

BMJ Open Predictive factors of sexual dysfunction and quality of life among type 2 diabetes outpatients in southern Iran: a cross-sectional survey

Vahid Keshtkar ¹, Mina Zarmehrpariroy ², Mohammad Ali Izadi,³
Mohammad Hossein Sharifi^{4,5}

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For numbered affiliations see end of article.

Correspondence to

Associate Professor Mohammad Hossein Sharifi;
mhsharifi1350@gmail.com

ABSTRACT

Objectives This study was conducted to determine the predictors of sexual dysfunction and quality of life (QOL) in patients with type 2 diabetes (T2D). Sexual dysfunction is a long-term consequence of diabetes that is widely ignored in personal management, even though it can have an adverse effect on QOL.

Design This research was designed as a cross-sectional study.

Setting 12 diabetes centres and clinics in Shiraz, south of Iran.

Participants 390 male patients with T2D mellitus participated in this project. The inclusion criteria were being 30–65 years, having a history of diabetes of at least 1 year, having fasting blood sugar and glycosylated haemoglobin tests and being willing to participate in the study. Patients with medication treatment for mental disorders, a history of heart disease and renal failure were excluded.

Primary outcome measures QOL and erectile dysfunction (ED). The questionnaires were the Audit of Diabetes-Dependent QOL (ADDQOL) and the International Index of Erectile Function (IIEF-15). Data were reported using descriptive and analytical statistics methods.

Result The participants' mean age was 48.35 ± 9.27 years. The average weighted impact (AWI) score of ADDQOL for the participants was -3.01 , indicating the negative influence of diabetes on their QOL. The mean value of the total score of sexual dysfunction was 42.79 ± 22.75 , and the rates of mild, mild to moderate, moderate and severe ED were 19%, 17.7%, 17.2% and 24.6%, respectively. Sexual dysfunction was significantly related to age (OR=1.06; 95% CI: 1.02 to 1.09), diabetes duration (OR=1.04, 95% CI: 1.01 to 1.07), HbA1c (OR=1.45, 95% CI: 1.07 to 1.95), BMI (OR=1.10, 95% CI: 1.03 to 1.16), marital status (married: OR=2.30, 95% CI: 1.40 to 3.77), without diabetes complication (OR=0.17, 95% CI: 0.08 to 0.31) and insulin therapy (OR=2.86, 95% CI: 1.67 to 4.92). ADDQOL was significantly related to age (OR=1.049), HbA1c (OR=2.192), marital status (married: OR=2.089), educational level (high school certificate: OR=0.337, university degree: OR=0.295), diabetes complication (no complication: OR=0.372) and insulin therapy (OR=3.82). AWI was correlated with the total score of IIEF-15 ($r=0.78$, p value <0.001).

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study design was a population-based study with a good sample size.
- ⇒ Accurate statistical models were used to determine the predictors of the outcomes.
- ⇒ Using validated and accurate tools, including the Audit of Diabetes-Dependent Quality of Life and International Index of Erectile Function.
- ⇒ There was a lack of measurement of serum biomarkers such as vitamin D status, zinc level, testosterone level and insulin level.
- ⇒ Cross-sectional studies cannot establish causal relationships between exposure and outcome.

Conclusion To improve the QOL of diabetic patients, it is suggested that all the predictors of sexual dysfunction, such as glycaemic control, obesity, diabetes complications and duration, should be considered in diabetic management guidelines.

INTRODUCTION

Sexual dysfunction is a long-term consequence of diabetes that is widely ignored in patient management, even though it has an adverse effect on quality of life (QOL).^{1 2} Millions of men suffer from sexual dysfunction, yet most prefer not to report it, as talking about sex is taboo in some societies.² Previous research revealed that the prevalence of sexual dysfunction was 20–85%.² In the recent decade, the issue of diabetes complications has received considerable critical attention. Sexual dysfunction may be a significant determinant of QOL in type 2 diabetes (T2D) mellitus (T2DM) and a predictor of sexual dysfunction and QOL in ongoing research gaps. This study seeks to obtain detailed data that will help to improve diabetes management in patients with T2DM. Although sexual dysfunction and QOL have been evaluated separately in other studies in patients with T2D, few studies have simultaneously

ED are two essential aspects of diabetes that were investigated concurrently in this study. The main finding of the present study showed that QOL was strongly correlated with the ED ($r=0.77$). In other words, this study showed that increased sexual function increased QOL. According to a recent systematic review of six high-quality studies, diabetes-related ED negatively impacted the QOL, with a higher ED severity associated with a lower rate of life.^{29 30}

This study had several limitations; serum biomarkers associated with ED were not measured, such as vitamin D status, zinc level, testosterone level and insulin level. Furthermore, our findings are not able to illuminate a causal relationship because the data is cross-sectional. We used the convenience sampling method in all diabetes clinics. Although convenience sampling inhibits the generalisability of the study, it is still an acceptable sampling technique. As a result, additional research is required.

