ORIGINAL RESEARCH ARTICLE

ASSOCIATION BETWEEN STRESS AND ERECTILE DYSFUNCTION AMONG ADULT PATIENTS IN A TERTIARY CENTER IN NIGERIA

ABSTRACT

Erectile dysfunction(ED) is a complex disorder with a biopsychosocial etiology that causes chronic stress on the individual thereby worsening the outcome of the disorder. The aim of this study is to establish an association between stress level and erectile dysfunction among adult patients presenting in the general outpatient of our tertiary hospital. A cross sectional study involving 421 adult males selected by simple random sampling was conducted using the International Index of Erectile Dysfunction (IIEF-5)and the Modified Percieved Stress Scale (PSS-10) Among the respondents, 219(52%) had ED while a greater proportion of those who had ED had mild ED 109 (49.8%). The other factors associated with ED on bivariate analysis include tobacco use ($p < 0.05$), alcohol intake ($p < 0.05$), diabetes mellitus, hypertension, use of anti hypertensive drugs, use of oral hyperglycaemic drugs, and perceived stress levels.Logistic regression showed that age, tobacco use, alcohol intake, and perceived stress levels were independent predictors of ED among the respondents.Perceived stress level has been found to be associated with ED. Routine evaluation of sexual health and the perceived stress levels of men isrecommended, while stress management as part of management of ER is highly advocated.

KEYWORDS; Erectile dysfunction, stress, stress management, sexual health.

1.1 INTRODUCTION.

1.2 Sexual health is an integral part of general health and its disorders can markedly affect one's quality of life.[1] Erectile dysfunction (ED) is one of the most prevalent and poorly treated sexual dysfunction[2]. Organic causes include certain chronic medical conditions, use of certain medications, and unhealthy lifestyle.[4,5] The psychogenic causes of ED include

psychosocial problems such as depression, anxiety, family relationship problems and the individual's perceived stress level (PSL).[6,7]

With regards to the burden posed by erectile dysfunction, it becomes necessary that the physician's approach to care should go beyond the biomedical model of care which focuses on the organic causes of ED; and encompass the psychosocial context such as the individual's PSL.[8] Routine assessment of the PSL among patients with ED and institution of appropriate therapy, especially at first contact, will help reduce the health and economic burden of ED.

Although ED is considered benign, it poses significant health burden; and adversely affects the Health Related Quality of Life (HRQoL) of both patients and their partners.[5] Also, ED adversely affects the sexual life of both the patients and their partners leading to poor self-esteem, anxiety and depression.

Furthermore, studies have shown that ED is associated with significant economic loss as men who have ED report more impairment in activity and higher work productivity loss.[9,10]Undoubtedly, these show that ED is a serious health and economic problem, hence requires a need for early recognition and institution of appropriate therapy. Unfortunately, ED is largely under-diagnosed due to ignorance or cultural values surrounding it especially in Africa that may preclude patient from discussing it, and mostly due to physicians' reluctance to initiate discussions about the sexual health of their patients.[10]

Besides being under-diagnosed, reports have also shown that ED is under-treated, hence further risking its impact on the patient's quality of life. This is because most physicians' efforts at managing ED is centred on searching for, and addressing its organic aetiologies, with little insight into the psychosocial components, which may be the sole cause in up to 55% of patients.[11.12] There exist very few literatures with respect to the association between erectile dysfunction and perceived stress level (PSL), especially in the West African sub-region. Most studies assessed the association between ED and other psychological variables such as anxiety and depression.[8] This, therefore calls for a great need for further studies especially in the West African sub-region.

In view of the burden of stress and its possible link with ED, efforts should be made especially at the level of primary care, to assess and possibly address the PSL, as an important strategy in promoting the sexual health of individuals with erectile dysfunction. Unfortunately, few articles

considered the psychosocial component as a major entity in the aetiology of ED which needs to be sought and addressed for a comprehensive and holistic care of patients presenting with ED.[12] Stress is a known major factor of sexual dysfunction and chronic stress can lead to erectile dysfunction.[13] Therefore, identification of individuals with high stress level using the stress scale assessment tool and treatment of stress would achieve better treatment outcome for erectile dysfunction. This study established an association between perceived stress level and erectile dysfunction among adult males in our environment. This study will help physicians inculcate sexual health discussions in consultation with adult males and manage their patients

1.2 METHODOLOGY

Study site: The study was carried out at the General Outpatient Clinic (GOPC) of Federal Medical Centre, Umuahia (FMC-U), a tertiary health facility located in Umuahia, the capital city of South-east Nigeria.

