Climacteric Symptoms and Nutritional Status of Menopause Women

Chandramati J. Rokhade and Khyrunnisa Begaum

Department of Dietetics, SDM College of Medical Sciences & Hospital, Shri Dharmasthala Manjunatheshwara University, Dharwad, Karnataka, India.

Dept. of Studies in Food Science and Nutrition, University of Mysore Manasagangotri, Mysore

ABSTRACT

Menopause is the most striking event occurring during middle age in women and represents the end of women's reproductive life. Menopause is due to decreased estrogen levels and disruption of hormonal cycle associated with ovulation. Menopause is associated with both physiological and psychological changes which has an impact on the nutritional status. Due to the changes, women experience variety of symptoms which range from mild to severe. The overall wellbeing during menopause is highly related to their nutrition, lifestyle, physical exercise and positive attitude towards menopause A cross -sectional study was conducted among 750 women between 35 to 55years who were attending the Out Patient department of SDM Medical college and Hospital Dharwad, (OPD). Nutritional status was assessed and the climacteric symptoms were classified systematically to identify the onset of menopause. The prevalence of overweight was high i.e.44.8 to 55.9% and13to18% of the subjects were obese in the study population. There was a marked increase in per cent occurrence of central obesity. Women experienced a variety of symptoms, so an attempt was made to classify them systematically based on the highest and lowest rate of occurrence and are presented as **Constant Symptoms**, **Usual Symptoms**, **Occasional Symptoms** and **Other Symptoms** which appears to be a useful tool to identify the onset of menopause.

Keywords: Climacteric Symptoms, Menopause, Reproductive life, Nutritional status.

INTRODUCTION

Menopause is the time of woman's life when reproductive capacity ceases **(WHO,1996).** Altered ovarian function is one of the etiologies for menopause. There is a natural decline in ovarian activity which coincides with onset of menopausal symptoms. The ovaries after long years of service have not the ability to retire graceful old age but become irritated and transmit their irritation to the brain which produces disturbances in cerebral tissue exhibiting in extreme nervousness. The years before menopause that encompasses the change from normal ovulatory cycles to the cessation of menses are known as the premenopausal transition years marked by irregularity of menstrual cycle. This transition period is called as climacteric period which leads

to the actual event of menopause where endocrinological, biological and clinical features of approaching menopause commence and they are typically experienced for a period of five to ten years**(Devi et al.,2003).** Before the onset of menopause, symptoms of hormonal imbalance arise in estrogen and progesterone levels which leads to both physiological and psychological changes. The changes associated to menopause have an impact on food intake and food choices of menopausal women **(Palacious et al.,2010, Prasad et al.,2011)**.It is a fact that a well-balanced diet is important for good health and to combat some of the complications of menopause. Most of the menopausal women are not aware about the symptoms and their effects on health and the remedial measures. Literature is limited to explain the food and nutrition-related aspects of menopause, changes in food intake, malnutrition-related changes in menopausal symptoms and distress. Hence the present study was undertaken to study the climacteric symptoms and nutritional status of menopausal women.

MATERIALS AND METHODS

A cross- sectional study was conducted among women aged between 35 to 55 years who were attending the Outpatient Clinic of S.D.M.College of Medical Sciences and Hospital Dharwad, Karnataka. A total of 750 subjects were explained about the purpose of the study. Women who were willing to participate out of their freewill were given the consent and considered as subjects of the study. The selected women were from urban and semi urban areas of Dharwad city, Karnataka.

Inclusion Criteria: Women aged between 35-55 years having normal and overweight without having renal and cardiovascular problems.

Exclusion Criteria: Women those who have undergone hysterectomy, on medication except for diabetes and other hormonal imbalances and ovarian problem.

The structured questionnaire was developed to elicit the general information. A close end assessment schedule was used to obtain symptoms of menopause. Nutritional assessment was done by taking anthropometric measurements i.e., Height, Weight, Waist and Hip circumference according Jelliffe techniques and dietary assessment by taking detailed information about frequency of food intake, diet behavior, 24-hour recall for food and nutrient intake.

The data was analyzed by using SPSS 16.0 version.

RESULTS AND DISCUSSION

The socio-demographic profile of subjects is presented in table (1). It is evident that 12.4 to 31% of the participants were illiterates while 8-20% were graduates and postgraduates. Interesting information elicited from this is an inverse association between literacy rate to age i.e. higher the age, lower was the literacy and vice-versa.

