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Original article

Prevalence of erectile dysfunction among turkish heterosexual men

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ABSTRACT

Erectile dysfunction (ED) is defined as the inability to attain or maintain an erection sufficient for satisfactory sexual performance and is one of the main complaints in male sexual medicine. We conducted an internet survey to determine the frequency and severity of ED in a group of Turkish men. The online survey was randomly offered to web surfers in Turkey. The survey was posted on the Internet with the title ‘‘Sexual Health Survey for Men”. The web address (www.cu.edu.tr/family) was hosted by the Cukurova University. Cukurova University Department of Family Medicine provided a link on the online site. Only one survey per computer could be completed (unique IP recognition). Surveys could not be returned to later nor could earlier entries be revised. The survey was designed to collect basic medical, sociodemographic characteristics and comorbidities as they may relate to erectile dysfunction include the Sexual Health Inventory for Men (SHIM). The data were installed and analyzed using the Statistical Package for Social Sciences software, version 15.0 (SPSS Inc., Chicago, IL, USA). Chi-square, Mann-Whitney, Kruskal-Wallis and Pearson's correlation coefficient tests were used for statistical analysis. A total of 1809 [137(7.57%) were excluded due to inclusion criteria] participants were enrolled. The mean score of erectile dysfunction was 17.87±4.56 (range 1–25, 95% confidence interval [CI] 1.34). The mean age of subjects was 38.6±10.3 years (range 18–79). The overall prevalence of erectile dysfunction of various degrees was 79.2%. There was a significant

relationship between different degrees of erectile dysfunction and age; it was significantly higher in patients older than 50 years of age (p=0.001). Erectile dysfunction was more common in patients with BMI >25 (p = 0.001). Sexuality is a sensitive issue that may be difficult to explore through surveys involving direct contact. Online surveys may provide more anonymity and less direct contact encouraging participation. Our study suggests that erectile dysfunction is a major health concern of Turkish males.

1. Introduction

Erectile dysfunction is one of the main complaints in male sexual medicine and is thought to affect some 150 million men worldwide and has been defined as the persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance (Travison et al, 2011).

The wide range of reported prevalence rates for erectile dysfunction is considered to be related to the variations in age groups reported, definitions used to describe the dysfunctions, data selection, data collection, length of dysfunction, the degree of severity of the dysfunction, and the possible sociocultural factors (Lewis et al, 2010).

Two of the Asian studies showed doubling of the prevalence rate at age 60–70, and almost another doubling at age 70–79 years. A more recent Korean report showed a tripling of the prevalence for the 60–69 age group compared with the younger cohort (Ahn et al, 2007).

Prevalence rate from Australia was overall about 21% for ages 40–80 years (Chew et al. 2008). For the studies that stratified for age, one study showed an increasing but still low rate of 13–19% for the decades 40–49 and 50–59 years. The other two studies stratifying older ages showed marked increasing rates, starting at age 60, with increases across each of the three following decades. The most recent report from Western Australia utilized an older age limit in their study and reported an overall prevalence of 40%, which corresponds to almost four times the prevalence for the other age-stratified study from Australia which reported an overall rate of 10% (Chew et al, 2008; De Almeida et al, 2007). Less than good overall health is likely to co-occur with erectile dysfunction.

2. Materials and methods

A web-based internet survey was used to collect the data between February to September 2011. Announcements about the study were sent electronically to the physicians' e-mail groups, patients' website groups, and organizations in Turkey, and potential participants were asked to forward information about the study to other individuals and groups that might be eligible to participate. Men who were at least 18 years of age were invited to take part and potential participants were informed that they would be asked intimate and private questions about male sexuality. Participants who followed the link were guided to a web-based information statement explaining the aim of the study, criteria for participation, and they were assured of total confidentiality. Inclusion criteria were as follows: (a) being male and sexually active during the last six months; (b) being married or in a stable sexual relationship; and (c) practicing only heterosexual sex. Participation was voluntary, and no financial incentive was offered. Those who agreed to participate then completed the questionnaire online. The survey was posted on the Internet with the title ''Sexual Health Survey for Men". The web address (www.cu.edu.tr/family) was hosted by the Cukurova University. Cukurova University Department of Family Medicine provided a link on the online site. Only one survey per computer could be completed (unique IP recognition). Surveys could not be returned to later nor could earlier entries be revised.