Study population:This was made up of adult male patients aged 18 years and above attending the GOPC of FMC-U.

Study design. This was a hospital-based cross-sectional study. It was carried out over a period of twelve weeks between March and May 2022.

Sample size determination:

The sample size was determined using Cochran's statistical formula for estimating minimum sample size in health related studies.[14]

Minimum sample size: $N = Z^2Pq/d^2$;

The minimum sample size was 382.

To account for non-response and missing data, 10% was added to the sample size.

Therefore, 421 adult male patients were recruited for this study

Sampling method: A systematic random sampling method was used to recruit 421 adult male patients who give consent and satisfy the exclusion criteria.

All consenting adult male patients aged 18 years and above presenting at the GOPC of FMC-U.

The purpose and procedure for the study was explained to every respondent, and was asked to sign or thumb-print the consent formwhen he gave a verbal consent to participate. A well-

structured and pre-tested “interviewer administered questionnaire” was used to collect data for the study.

The questionnaire was in four (4) sections (sections A - D). Section A was used to assess the socio-demographic characteristics of respondents.

Section B of the questionnaire was used to assess the respondents’ lifestyle factors.

Section C was used to assess respondents’ health status and prescription drug use; with the aid of the patients’ clinical data recording form.

Section D was used to assess the respondents’ erectile function and perceived stress level using the International Index for Erectile Function-5 (IIEF-5) , and the Perceived Stress Scale-10(PSS-10) respectively. The IIEF-5 is a validated abridged five-item version of the 15-item IIEF which was developed to diagnose the presence and severity of ED.[15]

Data Analysis.

The data was collated, coded and imputed into the Statistical Package for Social Sciences (SPSS) version 25. Frequency tables was used to present the demographic characteristics of respondents and factors affecting erectile dysfunction. The chi-square test was used to determine the association between categorical variables such as the erectile function and perceived stress level in a bivariate analysis, while a multivariate logistic regression was employed to ascertain the independence of various identified significant risk factors for erectile dysfunction from the bivariant analysis. All analyses were done at the 5% level of significance with a p-value less than 0.05 considered statistically significant.

1.3 RESULTS.

A total of 421 male patients attending general outpatient clinic (GOPC) of Federal Medical Center, Umuahia (FMC-U), were recruited for this study

Table 1 below shows the socio-demographic characteristics of respondents. The ages of respondents ranged from 18 - 62 years. The mean age of all the respondents was 35.2 ± 12.03

years.More than half of the respondents were single 230 (54.6%) followed by the married 117 (42%) and the least were the separated or divorced 6 (1.4%) while the widowed were 8 (1.9%). Almost two third of the respondents were employed 274 (65.1%) while the unemployed was 147 (34.7%).

TABLE 1: Socio-demographic characteristics of the respondents

Variable	Frequency (F)	Percentage (%)
AGE GROUP (YEARS)		
≤ 20	18	4.3
21 - 29	163	38.7
30 - 39	89	21.1
40 -49	84	20.0
50 - 59	57	13.5
≥ 60	10	2.4
Total	421	100
Range	18 - 62 years	
Mean age (Mean ± SD)	35.2 ± 12.03 years	
MARITAL STATUS		
Single	230	54.6
Married	177	42.1
Separated/Divorced	6	1.4
Widowed	8	1.9
Total	421	100
EDUCATIONAL STATUS		
No formal education	0.00	0.00
Primary education	36	8.5
Secondary education	154	36.6
Tertiary education	231	54.9
Total	421	100
CURRENT EMPLOYMENT STATUS		
Employed	274	65.1
Unemployed	147	34.9
Total	421	100

Figure 2 below shows the proportion of erectile dysfunction (ED) among the respondents using IIEF score. More than half proportion of the respondents 219 (52%) had ED while a little below half proportion of the respondents 202 (48%) didn't have ED. The mean IIEF score was 19.61 ± 4.77 with a range of 5 - 25. The prevalence of erectile dysfunction in this study was 52%.

