

Original Paper

Comparing the Prevalence of Depression in Postmenopausal Women With and Without Urinary Incontinence



Mandana Mansour Ghanaie¹ , Elaheh Abdolahi² , Ehsan Kazemnezhad Leili^{3*} , Roghayeh Hojat Ansari⁴ , Seyed Mohammad Asgari Galebin⁴ 

1. Associate Professor, Department of Obstetrics & Gynecology, Reproductive Health Research Center, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.

2. Assistant Professor, Department of Psychiatry, Kavosh Cognitive Behaviour Sciences and Addiction Research Center, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.

3. Associate Professor, Social Determinants of Health Research Center (SDHRC), Biostatistics, Guilan University of Medical Sciences, Rasht, Iran.

4. General Practitioner, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.

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ABSTRACT

Introduction: Urinary incontinence is a common disorder that often affects the elderly. The prevalence of depression in people with urinary incontinence varies from 20-40%.

Objective: This study aimed to investigate and compare the prevalence of depression in postmenopausal women with and without urinary incontinence.

Materials and Methods: This comparative study with cross-sectional design was, conducted on 284 postmenopausal women in two groups of with and without urinary incontinence (controls). After recording their demographic characteristics, they all completed the Beck Depression Inventory-II (BDI-II). Chi-square, Mann-Whitney U test and logistic regression were used to assess depression score and severity of depression.

Results: The mean age of participants was 57.62±9.62. The mean score of depression in women with urinary incontinence was higher than in the control group (8.85±7.35 vs. 6.11±5.03), and this difference was significant (P=0.001). According to the Chi-square test, the probability of depression in women with urinary incontinence was two-fold higher than that of controls (21.3% vs. 9.86%). Using logistic regression and controlling the effects of socio-demographic variables, the odds of depression in women with urinary incontinence were 2.5 times higher than the control group (P=0.01).

Conclusion: Depression and urinary incontinence in postmenopausal women are seemed to be related to each other. It is recommended that depression be screened in postmenopausal women with urinary incontinence.

* Corresponding Author:

Ehsan Kazemnezhad Leili, PhD.

Address: Determinants of Health Research Center (SDHRC), Biostatistics, Guilan University of Medical Sciences, Rasht, Iran

Tel: +98 (13) 33555056

E-mail: kazem_ah@yahoo.com

Highlights

- Urinary incontinence is a common and serious health problem and has various effects on the quality of life.
- Evidences have shown a significant association between depression and urinary incontinence
- The depression level in women with urinary incontinence was higher than controls

Plain Language Summary

Urinary incontinence is a common and serious health problem and has various effects on the quality of life. Urinary incontinence has three types: stress, urge and mixed and can affect the quality of life especially the mixed type. Similar symptoms of urinary incontinence, depression, and pain may be indicative of their common biochemical abnormalities. The purpose of this study was comparing the prevalence of depression in postmenopausal women with and without urinary incontinence in north of Iran. The results showed that the depression level of Postmenopausal women with urinary incontinence was higher than controls. Moreover, marital status and education were reported to be the predictors of depression in these women.

Introduction

Urinary incontinence is a common and serious health problem and has several effects on quality of life [1]. The incidence of urinary incontinence is found in women of Indian, White, Black and Asian ethnicity (36%, 30%, 25%, 19%). The results of a Korean study reported a urinary incontinence prevalence of 24.4% in older Korean women with uterine prolapse [2]. Urinary incontinence has three types: stress, urge and mixed [3, 4]. All of these types, especially mixed type, affect the quality of life [5]. In some studies, a significant association between depression and urinary incontinence has been reported [2, 6-14].

The prevalence of depression in people with urinary incontinence is estimated to be 20 to 40% [11, 12]. The involvement of some common biochemical factors, high severity of incontinence or psychosocial factors may be the cause of this association [15]. It should be noted that depression and urinary incontinence have a common neurochemical pathogenesis. In animal models, it has been observed that the depletion of certain monoamines, such as serotonin and noradrenaline in the central nervous system has led to depression, urinary frequency, and overactive bladder [16].

