Original Research Article

A study on the symptoms, sleep quality and cognitive function of the women during menopause

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ABSTRACT

Background: Menopause is the time that marks the end of your menstrual cycle. It is a natural biological process. But the physical symptoms, such as hot flashes, and emotional symptoms of menopause may disrupt your sleep, lower your energy or affect emotional health. The primary objective of the study was to evaluate the pattern of symptoms among women during menopause. The secondary objective was to assess the sleep quality and cognitive function of the women during menopause and to create awareness and educate rural women regarding menopause.
Methods: A cross-sectional observational study was carried out in and around B. G. Nagar, Nagamangala, Mandya for 6 months.
Results: A total of 504 women were enrolled in the study. Out of 504, 224 (44.4%) participants come under perimenopause, 117 (23.31%) participants come under perimenopause and 163 (33.34%) participants comes under post menopause. After filling out the questionnaire it was observed that there was a decline in cognitive function of postmenopausal women along with poor sleep quality. When the age group of the participants was compared with the different symptoms of menopause a significant relation was found between the age category of the participants and the somatic symptoms. A significant relation was found between the sexual activity and with the somatic symptoms (p=0.00**), psychological symptoms (p=0.00**) and urogenital symptoms (p=0.00**) of the participants.
Conclusions: As women passes from premenopausal to perimenopause to post menopause menopausal symptoms were increased. The menopausal transition and postmenopausal years are associated with significant symptoms.

Keywords: DSB, Menopause, MRS, PSQI, SDMT

INTRODUCTION

The continuum of an individual's life can be divided into several life stages, each characterized by certain features. Accompanied by considerable hormonal changes, the life stages of women are generally divided into infancy, puberty, reproductive age, climacteric period, menopause and elderly years, in addition to pregnancy and delivery that are generally included as the life events unique to women.[1]

Climacteric period is an important transition period in a woman's life, consisting of pre-menopause, menopause and post-menopause.[1] Here, the 5 years before and after menopause is defined as the climacteric period, the period of life starting from the decline in ovarian activity until after the end of ovarian function. Climacteric period is considered to be a natural change of life which may be accompanied by various health consequences i.e., menopausal symptoms, osteoporosis, coronary heart disease. The key concept is that women enter menopause with different menopausal status for instances, natural menopause, surgical menopause, early menopause or even premature ovarian failure. Women may experience various health consequences due to the difference in genetic and environmental interaction.[2]

The common climacteric symptoms experienced by them can be grouped into: vasomotor, physical, psychological or sexual complaint.[3]

Menopause is a point in time 12 months after a woman's last period, it's the time that marks the end of your menstrual cycles. It usually begins between the ages of 40 and 60, but can develop before or after this age range. Most women first begin developing menopause symptoms about 4 years before their last period. Symptoms often continue until about four years after a woman's last period.[2]

Menopausal status was defined according to STRAW (stages of reproductive aging workshop) classification. STRAW categorises and defines menopausal women as follows: premenopause, perimenopause, postmenopause.[2]

During premenopause, menstrual periods become irregular. Usually, the periods may be late, or may completely skip one or more periods. Menstrual flow may also become heavier or lighter. During perimenopause, menstruation may have occurred in the previous/last 2-12 months but not in the previous/last 2 months. Perimenopause has increasing irregularity of menses without skipping periods.[3]

During postmenopause, no menstrual bleeding in the previous/last 12 months.[3]

The aim of the study was to evaluate the pattern of symptoms among women during menopause. The secondary objective was to assess the sleep quality and cognitive function of the women during menopause and to create awareness and educate rural women regarding menopause.

This project may provide the information about menopausal changes in women. Though it is a natural and usual stage of life; still it can't be left as usual life stage because at these stage women suffers both physically and mentally hence we need to educate her, provide necessary information to manage it.

METHODS

An observational cross-sectional study was conducted in and around B. G. Nagara, over a period of 6 months (December 2022- June 2023). A total of 504 women were enrolled in the study.