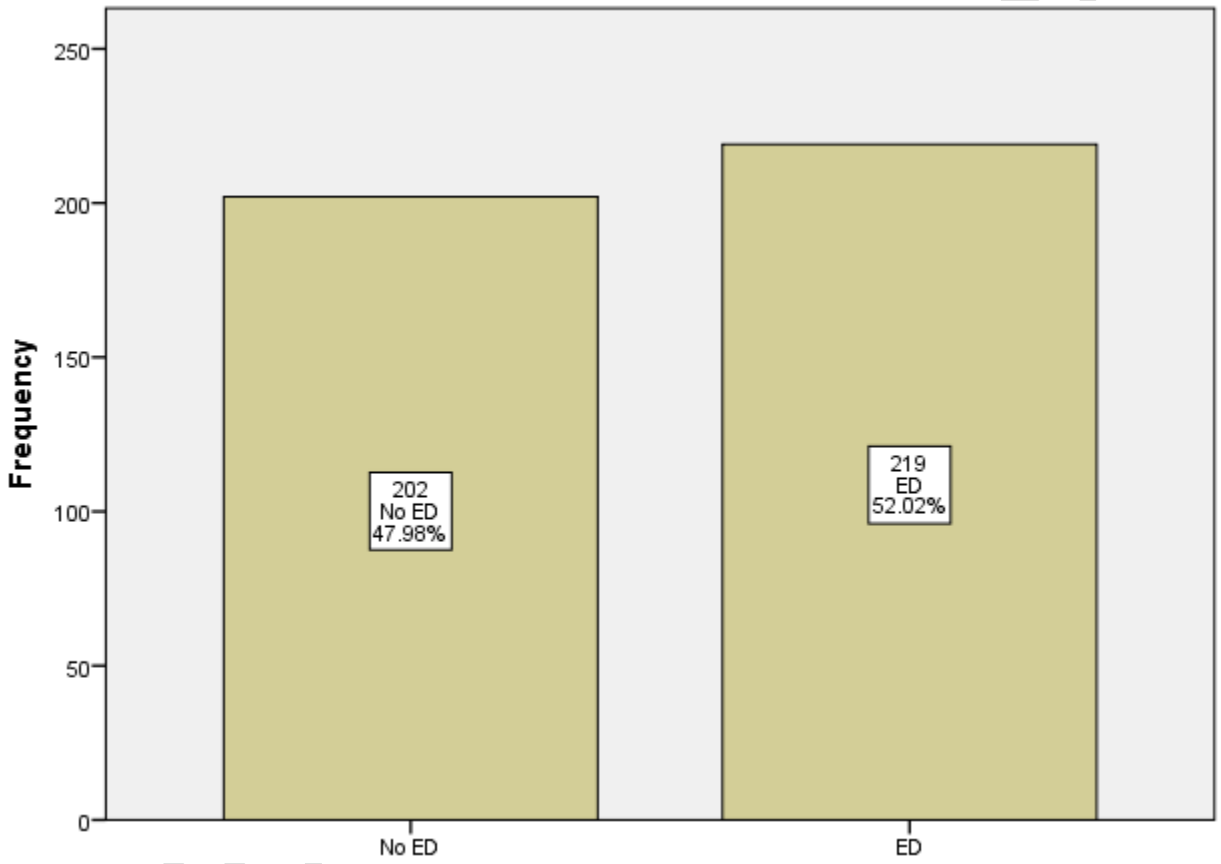

FIGURE 1: Prevalence of erectile dysfunction among the respondents

Figure2 below shows the pattern of erectile dysfunction among respondents. The highest proportion of ED was mild 109 (49.8%), followed closely by moderate type 98 (44.7%) while the least had severe ED 12 (5.5%).

