



## Anxiety in Women with Endometriosis -A Cross-sectional Study

Nazila Najdi<sup>1</sup>, Katayon Vakilian<sup>2,\*</sup>, Amir Almasi-Hashiani<sup>3</sup>, Fatemeh Mirzaie<sup>4</sup>, Maryam Shokrpour<sup>1</sup> and Hourieh Karimi<sup>5</sup>

<sup>1</sup>Obstetrics and Gynecologist, Obstetric Department, Arak University of Medical Sciences, Iran

<sup>2</sup>Midwifery Department, Medical School, Traditional and Complementary Medicine Research Center (TCMRC), Arak University of Medical Sciences, Iran

<sup>3</sup>Health Department, Arak University of Medical Sciences, Arak, Iran

<sup>4</sup>M.Sc. in Midwifery, Arak University of Medical Sciences, Arak, Iran

<sup>5</sup>Nursing -Midwifery Department, Islamic Azad University of Arak, Arak, Iran

### Abstract:

**Aim:** The present study aims to assess the anxiety in endometriosis women.

**Background:** Endometriosis is a disease with chronic pain due to the presence of endometrial-like tissue in other organs of the body. Pain and infertility can reduce the quality of mental health in women's underlying endometriosis.

**Objectives:** The present study wants to assess anxiety in endometriosis women and compare it with healthy women in Arak City in 2023.

**Methods:** The current research was conducted using a cross-sectional method. Eighty-four records of women who were diagnosed and treated by laparoscopy in one of the referral hospitals were included. In the control group, women who were referred to health centers for an annual checkup without any history of endometriosis were recruited for the study. They were entered into the study by convenience sampling. Two groups filled out the demographic and Anxiety Beck Inventory in 15 minutes. Data was analyzed through descriptive and inferential statistics using chi-square and t-tests using STATA software.

**Results:** The results showed that the mean age of patients in the case and control groups was  $31.5 \pm 5.7$  and  $31.1 \pm 6.1$ , respectively ( $p=0.57$ ). Findings revealed that there was a statistically significant difference in the mean scores of FSFI between the case and control, respectively ( $23.08 \pm 6.1$  vs  $24.47 \pm 6.6$ ;  $p=0.031$ ).

**Conclusion:** The present study showed that women with endometriosis still experience more anxiety after surgery than healthy women. Therefore, the reasons for women's anxiety should be identified during consultations, and drug and non-drug treatment methods should be used to reduce their anxiety.

**Keywords:** Reproductive health, Endometriosis, Anxiety, Mental health.

© 2024 The Author(s). Published by Bentham Open.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: <https://creativecommons.org/licenses/by/4.0/legalcode>. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

\*Address correspondence to this author at the Midwifery Department, Medical School, Traditional and Complementary Medicine Research Center (TCMRC), Basij Square, Khalije Fars Street, Arak University of Medical Sciences, Arak, Iran; Tel: 098-8634173505; E-mails: [cattv2002@yahoo.com](mailto:cattv2002@yahoo.com) and [dr.kvakilian@arakmu.ac.ir](mailto:dr.kvakilian@arakmu.ac.ir)

Cite as: Najdi N, Vakilian K, Almasi-Hashiani A, Mirzaie F, Shokrpour M, Karimi H. Anxiety in Women with Endometriosis -A Cross-sectional Study. Open Public Health J, 2024; 17: e18749445308945. <http://dx.doi.org/10.2174/0118749445308945240614110217>



Received: March 07, 2024  
Revised: May 28, 2024  
Accepted: June 06, 2024  
Published: June 25, 2024



Send Orders for Reprints to  
[reprints@benthamscience.net](mailto:reprints@benthamscience.net)

