

Prevalence of Sexual Dysfunction and Its Association with Depression Among Adults Aged Above 45 Years: A Cross-Sectional Study from a Tertiary Care Centre in Western India

Vishal Shirke¹, Nilesh Naphade², Jyoti Shetty³, Manjiri Datar⁴, Asmita Jagtap⁵

¹Junior Resident, Department of Psychiatry, Bharati Vidyapeeth (Deemed to be University) Medical College and Research Centre, Pune, Maharashtra, India. ²Professor and Guide, Department of Psychiatry, Bharati Vidyapeeth (Deemed to be University) Medical College and Research Centre, Pune, Maharashtra, India. ³Professor and Head, Department of Psychiatry, Bharati Vidyapeeth (Deemed to be University) Medical College and Research Centre, Pune, Maharashtra, India. ⁴Associate Professor, Department of Psychiatry, Bharati Vidyapeeth (Deemed to be University) Medical College and Research Centre, Pune, Maharashtra, India. ⁵MD Psychiatric, Bharati Vidyapeeth (Deemed to be University) Medical College and Research Centre, Pune, Maharashtra, India.

Abstract

Background: Sexual dysfunction (SD) is common among middle-aged and older adults yet remains under-recognised in clinical practice. Its bidirectional association with depression is well documented in Western literature but poorly characterised in Indian tertiary-care settings. The aim is to estimate the prevalence of SD among adults above 45 years attending a Medicine outpatient department (OPD) and to examine its association with depression. Settings and Design: descriptive cross-sectional study in the Medicine OPD of a tertiary care teaching hospital in western India. **Material and Methods:** One hundred consenting adults (56 males, 44 females) above 45 years were enrolled. SD was assessed using the Arizona Sexual Experience Scale (ASEX), International Index of Erectile Function (IIEF-15; males) and Female Sexual Function Index (FSFI-19; females); depression using the Hamilton Depression Rating Scale (HDRS-17). Statistical analysis used Chi-square test, Pearson's correlation and multivariate linear regression (SPSS v25.0); $p < 0.05$ considered significant. **Results:** SD was present in 67% of participants (males 67.86%, females 65.91%; $p = 0.838$), rising from 45.83% (45–54 years) to 81.25% (≥ 75 years; $p = 0.005$). Erectile dysfunction was the commonest male dysfunction (92.86%); 81.82% of females met FSFI criteria for SD. Depression was present in 70.15% of those with SD versus 27.27% without ($\chi^2 = 16.84$, $OR = 6.27$, 95% CI 2.48–15.86, $p < 0.001$). ASEX scores correlated with HDRS-17 ($r = 0.63$, $p < 0.001$). SD severity and age were the only independent predictors of HDRS score. **Conclusion:** SD is highly prevalent among adults above 45 years and strongly associated with depression. Routine structured assessment of sexual health in this age group in Medicine OPD settings is warranted.

Keywords: Arizona Sexual Experience Scale, depression, erectile dysfunction, Female Sexual Function Index, International Index of Erectile Function, sexual dysfunction.

Received: 02 September 2026

Revised: 21 September 2026

Accepted: 10 October 2026

Published: 16 October 2026

INTRODUCTION

Sexuality is a fundamental dimension of human health. The World Health Organization (WHO) defines sexual health as a state of physical, emotional, mental and social well-being in relation to sexuality — not merely the absence of disease or dysfunction. When this dimension is disrupted, the consequences extend beyond the individual, affecting self-esteem, intimate relationships, and overall quality of life.^[1] Sexual dysfunction (SD) encompasses persistent disturbances in the normal sexual response that cause clinically significant distress or interpersonal difficulty. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and the International Classification of Diseases, 11th Revision (ICD-11) provide detailed frameworks for the classification of these disorders in both men and women.^[2,3]

Epidemiological data from the United States document SD in 43% of women and 31% of men in the general population. Indian data, while more limited, indicate prevalences of approximately 21% among males and 14%

among females in rural south India. These figures almost certainly underestimate the true burden, given the strong cultural and social barriers to disclosure that characterise the Indian clinical encounter.^[4,5]

The relationship between SD and depression is well established and bidirectional: each condition potentiates and perpetuates the other through shared neurobiological substrates — particularly the dopaminergic reward and serotonergic inhibitory pathways — as well as through psychosocial mechanisms.^[6,7] Atlantis and

Address for correspondence: Dr. Vishal Shirke
Junior Resident, Department of Psychiatry, Bharati Vidyapeeth (Deemed to be University) Medical College and Research Centre, Pune, Maharashtra, India
E-mail: vishalshirke723@gmail.com

DOI:

10.21276/amit.2026.v13.i3.1128

How to cite this article: Shirke V, Naphade N, Shetty J, Datar M, Jagtap A. Prevalence of Sexual Dysfunction and Its Association with Depression Among Adults Aged Above 45 Years: A Cross-Sectional Study from a Tertiary Care Centre in Western India. *Acta Med Int.* 2026;13(3):685–689.