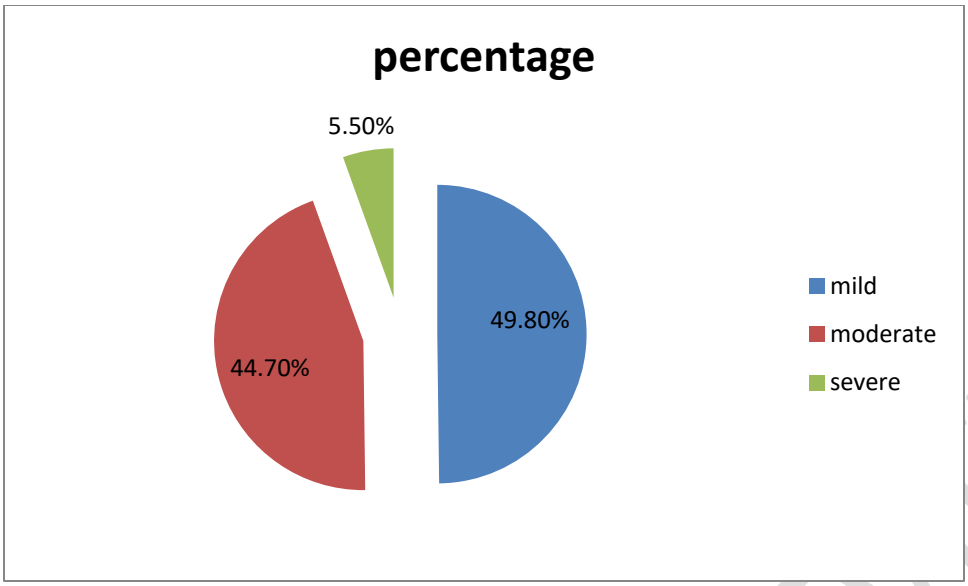

FIGURE 2: Pattern of Erectile Dysfunction (ED) among respondents.

Figure 3 below shows perceived stress level of respondents. More than half proportion of respondents 226 (53.7%) had perceived low stress level while a little below half of the respondents 195 (46.3%) had perceived high stress level. The mean score for the low stress was 16.44 ± 2.34 while the mean score for high stress level was 21.89 ± 2.16.

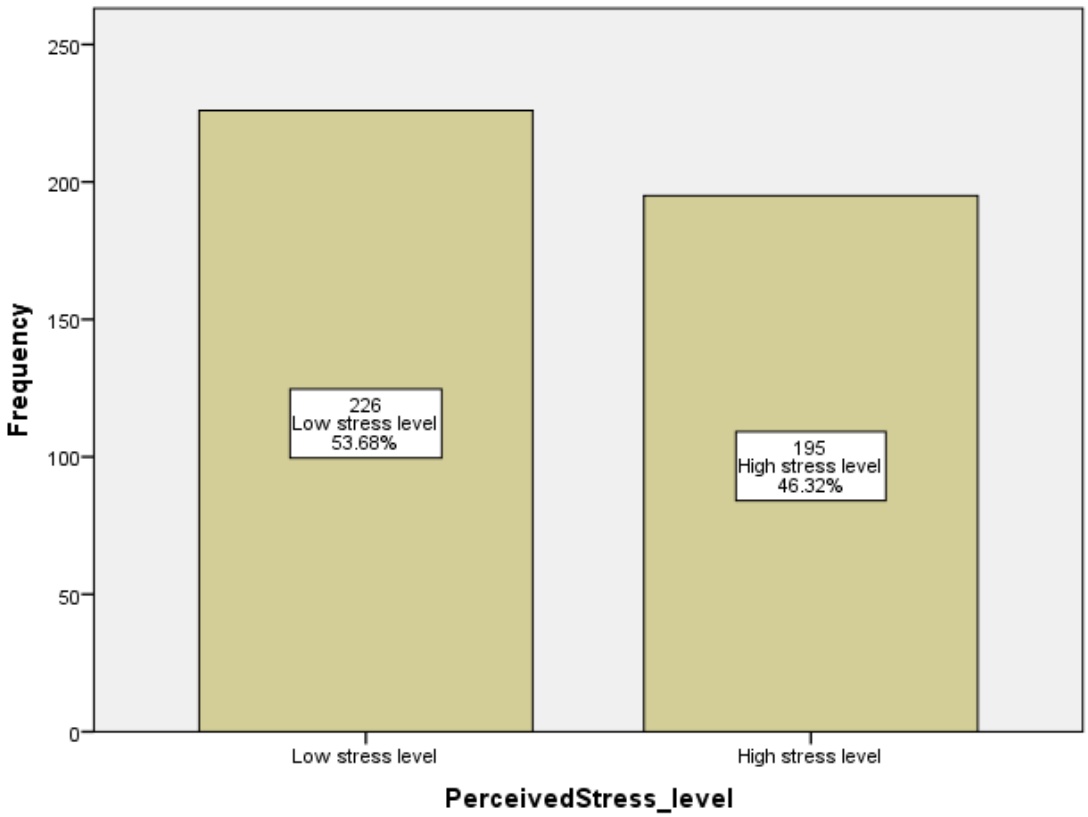

FIGURE 3: Perceived Stress Level of the respondents.