Another justification is that social isolation caused by this disorder causes depression [2]. Many people with urinary incontinence, for example, avoid going to places without toilets and lifting heavy objects [16]. New clinical

studies argue that similar symptoms of urinary incontinence, depression, and pain may be indicative of their common biochemical abnormalities.

Duloxetine is a serotonin and noradrenaline reuptake inhibitor that has therapeutic role in these three disorders [17]. However, some studies have found no association between depression and urinary incontinence [6, 18, 19].

One of the potential problems that can affect the lives of menopausal women is urinary incontinence [1]. Despite the high incidence of urinary incontinence in menopause period and the increasing prevalence of depression during this period [20], there are few studies on the possible association between the two in Iranian women. This study aimed to investigate and compare the prevalence of depression in postmenopausal women with and without urinary incontinence in Iran.

Materials and Methods

This is a comparative study with cross-sectional design. The study population consisted of all postmenopausal women referred to government women's clinic affiliated to Guilan University of Medical Sciences and private clinics in Rasht, Iran from November 2015 to March 2016. According to the study by Bradley et al., who reported the incidence of 19% for urinary incontinence in postmenopausal women and 95% CI=0.73-2.0 to the odds ratio of depression in postmenopausal women [19], and considering 90 test power, the sample size was determined 142 for each group who entered into

the study gradually. They assigned in two groups of with urinary incontinence (n=142) and without urinary incontinence (n=142). After obtaining informed consent, they completed a demographic form which records their age, marital status, occupation, education level, number of births, type of birth, body mass index (normal, overweight, obesity, excessive body fat) [21] and location.

Then, they all completed the Beck Depression Inventory-II (BDI-II). It has 21 items rated on a 4-point Likert scale from 0 to 3. The total score range from 0 to 63, where 0-13 indicates minimal depression; 14-19, mild depression; 20-28, moderate depression; and 29-63, severe depression [22]. For analyzing data, first the Kolmogorov-Smirnov test was used to determine the normal distribution of data. Descriptive statistics were used to describe the data and since the results indicated that the depression score distribution was not normal, nonparametric Mann-Whitney U and Chi-square tests were used to compare the two groups. To determine the odds ratio (OR) of depression, the logistic regression (Backward method) was used considering a significance level of 0.1 and 0.05 for entering and excluding the variables from the model, respectively in two adjusted

and un-adjusted models relative to the effect of socio-demographic variables. The significance level was set at $P < 0.05$. The data analysis was carried out in SPSS v. 21.

Results

Table 1 presents the demographic characteristics of participants in two groups. It should be noted that 2 (1.4%) of the group with urinary incontinence and 7 (4.9%) from the group without urinary incontinence (total number=9; 3.2%) were nulliparous. Table 2 presents the Mean \pm SD of the quantitative variables in the two groups. According to this table, the average number of children in the group with urinary incontinence was higher than in the control group ($P=0.009$). As shown in Figure 1, the mean depression score in the test group was 8.85 ± 7.35 (0-44) with a median value of 7; for the control group, the mean depression score was 6.11 ± 5.03 (0-44) with a median value of 5. This difference was significant according to Mann-Whitney U test results ($P=0.001$). Table 3 compares the severity of depression in two groups. The results show that the difference between groups is significant ($P=0.006$).

Table 1. Demographic characteristics of study participants

Variables		NO. (%)		Sig.*
		With Urinary Incontinence n=142	Without Urinary Incontinence n=142	
Marital status	Single	30(21.1)	26(18.3)	0.55
	Married	112(78.9)	116(81.7)	
Location	Urban	96(67.6)	101(71.1)	0.52
	Rural	46(32.4)	41(28.9)	
Education	Illiterate	26(18.3)	31(21.8)	0.0001
	Less than high school education	87(61.3)	58(40.8)	
	Diploma	22(15.5)	24(16.9)	
	Academic	7(4.9)	29(20.4)	
Occupation	housekeeper	102(71.8)	83(58.5)	0.046
	worker/farmer	22(15.5)	23(16.2)	
	employee	11(7.7)	21(14.8)	
	Unemployed	7(4.9)	15(10.6)	
type of childbirth	Normal vaginal delivery	123(86.6)	101(71.1)	0.004
	Cesarean section	(12)17	34(23.9)	

