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Frequency of Erectile Dysfunction among Smokers and Non-Smoker Men Visiting Tertiary Care Hospital Nawabshah

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ABSTRACT

Epidemiological studies have shown that cigarette smoking is the independent risk factor for erectile dysfunction (ED), with smokers 1.5–2 times more likely to develop ED than nonsmokers. Additionally, long-term research has shown that quitting smoking improves erectile function, with noticeable improvements even within 24 hours of cessation. **Objective:** To determine the frequency of erectile dysfunction among male smokers and non-smokers at PMC Hospital Nawabshah. **Methods:** This research was conducted at the Department of Urology, Peoples Medical University Hospital, Nawabshah. A formal written consent /agreement was obtained from every subject/individual who fulfilled the inclusion criteria and then decided to participate. The measure divides ED into four groups based on IIEF-5 scores: mild to moderate (12–16), mild (17–21), no ED (22–25), moderate (8–11), and severe (1–7). Data were being analyzed by computer software statistical package for social sciences version 23. Frequency and percentage were computed for variables. 85.9% are confirmed to have some degree of ED, and 14.1% are found not to have ED. **Results:** Among the smokers, 39(27%) had mild ED, but in non-smokers, 53(37%) had mild ED. Among the smokers, 50(35%) had moderate ED, and in non-smokers, 51(36%) had moderate ED. In smokers, 64(45%) had severe ED, and in non-smokers, 38(27%) had severe ED. **Conclusions:** Smoking tremendously affects the erection of patients. Whereas non-smokers had a little bit less effect on erectile function.

INTRODUCTION

The prevalence of ED is increasing, and more individuals are becoming aware that treatment options are available. ED is also thought to be a strong predictor of coronary artery disease, and a cardiovascular evaluation of a patient presenting with ED is indicated [1,2]. Aside from cardiovascular illness, there are considerable associations between Erectile dysfunction, hypertension, hypogonadism, smoking and drinking. E-cigarette usage may cause ED in men, but further research, particularly clinical trials, is needed to determine a link between e-cigarettes and ED [3]. Erectile dysfunction (ED), a health condition that greatly impairs men's quality of life around the world. Smoking is independently linked to erectile dysfunction and cardiovascular disease. This does not reduce life expectancy, but it might seriously harm one's health and standard of living [4, 5]. By 2025, there will be 200 million ED-affected males in Asia, a 130% increase from current predictions [6]. Few studies have shown to assess the frequency of ED in developing nations. Between the ages of 25 and 70, the frequency of ED in males is 19%; however, beyond the age of 50, it rises to above 25% [7]. Globally, with an estimated 322 million people expected to be affected by ED by 2025, the burden of the disease is enormous. Previous studies showed that the United States (US) and Asia have greater incidence of ED than the rest of the globe. By 2025, there will be 200 million ED-affected

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males in Asia, a 130% increase from current predictions [8]. The lack of data may also be due to the social stigma and differing cultural norms around sexual dysfunction, especially in South Asia, which discourage men from talking to their primary care doctors about it [9,10]. Remarkably, multicenter research conducted in 2003 discovered that Pakistan had the greatest frequency of ED (80.8%) among males visiting primary care clinics, comparable to Egypt (63.6%) and Nigeria (57.4%). ED is linked with many influences, including advanced age, depression, obesity, physical inactivity, and co-morbid conditions, including diabetes, cardiovascular disease, peptic ulcers, and prostate disease [11]. The frequency of ED in the general population in Pakistan is above 80%, which is rather concerning as the rate among diabetics in the US was 51.3% [12]. The population under study, terminology, and methodology affect how common ED is. Some research has been conducted to determine the occurrence and frequency of ED in healthy people, perhaps because the condition is correlated with long-lasting illnesses such as diabetes mellitus, heart disease, hypertension, and a range of neurological disorders that typically occur with age [13]. Although the etiology of smoking-related erectile dysfunction is still unclear, it may include endothelium-mediated smooth muscle relaxation impairment, similar to that of diabetes [14]. Beyond "further simple investigation upon the functional as well as chemical mechanisms which should motivate the cause, pathology, and reaction to management of the numerous methods of erectile dysfunction, the National Institutes of Health Consensus Development Panel on Impotence identified a need for future research [15]. Age and vascular variables impact the incidence of ED in Pakistan, highlighting that smoking is a significant risk factor. It also highlights a few possible influences, for example, diabetes, hypertension, and smoking, all of which tend to raise the chance of ED [16].

