World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

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Association between menopause and quality of life: A cross-sectional study using data from women living in Northern Greece

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World Journal of Advanced Research and Reviews, 2025, 25(03), 1377-1388

Publication history: Received on 08 February 2025; revised on 16 March 2025; accepted on 19 March 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.25.3.0839

Abstract

Menopause represents a significant life transition for women. Given the prolongation in women's life expectancy, they will spend a large period of their lives in the postmenopausal stage. The lack of female hormones causes physical and psychological symptoms that negatively affect quality of life. Common vasomotor symptoms include hot flashes, night sweats, sleep disturbances, sexual dysfunction, and weight gain, while psychological symptoms involve anxiety, depression, and irritability. This study aimed to evaluate menopausal symptoms and their effect on women's quality of life. The study sample consisted of 100 menopausal and 101 non-menopausal women aged 45-55. An anonymous questionnaire included sociodemographic questions, the DASS-21 index, MENQOL index, Pittsburgh Sleep Quality Index, SF-12 questionnaire, HFRS index and FSFI index. Results showed menopausal women had higher anxiety, stress, and depression levels (P<0.001) and poorer sleep quality (48.4% vs. 18%, P<0.001) compared to non-menopausal women. Non-menopausal women had better physical and mental health (P<0.001) and higher sexual desire. Increased physical and sexual menopausal symptoms correlated with poorer physical health (P<0.001), while psychosocial symptoms were linked to worse mental health (P<0.001). Menopause is associated with anxiety, stress, depression, poor sleep, and sexual dysfunction, reducing quality of life. Healthcare providers must guide women and suggest treatments based on their health history and preferences. Lifestyle changes, including a healthy diet and exercise, can help alleviate symptoms and improve well-being.

Keywords: Menopause; Quality of Life; Menopausal Symptoms; Exercise; Alternative Medicines

1. Introduction

Menopause represents a significant life transition for women, marking the end of their reproductive years [1]. With an increasing life expectancy, many women will spend a substantial portion of their lives in the postmenopausal phase (about 30- 40%) [2]. While some women perceive this change positively, it is often associated with aging and negative connotations, particularly in Western cultures [1]. The menopausal transition is characterized by a decrease in ovarian function, leading to reduced estrogen levels and various physical, psychological, and social changes [3]. These changes can result in common symptoms, including hot flashes, mood swings, sleep disturbances, and increased risks for osteoporosis and cardiovascular diseases [4]. The symptoms have a direct impact on women's quality of life, which tends to decline during this period [5]. Despite the growing body of research on menopausal symptoms, there remain gaps in understanding their frequency, severity, and the overall impact on women's well-being.

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2. Material and methods

2.1. Participants, setting and procedures

This study utilized a cross-sectional design with a sample of 201 women aged 45-55, divided into two groups, the menopausal group (n=100), women who had not menstruated for at least 12 consecutive months and the premenopausal group (n=101), women with regular menstrual cycles. The purpose of this study was to evaluate the menopausal symptoms and to investigate their effect in women's quality of life. This research was conducted in Gynecological Clinics of Health Centers in Drama and Serres. Women who came for a gynecological examination were asked about their participation in the study and those who agreed to participate were included in it. The survey was conducted from June to October 2023.

2.2. Measurements

The measurement tools are a self-administered questionnaire that, in addition to socio-demographic questions, includes the following validated instruments in order to evaluate various dimensions of health, such were the Depression, Anxiety, and Stress Scale (DASS-21) which measures depression, anxiety and stress [6], the Menopause-Specific Quality of Life (MENQOL) which assesses the impact of menopausal symptoms on her quality of life [7], the Pittsburgh Sleep Quality Index (PSQI) which evaluates sleep disturbances and overall sleep quality [8], the SF-12 Health Survey therein measures physical and mental health-related to quality of life [9], the Hot Flash-Related Daily Interference Scale (HFRS) which quantifies the frequency and impact of hot flashes on quality of life [10] and lastly, the Female Sexual Function Index (FSFI) which evaluates sexual dysfunction, including desire, arousal, and satisfaction [11].