The women were included who were under age group of 40-65 years and who are not used contraceptives in the last 3 months and the women are excluded who were aged below 40 years, pregnant and lactating women, who underwent hysterectomy, and who had history of drug or alcohol abuse and who fail to recall their menopausal status.

The questionnaires used are listed as follows:

Questionnaire 1: menopause rating scale (MRS)

MRS is a self-administered questionnaire and is widely tested and accepted internationally. The MRS score was generated by summing the score for each of the 11 symptoms. Scoring for each symptom was given as follows: none =0, mild =1, moderate =2, severe =3, very severe =4.

The MRS is composed of 11 items and was divided into three subscales: (a) somatic problems (b) psychological problems and (c) urogenital problems.

Questionnaire 2: the Pittsburgh sleep quality index (PSQI)

PSQI is a self-administered questionnaire that assesses the quality of sleep over a one-month period. The PSQI assesses seven components of sleep. The PSQI components are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficacy, sleep disturbance, use of sleep medication, and day time dysfunction. All components are scored on 0-3 scale. A global PSQI score (in the range 0-21) is obtained from the sum of seven components. For this study global PSQI score ≤ 5 was classified as "good sleep quality" and a global PSQI score >5 was classified as "poor sleep quality".

Questionnaire 3: symbol digit modalities test (SDMT)

The SDMT served as a measure of processing speed. The participant viewed a piece of paper with a key showing the numbers '1' to '9', each paired with a symbol. Below the key were rows of symbols and above each symbol was an empty box in which the participant was instructed to write in the particular number that was paired with the symbol. The outcome was the number of boxes correctly filled in during a 90-second time limit, with a maximum score of 110. A score obtained below 70 was categorized as poor cognitive functioning (fail) and that above 70 was categorized as normal (pass).

Questionnaire 4: digit span backward (DSB)

Working memory was assessed by digit span backward (DSB). Every item on digit span consists of two trials, each of which is scored 1 or 0 points. The pacing of the item stimuli is critical on digit span, as variations in how quickly or slowly they are provided can greatly impact item difficulty. there were 10 sets of questions for which each question carried 1 point for which a score obtained below 5 were categorized as poor cognitive functioning (fail), and one above 5 was categorized as normal (pass).

Statistical analysis

Data were entered into a Microsoft Excel spreadsheet and cross-checked for its accuracy. Data were analyzed using SPSS version 26 for analysis. Descriptive statistics were used to summarize quantitative data and were represented

by frequency, percentage, mean and standard deviation. The chi-square test was used to test the relationships between categorical variables. A p value of less than 0.05 was considered statistically significant.

RESULTS

Demographic details

Age distribution of the participants

Out of 504 participants, 146 (28.90%) fall under the age group of 40-44, 115 (22.81%) fall under the age group of 45-49, 100 (19.84%) fall under the age group of 50-54, 65 (12.89%) fall under the age group of 55-59 and 78 (15.47%) fall under the age group of 60-64.

Distribution of participants based on medical history

Among 504 participants, 315 (62.50%) participants did not have any medical history, 94 (18.65%) participants had a history of hypertension, 44 (8.73%) participants had a history of diabetes, 31 (6.15%) participants had a

history of thyroid and 20 (3.96%) participants had a history of both hypertension and diabetes.

Distribution of participants based on medication history

Among 504 participants, 321 (63.69%) participants did not have any medication history, 95 (18.8%) participants were using anti-hypertensive drugs, 37 (7.34%) participants were using anti diabetic drugs, 19 (3.76%) participants were using thyroid medication and 32 (6.34%) participants were using both anti-hypertensive and anti-diabetic drugs.

Distribution of participants based on menopausal status

Among 504 participants, 224 (44.44%) participants were premenopause, 117 (23.21%) participants were perimenopause and 163 (32.34%) were postmenopause.

Menopause rating scale (MRS)

Table 1 shows the assessment of menopausal symptoms using menopause rating scale.

Table 1: Assessment of menopausal symptoms using menopause rating scale.