## 1. INTRODUCTION

Endometriosis is a disease with chronic pain due to the presence of endometrial-like tissue in other organs of the body, including ovaries, fallopian tubes, and pelvic cavity. The prevalence of this disease in the world includes 10% of women of reproductive age [1]. The most common clinical symptoms of this disease are dyspareunia, dysmenorrhea and infertility [2]. Laparoscopy and hormonal treatments are common methods of treating endometriosis. Due to the fact that the drug treatments for this disease are long-term, many patients may stop the treatment. Frequent recurrent after stopping the treatment and pelvic pains decrease the mental health of these women. Fear of stigmatizing symptoms associated with menstruation, decreased sexual activity, decreased self-esteem, negative sexual thoughts about intercourse, avoidance of sexual activity, inability to conceive, or worry about future infertility can exacerbate psychological distress [3-5]. Because this disease affects the marital relationship of couples, women's work and education, it can reduce the quality of life of women [6]. Studies show that one-third of women with endometriosis suffer from psychological problems and need therapeutic interventions [7]. Depression is more common in women than men, and if women have chronic pain, the risk of depression will be higher [8, 9]. A study showed that women with chronic pelvic pain were 1.5 times more depressed than women in the control group [10]. Also, studies show that infertile women suffer from mental illnesses, including anxiety and depression, more than other women [11, 12]. Twenty-eight articles reviewed in women with endometriosis showed a prevalence between 10% and 98% for depression symptoms, and 11% to 88% for anxiety. The quality of life in patients with endometriosis was significantly reduced [13]. Many studies show that women who have not undergone endometriosis surgery suffer from psychological problems, including anxiety [14, 15], but few studies show that mental health has improved after surgery [16]. Since women with endometriosis have both symptoms of chronic pelvic pain and infertility, it is expected that a high level of mental problems, including anxiety. Therefore, this study was conducted to investigate the level of depression in 2 groups of healthy women and women with endometriosis under the treatment.

## 2. METHODS

### 2.1. Study Design

This cross-sectional study was conducted in Arak, Iran.

### 2.2. Setting of the Study

The case group entered the study from Taleghani Maternity Hospital by census sampling in Arak, one of the cities in Markazi Province, Iran. The control was selected from 5 regions of Arak city health centers and then sampling was done from each of the selected clinics in proportion to the covered population. This sampling was done by convenience method.

### 2.3. Patients

Eighty-four records of women who were diagnosed and treated by laparoscopy in one of the referral hospitals in

Arak City were recruited to study. Sampling was done from 2017 to 2020.

All patients had no history of chronic diseases. All patients reported characteristic symptoms of endometriosis, such as dysmenorrhea, pelvic pain, dyspareunia or dyschezia at the time of surgical treatment. Patients were invited to participate in the study through call number. Anxiety was measured at least 6 months after surgery. In the control group, women who were referred to health centers for annual checkups, without any history of endometriosis were recruited to the study. They were entered into the study by convenience sampling.

### 2.4. The Sampling Method

Out of 110 patients, 84 cases met the inclusion criteria and signed a written consent form after informing the study's goals and ethical considerations. Sixteen patients did not meet the inclusion criteria and 10 patients did not sign the informed consent. Finally, 84 patients participated in this study. In the control group, convenient sampling was done by the researchers.

### 2.5. Inclusion Criteria

The criteria of the case group include having been diagnosed with endometriosis and having undergone laparoscopy, ages between 20 and 40 years, not having any chronic or acute diseases under treatment, not having other gynecological diseases, not having mental illness and being treated, and not having addictions. In the control group, all were confirmed except that they did not have a history of endometriosis.

### 2.6. Sample Size

Two-fold sample of case group was considered for the control group. 160 samples were sampled, but 141 filled out the questionnaire completely.

### 2.7. Data Collection Tools

The questionnaire was composed of questions regarding demographic and obstetric history. Anxiety was measured by the Beck Anxiety Inventory (BAI). This scale contained a 21-question multiple-choice. Score of 0 - 21 = low anxiety score of 22 - 35 = moderate anxiety Score of 36 and above = potentially concerning levels of anxiety. Test-retest reliability, an internal consistency, in Iranian people were ( $r = 0.67$ ) and ( $\alpha = 0.88$ ), respectively [17].

### 2.8. Implementation

After obtaining the ethical code from the Arak University of Medical Sciences, the control group was selected from 5 health centers that were randomly selected from the north, south, east, center, and west of the city. From each center, between 25-35 women were recruited after signing informed consent by using the convenience sampling method. Sampling was collected from January 2017 to February 2020. The sampling was performed by one of the researchers, who was a midwife. Data gathering was performed by demographic and Beck Anxiety Inventory (BAI). In case group, sampling was done in a maternity hospital. They were invited to the hospital