The participant was presented the informed consent form before a link is encountered to guide him to the questionnaire and he was instructed about not submitting the completed questionnaire unless he has read and agreed to the content of the informed consent form.

The questionnaire was designed to collect basic sociodemographic and medical characteristics and comorbidities, as they may relate to erectile dysfunction. It included the Sexual Health Inventory for Men (SHIM), an abridged version of the International Index of Erectile Function. It is a clinical instrument used in the diagnosis of erectile dysfunction that is both valid and reliable (Rosen et al, 1999).

The participants answered questions in the Sexual Health Inventory for Men (SHIM) on a Likert scale from 0 to 5, where "0" indicates no activity, "1" is the most negative response, and "5" is the most positive response. Overall scores on the SHIM range from 1 to 25. Higher scores indicate better erectile function, with a score of 20 or higher indicating a normal degree of erectile functioning. Lower scores (10 or less) indicate moderate to severe erectile dysfunction. Ethical approval of the research is given by the local ethical board.

3. Statistical analysis

The data were installed and analyzed using the Statistical Package for Social Sciences software, version 15.0 (SPSS Inc., Chicago, IL, USA). Chi-square, Mann-Whitney, Kruskal-Wallis and Pearson's correlation coefficient tests were used for statistical analysis. Statistical significance was defined as $p \leq 0.05$ for all variables.

4. Results

A random sample of 1809 internet users completed the web-based survey. Of these, 137 (7.6%) were excluded due to not competed or some data missing the form. The mean age was 38.6±10.3 years (range= 18–79 years). The mean total SHIM score was 17.87±4.56 (range 1–25, [95% CI 1.34]); 328 subjects (20.8%) had total SHIM scores >21 (mean 23.23±1.09 [range= 22–25, 95% CI 0.33]) consistent with normal erectile function while 1247subjects (79.2%) had total SHIM scores <22 (mean 15.72±4.57) (range=1–21, [95% CI 1.51]) and these were categorized as having mild erectile dysfunction (n = 719, 45.7%), mild to moderate erectile dysfunction (n = 407, 25.8%), moderate erectile dysfunction (n = 64, 4.1%), and severe erectile dysfunction (n = 57, 3.6%). There was a significant relationship between different degrees of severity for erectile dysfunction and the age of the men (p=0.001); it was significantly higher in patients older than 50 years (p=0.002) (Table 1).

Table 1
Age groups and SHIM* scores of participants.

Age	N (%)	Mean SHIM score+ (range)	Mean no. of risk factors
< 20	48 (2.9)	14.9±6.4 (1-21)	0.95
20-29	344 (20.6)	19.8±5.3 (2-25)	1.01
30-39	516 (30.9)	19±3.8 (3-25)	1.15
40-49	473 (28.3)	17±3.6 (2-25)	1.17
50-59	241 (14.4)	15.7±4.7 (5-25)	1.27
60-69	46 (2.8)	15.1±2.9 (10-22)	1.32
70-80	4 (0.2)	14.8±5.3 (12-20)	1.39
Total	1672 (100.0)		

* SHIM: Sexual Health Inventory for Men
+ p=0,001

Out of 14 risk factors and comorbidities reviewed, the mean number of risk factors for the study population was 1.13. The SHIM scores were compared with the number of risk factors and the age profile. As expected, patients without any risk factors had the highest mean SHIM score (18.07). However, with only one risk factor, the mean SHIM score decreased to 17.80; with two risk factors to 17.07 (Table 2).

A further analysis was performed to determine the frequency of each individual risk factor and assess whether a relationship existed between any one risk factor [smoking, body mass index (BMI), hypertension, type 2 diabetes mellitus , pelvic surgery, renal disease, pelvic injury, heart disease, alcohol consumption, medications (antihypertensives, antidepressants, cimetidine, digoxin, antiandrogens)] and SHIM score (Table 3).

Table 2
Risk factors, age groups and SHIM* scores of participants.