Sullivan demonstrated in a systematic review that the association operates in both directions longitudinally, with each condition independently increasing the risk of the other.^[8]

Adults above 45 years of age represent a population in whom the burden of SD is particularly high, compounded by age-related physiological changes, increasing medical comorbidity, and social invisibilisation of their sexual health needs. Despite this, data from Medicine outpatient settings in western India remain sparse. The present study was undertaken to address this gap, using a validated three-instrument assessment framework to estimate the prevalence of SD and characterise its association with depression in adults above 45 years.^[9]

The present study was undertaken to estimate the proportion of SD among adults above 45 years attending the Medicine OPD (Primary Objective), and to examine the association between SD and depression in the same population (Secondary Objective).

MATERIALS AND METHODS

Study Design and Setting: A descriptive cross-sectional study was conducted in the Medicine OPD in tertiary care hospital, Pune, Maharashtra, India, over a 2-year period following Ethics Committee approval.

Participants: Consecutive adults aged above 45 years who attended the Medicine OPD and had a current sexual partner were enrolled after obtaining written informed consent in the local language. Patients with a known prior psychiatric diagnosis or on any psychotropic medication were excluded, in order to isolate the contribution of de novo depressive symptomatology to SD, free from the confound of pre-existing psychiatric illness or antidepressant-induced sexual side effects.

Sample Size: A sample size of 100 participants was estimated based on an anticipated prevalence of SD of 21% using the formula $n = Z^2pq/d^2$ with a precision of 8% and a confidence level of 95%.

Assessment Instruments: Arizona Sexual Experience Scale (ASEX): A five-item clinician-administered or self-report scale assessing sexual drive, arousal, lubrication/erection, ability to reach orgasm, and orgasmic satisfaction, each rated on a six-point Likert scale. Validated criteria for SD: total score >19, any single item scoring 5 or 6, or any three items scoring 4 or above.^[10] International Index of Erectile Function (IIEF-15): The

gold-standard 15-item self-report instrument for male sexual function, assessing five domains: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. Erectile dysfunction (ED) was classified by the erectile function domain score: 26–30 = no ED; 22–25 = mild; 17–21 = mild-to-moderate; 11–16 = moderate; 1–10 = severe.^[11]

Female Sexual Function Index (FSFI-19): A 19-item self-report instrument assessing six domains in women: desire, arousal, lubrication, orgasm, satisfaction, and pain. The validated clinical cut-off for SD is a total FSFI score ≤ 26.55 .^[12]

Hamilton Depression Rating Scale (HDRS-17): The 17-item clinician-administered rating scale developed by Hamilton (1960) for depression severity. Scoring: 0–7 = no depression; 8–13 = mild; 14–18 = moderate; 19–22 = severe; ≥ 23 = very severe. The HDRS was administered to all participants to capture de novo depressive symptomatology.^[13]

Procedure: All participants were first screened with ASEX. Males were additionally assessed with IIEF-15 and females with FSFI-19. Subsequently, all participants were assessed for depression using HDRS-17. Sociodemographic data including age, gender, education, occupation, marital status, and presence of medical comorbidities were recorded using a structured proforma.

Statistical Analysis: Data were entered into Microsoft Excel and analysed using SPSS version 25.0. Categorical data were summarised as frequencies and percentages; continuous data as means $\pm$ standard deviation. The chi-square test (or Fisher's exact test where appropriate) was used for group comparisons of categorical variables. Pearson's correlation coefficient was used to examine associations between continuous variables. Multivariate linear regression was performed to identify independent predictors of HAMD score. A p value of <0.05 was considered statistically significant.

Ethical Considerations: The study was approved by the Institutional Ethics Committee of Bharati Vidyapeeth (Deemed to be University) Medical College, Pune. Written informed consent was obtained from all participants in the local language. Participant confidentiality was maintained throughout.

RESULTS

A total of 100 participants were enrolled (56 males, 44 females). The mean age of the study sample was 59.4 ± 10.2 years. Medical comorbidities were present in 71% of participants, the most common being hypertension (38%), type 2 diabetes mellitus (29%), and dyslipidaemia (18%) [Table 1].