**Table 1. Demographic and obstetric variables in endometriosis and healthy women.**

Variables		Healthy Group (n=141)	Endometriosis Group (n=84)	*P Value	OR (95%CI)
Age	Mean (SD)	31.1 (6.1)	31.5 (5.7)	0.579	1.01 (0.96-1.06)
BMI	Mean (SD)	25.5 (3.9)	23.7 (3.1)	0.001	0.87 (0.80-0.95)
Education	Under diploma	45 (31.9)	12 (14.5)	0.001	1
	Diploma	63 (44.7)	19 (22.9)		1.13 (0.49-2.56)
	Academic	33 (23.4)	52 (62.6)		5.9 (2.7-12.7)
Marital status	Single	0	6 (7.2)	0.001	-
	Married	140 (100)	77 (92.8)		-
Job	Housewife	124 (87.9)	58 (73.4)	0.007	1
	Employed	17 (12.1)	21 (26.6)		2.6 (1.3-5.4)
Pregnancy	Yes	126 (89.4)	33 (40.2)	0.001	1
	No	15 (10.6)	49 (59.8)		2.4 (1.8-3.2)
Abortion	Yes	46 (32.6)	18 (21.9)	0.085	1
	No	95 (67.4)	64 (78.1)		1.7 (0.9-3.2)
Gravida	Mean (SD)	1.82 (1.08)	0.63 (0.90)	0.001	0.31 (0.22-0.44)
Para	Mean (SD)	1.49 (0.8)	0.4 (0.68)	0.001	0.15 (0.1-0.25)
Live Child	Mean (SD)	1.48 (0.8)	0.47 (0.66)	0.001	0.17 (0.10-0.3)
Family Endometriosis	Yes	0	15 (18.5)	0.001	-
	No	141 (100)	66 (81.5)		-

Note: \*chi-square.

**Table 2. BAI in endometriosis and healthy women.**

Variables		Endometriosis Group (n=141)	Healthy Group (n=84)	*P Value
BAI score	Mean (SD)	7.82 (7.48)	15.16 (10.52)	0.001
BAI categories	Low	81 (57.4)	24 (32.0)	0.001
	Mild	33 (23.4)	18 (24.0)	
	Moderate	22 (15.6)	17 (22.7)	
	Sever	5 (3.5)	16 (21.3)	

Note: \*T-test.

to fill out the questionnaires. The main outcome was an assessment of anxiety. Two groups filled out the demographic and BAI questionnaires in 15 minutes. Data were analyzed through descriptive and inferential statistics by chi-square and t-test by STATA software.

### 3. RESULTS

The demographic evaluation revealed that in the case and control groups, it was  $31.5 \pm 5.7$  and  $31.1 \pm 6.1$ , respectively ( $p=0.57$ ). Thirty-three (40.2) cases vs 126 (89.4) controls had experienced the pregnancy (Table 1).

The BAI scores revealed that 15.16 (10.52) of the women in case and 7.82 (7.48) in control presented anxiety, 16 (21.3) in endometriosis vs 5 (3.5) in healthy women had sever anxiety (Table 2).

### 4. DISCUSSION

This study showed that there was a significant association between endometriosis and anxiety. In the study including 91,530 women with endometriosis, the highest odds ratio of experiencing anxiety appeared in this group (OR = 2.719, 95% CI 2.481-2.979) [9]. In a study, 81 women with pelvic pain were studied, of which 40 had endometriosis and 41 had non-endometriosis chronic pain. All patients filled the state-trait anxiety inventory [STAI].

Based on the results of the study, endometriosis patients showed higher anxiety than women with other patients with chronic pain [18]. A systematic review study, resulting in 1,837 records, showed that endometriosis patients experienced significant anxiety compared with healthy controls, but no differences were found comparing endometriosis patients with other chronic pelvic pain patients for anxiety [19]. In contrast to these studies, one study showed that the state of anxiety in women with endometriosis did not significantly differ with healthy women [20]. Studies show that inflammatory reactions in endometriosis patients and chronic pain cause disturbances in the hypothalamus-pituitary-adrenal (HPA) axis, which leads to a decrease or increase in blood cortisol. Both decrease and increase of cortisol are a sign of disorder in this axis, and they are associated with different psychopathologies [21]. Eriksen *et al.* could not find any correlation between pain and anxiety and depression symptoms as an emotional response to endometriosis, but women with chronic pain had increased anxiety and depression levels [22].

Anxiety plays an important role in reducing self-confidence, self-worth and peace in women's marital relationships. Also, they experience a lot of anxiety during the diagnostic and treatment planning stages, which usually causes significant psychological effects on patients. The

specific factors affecting anxiety levels are still not well understood, although diagnostic delay, disease symptoms such as chronic pain, uncertainty of treatment, and consequences such as infertility seem to play a decisive role [23]. One study showed that creating a trustful relationship between health workers/specialists with women and providing them with the appropriate counseling methods could reduce baseline anxiety levels [23].