2.3. Statistical analysis

Data were analyzed using SPSS 22.0, with comparisons made between menopausal and premenopausal groups using t-tests and correlation analyses. Linear regression analysis using the stepwise method and logarithmic transformations, where necessary, were used to find independent factors related to the depression, sexual functioning and quality of life scales, from which dependence coefficients and their standard errors (SE) were obtained. To find independent factors related to the sleep quality scale, logistic regression analysis using the stepwise method was performed and Odds ratios with their 95% confidence intervals (95% CI) were obtained. Statistical significance was set at $p < 0.05$

3. Results and discussion

3.1. Participant characteristics

The study sample consisted of 201 women, of whom 100 (49.8%) were postmenopausal. Table S1 presents the demographic characteristics of the participants, both for the entire sample and separated by menopausal status. The majority of participants (95.5%) were Greek, with an average age of 50 years (SD = 2.7), 53.7% were overweight, and 55.2% were employed, with 47.7% working in the private sector. Educationally, 57.2% had completed high school, and a higher proportion of postmenopausal women had finished primary or secondary school compared to their premenopausal counterparts. Regarding marital status, 63.2% were married with children, and 53.2% reported an annual household income of €12,000-20,000, with postmenopausal women reporting higher incomes in the €5,000-12,000 range. Among women who still had menstruation, 48.5% were in the perimenopausal stage. For those who were postmenopausal, the average time since their last period was 1.9 years (SD = 0.9). Only one postmenopausal participant reported using hormone replacement therapy (table 1).

Table 1 Sociodemographic Characteristics of the Women in the Sample

		Total Sample	**Pre-Menopausal**	**Post-Menopausal**	**P P Pearson's x2 test**
		N (%)	**N (%)**	**N (%)**	
Ethnicity	Greek	192(95.5)	99(98)	93(93)	0.101+
	Other	9(4.5)	2(2)	7(7)	
If other, specify	Albanian	6(3)	2(2)	4(4)	-
	Russian	3(1.5)	0(0)	3(3)	
Age, Mean (SD)		50(2.7)	49.7(2.6)	50.3(2.9)	0.114++
BMI, Mean (SD)		26.8 (3.5)	26.6(3,5)	26.9(3.5)	0.471++
BMI Categories	Normal weight	63(31.3)	30(29.7)	33(33)	0.322
	Overweight	108(53.7)	59(58.4)	49(49)	
	Obese	30(14.9)	12(11.9)	18(18)	
Employment Status	No	90(44.8)	45(44.6)	45(45)	0.949
	Yes	111(55.2)	56(55.4)	55(55)	
If yes, occupation	Public Sector Employee	37(33.3)	18(32.1)	19(34.5)	0.792
	Self-employed	21(18.9)	12(21.4)	9(16.4)	
	Private Sector Employee	53(47.7)	26(46.4)	27(49.1)	
Educational Level	Primary School	11(5.5)	1(1)	10(10)	**0.031+**
	Middle School	38(18.9)	15(14.9)	23(23)	
	High School	115(57.2)	64(63.4)	51(51)	
	Technical Institute (TEI)	22(10.9)	12(11.9)	10(10)	
	University (AEI)	8(4)	4(4)	4(4)	
	Master's Degree	5(2.5)	3(3)	2(2)	
	Doctorate	2(1)	2(2)	0(0)	
Marital Status	Married	20(10)	13(12.9)	7(7)	0.264
	Married with children	127(63.2)	59(58.4)	68(68)	
	Divorced	16(8)	6(5.9)	10(10)	
	In a Relationship	29(14.4)	18(17.8)	11(11)	
	Single	9(4.5)	5(5)	4(4)	
Annual Household Income (in euros)	0-5.000	11(5.5)	6(5.9)	5(5)	**<0.001**
	5.000-12.000	58(28.9)	15(14.9)	43(43)	
	12.000-20.000	107(53.2)	66(65.3)	41(41)	
	>20.000	25(12.4)	14(13.9)	11(11)	

+Fisher's exact test ++Student's t-test

3.2. Levels of anxiety, depression and stress

Results showed that women who were in menopause consequently had higher levels of stress, anxiety, and depression compared to women who were not in menopause. More specifically, participants experiencing menopause had significantly higher moderate and high levels of depression, anxiety, and stress (table 2).

Table 2 Levels of Anxiety, Depression, and Stress (DASS-21) in Menopausal and Non-Menopausal Participants

