Original Research

Prevalence of erectile dysfunction among smokers in southwestern Saudi Arabia

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Abstract

Background: Erectile dysfunction (ED) is the failure to develop or maintain erections that are adequate for sexual performance. ED is increasing in prevalence and incidence worldwide. According to the latest epidemiologic studies, around 10% of men aged 40 to 70 have severe or complete ED. An additional 25% of men in this age group have moderate or sporadic ED. The literature is replete with evidence that smoking has a negative impact on erectile function independent of age or comorbidities. **Methods**: This cross-sectional study was conducted in the southwestern region of Saudi Arabia, from March-2021 to June-2021. Data on demographic characteristics, erectile dysfunction, and smoking habits was collected by self-administered questionnaire. The descriptive statistics were calculated to measure significant differences among variables, and the chi-square test and *t*-test were used at 5% level of significance. The data analysis was done by using Statistical Package for Social Sciences (SPSS)-version 20 software (IBM Corp., Armonk, NY, USA). **Results**: Out of 500 distributed questionnaires, 450 questionnaires were returned, yielding a response rate of 90.0%. Of 450 patients, the average (SD) age was 33.6 (8.9) years and 55.6% were sexually active (N = 250). Thirty six percent of sexually active respondents were smokers. Independent of age, smokers were at higher risk of having ED. **Conclusions**: Smoking was associated with higher risk of ED. So, health-policy makers should start an awareness campaign to educate people about the adverse effects of smoking on men's health. The government should also support these programs for the public.

Keywords: erectile; dysfunction; smoking; men; diseases

1. Introduction

Erectile dysfunction (ED) is identified as the incapability to reach and sustain an erection enough to warrant acceptable sexual intercourse (impotence) [1]. ED is increasing in prevalence and incidence globally and has become a widespread medical condition. According to recent epidemiologic studies, about 10% of men aged 40 to 70 have severe or complete ED while an additional 25% have moderate or sporadic ED [1]. In the United States, 20 to 30 million men are estimated to suffer from ED. ED may be caused by psychological, neurologic, hormonal, arterial, or cavernosal insufficiency or from a combination of causes in the same case [2,3].

ED is age-dependent, with a combined prevalence of moderate to full ED rising from approximately 22% at age 40 to 49% by age 70 [4]. ED affects 5% to 10% of males under the age of 40. ED has a major impact on mood and interpersonal functioning, according to the findings of this investigation [4].

Both physical and psychological wellness are highly linked to ED. Diabetes mellitus, cardiac disease, hypertension, and dyslipidemia, especially low levels of HDL, are all recognized risk factors. ED can be also caused by some medications like antidiabetes, antihypertensives, antidepressants and drugs that used for cardiovascular diseases [5,6]. Moreover, ED is more common in men who have had prostate cancer treated with radiation or surgery or who have a lower spinal cord injury or other neurological diseases (such as Parkinson's disease or multiple sclerosis). Additional risk factors include smoking, consuming alcohol, and engaging in a sedentary lifestyle [6].

In 1948, Kinsey published the first paper that explored the prevalence of sexual dysfunction in the general community and estimated prevalence to be less than 1% in men under the age of 19, 3% in men under the age of 45, 7% in men under the age of 55, and 25% in men over the age of 75 [7,8].

According to current statistics, 20% of the population of the United States will be over 65 years old by 2030 [2]. Given rising life expectancy and the growing preva-

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lence of ED in the elderly population, an increase in patients with ED is inevitable. In 2001, almost 46.2 million American adults were cigarette smokers, and the frequency was higher among men than women. High prevalence of smoking leads to mortality and huge expenses, with approximately 440,000 early deaths in the United States annually and around $157 billion in yearly health-related economic losses [9,10]. Regarding men's health, a lot of the focus has been on epidemiology of cancer and cardiovascular diseases. These diseases tend to occur at older ages therefore, younger adults and adolescents may be underestimated in cardiovascular risk estimates. ED has been shown to be strongly linked with smoking, and antismoking health campaigns have tried to use this knowledge to their advantage [11–14].

The vast majority of investigations have been conducted internationally, including China, North and South America, Europe, and the Middle East. Each study had a different smoking prevalence, the odds ratio of smokers with ED varied between 1.4 and 3.1, with statistically significant confidence intervals. Unfortunately, only some population-based studies have assessed the association between smoking and ED in the adult male population [15].

