

Pattern of Erectile Dysfunction and Associated Factors among Primary Care Clinic Attendees in South-west Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author TOO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author ISB contributed to the study design, interpretation of result and overall supervision of the study. Author AOO contributed to data collection, statistical analysis and literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Erectile dysfunction (ED) impairs sexual fulfilment and may predispose to disruption in relationships and family life. The condition appears under-recognized among primary care patients in this clime resulting in missed opportunities for prompt intervention.

Aims: This study sought to ascertain how common and the extent of recognition of ED among men attending a Family Medicine clinic in south-west Nigeria.

Methodology: A cross-sectional study of 414 men recruited by simple random sampling. Data was obtained using a questionnaire which incorporated the 6-item erectile function domain of the International Index of Erectile Function (IIEF) scale. The height, weight, body mass index, blood pressure and blood glucose were measured. Factors associated with ED were identified with the use of Pearson Chi square test and significant factors were subjected to multivariate logistic regression to determine the independent predictors of ED.

Results: The result showed that 168 (40.6%) had erectile dysfunction. The associated factors include age, hypertension, diabetes, the use of anti-hypertensives, smoking, alcohol consumption and low level of physical activity. A significant proportion (42.3%) of the men with ED had never raised the issue with their primary care physician. Multivariate logistic regression analysis showed that increasing age, diabetes and alcohol use were independent predictors of ED.

Conclusion: ED is relatively common among adult men in the study setting and a significant proportion of them were reluctant to raise the issue with their health care provider. Routine sexual evaluation of men with identified risk factors should be considered.

Keywords: Erectile dysfunction; male; health; clinical remedy; Nigeria.

1. INTRODUCTION

Sexual health is an integral part of general health and its disorders can markedly affect one's quality of life [1,2]. For many men, the ability to achieve a satisfactory erection defines their masculinity. This is easy to understand, as an erection is the most obvious physiological change that occurs during male sexual arousal and is mandatory for penetrative vaginal intercourse [1].

Erectile dysfunction (ED) is defined as the persistent inability to attain and/or maintain penile erection sufficient for satisfactory sexual intercourse [1]. It is one of the most frequent chronic health conditions in men older than 40 years of age [2]. Even though sexual dysfunction is not life threatening, it should not be considered a disorder that can be overlooked, as it may have a strong negative effect on patients' interpersonal relationships and compromise their well-being and quality of life [3].

Previous surveys in North and South America, Europe, Asia, and Africa have demonstrated that erectile dysfunction is a significant problem worldwide [4-8]. The majority of men with ED are ashamed of their condition, which may partly explain why only about 58% of men seek help [9]. It might also explain why men who do talk to a doctor about their ED often do so only when their symptoms are severe, despite the fact that men with all grades of ED are often extremely distressed by the problem [9]. For this reason, Dean et al. suggested that physicians and other health professionals should, as a general rule, regularly and routinely discuss sexual health and function in consultations with their patients [1].

There are a number of factors have been found to be correlates or predictors of ED. The knowledge of specific risk factors present in a population can aid physicians in diagnosing ED in men who may be reluctant to raise this sensitive issue particularly during its early phase.

ED has been consistently shown to increase with age [4-6]. A number of other socio-demographic, medical and lifestyle factors have also been found to be important correlates of ED [4-6, 10-18].

ED is a condition which often leads to considerable distress for a couple and predisposes to dysfunction in relationship and family life [7]. Family physicians have an important role to play in the management of ED, since the primary care setting provides opportunity for early detection of affected individuals and prompt treatment or referral to specialist care [19]. By virtue of their longitudinal relationship with their patients and commitment to comprehensive and holistic care, family physicians are well placed to inquire about a patient's sexual function during a routine office visit [19].