		Menopausal		**Non-Menopausal**		
		Mean (SD)	**Median (Range)**	**Mean (SD)**	**Median (Range)**	**P Mann-Whitney test**
Depression Score		5.7(5.3)	4.5(1-10)	2.3(4)	0(0-3)	**<0,001**
Depression Levels, N (%)	Normal	50(50)		80(79.2)		**<0.001+**
	Mild	9(9)		9(8.9)		
	Moderate	19(19)		5(5)		
	High	15(15)		3(3)		
	Very High	7(7)		4(4)		
Anxiety Score		5.3(4.2)	4.5(2-8)	1.7(3.5)	0(0-1)	**<0.001**
Anxiety Levels, N (%)	Normal	43(43)		86(85.1)		**<0.001+**
	Mild	7(7)		4(4)		
	Moderate	18(18)		3(3)		
	High	15(15)		1(1)		
	Very High	17(17)		7(6.9)		
Stress Score		8.9(5.2)	9(5-13)	4.1(5.5)	0(0-7)	**<0.001**
Stress Levels, N (%)	Normal	41(41)		78(77.2)		**<0.001+**
	Mild	13(13)		7(6.9)		
	Moderate	19(19)		7(6.9)		
	High	18(18)		4(4)		
	Very High	9(9)		5(5)		
Total DASS-21 Score (Anxiety, Depression, Stress)		19.9(13,1)	19(9-29.5)	8.1(12.2)	0(0-12)	**<0.001**

+Pearson's x2 test

3.3. Levels of vasomotor, psychosocial, physical, and sexual symptoms

Results showed that women who were in menopause consequently had higher levels of stress, anxiety, and depression compared to women who were not in menopause. More specifically, participants experiencing menopause had significantly higher moderate and high levels of depression, anxiety, and stress.

The scores in all dimensions were significantly higher in women who were in menopause. Consequently, they experienced more vasomotor, psychosocial, physical, and sexual symptoms compared to women who were not in menopause (table 3).

Table 3 Comparison of Menopausal Symptoms Between Menopausal and Non-Menopausal Women

	Menopausal		**Non-Menopausal**		**P Mann- Whitney test**
	Mean (SD)	**Median (Range)**	**Mean (SD)**	**Median (Range)**	
Vasomotor Symptoms	5(1.7)	5(3.7-6.3)	3.3(1.5)	2.3(2.3-4)	**<0.001**
Psychosocial Symptoms	3.5(1.7)	3.3(2.2-4.8)	2.1(1.5)	1.4(1-2.9)	**<0.001**
Physical Symptoms	3,6(1,4)	3,6(2,6-4,5)	2(1,4)	1,2(1-2,7)	**<0.001**
Sexual Symptoms	4,3(2,2)	4,3(2,3-6,2)	1,8(1,8)	1(1-1)	**<0.001**

3.4. Levels of poor sleep quality

The levels of poor sleep quality were significantly higher in participants who were in menopause (table 4).

Table 4 Comparison of Sleep Quality Between Menopausal and Non-Menopausal Women

		Menopausal	**Non-Menopausal**	**P Pearson X2 test**
		N(%)	**N(%)**	
Sleep Quality	Good	49(51.6)	82(82)	**<0.001**
	Poor	46(48.4)	18(18)	

3.5. Quality of life, physical and mental health

The scores on both the physical and mental health summary scales were significantly higher in women who were not in menopause. Thus, non-menopausal participants had overall better physical and mental health (table 5).

Table 5 Comparison of Quality-of-Life Levels Between Menopausal and Non-Menopausal Women

	Menopausal	**Non-Menopausal**	**P Students t test**
	Mean (SD))	**Mean (SD)**	
Summary Physical Health Scale	46.1(9.6)	53.9(7.9)	<0.001
Summary Mental Health Scale	43.9(10.4)	51.9(9.4)	<0.001

3.6. Sweating / hot flashes

Table 6 Comparison of Dimensions of the Hot Flashes/Flushes Scale (HFRS) Between Menopausal and Non-Menopausal Women

	Menopausal		**Non-Menopausal**		**P Mann-Whitney test**
	Mean (SD)	**Median (Range)**	**Mean (SD)**	**Median (Range)**	
Frequency of Hot Flashes/Flushes per Week	32.8(35.3)	21(14-37.5)	8.7(17.9)	2(2-10)	<0.001
Management/Control	6.5(2.6)	6(5-9)	8.9(2.1)	10(9-10)	<0.001
Problems	4.5(3)	4.3(1.7-6.8)	2.3(2.4)	1(1-2.7)	<0.001

Menopausal women experienced more frequent hot flashes and had more associated problems. The scores in the dimensions "Frequency of hot flashes/ sweating per week" and "Problems" were significantly higher in women who were in menopause. Consequently, menopausal participants experienced more hot flashes/ sweating weekly and faced more problems related to them. In contrast, higher scores in the "Control/ Management" dimension were observed in

participants who were not in menopause, meaning they managed and controlled potential hot flashes/ sweating more effectively. (table 6)

3.7. Spearman's correlation coefficients of anxiety/ depression/ stress scales, quality of life, and sexual functioning in menopausal women in relation to the menopausal symptoms scale.