Symptoms	Severity	Premenopause		Perimeopause		Postmenopause	
		n	%	n	%	n	%
Somatic	Hot flushes						
	None	74	33.03	45	38.7	57	34.7
	Mild	110	49.1	43	36.7	70	42.9
	Moderate	37	16.5	27	23.0	28	17.1
	Severe	3	1.33	2	1.7	2	1.2
	Very severe	0	0	0	0	6	3.6
	Heart discomfort						
	None	71	31.6	37	31.6	63	38.6
	Mild	128	57.1	54	46.1	68	41.7
	Moderate	22	9.8	26	22.2	29	17.7
	Severe	3	1.33	0	0	3	1.8
	Very severe	0	0	0	0	0	0
	Sleep problems						
	None	121	54	51	43.5	84	51.5
	Mild	84	37.5	41	35.0	47	28.8
	Moderate	12	5.3	22	18.8	27	16.5
	Severe	7	3.1	3	2.5	4	2.4
	Very severe	0	0	0	0	1	0.6
	Joint and muscular discomfort						
	None	140	62.5	55	47	61	37.4
	Mild	59	26.3	49	41.8	56	34.3
	Moderate	9	4.0	12	10.2	24	14.7
	Severe	4	1.7	0	0	8	4.9
	Very severe	12	5.3	1	0.85	14	8.5
Psychological	Depressive mood						
	None	83	37.0	54	46.1	91	55.8
	Mild	118	52.6	55	47	58	35.5
	Moderate	20	8.9	6	5.1	12	7.3
	Severe	3	1.3	0	0	1	0.6
	Very severe	0	0	2	1.7	1	0.6
	Irritability						
	None	129	57.5	68	58.1	80	49
	Mild	81	36.1	31	26.4	57	34.9
	Moderate	10	4.4	11	9.4	20	12.2
	Severe	4	1.7	7	5.9	5	3

Continued.

Symptoms		Severity	Premenopause		Perimeopause		Postmenopause	
			n	%	n	%	n	%
Urogenital problems	Anxiety	Very severe	0	0	0	0	1	0.6
		None	140	62.5	69	58.9	97	59.5
		Mild	74	33	32	27.3	46	28.2
		Moderate	8	3.5	16	13.6	16	9.8
		Severe	2	0.89	0	0	2	1.2
		Very severe	0	0	0	0	2	1.2
	Physical and mental exhaustion	None	42	18.75	82	70	89	54.6
		Mild	5	2.2	29	24.7	63	38.6
		Moderate	9	4.0	6	5.1	8	4.9
		Severe	4	1.7	0	0	2	1.2
		Very severe	0	0	0	0	1	0.6
	Sexual problem	None	167	74.5	86	73.5	107	65.6
		Mild	48	21.4	27	23	47	28.8
		Moderate	3	1.3	3	2.5	7	4.2
		Severe	6	2.6	0	0	2	1.2
		Very severe	0	0	1	0.85	0	0
	Bladder problems	None	181	80.8	78	66.6	95	58.2
		Mild	37	16.5	31	26.4	47	28.8
		Moderate	6	2.6	5	4.2	19	11.6
		Severe	0	0	2	1.7	2	1.2
		Very severe	0	0	1	0.85	0	0
	Dryness of vagina	None	188	83.9	84	71.7	120	73.6
		Mild	34	15.1	27	23.0	30	18.4
		Moderate	2	0.89	5	4.2	11	6.7
		Severe	0	0	1	0.85	2	1.2
		Very severe	0	0	0	0	0	0

Table 2: Mean scores of menopause rating scale.

Menopausal status	Symptoms	Mean±SD
Premenopause	Somatic	1.48±1
	Psychological	1.3±1
	Urogenital	0.5±0.6
Perimenopause	Somatic	3±1.1
	Psychological	2.6±1.1
	Urogenital	1.6±1
Postmenopause	Somatic	4.8±1.3
	Psychological	4.4±1.2
	Urogenital	3.9±1.4

Assessment of sleep quality using Pittsburgh sleep quality index (PSQI)

Table 3: Assessment of sleep quality using PSQI.