Despite these facts, the epidemiological data on ED in the primary care setting are relatively scanty especially in the developing nations like ours. Most of the available information in the literature emanates from cohorts of individuals attending specialty clinics. Ariba et al. noted that the burden of this problem appears to be poorly recognized especially among patients in primary care as the diagnosis is not often detected or documented in this setting [19]. Hence this study was carried out to determine the prevalence of erectile dysfunction among adult men attending a primary care clinic in south-west Nigeria and to explore its socio-demographic, medical, and lifestyle correlates.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This hospital based descriptive cross-sectional study was carried out at the Family Medicine clinic of the Ife Hospital Unit (IHU) of the Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile Ife, Osun State, Nigeria. The

OAUTHC is a conglomeration of six units with the headquarters in Ile Ibe. The hospital provides primary, secondary and tertiary levels of care for people of all ages. Apart from antenatal and pediatrics patients and those who require emergency attention, the Family Medicine clinic is the first place of contact for all adult patients attending the hospital. Many of these patients are managed and followed up at this level while others who require further specialist care are appropriately referred. The target population for the study consisted of all adult male patients that presented during the period of the study.

2.2 Sample Size and Sampling Technique

The sample size was determined with the formula for estimating a population proportion and using previously reported ED prevalence of 57.4% [8]. The minimum sample size was 376 which was increased to 414 to cater for projected attrition rate of 10%. Subjects were recruited using the simple random sampling technique from among the male patients that were registered for the clinic each day over the study period. An individual was included in the study if he was 40 years and above, was married or had a regular sexual partner and had been sexually active or attempted sexual intercourse in the six months preceding the study. Two potential respondents were excluded on account of cognitive impairment i.e. acute confusional state.

2.3 Data Collection

Data was obtained with the aid of a structured self-administered questionnaire which incorporated the erectile function (EF) domain of the International Index of Erectile Function (IIEF) questionnaire. The IIEF is a multidimensional, standardized and validated questionnaire for the clinical assessment of erectile dysfunction which has been shown to discriminate between men with and without the condition [20]. The erectile function domain of the questionnaire has also been shown to provide a reliable measure for classifying the severity of ED [21] The IIEF has been previously used in other studies in Nigeria [22, 23].

The 6 items on the erectile function domain include questions concerning erection frequency, firmness, penetration, maintenance frequency, maintenance ability, and erection confidence during sexual activity. Each item is based on a 5-point Likert scale with lower score indicating poorer erectile function. The responses to all 6 items were summed up to arrive at a total EF

score ranging from 6 to 30. The presence of ED was defined as having a score that is less than or equal to 25. Previous evaluation of the EF domain had classified erectile function into the following 5 categories: no ED (EF score, 26-30), mild (EF score, 22-25), mild to moderate (EF score, 17-21), moderate (EF score, 11-16), and severe (EF score, 6-10) [21]. There were also questions about respondent's willingness to seek medical help or discuss problems related to erectile function with their doctor and their opinion on whether physicians should routinely screen for ED among men older than 40 years.

Information was also obtained about socio-demographic characteristics, past medical history, medication history and lifestyle habits i.e. smoking, alcohol use and level of physical activity. The respondents' cigarette smoking status was categorized into 'ever smokers' and 'never smokers'. 'Ever smokers' include former and current smokers. 'Current smokers' were respondents who smoked at least a cigarette in the one month prior to the study. 'Former smokers' those who had smoked in the past but had stopped and had not smoked for at least one month prior to the study while 'Never smokers' had never smoked a cigarette [16,24]. Data about alcohol use was elicited with a simple 'yes' or 'no' question on whether patient drank alcohol or not. The level of physical activity was obtained using a standardized physical activity assessment questionnaire [25]. An active respondent was defined as someone who regularly engaged in 30 or more minutes of moderate-intensity physical activities (e.g. brisk walking, carrying light loads, bicycling at a regular pace, or doubles tennis) at least 5 times in a week i.e. total of 150 minutes in a week in line with WHO recommendations. A respondent with less than 150 minutes / week was categorized as inactive [25].