In the correlation between sweating/ hot flashes and menopausal symptoms in menopausal women with quality of life, sleep quality, sexual functioning, and symptoms of anxiety, depression, and stress, the study found that more psychosocial, sexual, physical, and vasomotor symptoms were associated with higher levels of depression, anxiety, and stress. Just as the frequency of hot flashes/ sweating increased per week, participants' levels of anxiety and depression also rose. Additionally, higher levels of stress and depression were associated with greater problems related to these hot flashes/ sweating. Conversely, participants who managed and controlled these symptoms more effectively experienced fewer symptoms of depression. The more frequently participants experienced hot flashes/ sweating on a weekly basis, the worse their mental health was (table 7).

Table 7 Spearman Correlation Coefficients of Anxiety/Depression/Stress Scales, Quality of Life, and Sexual Functionality in Menopausal Women in Relation to the Menopausal Symptoms Scale

			Menopausal Symptoms Scale (MENQOL)			
			Vasomotor	**Psychosocial**	**Psychosocial**	**Sexual**
Anxiety, Depression, Stress Scale (DASS-21)	Depression Score	r	0.27	0.73	0.34	0.34
		P	0.007	<0.001	0.001	<0.001
	Anxiety Score	r	0.20	0.67	0.44	0.39
		P	0.050	<0.001	<0.001	<0.001
	Stress Score	r	0.24	0.82	0.52	0.35
		P	0.016	<0.001	<0.001	<0.001
	Total DASS-21 Score	r	0.25	0.83	0.48	0.41
		P	0.011	<0.001	<0.001	<0.001
Quality of Life (SF-12)	Physical Health Summary Scale	r	-0.29	-0.36	-0.62	-0.23
		P	0.004	<0.001	<0.001	0.023
	Mental Health Summary Scale	r	-0.32	-0.69	-0.34	-0.28
		P	0.001	<0.001	0.001	0.005
Female Sexual Function Index (FSFI)	Sexual Desire	r	-0.40	-0.21	-0.39	-0.72
		P	<0.001	0.036	<0.001	<0.001
	Arousal	r	-0.46	-0.26	-0.42	-0.71
		P	<0.001	0.009	<0.001	<0.001
	Lubrication	r	-0.40	-0.26	-0.40	-0.74
		P	<0.001	0.010	<0.001	<0.001
	Orgasm	r	-0.42	-0.26	-0.41	-0.71
		P	<0.001	0.008	<0.001	<0.001
	Satisfaction	r	-0.43	-0.29	-0.43	-0.72
		P	<0.001	0.004	<0.001	<0.001
	Pain	r	-0.26	-0.39	-0.33	-0.40
		P	0.009	<0.001	0.001	<0.001

	Total FSFI Score	r	-0.43	-0.28	-0.43	-0.74
		P	<0.001	0.005	<0.001	<0.001

3.8. Spearman's correlation coefficients of anxiety/ depression/ stress scales and quality of life in menopausal women in relation to the sweating/ hot flashes scale.

Additionally, the more problems they had related to potential hot flashes/ sweating and the less they controlled/ managed them, the worse both their physical and mental health were overall (table 8).

Table 8 Spearman Correlation Coefficients of Anxiety/Depression/Stress Scales and Quality of Life in Menopausal Women in Relation to the Menopausal Symptoms Scale

			Hot Flush Rating Scale (HFRS)		
			Frequency of Hot Flushes/Sweating per Week	**Control/ Management**	**Problems**
Anxiety, Depression, and Stress Scale (DASS-21)	Depression Score	r	0.23	-0.26	0.28
		P	0.019	0.008	0.005
	Anxiety Score	r	0.21	-0.18	0.17
		P	0.041	0.074	0.100
	Stress Score	r	0.16	-0.16	0.22
		P	0.117	0.109	0.027
	Total DASS-21 Score	r	0.21	-0.22	0.24
		P	0.038	0.031	0.016
Quality of Life (SF-12)	Physical Health Summary Score	r	-0.10	0.20	-0.24
		P	0.308	0.042	0.016
	Mental Health Summary Score	r	-0.25	0.33	-0.34
		P	0.013	0.001	0.001

3.9. Sleep Quality of Menopausal Women in Relation to the Hot Flushes/Sweating Scale.

Poor sleep quality was found to be associated with more vasomotor, psychosocial, physical, and sexual menopausal symptoms. Furthermore, women with poor sleep quality experienced hot flashes/ sweating more frequently and faced more problems related to their occurrence. (table 9).