Menopausal status	PSQI global score	N	%
Premenopause	>5 (poor sleep)	26	11.6
	<5 (good sleep)	198	88.3
Perimenopause	>5 (poor sleep)	53	45.2
	<5 (good sleep)	64	54.7
Postmenopause	>5 (poor sleep)	99	60.7
	<5 (good sleep)	64	39.2

Mean score of menopause rating scale is shown in Table 2.

Mean scores of comparison of PSQI among premenopause, perimenopause and postmenopause is shown in Table 4.

Table 4: Comparison of PSQI among premenopause, perimenopause and postmenopause.

Category	Pre menopause (n=224)	Peri menopause (n=117)	Post menopause (n= 163)
Sleep quality	0.90±0.67	1.21±0.76	1.25±0.72
Sleep latency	0.71±0.77	1.07±0.92	1.23±0.98
Sleep duration	0.91±0.88	1.12±1.00	1.12±0.98
Sleep efficiency	0.27±0.64	0.50±0.93	0.40±0.81
Sleep disturbance	0.81±0.51	1.04±0.60	1.04±0.63
Sleep medication	0.12±0.44	1.04±0.60	0.33±0.73
Daytime sleep dysfunction	0.20±0.721	1.22±0.77	1.21±0.68

Assessment of cognitive impairment

Assessment of cognitive impairement using symbol modalities test (SDMT) is shown in Table 5.

Table 5: Assessment of cognitive impairment using symbol modalities test (SDMT).

Parameters	Pass/fail	Frequency	Percentage
Premenopause	Pass	208	92.80
	Fail	16	7.10
Perimenopause	Pass	104	88.80
	Fail	13	11.11
Postmenopause	Pass	79	48.46
	Fail	84	51.50

Assessment of cognitive impairment using digit span backward (DSB) is shown in Table 6.

Table 6: Assessment of cognitive impairment using digit span backward (DSB).

Parameters	Pass/fail	Frequency	Percentage
Premenopause	Pass	106	47.30
	Fail	118	54.30
Perimenopause	Pass	54	46.10
	Fail	63	53.80
Postmenopause	Pass	54	33.10
	Fail	109	66.80

Chi square test

Menopausal status of the participants with symptoms of menopause

When the menopausal status of the participants was compared with the different symptoms of menopause, a significant relation was found between the menopausal status and with the psychological symptoms (p=0.005**) and urogenital symptoms (0.008**) of the participants.

Comparison of demographic details, personal history and gynecological history with quality of sleep using PSQI

When the different parameters of the subject were compared, a significant relation was found with their age (p=0.00**), parity (p=0.00**), marital status (p=0.00*), employment status (p=0.00**), occupational status (p=0.00*), marital status (p=0.00**), smoking status (p=0.00**), sexual activity (p=0.00**) of the participants.

Comparison of demographic details, personal history and gynecological history with the cognitive impairment using symbol digit modality test (SDMT)

When the different parameters of the subject were compared, a significant relation was found with their age (p=0.01*), annual income (p=0.00*), BMI (p=0.00*), marital status (p=0.00**), occupation (p=0.00**), physical activity (p=0.00**), diet (p=0.00**) and sexual activity (p=0.00**) of the participants.

Comparison of demographic details, personal history and gynecological history with the cognitive impairment using digit span backword (DSB)

When the different parameters of the subject were compared, a significant relation was found with their age (p=0.00**), parity (p=0.00**), annual income (p=0.08*), WHR (p=0.00**), BMI (p=0.00*), educational status (p=0.023*), marital status (p=0.00**), smoking status (p=0.00**), sexual activity (p=0.00**), menstrual status (p=0.000**) of the participants.