2.4 Procedure

The questionnaire was available in English and Yoruba (which was the predominant local language) using back translation. The Yoruba version was not however validated. It was self-administered in their preferred language and based on level of literacy.

The following physical measures were also obtained: weight, height, blood pressure and blood glucose. A weighing scale (calibrated in kilograms) coupled with a stadiometer (calibrated in meters) was used to measure the weight and height. The weight was measured in light clothing

to the nearest 0.1 kilograms. The weighing scale was regularly adjusted to reset it to zero.

An Accosson® Mercury sphygmomanometer was used to measure the blood pressure of the subjects. The blood pressure (BP) reading was taken in sitting position after the subject has been seated and well rested for about ten minutes. Two readings were taken at 5 minutes interval and the average was recorded. A respondent was classified as hypertensive if he was a previously diagnosed hypertensive or had an average systolic BP of ≥ 140 mmHg and/or diastolic BP reading of ≥ 90 mmHg [26,27].

The random blood glucose (RBG) of each subject was done with a CareSens® glucometer (Model: GM505NA, Serial No: CN37G11273) with the appropriate test strips. A drop of blood obtained by a needle prick on subject's thumb was placed on the test strip that had been appropriately mounted on the glucometer and the reading was recorded. Those with RBG ≥ 11 mmols/L and who had not been previously diagnosed as having diabetes mellitus (DM) were asked to return for confirmatory fasting blood glucose (FBG). A study participant was said to have DM if he had been previously diagnosed or had fasting blood glucose of 7.0mmols/L and above [28].

2.5 Data Analysis

Data was analyzed using the IBM SPSS (version 22). Univariate analysis was used to summarize the data in the form of frequency counts and percentages for categorical variables and means and standard deviations for continuous variables. The factors associated with ED were identified with the use of Pearson Chi square statistical test. For the purpose of the bivariate analysis, some of the variables were dichotomized in view of the low frequency counts of some of the sub-categories. The variables that were significantly associated with ED from the bivariate analysis were entered into a multivariate logistic regression model to determine those that independently predicted the risk of ED. The odds ratio and confidence intervals were thus determined. The level of significance for all the statistical analyses was set at $P < .05$.

3. RESULTS

A total of 414 respondents were studied, the mean age was 52.7 ± 10.0 years and majority (48.1%) were between ages of 40 and 50 years. Table 1 shows the socio-demographic, medical and lifestyle characteristics of the respondents.

3.1 Prevalence of Erectile Dysfunction

Among the respondents, 168 (40.6%) had erectile dysfunction. Of these, 121 (29.2%) had mild ED while 37 (9.0%) and 10 (2.4%) had the moderate and severe form respectively. When asked about willingness to make a complaint about their ED or previous attempt to seek medical care, up to 42.3% of those with ED had never mentioned the problem to their doctor. However, almost all the respondents i.e. 394 (95.2%) were of the opinion that it would be desirable for their primary care doctors to routinely ask men above 40 years about their sexual function.

3.2 Factors Associated with ED among the Respondents

Table 2 shows the association between ED and various demographic, clinical and lifestyle factors. There was a significant increase in the prevalence of ED with increasing age from 27.6% in the age group 40 – 50 years to 60% in the 61 – 70 age group ($P < .001$). The other factors significantly associated with ED include: hypertension ($P < .001$), diabetes ($P = .001$), the use of anti-hypertensives ($P = .002$), smoking ($P = .001$), alcohol consumption ($P = .004$), and low level of physical activity ($P = .03$).

3.3 Predictors of Erectile Dysfunction among the Respondents

The variables that were significantly associated with ED from bivariate analyses were entered into binary logistic regression model. The result is as presented on Table 3. The factors that maintained their significance as independent predictors of ED include: older age, diabetes and alcohol use.