Table 9 Sleep Quality of Menopausal Women in Relation to the Hot Flushes/Sweating Scale

		Sleep Quality				**P Mann-Whitney test**
		Good		**Poor**		
		Mean (SD))	**Median (range)**	**Mean (SD)**	**Median (range))**	
Menopausal Symptom Scale (MENQOL)	Vasomotor	4.3(1.5)	4(3-5)	5.7(1.6)	5.8(4.7-7)	<0.001
	Psychosocial	2.9(1.4)	2.7(1.9-3.7)	4.3(1.7)	4.1(3.1-5.3)	<0.001
	Somatic	2.9(1.1)	2.9(1.9-3.7)	4.4(1.3)	4.3(3.5-5.3)	<0.001
	Sexual	3.2(1.9)	3(1.7-4.3)	5.5(2)	6(4-7)	<0.001

Hot Flushes/Sweating Scale (HFRS)	Frequency of hot flushes/sweating per week	21.9(12)	14(14-28)	45.4(47.4)	28(14-56)	0.001
	Control/Management	7(2.6)	7.5(5-10)	6(2.3)	5(4.5-8)	0.053
	Problems	3.5(2.5)	2.7(1-5)	5.8(2.9)	5.8(3.7-8.7)	<0.001

3.10. Mental health scores.

This regression model examines the relationship between mental health-related quality of life and factors such as depression, psychosocial symptoms, and marital status in menopausal women. Menopausal women with depressive and psychosocial symptoms tend to have significantly lower mental health scores. Additionally, married women report poorer mental health compared to unmarried women. (table 10).

Table 10 Multivariate logistic regression on the mental health dimension of quality of life as the dependent variable and independent variables including sociodemographic characteristics, hot flashes/ sweating, and menopausal symptoms (table 10)

χ		**Regression coefficient**	**Standard error of the coefficient**	**P-value**
Depression		-0.59	0.20	0.004
Psychosocial symptoms		-2.82	0.63	<0.001
Marital status	No (Reference)) Yes	-3.90	1.68	0.022

4. Discussion

The aim of this population-based study of middle-aged women was to assess the menopausal symptoms and investigate their impact on the quality of life of postmenopausal women living in Northern Greece. Many women, during the transition to menopause, will report minimal symptoms. Some will suffer significantly, and many will face issues that neither they nor healthcare professionals will associate with menopause [1]. Typical symptoms during menopause, which last 4-5 years, include hot flashes, night sweats, vaginal dryness, and sleep disturbances. Additionally, women report a variety of other symptoms such as sexual dysfunction, depression, anxiety, memory loss, fatigue, joint pain, and weight gain, which may be related to aging or menopause [12], specifically, according to our study, participants experiencing menopause had higher moderate and high levels of depression, anxiety, and stress. Symptoms such as depression, concentration difficulties, and poor mood are believed to be associated with menopause, while vasomotor symptoms are the only symptoms that are clearly and directly linked to menopause [13]. Based on our study, women who were in menopause experienced more vasomotor, psychosocial, physical, and sexual symptoms compared to women who were not in menopause. In a study by Gold et al. [14], it was found that psychosocial factors such as anxiety and depression are more strongly associated with vasomotor symptoms. In the SWAN study [15], depressive symptoms and anxiety, when occurring with vasomotor symptoms, were linked to a longer duration of these symptoms, relative to our study. Anxiety and general sensitivity to menopausal symptoms were also found to be related to a longer duration of vasomotor disturbances [16]. In the present study, vasomotor symptoms were found to be associated with levels of anxiety, depression, and mental health in women. Overall, data from cross-sectional studies suggest that depressive symptoms may occur in a significant percentage of women during menopause compared to approximately 30% during the premenopausal years [17]. A recent study [18] conducted in Qatar highlighted the importance of examining psychosocial factors, lifestyle, and management of chronic diseases to guide the health of women during menopause, to improve their quality of life and reduce the risk of depression and anxiety. The data from this study indicate a strong correlation between high rates of depression, anxiety, and stress in menopause and postmenopause. The results observed that the more menopausal symptoms women had, the higher their levels of anxiety, stress, and depression.

As indicated in our study, the levels of poor sleep quality were significantly higher in participants who were in menopause, though data does not support the hypothesis that menopause has a specific contribution to causing sleep

problems [19]. A retrospective cohort study was conducted, which no significant differences in sleep quality was found in any among the three reproductive stages of women's life [20].

In a study by Wang et al. [21], it was found that family income was negatively related to depressive symptoms. Similar results were observed by Li et al. [22], who found that lower income was a risk factor related to depressive symptoms. In the present study, women with an annual family income above €20,000 had lower anxiety levels compared to those with an income of up to €12,000. Sexual health and activity are essential components of care for menopausal women.