*Chi 2 test

Table 2. Mean±SD of the quantitative variables in participants

Variable	Mean±SD (Ranged)		Sig.*
	With Urinary Incontinence n=142	Without Urinary Incontinence n=142	
Number of children	1.96±4.23 (0-12)	1.91±3.63 (0-10)	0.009
Weight	10.1±73.45 (50-100)	10.36±72.41 (45-95)	0.389
Height	5.66±159.50 (147-180)	157.85±6.23 (145-175)	0.002
Age	8.75±56.82 (43-86)	58.42±10.39 (47-88)	0.162
Body mass index	4.97±29.32 (18.5-58.95)	29.14±4.58 (17.57-37.8)	0.001

*Mann Whitney test

According to the results, 21.3% of women with urinary incontinence and 9.86% of controls had depression and this difference was significant according to the Chi-square test results ($P=0.009$). Comparison of mean depression score in two groups of people over 50 years old, married, city dwellers, illiterate, housewives and employees, having more than 4 children, having a history of normal childbirth and, being overweight and obese showed that the difference between groups was significant ($P<0.05$).

In determining the association between urinary incontinence and depression by controlling the effects of socio-demographic variables, the results of logistic regression analysis for unadjusted model reported that the odds of depression was 2.5 times higher in women with urinary incontinence (OR=2.5; 95% CI; 1.2-4.8,

$P=0.001$). For adjusted model, results (Table 4) showed that by controlling the effects of socio-demographic variables, urinary incontinence can predict depression in women (OR=2.1; 95% CI; 1.01-4.3, $P=0.046$). According to the results in Table 4, the effect of marital status on depression was borderline significant; single women with urinary incontinence were 2.05 times more likely to be depressed than married women. Moreover, illiterate women were 11.3 times more likely to be depressed than women with college degrees.

Discussion

The results of this study showed that depression in postmenopausal women with urinary incontinence was higher in terms of severity and rate compared to controls. Bradley et al. [19] and Lagana et al. [6] conducted

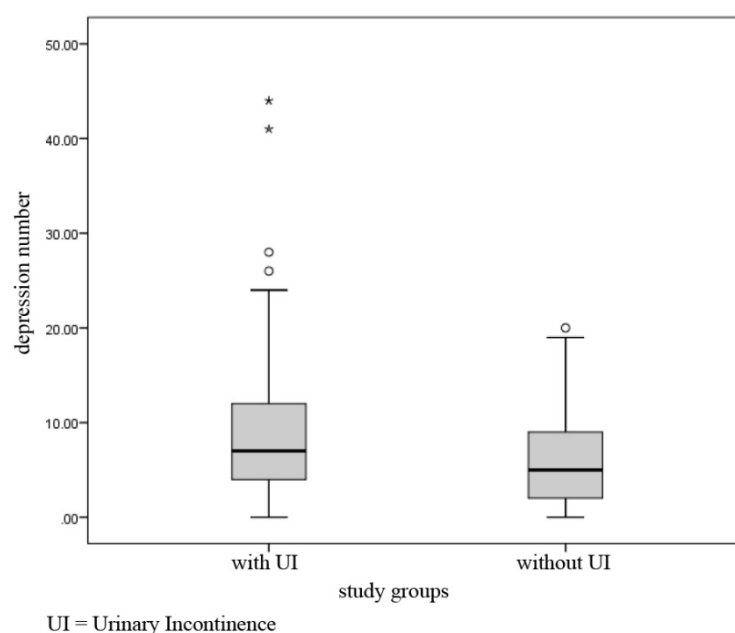


Figure 1. Box Plot of depression frequency in two study groups

Table 3. The frequency of depression based on severity

Variables	NO. (%)		Total
	With Urinary Incontinence n=142	Without Urinary Incontinence n=142	
Severity of depression	Minimal (0-13)	112(87.9)	128(90.1)
	Mild (14-19)	18(12.7)	13(9.2)
	Moderate (20-28)	10(7)	1(0.7)
	Severe (29-63)	2(1.4)	0(0)
Median	150.99	134.01	*P=0.006

