pakistan, research on ED is notably scarce, with few studies exploring its prevalence or associated factors (9). To address this gap, the present study examines the correlation between smoking and ED among adult men in Balochistan, Pakistan, providing critical insights into a pressing yet overlooked public health issue.

Methodology

Study design and study participants

This study was a cross-sectional, questionnaire-based observational study designed to evaluate the correlation between smoking and erectile dysfunction (ED) among male patients. It was conducted at the Urology Ward of Bolan Medical Complex Hospital, Quetta, and Doctor Hospital, Quetta, over a period of six months, from November 2024 to April 2025, following approval of the synopsis from PGMI, Quetta, and the

ethical review committee. A purposive sampling technique was employed to select 104 sexually active adult male patients (aged 18 years and older) who visited the aforementioned hospitals and consented to participate. The participants were divided into two groups: smokers (n = 52) and non-smokers (n = 52).

Inclusion and Exclusion Criteria

The study included male patients aged 21 years and above who were willing to participate and provided informed consent. Participants in the smoker group were current users of tobacco, whether through cigarettes or other forms. Individuals were excluded from the study if they had known chronic illnesses such as diabetes or cardiovascular disease, which could independently contribute to erectile dysfunction. Additionally, patients taking medications known to affect erectile function, as well as those with a history of psychiatric disorders or substance abuse, were not included in the study.

Statistical Analysis

Data were analyzed using Microsoft Excel and the Chi-square and Pearson correlation tests were conducted to evaluate the correlation between smoking status and the presence of erectile dysfunction and its severity. A p-value < 0.05 was considered statistically significant.

Results

A total of 110 patients were initially enrolled in the study. However, 6 participants declined to complete the SHIM questionnaire. Therefore, the final analysis included 104 patients, with 52 in the smoker group and 52 in the non-smoker group.

The study revealed a correlation between smoking and erectile dysfunction (ED). As shown in Figure 1, SHIM scores decreased as the duration of smoking increased. It was also noted that both the prevalence and severity of ED escalated with longer smoking duration in the smoker group (Table 1). Additionally, ED was found to be more prevalent in the smoker group than in the non-smoker group. Among the smokers, 57.7% (30 participants) had ED, while only 17.3% (9

participants) in the non-smoker group reported ED (Figure 2).

The severity of ED was also greater among smokers compared to non-smokers. According to the results, 22 smokers and 43 non-smokers reported no ED. Mild ED was noted in 2 smokers and 1 non-smoker. The "mild to moderate ED" category included 4 smokers and 4 non-smokers. Moderate ED was more common in smokers, with 6 cases reported, compared to 3 cases among non-smokers. Severe ED was significantly more frequent in smokers (18 cases) than in non-smokers (3 cases) (Figure 3). Overall, the data suggests that smokers experience a higher incidence of ED across all severity levels compared to non-smokers, with the gap widening as the severity of ED increases.

To ensure meaningful comparisons, the age distribution of ED-positive individuals was kept consistent across both smokers and non-smokers in this study (Table 2). Among the 30 ED-positive smokers, 10% (3 participants) were aged between 21-30 years, 20% (6 participants) were between 31-40 years, 33.33% (10 participants) were aged 41-50 years, and 36.6% (11 participants) were above 50 years. Similarly, among the 9 ED-positive non-smokers, the age distribution was maintained as follows: none were in the 21-30 age group, 11.11% (1 participant) were between 31-40 years, 44.44% (4 participants) were between 41-50 years, and 44.44% (4 participants) were above 50 years. This uniform age distribution helped minimize age-related bias when analyzing the correlation between smoking and erectile dysfunction.