## CONCLUSION

The present study showed that women with endometriosis still experience more anxiety after surgery than healthy women. Therefore, the reasons for women's anxiety should be identified during consultations, and drug and non-drug treatment methods should be used to reduce their anxiety. There are limitations in the study. We included more than 97% of marital women, which may be influenced by marital status, and all samples were selected from referral center, which influenced the study generalization. We recommend more studies in this field.

## AUTHORS' CONTRIBUTION

It is hereby acknowledged that all authors have accepted responsibility for the manuscript's content and consented to its submission. They have meticulously reviewed all results and unanimously approved the final version of the manuscript.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved with the ethical code no. IR.ARAKMU.REC.1398.253 was also received from Arak University of Medical Sciences.

## HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

## CONSENT FOR PUBLICATION

The participants in this study signed the written informed consent forms. Moreover, women had the right to participate or leave the study.

## AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from Arak University of Medical Sciences but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are, however available from the authors upon reasonable request and with permission of Arak University of Medical Sciences.

## FUNDING

This study was funded by Arak University of Medical Sciences under the code: 6001.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

## ACKNOWLEDGEMENTS

Declared none.

## REFERENCES

- [1] Gambadauro P, Carli V, Hadlaczy G. Depressive symptoms among women with endometriosis: A systematic review and meta-analysis. *Am J Obstet Gynecol* 2019; 220(3): 230-41. <http://dx.doi.org/10.1016/j.ajog.2018.11.123> PMID: 30419199
- [2] Estes SJ, Huisingh CE, Chiuvè SE, Petruski-Ivleva N, Missmer SA. Depression, anxiety, and self-directed violence in women with endometriosis: A retrospective matched-cohort study. *Am J Epidemiol* 2021; 190(5): 843-52. <http://dx.doi.org/10.1093/aje/kwaa249> PMID: 33184648
- [3] Fritzer N, Haas D, Oppelt P, et al. More than just bad sex: Sexual dysfunction and distress in patients with endometriosis. *Eur J Obstet Gynecol Reprod Biol* 2013; 169(2): 392-6. <http://dx.doi.org/10.1016/j.ejogrb.2013.04.001> PMID: 23642970
- [4] Ping Z, Wen Z, Jinhua L, Jinghe L. Research on central sensitization of endometriosis-associated pain: A systematic review of the literature. *J Pain Res* 2019; 12: 1447-56. <http://dx.doi.org/10.2147/JPR.S197667> PMID: 31190954
- [5] Shum LK, Bedaiwy MA, Allaire C, et al. Deep dyspareunia and sexual quality of life in women with endometriosis. *Sex Med* 2018; 6(3): 224-33. <http://dx.doi.org/10.1016/j.esxm.2018.04.006> PMID: 29801714
- [6] Zarbo C, Brugnera A, Frigerio L, et al. Behavioral, cognitive, and emotional coping strategies of women with endometriosis: A critical narrative review. *Arch Women Ment Health* 2018; 21(1): 1-13. <http://dx.doi.org/10.1007/s00737-017-0779-9> PMID: 28932912
- [7] Maulitz L, Stickeler E, Stickel S, Habel U, Tchaikovski SN, Chechko N. Endometriosis, psychiatric comorbidities and neuroimaging: Estimating the odds of an endometriosis brain. *Front Neuroendocrinol* 2022; 65: 100988. <http://dx.doi.org/10.1016/j.yfrne.2022.100988> PMID: 35202605
- [8] Han H, Xia X, Zheng H, et al. Factors associated with the high susceptibility to depression of women during the perimenopause. *Brain Behav* 2023; 13(1): e2826. <http://dx.doi.org/10.1002/brb3.2826> PMID: 36479809
- [9] Nassiri Kigloo H, Itani R, Montreuil T, et al. Endometriosis, chronic pain, anxiety, and depression: A retrospective study among 12 million women. *J Affect Disord* 2024; 346: 260-5. <http://dx.doi.org/10.1016/j.jad.2023.11.034> PMID: 37956828
- [10] Siqueira-Campos VME, Da Luz RA, de Deus JM, Martinez EZ, Conde DM. Anxiety and depression in women with and without chronic pelvic pain: Prevalence and associated factors. *J Pain Res* 2019; 12: 1223.
- [11] Kamboj N, Saraswathy KN, Prasad S, et al. Women infertility and common mental disorders: A cross-sectional study from North India. *PLoS One* 2023; 18(1): e0280054. <http://dx.doi.org/10.1371/journal.pone.0280054> PMID: 36603005
- [12] Sultana N. Depression among primary and or Or secondary infertile women. *Insight* 2022; 5(02): 73-80.
- [13] Szyplowska M, Tarkowski R, Kułak K. The impact of endometriosis on depressive and anxiety symptoms and quality of life: A systematic review. *Front Public Health* 2023; 11: 1230303. <http://dx.doi.org/10.3389/fpubh.2023.1230303> PMID: 37744486
- [14] Friedl F, Riedl D, Fessler S, et al. Impact of endometriosis on quality of life, anxiety, and depression: An Austrian perspective. *Arch Gynecol Obstet* 2015; 292(6): 1393-9. <http://dx.doi.org/10.1007/s00404-015-3789-8> PMID: 26112356
- [15] Vitale SG, La Rosa VL, Rapisarda AMC, Laganà AS. Impact of endometriosis on quality of life and psychological well-being. *J Psychosom Obstet Gynaecol* 2017; 38(4): 317-9. <http://dx.doi.org/10.1080/0167482X.2016.1244185> PMID: 27750472
- [16] Van den Broeck U, Meuleman C, Tomassetti C, et al. Effect of laparoscopic surgery for moderate and severe endometriosis on