Researchers have found that the transition to menopause is associated with increased sleep disturbances, but the effects on sleep are contradictory [23]. Vasomotor symptoms are strongly associated with sleep disturbances and often lead to wakefulness during the night. Women with hot flashes have worse sleep quality compared to women without hot flashes [25]. Similar results were observed in our study. In the study by Yazdi et al. [25], the negative impact of sleep disturbances, particularly insomnia and daytime sleepiness, on quality of life was demonstrated. According to the results of this study, insomnia and daytime sleepiness can lead to physical pain, fewer social interactions, and psychosocial and sexual issues. The transition to menopause, regardless of the presence of characteristic symptoms, is related to poor quality of life. Additionally, married women report poorer mental health compared to unmarried women, possibly due to relationship stress during menopause. In a previous study, no differences were found due to menopausal stage [26], when levels of stress and menopausal symptomatology were examined, with women who were dissatisfied with their marriages than women in satisfying marriages. Therefore, healthcare professionals must be aware of this impact in order to provide appropriate counseling for improving quality of life [27]. Providing counseling to women by healthcare professionals should be done individually, taking into account their symptoms, health history, preferences, and consideration of therapeutic options to reduce symptoms related to menopause and early postmenopause for improving quality of life [5]. Exercise intervention programs have been shown to reduce menopausal symptoms, including physical, psychological, and to a lesser extent, vasomotor and sexual symptoms. Overall, the evidence suggests that exercise is a useful intervention strategy during and after menopause to alleviate symptoms. In relation to our study, menopausal women with depressive and psychosocial symptoms tend to have significantly lower mental health scores. Elavsky and McAuley [28] found significant differences in women's reports of symptoms during menopause based on their physical activity status. Women who engaged in physical activity reported lower severity and frequency of symptoms compared to those who did not exercise. These results are consistent with the findings of a large study conducted in Finland [12], where women who exercised had fewer menopausal symptoms compared to those who did not. Additionally, in a study by Col et al. [29], more physical activity was associated with a shorter duration of menopausal symptoms. Similar findings were observed in the present study, as women who exercised and having lower BMI, indicated better physical health, compared to those who did not exercise. Exercise has not been proven to cure menopausal symptoms, but women who exercise tend to be less stressed and have better overall quality of life, as mentioned in our study. Exercise as an intervention has also been shown to have a positive effect on menopausal symptoms, depression, and quality of life. More importantly than women participating in physical activity programs is motivating them to adopt regular exercise throughout their lives. It is challenging for some women during menopause to incorporate exercise into their daily routine due to the presence of certain symptoms. For exercise to offer long-term health benefits, it must be tailored to women's needs, preferences, and limitations, particularly concerning the musculoskeletal system and cardiovascular function [30]. Lifestyle changes, including a healthy diet and avoiding foods that trigger hot flashes, can help reduce hot flashes [31]. As science progresses and women have a longer life expectancy, it is crucial to provide counseling to encourage behaviors that will help women live healthier and happier lives [1]. As aforementioned, addressing these factors, counseling and future research will help support women as they journey through their midlife years. Distraction and social interaction are some of the psychological benefits associated with participation in exercise [32]. Psychological and social interventions could be beneficial in improving mental and physical well-being during this life stage. As analyzed [33], clinicians need to provide a tailored management approach for these women, in order to improve health or change behavior. It is not appropriate to deem this type of depression as minor or presume that, once the hormonal fluctuations settle, the depression, sexual dysfunction, anxiety and quality of life will improve. The process of menopause can take many years, during which the patient's quality of life and that of her family, may deteriorate irremediably, which can unfortunately lead to suicide in middle-aged women, as it becomes a more common phenomenon [34].

4.1. Limitations of the study

This study has some limitations. The sample size in this study was relatively small, which limits the ability to draw broader conclusions and generalize the results to the wider population from which the sample was derived. Additionally, the majority of participants were Greek women. Women of other nationalities or minority groups, such as Roma women, were not included in the study due to language barriers, as they did not understand the language used in the study. The nonclinical sample provided information on mental health problems, which were often undiagnosed.

However, menopausal stage was based on self-report, which were not validated by hormone levels. Self-report might have led underreported perimenopausal stages. Therefore, the generalizability of our findings should be cautiously considered.

5. Conclusion

This study highlights the significant impact of menopause on women's quality of life, emphasizing the need for targeted interventions. Menopausal women experience higher levels of anxiety, depression, stress, and poor sleep quality, which negatively affect their overall well-being. Given the increasing life expectancy, it is essential for healthcare professionals to provide personalized support, counseling, and lifestyle recommendations to help women manage menopausal symptoms effectively. Future research should focus on developing comprehensive strategies to improve the physical and mental health of women during this life stage.