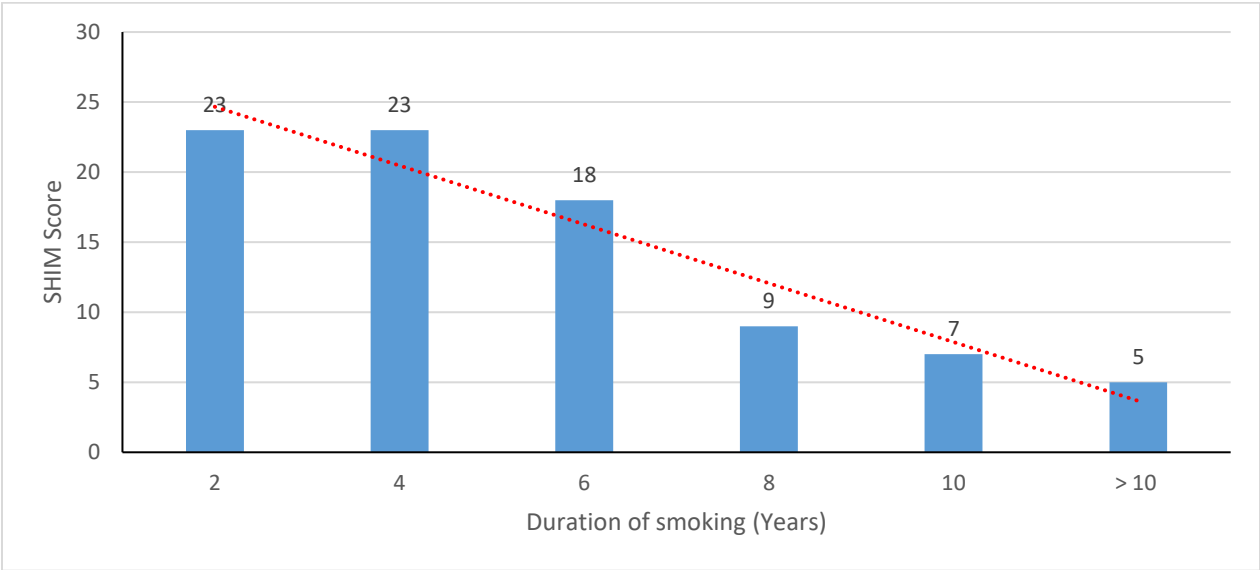


Figure 1: Correlation between duration of smoking and SHIM score

Table 1: Dose-Response Relationship between Smoking Duration, SHIM Scores, and ED Prevalence

Smoking Duration (Years)	Number of Smokers	Mean SHIM Score	ED Prevalence (%)
0	-	-	-
2	13	23 (No ED)	-
4	9	23 (No ED)	-
6	2	18 (Mild)	7%
8	4	13 (Mild-Moderate)	13%
10	6	9 (Moderate)	20%
> 10 years	18	6 (Severe)	60%