Associated bio psychosocial factors of erectile dysfunction among respondents.

This shows the test of associations on bivariate analysis using chi-square test between erectile dysfunction, bio psychosocial and clinical characteristics of the participants.

The association of age and tobacco use with erectile dysfunction among respondents.

Table 2 below shows the association of age and tobacco use with erectile dysfunction among respondents. It can be seen that in the respondents below 40 years of age, 41.9% had ED whereas 58.1% of them did not have ED.

However, among those greater than or equal to 40 years of age, about 70.2% of them had ED compared to 29.8% that did not. This shows that ED increases with age above 40 years. This association between age and ED is statistically significant ($\chi^2 = 31.177$, p-value = 0.000).

It can also be seen that more than two third of ED respondents 68.6% use tobacco compared to 48.7% that did not use tobacco. This shows that ED increases with tobacco use. This association between ED and tobacco use was statistically significant ($\chi^2 = 9.216$, p-value = 0.002).

Table 2: Association of age and tobacco use with erectile dysfunction among respondents.

Variable	No ED (n = 202)	ED (n = 219)	χ^2	p-value (< 0.05)
Age				
< 40 years	157 (58.1)	113 (41.9)	31.177	0.000*
≥ 40 years	45 (29.8)	106 (70.2)		
Tobacco use				
Yes	22 (31.4)	48 (68.6)	9.216	0.002*
No	180 (51.3)	171 (48.7)		

Association between erectile dysfunction (ED) and perceived stress level (PSL)among respondents using chi square bivarient analysis.

Table 3 below shows the association between ED and PSL among respondents. A higher proportion of ED respondents (62.1%) had perceived high stress level compared to 37.9% who had perceived low stress level. This shows that ED increases with perceived high stress level. This association between ED and PSL is statistically significant ($x^2 = 45.722$, p-value = 0.000).

TABLE 3: Association between ED and PSL among respondents.

PSL	NO ED F (%)	ED F (%)	X^2	p-value (< 0.05)
Low stressed	143 (70.8)	83 (37.9)	45.722	0.000*
High stressed	59 (29. 2)	136 (62.1)		
Total	202 (100)	219 (100)		

LOGISTIC REGRESSION FOR RISK FACTORS OF ERECTILE DYSFUNCTION

Table 4 below shows the logistic regression done to determine the independency of the significant risk factors (on bivariate analysis) of erectile dysfunction among respondents.

It can be deduced from the table that age (OR 1.09 , CI [1.05 - 1.13]), tobacco use(OR 0.37 , CI [0.18 - 0.73]), alcohol intake (OR 1.82, CI [1.11 - 2.97]) and perceived stress level (OR 0.24 , CI [0.14 - 0.41]) were independent risk factors for erectile dysfunction.

Diabetes mellitus, hypertension, antihypertensive use and oral hypoglycaemic use did not show to be independent risk factors.

TABLE 4: Multivariate Logistic regression analysis of factors associated with erectile dysfunction among respondents.

Risk factor	p-value	OR 95% (CI)
Age	0.000	1.09 (1.05 - 1.13)
Tobacco use	0.004	0.37 (0.18 - 0.73)
Alcohol intake	0.017	1.82 (1.11 - 2.97)
Diabetes mellitus	0.999	0.10 (0.00 - 0.03)
Hypertension	0.473	2.02 (0.30 - 13.70)
Antihypertensive use	0.083	0.18 (0.03 - 1.25)
Oral hypoglycaemic use	0.999	4.265 (0.00 - 2.05)
PSL	0.000	0.24 (0.14 - 0.41)

DISCUSSION.