Compared with those in the 40-50 years age group, those aged 51-60 years were more than twice likely to have ED (OR = 2.204, CI = 1.307 – 3.714) while those in the 61-70 age group were about three and half times more likely to have ED (OR = 3.657; CI = 2.043 – 6.546). In same vein, those who had diabetes were more about twice likely to have ED (OR = 1.945, CI = 1.106 – 3.419). The odds of having ED was similarly about two times higher among respondents who use alcohol use compared to those who did not drink at all (OR = 1.894, CI = 1.167 – 3.075). Age as a variable had the highest beta coefficients among all the predictors thus indicating that it was the strongest predictor of ED.

Table 1. Frequency distribution of respondents by socio-demographic, medical and lifestyle characteristics (N = 414)

Characteristic	Frequency (n (%))
Age groups (years)	
40 – 50	199 (48.1)
51 – 60	120 (29.0)
61 – 70	95 (22.9)
Marital Status	
Married	394 (95.2)
Not married	20 (4.8)
Tribe	
Yoruba	386 (93.2)
Hausa	9 (2.2)
Igbo	11 (2.7)
Others*	8 (1.9)
Religion	
Islam	101 (24.4)
Christianity	313 (75.6)
Education	
None	43 (10.4)
Primary	93 (22.5)
Secondary	130 (31.4)
Tertiary	140 (35.7)
Occupation**	
Professionals	19 (4.6)
Intermediate	89 (21.5)
Skilled workers	49 (11.8)
Semi/Un-skilled manual workers	204 (49.3)
Pensioners / Unemployed	28 (6.8)
Clergy	25 (6.0)
Hypertension	
Yes	184 (44.4)
No	230 (55.6)
Diabetes Mellitus	
Yes	71 (17.1)
No	343 (82.9)
Heart disease	
Yes	6 (1.4)
No	408 (98.6)
Antihypertensive drugs	
Yes	121 (29.2)
No	293 (70.8)
Smoking	
Current smokers	13 (3.1)
Former smokers	65 (15.7)
Never smoked	336 (81.2)
Alcohol Intake	
Yes	148 (35.7)
No	266 (64.3)
Physical activity category	
Inactive (< 150 minutes/week)	195 (47.1)
Active (≥ 150 minutes/week)	219 (52.9)
Body Mass Index	
< 25 kg/m ²	293 (70.8)
≥ 25 kg/m ²	121 (29.2)

* Ijaw, Idoma, Ebira, **Adaptation of U.K classification system²³

Table 2. Relationship between ED and associated factors among the respondents (N = 414)

	Has ED (n (%))	No ED (n (%))	X ²	p value
Age groups (years)				
40 – 50	55 (27.6)	144 (72.4)	30.525	< 0.001
51 – 60	56 (46.7)	64 (53.3)		
61 – 70	57 (60.0)	38 (40.0)		
Marital Status				
Married	159 (40.4)	235 (59.6)	0.170	0.68
Not married	9 (45.0)	11 (55.0)		
Tribe				
Yoruba	161 (41.7)	225 (58.3)	3.023	0.08
Others	7 (25.0)	21 (75.0)		
Religion				
Christianity	126 (40.5)	185 (59.5)	0.02	0.96
Islam	42 (40.8)	61 (59.2)		
Educational Status				
No Formal Education	21 (48.8)	22 (51.2)	1.357	0.24
Formal Education	147 (39.6)	224 (60.4)		
Occupational Status				
Employed	152 (39.4)	234 (60.6)	3.417	0.06
Unemployed	16 (57.1)	12 (42.9)		
Diabetes				
Yes	41 (57.7)	30 (42.3)	10.474	0.001
No	127 (37.0)	216 (63.0)		
Hypertension				
Yes	94 (51.1)	90 (48.9)	15.164	<0.001
No	74 (32.2)	156 (67.8)		
Heart disease				
Yes	4 (66.7)	2 (33.3)	0.23 [†]	
No	164 (40.2)	244 (59.8)		
Antihypertensive drugs				
Yes	63 (52.1)	58 (47.9)	9.355	0.002
No	105 (35.8)	188 (64.2)		
Smoking				
Ever smokers	45 (57.7)	33 (42.3)	111.672	0.001
Never smoked	123 (36.6)	213 (63.4)		
Alcohol intake				
Yes	74 (50.0)	74 (50.0)	8.477	0.004
No	94 (35.3)	172 (64.7)		
Physical activity level				
Inactive	90 (46.2)	105 (53.8)	4.750	0.03
Active	78 (35.6)	141 (64.4)		
Body Mass Index				
< 25 kg/m ²	111 (37.9)	182 (62.1)	3.021	0.08
≥ 25 kg/m ²	57 (47.1)	64 (52.9)		