DISCUSSION

In our study among perimenopausal women, muscle and joint pain (67%), depression (57.4%), sexual problems (59.4%), and sleep disorders (45.2%) were the most common symptoms. Whereas a study conducted by Chedraui et al to assess menopausal symptoms among healthy middle-aged women working at the Luis Vernaza Hospital, Guayaquil, Ecuador, with the menopause rating scale it was found that muscle and joint pain (77%), depression (74.6%), sexual problems (69.6%), and sleep disorders (45.6%) were the most common symptoms in perimenopausal women in Ecuador.[4]

In premenopausal (224), 106 (47.30%) participants had passed the DSB test, in perimenopause (117), 54 (46.10%) participants had passed in the DSB test, in post menopause (163) participants, 54 (33.10%) participants passed in the DSB test. Similarly in a study conducted by Greendale et al, it was observed that in post menopause (178), 57 (38.17%) participants had no decline in cognitive functioning and 114 (68.89%) participants showed major decline in cognitive functioning. Hence, it was observed that there was a decline in cognitive function of postmenopausal women along with poor sleep quality.[7]

In our study among 117 perimenopausal women, 54 (46.1%) participants had mild symptoms of heart discomfort, 55 (47%) participants had mild symptoms of depressive mood. Whereas in the study conducted by Rahman et al, perimenopausal women (n=141) experienced mild symptoms of heart discomfort compared to premenopausal (n=82) and postmenopausal (n=133) women and depressive mood mostly occur in the postmenopausal group of women.[10]

A total of 504 women were enrolled in the study. Out of 504, 146 (28.90%) fall under 40-44 age group, 115 (22.81%) fall under 45-49 age, 100 (19.84%) fall under 50-54 age, 65 (12.89%) fall under 55-59 age and 78 (15.47%) falls under 60-64 age. 224 (44.4%) participants come under premenopausal, 117 (23.31%)

participants come under perimenopause and 163 (33.34%) participants comes under post-menopause. However, in a study conducted by Chuni et al, it was found that out of 739, 130 (17.8%) fall under 40-44 age, 269 (36.9%) fall under 45-49 age, 100 (19.84%) fall under 50-54 age, 195 (26.7%) fall under 55-59 age and 70 (9.6%) falls under 60-64 age and among these participants, 65 (8.9%) participants come under premenopausal, 112 (15.1%) participants come under perimenopause and 562 (76.04%) were postmenopausal women.[19]

In our study premenopausal women 26 (11.6%) had less prevalence of all the symptoms when compared with postmenopausal women 54 (46.1%) and perimenopausal 55 (47%) women. Similarly, a study conducted by Chuni et al, postmenopausal women (247, 33.9%) and perimenopausal (215, 29.5%) women together experienced significantly higher prevalence of all symptoms than the premenopausal (267, 36.6%) women.[19]

Our study found a high prevalence but low severity of menopausal symptoms. Our findings point to a need for mitigating symptoms of menopause through diet, physical activity, tobacco, cessation, and counseling for depression. A better understanding of the nature of the risk for these common symptoms in menopausal women will aid in prevention, detection, and treatment.

The limitations of our study include small number of subjects were not cooperative for interviews, so there was some response bias. This study did not assess the presence of associated comorbidities, among the women studied, such as cardiovascular and musculoskeletal diseases. The cross-sectional design did not allow for establishing the directionality of the associations found and the convenience sampling may have compromised the heterogeneity of the sample, limiting the generalization of results. The participants exhibited constraints due to a lack of time for filling out the questionnaire and the final limitation of this study is the lack of information on the regularity of menstruation. Some subjects could have been misclassified into the incorrect menopause status group.

CONCLUSION

As women passes from premenopausal to perimenopause to post menopause menopausal symptoms were increased. The menopausal transition and postmenopausal years are associated with significant symptoms. Vasomotor symptoms and adverse mood often demonstrate improvement after a woman is postmenopausal, whereas sleep complaints, vaginal dryness/dyspareunia, and cognitive complaints tend to persist or worsen in association with aging. Menopausal symptoms are strongly correlated with the degree of sleep disorders, and cognitive changes.

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