The prevalence of erectile dysfunction among respondents in this study was high at 52%. This finding was similar to that found in some studies in Africa countries. Oyelade et al, in their cross sectional study in Ogbomoso, south western Nigeria reported an ED prevalence of 58.9% among the study population.[16] This finding is also consistent with the findings of Mutagaywa etal.(55.1%) and Accam (60%) in two different cross sectional study in Tanzania and Ghana respectively.[17,18]

Concerning the pattern of ED in this study, almost half of the ED respondents (49.8%) had mild ED and over two fifth of the ED respondents (44.7%) had moderate ED while only 5.5% had severe ED among the study respondents. This finding was similar to other studies done which showed more of mild ED and less of severe ED.[19,20]

This study showed that among the study respondents, more of the respondents had a perceived low stress level (53.7%). This finding was similar to other studies which showed more of perceived low stress in the respondents.[21,20] In a cross-sectional study in Ife, Olayinka et al. reported that more than half of the respondents (58 %) perceived their stress level low followed by perceived moderate stress (23.3 %) and the least was perceived high stress (18.7 %).[20] Similarly in a study in Lagos, Aiyegbusi et al. reported more than half of respondents (59.2 %) had perceived low stress, perceived moderate stress (14.6%), perceived high stress (0.6 %) and perceived good stress (25.5 %)[21]

In the current study it could be deduced that age (OR 1.09 , CI [1.05 - 1.13]), tobacco use(OR 0.37 , CI [0.18 - 0.73]), alcohol intake (OR 1.82, CI [1.11 - 2.97]) and perceived stress level (OR 0.24 , CI [0.14 - 0.41]) were independent risk factors for erectile dysfunction.

This study showed that erectile dysfunction increased with high perceived stress level. This finding was similar to some studies which showed association of erectile dysfunction with perceived stress.[12,16] The relationship between stress and erectile study was reported in a comparative study where stress management was found more effective than tadalafil.[22]

Conclusion .

This study has shown that there is high prevalence of erectile dysfunction among men attending general outpatient clinic of Federal Medical Centre, Umuahia. The prevalence of erectile dysfunction increased as they aged as reported in other studies. The perceived stress level of the respondents was more of perceived low stress level just as reported in other studies.

This study has shown that erectile dysfunction increases with perceived high stress as more than half of the erectile dysfunction respondents had perceived high stress level.

Recommendation.

Considering the high burden of erectile dysfunction found among men in this study, it is recommended that health care professionals especially the family physicians need to involve in holistic and patient centred care which incorporates sexual health assessment in men. Men should be encouraged and stimulated on discussions concerning their sexual issues at each clinic visit. In view of the fact that erectile dysfunction increases with perceived high stress level, the physicians should endeavour to use the stress assessment tool on each patient with erectile dysfunction and treatment of stress should be inculcated to achieve better management of erectile dysfunction.

REFERENCES

1.Kalaitzidou I., Venetikou M.S.,Konstadinidis k.,Artemiadis a.k., Chrousos G., Darviri C.Andrologia 2014 Aug; 46(6):698-702.

2.Chen L, Shi G rui, Huang D dan, Li Y, Ma C chao, Shi M, et al. Male sexual dysfunction: A review of literature on its pathological mechanisms, potential risk factors, and herbal drug intervention. Biomed Pharmacother. 2019 Apr 1;112:108585.

3.Yafi FA, Jenkins L, Albersen M, Corona G, Isidori AM, Goldfarb S, et al. Erectile dysfunction.Dis Prim. 2016;2(1):1–20.

4. Abu S, Atim T, Ripiye NR. Prevalence of Erectile Dysfunction and Awareness of Its Treatment in Abuja, Nigeria. Int J Trop Dis Heal. 2019 Jul 23;1–10.

5. Mourikis I, Antoniou M, Matsouka E, Vousoura E, Tzavara C, Ekizoglou C. Anxiety and depression among Greek men with primary erectile dysfunction and premature ejaculation. Ann Gen Psychiatry. 2015;14(34):1–8.

6. Bardi GK, Aboloje EA, Inem V. Erection hardness score and family functioning of men with erectile dysfunction in Eku Baptist Hospital, Delta State. Niger J Fam Pract. 2018;9(4):1–7.

7.Madebo WE, Yosef T, Tesfaye MS. Assessment of Perceived Stress Level and Associated Factors among Health Science Students at Debre Birehane University, North Shoa Zone of Amhara Region, Ethiopia. undefined. 2016;4(2):2-10

8 Ahmed SM, Lemkau JP, Hershberger PJ. Psychosocial Influences on Health. In: Rakel RE, Rakel DP, editors. Textbook of Family Medicine. 8th ed. Philadelphia: Saunders (Elsevier) Publishers; 2011. p. 24-32.