Compliance with ethical standards

Acknowledgments

The author did not receive specific funding or assistance from third parties for the completion of this study.

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The conduct of the research was permitted by the 4th Ministry of Education and Culture of Macedonia & Thrace (DADAX 1937/22-6-2023), which includes the aforementioned Health Centers, and after the approval of the Ethics Committee of the PADA (50262/ 7-13-2023).

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Minkin MJ. Menopause: hormones, lifestyle and optimizing aging. Obstet Gynecol Clin North Am. 2019;46(3):501-14. doi:10.1016/j.ogc.2019.04.008.

[2] Takahashi TA, Johnson KM. Menopause. Med Clin North Am. 2015;99(3):521-34.

[3] Makara-Studzinska MT, Krys-Noszczyk KM, Jakiel G. Epidemiology of the symptoms of menopause—an intercontinental review. Menopause Rev. 2014;3:203-11. doi:10.5114/pm.2014.43827.

[4] Smail L, Jassim G, Shakil A. Menopause-specific quality of life among Emirati women. Int J Environ Res Public Health. 2020;17(1):40. doi:10.3390/ijerph17010040.

[5] Greenblum CA, Rowe MA, Neff DF, Greenblum JS. Midlife women: symptoms associated with menopausal transition and early postmenopause and quality of life. Menopause. 2013;20(1):22-7. doi:10.1097/gme.0b013e31825a2a91.

[6] Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd ed. Sydney: Psychology Foundation; 1995.

[7] Lewis JE, Hilditch JR, Wong CJ. Further psychometric property development of the Menopause-Specific Quality of Life questionnaire and development of a modified version, MENQOL-Intervention questionnaire. Maturitas. 2005;50:209-221.

[8] Buysse DJ, Reynolds CF III, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research. J Psychiatr Res. 1989;28(2):193-213.

[9] Ware JE, Kosinski M, Keller SD. A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. Med Care. 1996;34:220-233.

[10] Hunter MS, Liao KL. A psychological analysis of menopausal hot flushes. Br J Clin Psychol. 1995;34(4):589-99.

[11] Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsign 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;26:191-208.

[12] Moilanen J, Aalto AM, Hemminki E, Aro AR, Raitanen J, Luoto R. Prevalence of menopause symptoms and their association with lifestyle among Finnish middle-aged women. Maturitas. 2010;67(4):368-374.

[13] Avis NE, Crawford SL, Green R. Vasomotor Symptoms Across the Menopause Transition: Differences among women. Obstet Gynecol Clin North Am. 2018;45(4):629-540. doi:10.1016/j.org.2018.07.005

[14] Gold EB, Colvin A, Avis N, Bromberger J, Greendale GA, Powell L, et al. Longitudinal Analysis of the Association Between Vasomotor Symptoms and Race/Ethnicity Across the Menopausal Transition: Study of Women's Health Across the Nation. Am J Public Health. 2006;96(7):1226-1235.

[15] Avis NE, Colvin A, Bromberger JT, Hess R, Matthews KA, Ory M, Schocken M. Change in health-related quality of life over the menopausal transition in a multiethnic cohort of middle-aged women: Study of Women's Health Across the Nation (SWAN). Menopause. 2009;16(5):860-869.

[16] Avis NE, Crawford SL, Greendale G, Bromberger JT, Everson-Rose SA, Gold EB, Hess R, Joffe H, Kravitz HM, Tepper PG, Thurston RC. Duration of Menopausal Vasomotor Symptoms Over the Menopause Transition. JAMA Intern Med. 2015;175(4):531-539.

[17] Soares CN. Depression and Menopause. Current Knowledge and Clinical Recommendations for a Critical Window. Psychiatr Clin North Am. 2017;40(2):239-254. doi:10.1016/j.psc.2017.01.007

[18] Bener A, Saleh NM, Bakir A, Bhugra D. Depression, Anxiety and Stress Symptoms in Menopausal Arab Women: Shedding More Light on a Complex Relationship. Ann Med Health Sci Res. 2016;6(4):224-31

[19] Tao MF, Sun DM, Shao HF, Li CB, Teng YC. Poor sleep in middle-aged women is not associated with menopause per se. Braz J Med Biol Res. 2016 Jan;49(1):e4718. doi: 10.1590/1414-431X20154718. Epub 2016 Nov 17.

[20] Maxwell RA, Reisinger-Kindle KM, Rackett TM, Yaklic JL, Czerwinski SA, Lee M. Perceived quality of sleep across the menopausal transition:A retrospective cohort study. Health Sci Rep. 2023 Jun 4;6(6):e1250. doi: 10.1002/hsr2.1250. eCollection 2023 Jun.