In Jeddah, one study was found where ED and ED risk variables were highly common in a cross-sectional office-based study of >1500 male patients visiting an andrology clinic. Overall, 92.6% of patients had ED, 50.8% had premature ejaculation, and 7.6% had reduced sexual desire [16].

The most cited men's health study in the United States is the Massachusetts Male Aging Study, which assessed ED in men aged 40–70 years. Men were grouped as former smokers, nonsmokers, or current smokers at baseline and follow-up [8]. Outcomes from this study confirmed that cigarette smoking at baseline nearly doubled the risk of having moderate or full ED at up to 10 years of follow-up. On the other hand, former smokers, compared with never smokers, were not at increased risk of ED [7], but there was no data on dose response, that is, number of cigarettes smoked. A previous study of Vietnam-era veterans aged 31–49 years, mentioned that a greater percentage of smokers reported ED problems than did nonsmokers [17]. Nevertheless, neither number of years of smoking nor number of cigarettes smoked daily were significant predictors of ED in current smokers in this study [17].

The aim of this study is to explore the relationship between smoking and ED among adult Saudi men living in the southwestern region of Saudi Arabia.

2. Methodology

In this cross-sectional study, data was collected by the purposely constructed questionnaire. The questionnaire collected demographic data and items related to ED and smoking. The questionnaire was constructed following a series of discussions between a panel of experts (subject specialist, researcher, language expert). Cronbach alpha of the questionnaire was calculated. The study was conducted in the southwestern region of Saudi Arabia. An electronic version of questionnaires were self-administered by participants who visited primary health care centers at Abha (southwestern) of Saudi Arabia as well as general smokers who were living in the southwestern region of Saudi Arabia.

After collection, data was coded and entered into the statistical package for social sciences SPSS-version 20 software (IBM Corp., Armonk, NY, USA) for analyses, descriptive statistics were computed. To measure significant differences among variables, the chi-square test and t-test were used at 5% level of significance. The study was conducted from March-2021 to June-2021 and excluded those who were not willing to participate in the research. The sample size was calculated with a 95% CI, and we used 500 samples to avoid omissions.

3. Results

Four hundred fifty questionnaires were returned of the 500 distributed, yieldidng a response rate of 90.0%. The average (SD) age of respondents was 33.6 (8.9) years (range: 18 to 65). The Cronbach alpha of the questionnaire was 0.78. Two hundred fifty (56%) of respondents were sexually active while 44% were not sexually active. Of sexually active respondents 205 (82%) lived in cities, while 45 (18%) were living in 88% were married, and 4% had more than one wife while 6% and 2% were divorced or widowed, respectively (Fig. 1). The mean (SD) age of sexually active smokers was 36.3 (13.5) years. Of 90 sexually active smokers, 65 smoked cigarettes, 14 used shisha (waterpipes), 6 smoked cigars, 2 used electronic shisha, while 45 used multiple ways of smoking. Table 1 depicted that we have observed significant differences while comparing smokers and nonsmokers regarding erectile functions. Table 2 depicted that as we are increasing in age mean score of Erectile function EF is decreasing.
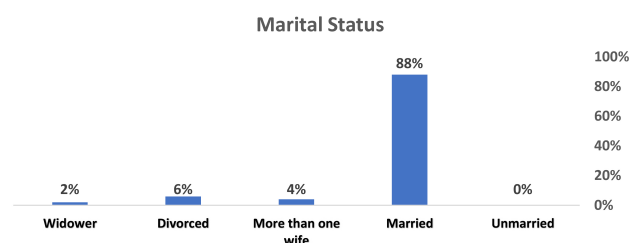

Fig. 1. The marital status of the sexually active participants. Out of 250 sexually active respondents, 88% were married, 4% have more than one wife while 6% and 2% were divorced and widowers respectively.

Table 1. Comparison between erectile function domains among smokers and non-smokers.