In conclusion, our finding of QOL predictors among patients with T2D adds to the knowledge of associated diabetes-related factors and enhances diabetic management. Our results showed that diabetes adversely affected the patients' QOL in most domains of life, including sexual dysfunction. The prevalence of ED is substantial, and it would be helpful to understand its predictors in patients with T2D to better manage their condition. However, because our study was cross-sectional, additional prospective studies are required to confirm our findings. To improve the patient's QOL, we recommend developing and implementing individual consultation strategies and interventions for patients with diabetes.

Author affiliations

¹Department of Community Medicine, Shiraz University of Medical Sciences, Shiraz, Iran (the Islamic Republic of)

²Department of Biostatistics, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran (the Islamic Republic of)

³Shiraz University of Medical Sciences, Shiraz, Iran (the Islamic Republic of)

⁴Research Center for Traditional Medicine and History of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran (the Islamic Republic of)

⁵Non-Communicable Diseases Research Center, Shiraz University of Medical Sciences, Shiraz, Iran (the Islamic Republic of)

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ORCID iDs

Vahid Keshkar <http://orcid.org/0000-0001-5293-724X>

Mina Zarmehrparioury <http://orcid.org/0000-0002-4226-7331>

REFERENCES

- 1 Koudrat Y, Pizzol D, Cosco T, *et al*. High prevalence of erectile dysfunction in diabetes: a systematic review and meta-analysis of 145 studies. *Diabet Med* 2017;34:1185–92.
- 2 Anwar Z, Sinha V, Mitra S, *et al*. Erectile Dysfunction: An Underestimated Presentation in Patients with Diabetes Mellitus. *Indian J Psychol Med* 2017;39:600–4.
- 3 Salvio G, Ciarloni A, Cutini M, *et al*. Hyperhomocysteinemia: Focus on Endothelial Damage as a Cause of Erectile Dysfunction. *Int J Mol Sci* 2021;22:418.
- 4 Gutiérrez-Valverde JM, Portillo PF, Guevara-Valtier MC, *et al*. Sexual Dysfunction, Depression and Quality of Life in Individuals with Diabetes Mellitus Type 2. *IJN* 2016;3:9–19.
- 5 Peixoto MM, Lopes J, Rodrigues AL. Quality of Life, Sexual Functioning and Chronic Disease: A Comparative Study with Portuguese Women without Chronic Disease, and Women with Diabetes Type 1 and 2, and Arterial Hypertension. *Int J Sex Health* 2022;34:209–20.
- 6 Rew KT, Heidelbaugh JJ. Erectile Dysfunction. *Am Fam Physician* 2016;94:820–7.
- 7 Ford JV, Ivankovich MB, Douglas JM Jr, *et al*. The Need to Promote Sexual Health in America: A New Vision for Public Health Action. *Sex Transm Dis* 2017;44:579–85.
- 8 Levterova BA, Orbetzova M, Levterov G, *et al*. Assessment of the impact of type 2 diabetes on the quality of life by Audit of Diabetes-Dependent Quality-of-Life (ADDQoL-19). *Biotechnology & Biotechnological Equipment* 2018;32:1627–34.
- 9 Zurita-Cruz JN, Manuel-Apolinar L, Arellano-Flores ML, *et al*. Health and quality of life outcomes impairment of quality of life in type 2 diabetes mellitus: a cross-sectional study. *Health Qual Life Outcomes* 2018;16:94.
- 10 Mofid A, *et al*. Prevalence and risk factors of erectile dysfunction in Iranian diabetic men. *Acta Med Iran* 2009;309–14.
- 11 Jafari Torkamani Z, Dolatian M, Omani-Samani R, *et al*. Relationship between sexual function and type 2 diabetes in infertile men referred to Royan institute. *J Renal Inj Prev* 2020;10:e33.
- 12 Rosen R, O'Leary M, Altwein J, *et al*. Luts and male sexual dysfunction: The multi-national survey of the aging male (MSAM-7). *European Urology Supplements* 2003;2:S25:94:.
- 13 Rezaei N, Sharifi N, Fathnezhad-Kazemi A, *et al*. Evaluation of Psychometric Properties of the Persian Version of Brief Male Sexual Function Inventory: A Cross-Sectional Study. *Sex Med* 2021;9:100409.
- 14 Chung JO, Cho DH, Chung DJ, *et al*. Assessment of Factors Associated with the Quality of Life in Korean Type 2 Diabetic Patients. *Intern Med* 2013;52:179–85.
- 15 Ghazanfari Z, Naghizadeh MM, Hadavi M, *et al*. Translation and psychometric properties of the Persian version of the Audit of