[†]Fisher exact test

4. DISCUSSION

The results of this study indicate that erectile dysfunction is not an uncommon condition among men in the primary care clinic setting in this environment. The prevalence of 40.6% is similar to what has been reported in previous studies [22,29-30]. This finding is quite significant

in view of the fact that many men with ED tend to suffer in silence and do not confide readily in others including their doctors. There are taboos and myths associated with ED in this environment and thus not usually discussed outside the confines of the bedroom [23]. This result may therefore still under-represent the true burden of ED among the respondents.

Table 3. Multivariate logistic regression analysis of factors associated with ED among the respondents (n = 414)

	Beta coefficient	Standard error	P value	Odds Ratio (OR)	95% confidence interval (CI)
Age					
40 – 50 (Reference)				1	
51 – 60	0.790	0.267	0.003*	2.204	1.307 – 3.716
61 – 70	1.297	0.297	< 0.001*	3.657	2.043 – 6.546
Hypertension					
No (Reference)				1	
Yes	0.550	0.303	0.07	1.734	0.957 – 3.141
Diabetes					
No (Reference)				1	
Yes	0.665	0.288	0.02*	1.945	1.106 – 3.419
Anti-hypertensive use					
No (Reference)				1	
Yes	- 0.169	0.329	0.61	0.844	0.443 – 1.609
Alcohol use					
No (Reference)				1	
Yes	0.639	0.247	0.01*	1.894	1.167 – 3.075
Smoking					
Never (Reference)				1	
Former / Current	0.566	0.295	0.06	1.761	0.988 – 3.138
Physical activity					
Inactive (Reference)				1	
Active	- 0.138	0.225	0.54	0.871	0.560 – 1.354

*Significant at $P = .05$

This prevalence is however higher than those reported in studies among the men in developed countries [4, 10]. In the MALES study by Rosen et al conducted in eight countries across Europe and America, the overall prevalence of ED was 16% [4]. This may be due to the fact that men of African descent are said to have a greater risk of developing ED than the Caucasians [23]. They have different lifestyle habits and health conditions compared with Caucasians as well as having higher incidence of aetiological factors like hypertension.

Among the socio-demographic characteristics, age was found to be significantly associated with ED. This corroborates the findings in virtually all the studies on ED [4-8, 29-31]. Several reasons have been adduced for the consistent independent association between ED and aging. The male sexual organ is a vascular organ and age-related vascular changes in the arteries and sinusoids of the corpora cavernosa have been shown to contribute to the development of ED [32]. The association is further accentuated by the relationship that exists between aging and many chronic disorders that cause ED such as hypertension, diabetes and dyslipidemia [31].

In agreement with reports from some previous surveys, our study found an association between ED and hypertension [23, 29-33]. Cardiovascular disease like hypertension have a damaging effect on the vascular endothelium thus impairing the production of Nitric oxide which has a fundamental role in the regulation of erection [33]. ED has thus been described as a sentinel manifestation of damage to the vascular endothelium and it has been said that the presence of erectile dysfunction should alert men and healthcare providers to the future risk of developing cardiovascular disease and vice versa [33,34]. This underscores the reason why primary care doctors must inquire and search for ED.