*Mann-Whitney U

Table 4. Regression coefficients and odds ratio of depression in participants (adjusted model)

Variables	B	SE	P	OR	95% CI	
					Lower	Upper
urinary incontinence	0.740	0.372	0.046	2.10	1.012	4.341
Single/married	0.719	0.394	0.068	2.05	0.948	4.447
education			0.015			
Illiterate/academic	2.428	1.066	0.023	11.34	1.404	91.544
Less than diploma/academic	1.743	1.060	0.9	5.72	0.717	45.611
Diploma/academic	0.754	1.190	0.526	2.13	0.206	21.901
Constant	-3.980	1.031	0	0.02		

studies similar to our study using the comparative cross-sectional design to examine the difference in depression level of women with and without urinary incontinence where the significant difference was reported only in Bradley et al.'s study.

In Lagana et al.'s study, Center for Epidemiologic Studies Depression Scale (CES-D) had been used and reported no significant relationship between depression and urinary incontinence. Hung et al. [12] in a longitudinal study with a larger sample size using COX Regression analysis, showed that urinary incontinence can predict depression in postmenopausal women. Our results are hence consistent with the results of Bradley et al. and Hung et al. The reason for discrepancy between our results and those of Lagana et al. [6] may be due to the difference in the assessment tool; we used the BDI-II tool, while they used CES-D scale which reported no overall score of depression (only in dimensions).

The result of the present study, although was consistent with the results of the Bradley et al. in terms of uni-

variate ANOVA results, but it was inconsistent in terms of multivariate ANOVA results may be due to the difference in the study population; in Bradley et al.'s study, population consisted of both postmenopausal and non-menopausal women, while in our study, they included only postmenopausal women. It also can be due to matching groups for some variables such as exercise, sexual activity, history of urinary tract infection and race which were not studied in our study. Moreover, Bradley et al. used composite international diagnostic interview – short form for major depression, while we used BDI-II. It should be noted that in Hung et al.'s study, the duration of urinary incontinence (<15 days or >15 days) was statistically significant in subjects with urinary incontinence compared to control. These variables were not studied in the present study.

In the present study, results of multivariate analysis showed that marital status had a borderline significant association with depression. Bradley et al. [19] suggested the sexual activity as a confounding variable in the relationship between depression and urinary in-

continence, while according to the present study, single women were more likely to be depressed than married. This may be attributed to the effects of loneliness caused by being single. Educational level was also significantly correlated with depression in the final logistic model where illiterate women had higher odds of depression than women with a college degree. This is consistent with the results of Brown et al. [23]. Perhaps the opportunities offered to individuals with higher level of education in society is effective in achieving this result.

According to the results of this study, depression and urinary incontinence in menopausal women are related to each other. This indicates the need for screening of postmenopausal women with urinary incontinence for depression. Based on this finding, we can try to identify women with urinary incontinence and depression for timely treatment and proper management of the factors involved and improve their quality of life.

The use of a questionnaire to determine depression level which may not reflect the whole possible level, is one of the limitations of the present study. A prospective longitudinal study of postmenopausal women with and without urinary incontinence and measuring the incidence of depression as well as a study of the relationship between depression and duration of urinary incontinence and the role of exercise activity and history of urinary tract infections are our recommendations for future studies.

Ethical Considerations

Compliance with ethical guidelines

This study obtained its ethical approval from the Research Ethics Committee of Guilan University of Medical Sciences (Code: IR.GUMS.REC.1394.339). Informed consent was obtained from the all participants.

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Authors contributions

Implementation, writing the manuscript: Mandana Mansour Ghanaie and Elaheh Abdolahi; Data collection and project management: Roghayeh Hojat Ansari and Seyed Mohammad Asgari Galebin; Data analyses: Ehsan Kazemnezhad Leili; Supervision: All authors.

Conflict of interest

The authors declare no conflict of interest

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