Risk factors (n)	N (%)	Age range (years)	SHIM score range	Mean SHIM+
0	461 (27.6)	44-50	2-25	18.07±4.6
1	566 (33.9)	39-44.5	1-25	17.80±3.7
2	609 (36.4)	44-50	2-25	17.07±2.9
3	30 (1.8)	40-49	17-25	16.90±4.1
4	4 (0.2)	60-69.5	13-15	14.00±3.6
5	2 (0.1)	60-69	10-10	10.00±2.3

* SHIM: Sexual health inventory for men
+ p=0,001

Table 3
Individual risk factors, comorbidities, medications and SHIM* scores of participants.

	N (%)	SHIM score range	Mean SHIM (range)	P value
Smoking	860 (51.4)	1-25	17.60±4.7 (1-25)	0.001
Alcohol				0.0001
≤12 gr / week	501 (29.9)	4-25	18.60±2.8 (4-	
13-48 gr / week	385 (23.0)	2-21	17.40±4.6	
49-197 gr / week	93 (5.5)	2-20	16.20±3.1	
BMI				0.001
< 18.5 (underweight)	25 (1.5)	2-24	16.80±4.1	
18.5-25 (normal)	694 (41.5)	1-25	18.05±2.9	
26-30 (overweight)	795 (47.5)	2-25	17.03±3.3	
> 30 (obese)	158 (9.4)	2-25	16.60±4.5	
Hypertension	124 (7.4)	2-25	17.18±3.8	0.001
Diabetes Mellitus Type 2	74 (4.4)	2-25	16.20±4.8	0.001
Pelvic surgery	40 (2.4)	7-24	16.95±3.4	0.001
Renal disease	39 (2.3)	10-22	16.79±5.1	0.005
Pelvic injury	29 (1.7)	9-22	18.24±5.9	0.005
Heart disease	25 (1.5)	10-21	15.64±6.1	0.001
Medication used				
Antihypertensive	99 (5.9)	2-25	16.51±4.6	0.005
Antidepressant	50 (3.0)	7-25	16.50±3.2	0.005
Simetidine	21 (1.3)	9-23	17.60±4.1	0.005
Digoxin	6 (0.4)	13-20	17.33±5.4	0.005
Antiandrogen	4 (0.2)	19-20	19.50±3.2	0.059

* SHIM: Sexual Health Inventory for Men

The incidence of the risk factors for erectile dysfunction , which include smoking, antihypertensive drugs, antidepressants, cimetidine, digoxin, and antiandrogens was 51.4%, 5.9%, 3.0%, 1.3%, 0.4% and 0.2%, respectively.

Smokers who used to smoke 20 cigarettes or more per day had a significantly increased risk of erectile dysfunction than less smokers (OR=1.43; 95%CI=1.21-1.65; p=0.001). The risk of erectile dysfunction was still significantly higher in men smoking more than 17 years than never smokers (OR=1.79; 95%CI=1.34 -2.23; p=0.001).

Subjects were divided into four groups according to their BMI: underweight (BMI < 18.5 kg/m2), normal weight (BMI = 18.5-24.9 kg/m2), overweight (BMI = 25.0-29.9 kg/m2), and obese (BMI ≥ 30.0 kg/m2). Of participants; 1.5% were underweight, 41.5% were normal weight, 47.5% were overweight, and 9.4% were obese. Erectile dysfunction was more common in patients with BMI >25 (p=0.001). There was also a strong relationship between erectile dysfunction and alcohol drinking (p=0.0001). Compared with never drinkers, alcohol drinkers who consumed three or more standard drinks (one standard drink equals 12 g of alcohol) per week were more likely to report erectile dysfunction (p=0.0001) after adjusting for age.

5. Discussion

The Massachusetts Male Aging Study (MMAS) reported that subject age was the most strongly associated variable for erectile dysfunction. The MMAS reports an overall prevalence of 52% erectile dysfunction in 40- to 70-year-old men; specific prevalence for the minimal, moderate, and complete erectile dysfunction were 17.2%, 25.2%, and 9.6%, respectively. As observed from the European studies for the 50–59 years of age group, there was tremendous variance from rates as low as 6–18% to rates as high as 32–35%. The rates were much higher for the age group 60 and beyond (Feldman et al, 1994).