Despite growing global evidence linking cigarette smoking as an independent risk factor for erectile dysfunction, there remains a critical research gap in Pakistan where cultural taboos, social stigma, and limited urological health awareness have resulted in a severe underreporting and understudying of ED, particularly in relation to modifiable risk factors such as smoking in Sindh's semi-urban and rural populations. The problem is compounded by the alarming statistic that Pakistan recorded the highest frequency of ED at 80.8% among primary care attendees in a multicenter study, yet locally generated comparative data between smokers and non-smokers using validated tools like the IIEF remains sparse and methodologically limited. Thus, the current research aimed to inspect the frequency of ED at PMC Nawabshah's Department of Urology and evaluate its correlation with other parameters. The results of the research will aid medical professionals in comprehending the frequency and dynamics of erectile problems in men and also in identifying and addressing the condition's modifiable risk factors.

METHODS

Current study was conducted at the Department of Urology Peoples Medical College Hospital Nawabshah, Shaheed Benazir Abad, from July 2023 to December 2023. The design of the study was comparative cross-sectional. The non-probability convenience sampling technique was used for data collection. The sample size was calculated using the Rao soft sample size calculator using P= Prevalence 25% [2], Confidence level = 95%, Margin of Error = 5%, and Population size = 20000. The sample size was 289. The participants aged 30 years or older and willing participants were included in the study, while the participants aged above 80 years and not willing participants were excluded. The Peoples University of Medical & Health Sciences' Ethical Review Committee (ERC) gave its approval for this research to be carried out for women in Nawabshah (SBA) under letter no: ERC/2023/299. The formal approval was obtained by the Peoples Medical College Hospital Nawabshah's Medical Superintendent, who has a higher position. All participants received a pre-made questionnaire. The questionnaire was arranged according to the IIEF. The International Index of Erectile Function (IIEF) is a multidimensional self-report instrument that has been used to evaluate male sexual function. It addresses the most relevant aspects of male sexual function, such as erectile strength, orgasm, desire, satisfaction with intercourse, and overall satisfaction. This can be readily self-administered either in research or in clinical settings, and it has the requisite sensitivity and specificity needed to detect treatment-related changes in patients with ED. The IIEF classifies the severity of ED into five categories stratified by score:

1. No ED=26–30
2. Mild=22–25
3. Mild to moderate=17–21
4. Moderate=11–16
5. Severe.6–10

Data were analyzed using SPSS version 23.0. Frequency and percentage were computed for variables. The Chi-square test was applied to see the frequencies and T- the test was applied to compare the mean scores of the two groups.

RESULTS

Two groups were made. Group A were smokers and were 143, and group B were nonsmokers, and they were 142 (Table 1).

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Table 1: Characteristics of Study Participants

Group	Number of Participants
Smokers	143
Non-Smokers	142

In smokers' patients aged between 30-39 years, 10 had mild ED, 7 had Moderate ED, and 8 had severe ED, respectively. Of the patients aged between 40-49 years, 15 had mild ED, 10 had Moderate ED, and 15 had severe ED, respectively. Of the patients aged between 50-59 years, 8 had mild ED, 20 had Moderate ED, and 20 had severe ED, respectively. Among patients aged between 60-69 years, 4 had mild ED, 8 had Moderate ED, and 12 had severe ED, respectively. Among patients aged between 70-80 years, 2 had mild ED, 5 had Moderate ED, and 9 had severe ED, respectively. In non-smokers, among patients aged between 30-39 years, 12 had mild ED, 8 had Moderate ED, and 5 had severe ED, respectively. Among patients aged between 40-49 years, 18 had mild ED, 12 had Moderate ED, and 10 had severe ED, respectively. Among patients aged between 50-59 years, 10 had mild ED, 20 had Moderate ED, and 15 had severe ED, respectively. Among patients aged between 60-69 years, 7 had mild ED, 6 had Moderate ED, and 5 had severe ED, respectively. Among patients aged between 70-80 years, 6 had mild ED, 5 had Moderate ED, and 3 had severe ED, respectively. In smokers, 39(27%) had mild ED, but in non-smokers, 53(37%) had mild ED. In smokers, 50(35%) had moderate ED and in non-smokers, 51(36%) had moderate ED. In smokers, 64(45%) had severe ED, and in non-smokers, 38(27%) had severe ED (Table 2).

Table 2: Comparison of ED Severity Between Smokers and Smokers

Severity of ED	Smokers	Non-Smokers	p-Value
Mild ED	39 (27%)	53 (37%)	0.30
Moderate ED	50 (35%)	51 (36%)	
Severe ED	64 (45%)	38 (27%)	
Total	143	142	

Table no 3 shows IIEF among the smoker and non-smoker participants of the study. 55 participants had severe ED with a score range 6-10, 45 participants had moderate ED with a score range of 11-16, 25 participants had mild to moderate ED with a score range of 17-21, 10 had mild ED with a score range 22-25, and 8 participants had no ED with score range 26-30. The IIEF among the non-smoker participants of the study out of which 30 participants had severe ED with a score of range 6-10, 30 participants had moderate ED with a score range 11-16, 40 of the participants had mild to moderate ED with score range 17-21, 22 participants had mild ED with score range 22-25, and 20 participants had no ED with score range 26-30. The p-value was 0.003.