A significant association and predictive effect was found in this study between ED and diabetes. This association has also been consistently reported in ED-related studies [22, 23, 29, 35]. Diabetes is known to cause sexual dysfunction and the prevalence of erectile dysfunction in diabetic men increases with age, duration and severity of the diabetes [35].

With regards to lifestyle factors, previous studies from different countries have shown a relationship between ED and smoking which is supported by this study [14-16, 36]. This observed association is not surprising since smoking is a known cause of vascular damage [16]. It must also be noted that the effect of smoking did not remain as an independent predictor of ED among our respondents.

On the other hand, alcohol consumption was shown to be associated and to predict the risk of ED. This is in agreement with findings from the study by Kupelian et al. [14]. However, Adebusoye et al. and Fafolu et al. did not find any relationship between ED and alcohol intake [23,31]. A lower prevalence of ED with moderate alcohol consumption has also been reported [17]. Population characteristics, cultural differences and differences in quantification of level of alcohol consumption may partly explain these variations.

Physical activity is another lifestyle factor that been consistently associated with lower risk of ED in previous reports [18,23,37]. This is consistent with our findings. Given the similar vascular pathophysiology and risk factor profile which ED shares with cardiovascular diseases, its therefore understandable that they may share similar protective factors among which is physical activity [18].

The lack of association between ED educational status, occupational status and BMI may be explained by the fact that most of the ED cases were mild.

Another important area of interest in this study is the health-care seeking behaviour of men regarding ED. A significant proportion of men suffering from ED in this study had never discussed it with their physicians nor had the intention of doing so. Though we did not ask the men for the reasons informing their disposition, the top 3 barriers identified by Shabsigh et al. in their cross-national survey include the following; embarrassment and fear of social stigmatization, the belief that ED was a normal part of aging and thirdly, the belief that the condition would resolve on its own [38]. In our environment, as Ariba et al. highlighted, patient's preference for local herbal medications contributes to this phenomenon of not seeking medical care [19]. Interestingly, virtually all the respondents in this present study agreed with the notion of a routine inquiry about sexual function by their physicians.

This seems to corroborate the argument that has been made by some e.g. Dean et al. to the effect that health care providers should routinely inquire about sexual health issues in their consultations [1].

5. LIMITATIONS

The study was cross-sectional in nature and this limits the interpretation of the findings with regards to causality between some of the identified variables and the diagnosis of erectile dysfunction. Also, it was a hospital based study carried out in only one centre thus restricting its generalizability. The data was based on self-report and this may be associated with biases in the responses especially because of the stigma and shyness associated with erectile dysfunction. It should also be noted that majority of ED cases were mild and it is known that the specificity of any sexual inventory in mild cases is low. Furthermore, the quality of life was not assessed, hence, the real impact of ED on such respondents' quality of life could not be ascertained.

6. CONCLUSION AND RECOMMENDATIONS

This study showed that erectile dysfunction is common in study setting and the prevalence increased with age. The prevalence of ED was further shown to be associated with other factors including hypertension, diabetes, the use of anti-hypertensives, smoking, alcohol consumption, and low physical activity. Quite a number of the respondents were unwilling to raise this sensitive issue with their doctors. There may thus be the need to consider a routine sexual evaluation of men presenting to family physicians in our setting so as to diagnose ED early, especially in patients with the identified risk factors. The use of simple and brief screening tools may be clinically helpful in this direction. Further research on the clinical relevance and outcome of the use of such screening tools in our clime is warranted. Also, patients attending primary care should be educated on appropriate lifestyle modification.

CONSENT AND ETHICAL APPROVAL

Ethical clearance was obtained for the study from the ethics and research committee of the OAUTHC, Ile-Ife (protocol Number: ERC/2013/01/06) and informed consent was obtained from all respondents.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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