In the Cologne study of men aged 30-80 years old, the prevalence of erectile dysfunction was 19.2%, with a steep age-related increase from 2.3% to 53.4% (Braun et al. 2000). In the National Health and Social Life Survey (NHSLS), the prevalence of sexual dysfunctions (not only erectile dysfunction) was 31% (Laumann et al, 1999).

In our study, 79.2% of subjects had some degree of erectile dysfunction; mild (45.7%), mild to moderate (25.8%), moderate (4.1%) and severe (3.6%). For each increasing age group, the prevalence also increases. The prevalence of moderate and severe erectile dysfunction also increased with age. The age-adjusted overall prevalence of erectile dysfunction in Turkey was 69.2% (mild 33.2%, moderate 27.5%, and severe 8.5%) and increased with age, as did severity of erectile dysfunction. When we consider the moderate plus severe erectile dysfunction cases, the prevalence is 36% (Akkus et al, 2002).

It has been argued that erectile dysfunction, like cardiovascular disease and other age-related disorders can be attributed, at least partly, to such modifiable para-aging phenomena (McKinlay et al, 1989).

In the context of an aging population, the relationship between erectile dysfunction and vascular disease, and multiple nonsurgical treatment options, with one risk factor yielding a SHIM score below 20, indicate that patients with any identifiable risk factor should be screened for erectile dysfunction (Padma-Nathan et al, 1997).

The relationship between erectile dysfunction and cardiovascular disease is well-documented. Injury sustained in coronary arteries will also occur in the vasculature of the penis. A decrease in erectile ability may give clues to clinically silent but significant cerebrovascular, peripheral vascular, or coronary artery disease. Wabrek and Burchell reported that among men aged 31 to 86 years who were hospitalized for an acute myocardial infarction, 64% had severe erectile dysfunction (Wabrek and Burchell, 1980; Michal et al, 1984).

This implies that vigilant screening for erectile dysfunction during a routine review of systems may uncover occult pathologic features.

Sexuality is a sensitive issue that may be difficult to explore through surveys involving direct contact. Epidemiological studies in this domain are scarce. There is still clearly a need for more longitudinal studies for the erectile dysfunction in men in order to obtain more accurate prevalence data. There is a variation in the prevalence rate reported because of different age groups reported, differences in definitions used to describe the dysfunctions, data selection, data collection, length of time the dysfunction was present, the degree of severity of the dysfunction, and possible socio-cultural differences. On the basis of the data, a general decrease in SHIM score, increase in risk factors and increases the prevalence of erectile dysfunction was evident as men become older.

The prevalence of erectile dysfunction on a worldwide basis shows a great deal of variation possibly attributed to the way the information was collected, the way the population was sampled, the tools used for the survey, and more importantly the way erectile dysfunction was defined. Below the age of 40 years, prevalence for erectile dysfunction is 1–10%. In the decades from 40 to 49, the prevalence ranges from 2% to 9% to as high as 15%. The 50–59- year age group showed the greatest range of reported prevalence rates. Most of the world showed a rather high rate of 20–40% for the ages 60–69 years, some increasing after age 65, except for the Scandinavian report where the age of 70 years and older is the decade of major prevalence rate change (there was one report from Finland that showed high rates beginning at age 50). Almost all of the reports showed a higher

prevalence rate for those men in their 70s and 80s ranging from 50% to 100% prevalence of erectile dysfunction in these decades. (Lewis et al., 2010)

Assuming that a SHIM score of 21 or less is evidence of a component of erectile dysfunction, we estimated our prevalence of an element of erectile dysfunction at 79.2%. However, erectile dysfunction is best defined by the individual's assessment of his own situation in simple terms of minimal, moderate, or complete impotence. (Schmidt 1997)

6. Limitations

First, the data is not applicable to more sociodemographically diverse populations. Furthermore, a selection bias may have inadvertently occurred because a participant with erectile dysfunction would be more likely to complete this survey than a healthy internet user. Second, our study seems to lack considerations of more social factors and social-psychological factors, but limits to more medicalized design. Third, cross-country, cross-study comparison is hard due to the different methodology adopted.

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Conflict of interest

There is no potential conflict of interest to declare for the authors.

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