Functions domain	Non smokers			Smokers			p-value
	Mean	S.D	Max score	Mean	S.D	Max score	
A. Erectile function (Q1, 2, 3, 4, 5, 15)	3.14	4.7	23	2.4	4.5	24	0.017
B. Orgasmic function (Q9, 10)	3.2	4.2	22	2.4	3.6	22	0.006
C. Sexual desire (Q11, 12)	3.3	3.5	28	2.6	4.2	28	0.006
D. Intercourse satisfaction (Q6, 7, 8)	3.26	3.6	24	2.3	2.4	25	0.00001
E. Overall satisfaction (Q13, 14)	3.4	7.9	29	1.98	2.1	29	0.002

t-test.

Table 2. Age and E.D.

Functions domain	Age group			
	20–30	30–40	40–50	Above 50
	Mean (SD)			
A. Erectile function (Q1, 2 , 3, 4, 5, 15)	3.6	3.2	2.5	2.1
B. Orgasmic function (Q9, 10)	3.4	2.9	2.4	2.9
C. Sexual desire (Q11, 12)	3.5	3.1	2.5	2.6
D. Intercourse satisfaction (Q6, 7, 8)	3.2	3	2.6	2.6
E. Overall satisfaction (Q13, 14)	3.4	3.1	2.9	2.9

4. Discussion

Few studies have discussed the prevalence of ED in the world [9–12]. The referenced studies show that the USA and eastern and southeastern Asian countries have a higher prevalence of ED than Europe or South America. These disparities can be explained by a variety of possible reasons, including cultural, environmental or socioeconomic factors. A man's virility and sexual prowess have traditionally been symbolized by his erect penis. Although not life-threatening, ED and its treatments have piqued public interest throughout history. In our study we evaluated the association between ED and smokers. Previous population-based investigations revealed a link between ED and cigarette exposure levels [18–20]. Cigarette smoking has been implicated as a risk factor for atherosclerotic cardiovascular diseases and ED, with dose-dependency observed. When men smoked more than 10 cigarettes per day, their potential to experience ED was higher. Consistent with these studies, we also observed significant differences in erectile functions between smokers and nonsmokers [21–24].

According to the European Male Ageing Study (EMAS), the biggest European multicenter population-based research of males aged 40 to 79 years, the prevalence of ED ranged from 6% to 64%, depending on age subgroup, and increased with age. Our findings support earlier study indicating ED is a problem that worsens with age, suggesting that older men will likely have more problems with ED.

According to the World Health Organization (WHO), more than 1 billion people are addicted to tobacco smoking, 5 million people die anually from smoking-related diseases, and the mortality numbers is expected to grow to be over 8 million by 2030 if current trends continue. Tobacco use is a well known risk factor for many chronic diseases, a finding that we observed in our study [25,26].

In our study, men in an established relationship who attempted sexual activity and intercourse could be divided into several categories depending on the degree of severity as follows: no ED (EF score = 26–30); mild ED (EF score = 22–25); mild to moderate (EF score = 17–21); moderate (EF score = 11–16); and severe (EF score = 6–10). We evaluated the ED score in all domains of the ED, and we observed scores above 24 in all domains of ED.

To our knowledge, this is the first study in the southwestern region of Saudi Arabia to explore the association between smoking and ED. This study has some limitations that include its cross-sectional design, which lacks temporality and the ability to determine the cause-and-effect order. Another limitation is that we do not study all other possible risk factors of ED, like chronic diseases including diabetes mellitus and obesity, and use of medications.

5. Conclusions

Erectile dysfunction (ED) is a growing health issue and is strongly linked to current smoking. Regardless of age, smokers were at an even higher risk of having ED. We observed a significant association between smoking and ED in the younger age groups. The link between smoking and ED could be used in health promotion programs to help men quit smoking.

Abbreviations

ED, erectile dysfunction; HDL, high density lipoprotein; CI, confidence interval; SD, standard deviation; EF, erectile function.

Ethics approval and consent to participate

The research proposal was approved by the King Khalid university's research committee with approval number of (ECM# 2020-3102). Informed written consent was obtained from the participants.

Author contributions

AA designed the research and conceptualization; FSAl-Q edited and reviewed the manuscript; ASA contributed in conceptualization and original draft preparing. FSA, SAA, NMa, AMA undertook the searches and

screened studies for eligibility, assessed the quality of the papers. AB contributed in supervision and writing. All authors shared and participated in collecting and analyzing the data as well as in revising the paper.

Conflict of interest

The authors declare no conflict of interest.

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