[21] Wang HL, Booth-LaForce C, Tang SM, Wu WR, Chen CH. Depressive symptoms in Taiwanese women during the peri- and post-menopause years: Association with demographic, health, and psychosocial characteristics. Maturitas. 2013;75(4):355-360.

[22] Li Y, Yu Q, Ma L, Sun Z, Yang X. Prevalence of depression and anxiety symptoms and their influence factors during menopausal transition and postmenopause in Beijing city. Maturitas. 2008;61:238-242.

[23] Lampio L, Polo-Kantola P, Himanen SL, Kurki S, Huupponen E, Engblom J, Heinonen OJ, Polo O, Saaresranta T. Sleep During Menopausal Transition: A 6-Year Follow-Up. Sleep. 2017;40(7). doi:10.1093/sleep/zsx090

[24] Moe K. Reproductive Hormones, Aging, and Sleep. Semin Reprod Med. 1999;17(4):339-348.

[25] Yazdi Z, Sadeghniiat-Haghighi K, Ziaee A, Elmizadeh K, Ziaeeha M. Influence of sleep disturbances on quality of life of Iranian menopausal women. Psychiatry J. 2013;1-5.

[26] Fielder KV, Robinson Kurpius SE. Marriage, stress and menopause: midlife challenges and joys. Medicine, Psychology, Sociology; 2006. Corpus ID: 41589617.

[27] Hess R, Thurston RC, Hays RD, Chang CC, Dillon SN, Ness RB, Bryce CL, Kapoor WN, Matthews KA. The impact of menopause on health-related quality of life: results from the STRIDE longitudinal study. Qual Life Res. 2012;21(3):535-544. doi:10.1007/s11136-011-9959-7

[28] Elavsky S, McAuley E. Physical activity, symptoms, esteem, and life satisfaction during menopause. Maturitas. 2005;52(3-4):374-85.

[29] Col NF, Cuthrie JR, Politi M, Dennerstein L. Duration of vasomotor symptoms in middle-aged women: a longitudinal study. Menopause. 2009;16(3):453-457.

[30] Agil A, Abik F, Daskapan A, Alaca R, Tuzun H. Short-Term Exercise Approaches on Menopausal Symptoms, Psychological Health, and Quality of Life in Postmenopausal Women. Obstet Gynecol Int. 2010;1-7

[31] Abedel-AzimMohamed HA, MansourLamadah S. Improving women's practices for reducing the severity of menopausal symptoms. J Nurs Educ Pract. 2016;6(4):72-83. doi:10.5430/jnep.v6n4p72

[32] Stojanovska L, Apostolopoulos V, Polman R, Borkoles E. To exercise, or, not to exercise, during menopause and beyond. Maturitas. 2014;77(4):318-323. DOI:10.1016/j.maturitas.2014.01.006

[33] Kulkarni J. Perimenopausal depression-an under-recognised entity. Aust Prescr. 2018 Dec;41(6):183-185. doi: 10.18773/austprescr.2018.060. Epub 2018 Dec 3.

[34] Nakanishi M, Endo K, Yamasaki S, Stanyon D, Sullivan S, Yamaguchi S, Ando S, Hiraiwa-Hasegawa M, Kasai K, Nishida A, Miyashita M. Association between menopause and suicidal ideation in mothers of adolescents: A longitudinal study using data from a population-based cohort. J Affect Disord. 2023 Nov;1(340):529-534. doi: 10.1016/j.jad.2023.08.055. Epub 2023 Aug 16.

Author's short biography

Aikaterini E. Sousamli Born in January 1978 in the USA and repatriated in the year 1990 to the city of Mytilene where I graduated from Secondary Education with a grade of "Twenty" (20/20). Then, in the year 2000, I graduated from the Athens University of Midwifery with a grade of "7.26", continuing the tradition of my family circle in midwifery. After a few years of working in the private sector, I was hired as a "Midwife" at I.K.A. where I still work today. Since 2007 I am married and now a mother of three children. As a permanent resident of the city of Larissa, I was given the opportunity and in 2021, I graduated from the Msc "Primary Health Care", of the Department of Medicine, University of Thessaly as first honors with a grade of "9.65". From March 2023, I am a PhD candidate at the University of Western Attica, Department of Midwifery, with supervising professor Dr. Sarandaki Antigoni, on the topic "Study of perinatal factors related to the appearance of ASD in the child and the dynamics of his family". Reviewer for the scientific journal, Journal of Gynecology and Obstetrics

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