Table 1: Sociodemographic and clinical profile of study participants (N = 100)

Variable	Category	n (%)
Age (years)	Mean $\pm$ SD	59.4 $\pm$ 10.2
	45–54	24 (24.0)
	55–64	31 (31.0)
	65–74	29 (29.0)
	≥ 75	16 (16.0)
Gender	Male	56 (56.0)
	Female	44 (44.0)
Medical comorbidity	Present	71 (71.0)
	Absent	29 (29.0)
Type of comorbidity*	Hypertension	38 (38.0)
	Type 2 diabetes mellitus	29 (29.0)

	Dyslipidaemia	18 (18.0)
Sexual partner status	Currently partnered	100 (100.0)

*Categories not mutually exclusive; participants could have more than one comorbidity. Percentages calculated on the total sample (N = 100). SD = Standard Deviation.

All participants had a current sexual partner (inclusion criterion). Participants with a prior psychiatric diagnosis or on psychotropic medication were excluded.

SD was present in 67 of 100 participants (67.00%; 95% CI: 57.15–75.68). The distribution by gender and age group is summarised in [Table 2].

SD was present in 67.86% of males and 65.91% of females.

No statistically significant gender difference was observed ($\chi^2 = 0.042$, $p = 0.838$) [Table 2].

A statistically significant increasing trend of SD with advancing age was observed, from 45.83% in the 45–54 year group to 81.25% in the ≥ 75 year group (trend $\chi^2 = 7.92$, $p = 0.005$) [Table 2].

Table 2: Prevalence of sexual dysfunction by gender and age group (N = 100)

Variable	Category	Total (n)	Sexual dysfunction n (%)
Gender	Male	56	38 (67.86)
	Female	44	29 (65.91)
Age group (years)	45–54	24	11 (45.83)
	55–64	31	21 (67.74)
	65–74	29	22 (75.86)
	≥ 75	16	13 (81.25)
Overall	–	100	67 (67.00)

Gender comparison: $\chi^2 = 0.042$, $p = 0.838$. Age trend: Cochran–Armitage trend $\chi^2 = 7.92$, $p = 0.005$. Overall prevalence 95% CI: 57.15–75.68.

By ASEX criteria, 36% of participants had severe SD, 31% mild-to-moderate SD, and 33% had no SD. The overall mean ASEX score was 17.92 ± 4.98 .

Male Sexual Dysfunction (n = 56): In males, ED was the most prevalent dysfunction, present in 52 (92.86%) participants (mean erectile function domain score $18.28 \pm$

6.52). Dysfunction was also identified in orgasmic function (60.71%), sexual desire (64.29%), intercourse satisfaction (73.21%), and overall satisfaction (67.86%) [Table 3]. Severity of ED increased progressively with age; in the ≥ 75 year group, none had normal erectile function.

Table 3: Domain-wise analysis of male sexual function using IIEF-15 (n = 56)

IIEF Domain	Mean Score $\pm$ SD	Dysfunction n (%)
Erectile Function	18.28 ± 6.52	52 (92.86)
Orgasmic Function	6.78 ± 2.98	34 (60.71)
Sexual Desire	6.08 ± 2.41	36 (64.29)
Intercourse Satisfaction	7.88 ± 3.51	41 (73.21)
Overall Satisfaction	5.21 ± 2.24	38 (67.86)

IIEF = International Index of Erectile Function; SD = Standard Deviation

Female Sexual Dysfunction (n = 44): Overall SD was present in 36 (81.82%) female participants. Lubrication was the most affected domain (79.55%), followed by arousal (77.27%), orgasm (75.00%), satisfaction (72.73%), desire

(70.45%), and pain (54.55%). Mean total FSFI score was 15.11 ± 8.92 [Table 4]. FSFI scores across all domains showed a statistically significant decline with advancing age (all $p < 0.01$).