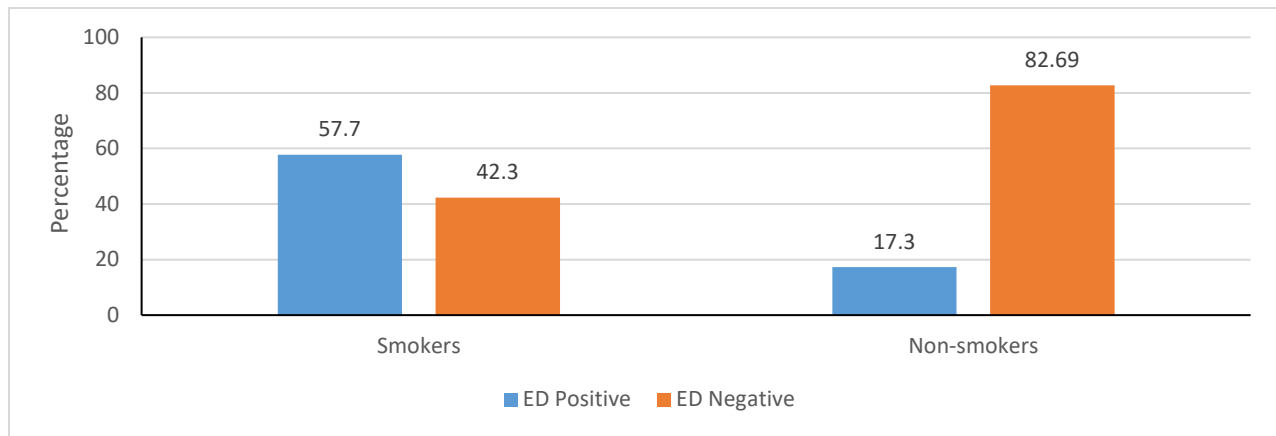


Figure 2. Percentage of erectile dysfunction in smokers and Nonsmokers

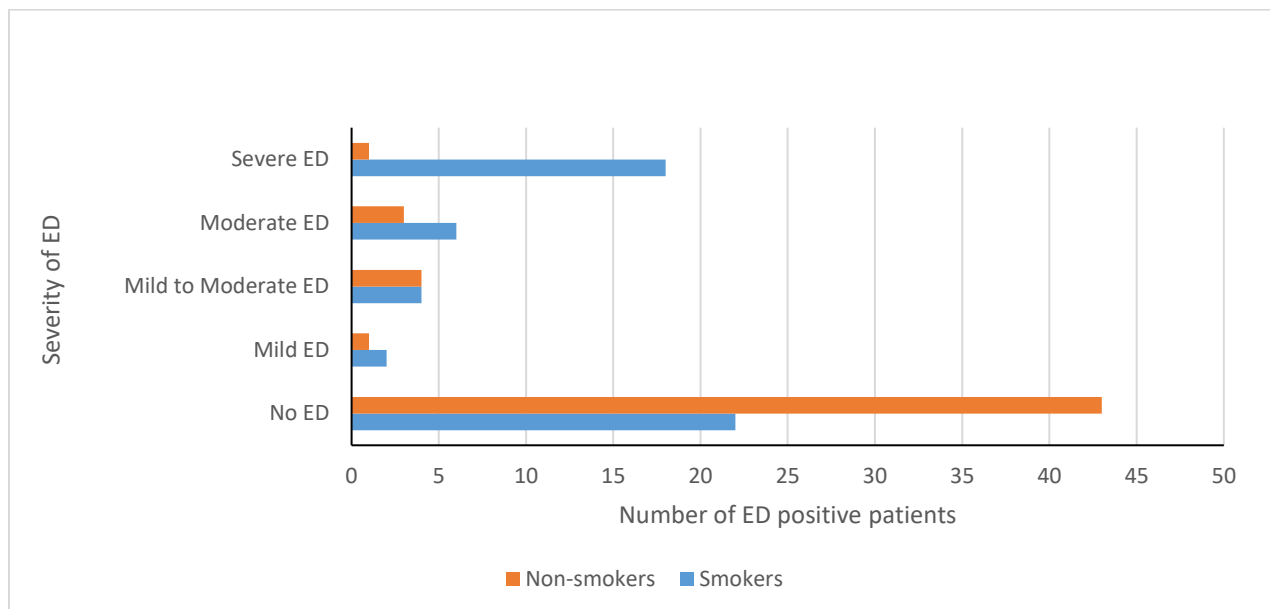


Figure 3: Comparison of severity of ED in smoker and nonsmoker

Table 2. Comparisons of the age distribution of erectile dysfunction positive individuals

Group	Age (years)	Number of patients	Percentage
Smoker	21-30	3	10
	31-40	6	20
	41-50	10	33.33
	Above 50	11	36.6
Non smoker	21-30	0	0
	31-40	1	11.11
	41-50	4	44.44

	Above 50	4	44.44
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Discussion

This study investigated the correlation between smoking and erectile dysfunction among 104 adult males using the SHIM questionnaire. The final analysis included two equally sized groups: smokers and non-smokers ($n = 52$ each). The findings demonstrated a significant correlation between smoking and both the prevalence and severity of ED.

A key finding was that SHIM scores declined progressively with increased smoking duration (Figure 1), indicating a negative correlation between smoking duration and erectile function. This trend aligns with existing literature, where chronic exposure to tobacco leads to endothelial dysfunction, impaired nitric oxide (NO) bioavailability, and reduced vasodilation mechanisms essential for penile erection (14, 15). Additionally, smoking accelerates atherosclerosis, disrupts testosterone regulation, and damages autonomic nerves, all of which are implicated in erectile dysfunction (6).

The dose-response pattern, as shown in Table 1, further reinforces this correlation. Participants with more than 10 years of smoking history demonstrated the lowest SHIM scores and a 60% prevalence of ED, with most cases categorized as severe. Notably, no ED cases were observed during the first four years of smoking, suggesting that short-term smoking does not immediately impact erectile function. However, ED prevalence began to rise after six years (7%), followed by increases at eight years (13%) and ten years (20%). This progressive trend aligns with earlier studies showing that cumulative exposure to tobacco impairs both vascular and neural pathways responsible for erectile response (16).

The most convincing result was the sharp increase in ED prevalence among individuals with over a decade of smoking (60%). This aligns with epidemiological evidence that long-term smoking induces persistent oxidative stress, vascular inflammation, and cavernosal tissue changes, including fibrosis and androgen disruption (17-19). These findings support the clinical

recommendation that smoking cessation programs are vital in reducing the long-term risk of ED, as prolonged exposure may cause irreversible sexual health consequences.

In addition to the correlation with duration, the overall prevalence of ED was significantly higher among smokers (57.7%) compared to non-smokers (17.3%) as shown in Figure 2. This substantial difference reinforces the positive correlation between smoking habits and the likelihood of developing ED, consistent with previous studies (5, 6).

To reduce age-related bias, the study maintained a consistent age distribution among ED-positive individuals in both smoker and non-smoker groups. This adjustment was important, as age is an independent risk factor for ED due to natural declines in testosterone levels and vascular function (20). Interestingly, ED was observed in smokers as young as 21-30 years (11.11%), while no such cases were reported in this age group among non-smokers. This suggests that smoking may contribute to early-onset ED, even in younger men, a finding consistent with previous research (21). The presence of ED across all age groups in smokers further confirms that smoking is an independent risk factor, regardless of age. This is consistent with earlier evidence of a dose-response correlation between smoking intensity and erectile function decline (22).

Conclusion

This study found a substantial, statistically significant correlation between smoking and erectile dysfunction. The Chi-Square test confirmed a strong correlation ($X^2=18.08$, $p<0.001$), with smokers exhibiting a significantly higher prevalence of ED (57.59%) compared to non-smokers (17.3%). The severity of ED was also greater among smokers, particularly in long-term smokers, where the dose-dependent relationship was evident: those who smoked for over a decade faced the highest ED burden (60%). Importantly, the correlation persisted even after adjusting for age, underscoring smoking as an independent risk

factor for ED. These findings highlight the urgent need for public health interventions targeting smoking cessation, especially among young adults, to mitigate the rising prevalence of ED linked to tobacco use.

Conflict of Interest: NO

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Authors Contributions

Conceptualization: Shahzaman Khan and Abdul Razzaq;

Methodology: Shahzaman Khan, Abdul Razzaq, and Naimatullah Tareen;

Formal analysis and investigation: Shahzaman Khan;

Results analysis: Shahzaman Khan, Abdul Razzaq, and Jamail Kakar;

Writing - original draft preparation: Shahzaman Khan;

Writing - review and editing: Shahzaman Khan and Abdul Razzaq;

Supervision: Abdul Razzaq

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