- depression, relationship satisfaction and sexual functioning: Comparison of patients with and without bowel resection. *Hum Reprod* 2013; 28(9): 2389-97.  
<http://dx.doi.org/10.1093/humrep/det260> PMID: 23798058
- [17] Khesht-Masjedi M, Omar Z, Kafi Masoleh SM. Psychometrics properties of the Persian version of Beck Anxiety Inventory in North of Iranian adolescents. *Int J Educ Psychol Res* 2015; 1(2): 145.  
<http://dx.doi.org/10.4103/2395-2296.152233>
- [18] Laganà AS, Condemi I, Retto G, *et al.* Analysis of psychopathological comorbidity behind the common symptoms and signs of endometriosis. *Eur J Obstet Gynecol Reprod Biol* 2015; 194: 30-3.  
<http://dx.doi.org/10.1016/j.ejogrb.2015.08.015> PMID: 26319653
- [19] van Barneveld E, Manders J, van Osch FHM, *et al.* Depression, anxiety, and correlating factors in endometriosis: A systematic review and meta-analysis. *J Womens Health* 2022; 31(2): 219-30.  
<http://dx.doi.org/10.1089/jwh.2021.0021> PMID: 34077695
- [20] Arslan EB, Kocaöz S, Kızılırmak A. The effect of endometriosis on anxiety and the Quality of Life in women. *Health Care Women Int* 2023; 1-12.  
 PMID: 36961454
- [21] Quiñones M, Urrutia R, Torres-Reverón A, Vincent K, Flores I. Anxiety, coping skills and hypothalamus-pituitary-adrenal (HPA) axis in patients with endometriosis. *J Reprod Biol Health* 2015; 3(1): 2.  
<http://dx.doi.org/10.7243/2054-0841-3-2> PMID: 26900480
- [22] Eriksen HLF, Gunnersen KF, Sørensen JA, Munk T, Nielsen T, Knudsen UB. Psychological aspects of endometriosis: Differences between patients with or without pain on four psychological variables. *Eur J Obstet Gynecol Reprod Biol* 2008; 139(1): 100-5.  
<http://dx.doi.org/10.1016/j.ejogrb.2007.10.002> PMID: 18022311
- [23] Arena A, Orsini B, Degli Esposti E, *et al.* The unbearable burden of endometriosis: Results from a large cohort about anxiety reduction during the first outpatient evaluation. *J Psychosom Res* 2021; 147: 110512.  
<http://dx.doi.org/10.1016/j.jpsychores.2021.110512> PMID: 34020342

**DISCLAIMER:** The above article has been published, as is, ahead-of-print, to provide early visibility but is not the final version. Major publication processes like copyediting, proofing, typesetting and further review are still to be done and may lead to changes in the final published version, if it is eventually published. All legal disclaimers that apply to the final published article also apply to this ahead-of-print version.