Table 4: Domain-wise analysis of female sexual function using FSFI-19 (n = 44)

FSFI Domain	Mean Score $\pm$ SD	Dysfunction n (%)
Desire	2.81 ± 1.48	31 (70.45)
Arousal	2.28 ± 1.72	34 (77.27)
Lubrication	2.04 ± 1.94	35 (79.55)
Orgasm	2.12 ± 1.63	33 (75.00)
Satisfaction	2.48 ± 1.81	32 (72.73)
Pain	3.38 ± 2.38	24 (54.55)
Total FSFI Score	15.11 ± 8.92	36 (81.82)

FSFI = Female Sexual Function Index; SD = Standard Deviation; Cut-off for dysfunction: total FSFI ≤ 26.55

Association between Sexual Dysfunction and Depression: Depression was present in 70.15% of participants with SD versus 27.27% in those without SD. The association was highly significant ($\chi^2 = 16.84$, p

< 0.001 ; OR = 6.27, 95% CI: 2.48–15.86) [Table 5]. Mean HAMD score was significantly higher in participants with SD (9.92 ± 4.34) compared to those without (4.42 ± 2.21 ; $t = 7.12$, $p < 0.001$).

Table 5: Prevalence of depression in patients with and without sexual dysfunction (N = 100)

Group	Total	Depression Present n (%)	Depression Absent n (%)
Sexual Dysfunction Present	67	47 (70.15)	20 (29.85)
Sexual Dysfunction Absent	33	9 (27.27)	24 (72.73)
Total	100	56 (56.00)	44 (44.00)

$\chi^2 = 16.84$, $p < 0.001$; OR = 6.27 (95% CI: 2.48–15.86); HAMD = Hamilton Depression Rating Scale

Correlation analysis demonstrated a strong positive correlation between ASEX total score and HAMD ($r = 0.63$, $p < 0.001$), and significant negative correlations for IIEF erectile function ($r = -0.59$) and FSFI total score ($r = -0.65$) with HAMD (all $p < 0.001$).

Multivariate linear regression analysis revealed that SD severity (ASEX score: $\beta = 0.59$, $p < 0.001$) and age ($\beta = 0.15$, $p = 0.040$) were the only statistically significant independent predictors of HAMD score. Gender ($p = 0.556$), medical comorbidity ($p = 0.184$), marital discord ($p = 0.167$), and presence of stressors ($p = 0.137$) were not significant predictors in the model.

DISCUSSION

The present study found SD in 67% of adults above 45 years attending a Medicine OPD, a prevalence consistent with and at the higher end of ranges reported in comparable international studies. Li et al. reported ED in 41.5% of UK men in the general population,^[14] while the Massachusetts Male Aging Study documented combined ED prevalence of 52% in men aged 40–70 years.^[15] The higher figure in the present study is attributable to the older age range, the clinical (OPD) setting, and the inclusion of both male and female participants with assessment across multiple domains.

The absence of a significant gender difference in SD prevalence (67.86% males vs. 65.91% females; $p = 0.838$) is a notable finding. This parity challenges the persistent clinical assumption that SD is predominantly a male problem. The biopsychosocial framework proposed by Carvalho and García-Gómez emphasises that SD in both sexes arises from the interaction of biological, psychological, and sociocultural factors — an observation supported by the similar prevalence burden observed here.^[16]

The age-related increase in SD (45.83% to 81.25%; $p = 0.005$) replicates the well-established dose-response relationship between advancing age and sexual dysfunction. In males, 92.86% had some degree of ED, with severity increasing with age — consistent with Anderson et al.'s observations regarding the role of age-related vascular, endocrine, and neurological changes. In females, FSFI scores declined significantly across all domains with age (all $p \leq 0.009$), reflecting the cumulative effects of menopause-related oestrogen deficiency, reduced vaginal tissue integrity, and psychosocial factors associated with aging.^[17]

The most clinically significant finding is the strong and independent association between SD and depression (OR = 6.27, $p < 0.001$). Depression was nearly three times more prevalent among participants with SD (70.15% vs. 27.27%). This finding aligns with the bidirectional model documented by Atlantis and Sullivan,^[8] and the clinical

study by Ghosh et al.,^[18] who similarly found a significant positive correlation between ASEX and BDI-II scores ($r = 0.686$, $p < 0.001$) in depressed patients. The neurobiological substrate for this relationship involves shared dopaminergic (reward) and serotonergic (inhibitory) pathways: dopaminergic hypoactivity in depression directly attenuates sexual motivation, while serotonergic excess amplified by SSRIs inhibits arousal, ejaculation, and orgasm.^[6,7,19]

Sreelakshmy et al. reported SD in approximately 90% of drug-naive women with depression using FSFI and HAMD — the same instruments employed in the present study. While our female FSFI prevalence (81.82%) is somewhat lower, likely reflecting a mixed-aetiology rather than exclusively depressive sample, the direction and magnitude of the association are consistent.^[20]

Multivariate regression identified SD severity and age as independent predictors of depression, while gender, medical comorbidity, marital discord, and psychosocial stressors were not significant predictors. This finding suggests that the contribution of SD to depression is not merely a proxy for aging or medical illness, but represents an independent psychological and neurobiological burden warranting targeted clinical attention.