Table 3: International Index of Erectile Function (IIEF) in Smokers and Non-Smoker Participants of the Study

Score Range	Classification	No Smoker participants	No of non-smoker participants	p-Value
6-10	Severe ED	55	30	0.03
11-16	Moderate ED	45	30	
17-21	Mild to moderate ED	30	40	
22-25	Mild Ed	10	22	
26-30	No ED	8	20	

Among the smoker participants, 94.4% had ED with an 11.8 mean erectile function score, while among the non-smoker participants, 85.9% had ED with an 18.4 mean erectile function score (Table 4).

Table 4: Comparison of Smokers and Non-Smokers by Erectile Function Score

Status	ED	Mean erectile Function score
Smokers	94.4%	11.8
Non-Smokers	85.9%	18.4

DISCUSSION

In addition to the well-established harmful effects of smoking (i.e., coronary artery disease and lung cancer), the past three decades have led to a compendium of evidence being compiled into the development of a relationship between cigarette smoking and erectile dysfunction. It was observed in the current study that more smoker participants had ED than non-smokers [15]. The current study observed that smokers had more severe to moderate ED than the non-smoker participants of the study. Other studies found that erectile dysfunction should become an age-linked disorder most frequent in males with diabetes and/or cardiovascular disease. Because the physiology of erection is heavily dependent on vascular changes, many of the known cardiovascular risk factors, such as hypertension and diabetes, have been associated with the development of erectile dysfunction. It seems that comorbidities also affect the ED. In this study, it was observed that aging has a major effect on ED [16]. According to a study conducted on habitual smokers, there is important progress between nocturnal penile tumescence and rigidity within 24 hours of quitting smoking. That progress was observed even when patients received nicotine through transdermal patches, representing the influences further than nicotine plays a role in ED [17]. Cigarette smoking was the significant autonomous reason for ED in studies significant for confounding variables (e.g., age and healthy living). The findings demonstrated a dose-response effect, where in low intensities of cigarette smoking (~8.6 cigarettes/d; RR = 1.26; 95% CI, 1.10-1.44) were linked to a lower risk of ED than high intensities of current smoking (>20 cigarettes/d; risk ratio [RR] = 1.53; 95% CI, 1.31-1.80). Additionally, the

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meta-analysis showed that a higher risk of ED was linked to higher levels of past cigarette smoking (~23 pack-years total, <5 years since quit; RR = 1.64; 95% CI, 1.52-1.76) than lower levels (~10 pack-years total, >10 years since quit; RR = 1.17; 95% CI, 1.13-1.21). Similar findings were observed in the current study [18]. Furthermore, the severity of a patient's ED may also predict one's response to quitting. Feldman HA *et al.* observed in their study that smoker patients suffer from ED severely as compared to nonsmokers and observed that smoking has an effect on the ED of the patients. It was also observed in the current study [19]. In a subgroup analysis of other larger studies, odds ratios of patients who developed ED showed a significant difference when men smoked more than 10 cigarettes per day. Among smokers, a positive but non-significant trend towards increased ED occurred in relation to daily cigarette intake. Strong evidence has been found in research on erectile dysfunction with tobacco contact intensities in current smokers. Gilbert DG and Hagen RL *et al.* also observed the same [20]. Diabetes also contributes to ED through both microvascular and macrovascular damage. Studies have shown that >50% of diabetics have some degree of ED. Furthermore, men with diabetes have a threefold increase in risk for developing ED. The prevalence of the main risk factors for erectile dysfunction (smoking, alcoholism, heart illness, and diabetes) was approximately alike with sexually active and quiet groups. Which were comparable to Harte CB and Meston's study [21].

This comparative cross-sectional study conducted at a single tertiary care hospital in Nawabshah carries several important limitations, including the use of non-probability convenience sampling restricting generalizability to the broader Pakistani male population, reliance on self-reported IIEF-5 questionnaire data susceptible to social desirability and recall bias particularly given the cultural stigma surrounding sexual dysfunction in South Asia, absence of quantitative smoking data such as pack-years or cigarettes per day to establish a dose-response relationship, and failure to control for confounding comorbidities like diabetes, hypertension, and cardiovascular disease. Future research should employ population-based longitudinal study designs with larger, more diverse samples, incorporating objective vascular and hormonal assessments alongside IIEF scoring, and should evaluate the reversibility of smoking-induced ED through structured smoking cessation intervention trials to establish clearer causal pathways.

CONCLUSIONS

It is established that smoking tremendously affects the erection of patients who are smokers. Whereas non-smokers had a little bit less effect on erectile function. In smokers, age and co-morbidities also participate and enhance the ED, whereas the reverse is in the case of non-smokers.

Authors' Contribution

Conceptualization: SAC
Methodology: ZAB, HURT, AHG
Formal analysis: IAZ, ZAS
Writing and Drafting: HURT
Review and Editing: HURT

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

The authors declare no conflict of interest.

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