9.Goldstein I, Goren A, Li VW, Maculaitis MC, Tang WY, Hassan TA. The association of erectile dysfunction with productivity and absenteeism in eight countries globally. Int J Clin Pr. 2019;1(1):1–22.

10.Jannini EA, Sternbach N, Limoncin E, Ciocca G, Gravina GL, Tripodi F et al. Health-Related Characteristics and Unmet Needs of Men with Erectile Dysfunction: A Survey in Five European Countries. J Sex Med. 2014;11:40–50.

11.Mobley DF, Khera M, Baum N. Recent advances in the treatment of erectile dysfunction. Postgr Med J. 2017;93:679–85.

12.Ekpenyong CE, Daniel NE, Aribo EO. Associations Between Academic Stressors, Reaction To Stress, Coping Strategies And Musculoskeletal Disorders Among College Students. Ethiop J

Heal Sci. 2013;23(2):98–112.

13.Bryan-Thomas J, Bicknell D, Brown D, Dennis S-G, Francis M, Robinson J. Relationship of Stress to Male Impotence. Int J Sci Res Publ [Internet]. 2018 [cited 2022 Nov 29];8(2):503-15.

14..Araoye MO. Sample size. In: Araoye MO, editor. Research methodology with statistics for health and social sciences. 2nd ed. Ilorin: Nathadex publishers; 2004.p.115-29.

15.Rosen RC, Cappelleri JC, Smith MD, Lipsky J, PenÄ BM. Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool for erectile dysfunction. Int J Impot Res. 1999;11:319–26.

16. Oyelade BO, Jemilohun AC, Aderibigbe SA. Prevalence of erectile dysfunction and possible risk factors among men of South-Western Nigeria: a population based study. Pan Afr Med J [Internet]. 2016 Sep 13 ;24(1):20-8.

17. Mutagaywa RK, Lutale J, Muhsin A, Kamala BA. Prevalence of erectile dysfunction and associated factors among diabetic men attending diabetic clinic at Muhimbili National Hospital in Dar-es-Salaam, Tanzania. PAMJ 2014; 17:227 [Internet]. 2014 [cited 2023 Jun 13];17(227). Available from: https://www.panafrican-med-

18. Accam GT. Ghana Alternative Medicine Journal (GAMJ) Prevalence and Determinants of Erectile Dysfunction among Men Attending Naturopathic Health Centers in Ashaiman Municipal. 2020.

19.Vo T Van, Hoang HD, Thanh Nguyen NP. Prevalence and associated factors of erectile dysfunction among married men in Vietnam. Front Public Heal. 2017 May 4;5:219-25.

20.Birowo P, Deswanto IA, Rasyid N. Epidemiology of erectile dysfunction: A cross-sectional web-based survey conducted in an Indonesian national referral hospital. F1000Research 2019 8817 [Internet]. 2019 Jun 7 ;8:817-30

21.Awoke M, Mamo G, Abdu S, Terefe B. Perceived Stress and Coping Strategies Among Undergraduate Health Science Students of Jimma University Amid the COVID-19 Outbreak: Online Cross-Sectional Survey. Front Psychol. 2021 Mar 30;12:639955.

20.Olatubi MI, Olayinka O, Oyediran OO, Ademuyiwa GO, Dosunmu TO. Perceived Stress, Sexual and Marital Satisfaction among Married Healthcare Workers in Nigeria. Nurse Media J Nurs. 2022 Dec 1;12(3):367–79.

21.Aiyegbusi AI, Akinbo SR, Adebisi OB. Patterns and the Relationship between Socio-demographic Variables and Perceived Stress among Undergraduate Students of the College of Medicine, University of Lagos, Nigeria. Univ Lagos J Basic Med Sci [Internet]. 2022 Sep 1 [cited 2023 Jun 19];3(5). Available from: https://jbms.unilag.ng/index.php/jbms/article/view/157

22.Kalaitzidou I, Venetikou MS, Konstadinidis K, Artemiadis AK, Chrousos G, Darviri C. Stress management and erectile dysfunction: a pilot comparative study. Andrologia. 2014 Aug;46(6):698-702. doi: 10.1111/and.12129. Epub 2013 Jul 3. PMID: 23822751.