A limitation of the present study is its cross-sectional design, which precludes causal inference about the directionality of the SD-depression relationship. The single-centre Medicine OPD setting, although representative of western Indian tertiary care practice, may not be fully generalisable to community or primary care populations. Cultural barriers to disclosure of sexual concerns, despite the use of validated Marathi-language instruments and a structured confidential assessment approach, may have resulted in some residual underestimation of true prevalence.

CONCLUSION

Sexual dysfunction is highly prevalent among adults above 45 years in a Medicine OPD setting in western India, affecting approximately two-thirds of the study population. The prevalence increases significantly with age and does not differ meaningfully between men and women. The association with depression is strong and independent: individuals with SD are more than six times more likely to have depression, and SD severity is a significant predictor of depressive symptom severity. These findings argue for routine, structured assessment of sexual health as a standard component of clinical evaluation in this age group, and for the integration of screening for depression in all patients presenting with sexual dysfunction. A multidisciplinary approach to management — incorporating psychiatry, internal medicine, urology, and gynaecology — is warranted.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. World Health Organization. Defining sexual health: Report of a technical consultation on sexual health. Geneva: WHO Press; 2006.
2. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Arlington: APA Publishing; 2013.
3. World Health Organization. International Classification of Diseases. 11th Revision. Geneva: WHO Press; 2022.
4. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: Prevalence and predictors. *JAMA*. 1999;281(6):537–544.
5. Sathyanarayana Rao TS, Tandon A, Darshan M. An epidemiological study of sexual disorders in south Indian rural population. *Indian J Psychiatry*. 2015;57(2):150–157.
6. Bancroft J. Human Sexuality and Its Problems. 3rd ed. Edinburgh: Elsevier; 2009.
7. Krishnan V, Nestler EJ. The molecular neurobiology of depression. *Nature*. 2008;455(7215):894–902.
8. Atlantis E, Sullivan T. Bidirectional association between depression and sexual dysfunction: A systematic review and meta-analysis. *J Sex Med*. 2012;9(6):1497–1507.
9. Kalra G, Subramanyam A, Pinto C. Sexuality: Desire, activity and intimacy in the elderly. *Indian J Psychiatry*. 2011;53(4):300–306.
10. McGahuey CA, Gelenberg AJ, Laukes CA, Moreno FA, Delgado PL, McKnight KM, et al. The Arizona Sexual Experience Scale (ASEX): Reliability and validity. *J Sex Marital Ther*. 2000;26(1):25–40.
11. Rosen RC, Riley A, Wagner G, Osterloh IH, Kirkpatrick J, Mishra A. The International Index of Erectile Function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology*. 1997;49(6):822–830.
12. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther*. 2000;26(2):191–208.
13. Hamilton M. A rating scale for depression. *J NeurolNeurosurg Psychiatry*. 1960;23:56–62.
14. Li H, Gao T, Wang R, et al. Prevalence and risk factors of erectile dysfunction in men: results from a large cross-sectional survey in the United Kingdom. *J Sex Med*. 2022;19(4):610–620.
15. Feldman HA, Goldstein I, Hatzichristou DG, Krane RJ, McKinlay JB. Impotence and its medical and psychosocial correlates: Results of the Massachusetts Male Aging Study. *J Urol*. 1994;151(1):54–61.
16. Carvalho J, García-Gómez A. Introduction, epidemiology and etiology of sexual dysfunctions in men and women. In: *Andrology and Sexual Medicine*. Cham: Springer; 2022.
17. Anderson D, McCabe M, et al. Male sexual dysfunction: epidemiology, pathophysiology, and treatment. In: *StatPearls*. Treasure Island: StatPearls Publishing; 2022.
18. Ghosh A, Bhattacharya S, Das S, Bhowmick B, Ghosh KK, Bhattacharjee P. Prevalence of sexual dysfunction in depression and its association with severity of depression. *J Psychiatry*. 2021;24:1–6.
19. Serretti A, Chiesa A. Treatment-emergent sexual dysfunction related to antidepressants: A meta-analysis. *J ClinPsychopharmacol*. 2009;29(3):259–266.
20. Sreelakshmy K, Velayudhan R, Kuriakose D, Nair R. Sexual dysfunction in women with depression: A cross-sectional study. *Indian J Psychiatry*. 2017;59(4):449–454.