The marital status of the participants indicated 70% of the women from group I were married and those from other age groups 98to 99% were married. The mean age at marriage was found to be consistently 18 years among group II, III, and IV. It is interesting to note that the mean age at first pregnancy among women in the older age group was 19±5.39years while in the younger age group (group I & II) was 20±5years. A mean difference of one year was noted between older and younger women. The mean number of pregnancies also differed across the age groups with a marked difference; younger women had 2 to 3 pregnancies, while older women were found to have 3 to 5 pregnancies. The mean age at last pregnancy as reported by the participating women was also different among women in all the groups. Women from higher age groups (groups III & IV) gave birth to the last child at a mean age of 40±6.57years. Nevertheless, women in less than

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44 years gave birth to the last baby at 23±6.1 and 25±5.92 years. Although these differences in the age at the last pregnancies varied to a great extent accounting for an average of 15-17 years, the time gap between the first pregnancy to last pregnancy among all the women in the four groups exhibited a linear increase with age. Women in groups III & IV exhibited a mean difference of 20 years while those in groups I & II had a mean difference of 3 to 5 years. This indicated that older women had planned pregnancies and therefore had a wide gap between first and last pregnancy.

Details about the obstetric history are also presented, percentage of women having abortions varied between 16.5 to 25.7%, with a higher percentage among older women (group IV); however, it is not clear whether abortions were natural or induced. Surprisingly, nearly 65 to 79% of women across the age groups underwent tubectomy. The mean age at tubectomy in different groups varied between 24.7±3.69 to 27±4.57 years. It can be noted that the age at tubectomy was less than 30 in all age groups, based on WHO reports it suggests that the tubectomy age to be the characteristics of the participants. It is reflective of semi-urban culture. (**Devi et al., 2003**).

Table1: Subjective Information and Obstetric History of the Selected Subjects

Variables	Age Categories (years)			
	Group I (35-39yr) (n=145)	Group II (40-44yr) (n=176)	Group III (45-49yr) (n=168)	Group IV (50-55yr) (n=261)
Education (%)				
Illiterate	18(12.4)	40 (22.7)	51(30.40)	81(31.0)
Primary	33(22.8)	51 (29.0)	34(20.20)	87(33.30)
Secondary	43 29.7)	41 (23.3)	41(24.40)	53(20.30)
P.U.C.	22(15.2)	16 (9.1)	25(14.90)	19(7.20)
Graduate	14(9.7)	18(10.2)	13(7.70)	15(5.70)
Post-graduate	15(10.3)	10(5.70)	04(2.40)	06(2.30)
Marital Status (%)				
Married	145(69.7)	174(98.9)	164(97.6)	258(98.9)
Unmarried	Nil	2(1.1)	04(2.4)	3(1.1)
Mean age at marriage(yr)	19±4.59	18 ±4.70	18±4.90	18±5.03
Mean age at first pregnancy(yr)	20±5.01	20±4.84	19±5.34	19±5.39
Mean no. of pregnancies()	2±1.21	3±1.29	3±1.60	3±1.94
No. of abortions (%)	47(18.0)	49(18.8)	43(16.5)	67(25.)
Mean age at last pregnancy(yr)	23±6.10	25±5.92	40±6.57	39±6.47
No.of women underwent tubectomy (%)	94(64.8)	136(77.3)	132(78.6)	91(73.2)
Mean age at the time of tubectomy(yr)	24.7±3.69	26.6±4.43	25.6±4.1	27.4±4.57

Table 2: Age Related Differences in Menstrual Pattern of the Participants

Age Groups	% Women Menstruating	Menstruation Stopped (%)	Frequency of Menstruation (%)			
			Monthly	**Once in 2 month**	**Once in 3 months**	**Once in 6 months**
Group I (35-39yr) (n=145)	144 (99.3)	1 (0.7)	135(93.1)	7 (4.8)	1 (0.7)	1 (0.7)
Group II (40-44yr) (n=176)	134(76.13)	42(23.91)	119(88.80)	5 (2.8)	8 (4.5)	2 (1.1)
Group III (45-49yr) (n=168)	65(38.7)	103 (61.30))	34 (20.30)	10 (6.0)	14 (8.3)	7 (4.2)
Group IV (50-55yr) (n=261)	14(5.3)	247 (94.6)	6(2.30)	1 (0.4)	4 (1.5)	3 (1.1)

Age-related differences in the menstrual status of participants are presented in the table2.It presents a clear picture of menstruation and the pattern of variations in its occurrence in the 20 years of life span i.e., between 35-55 years. All women in Group I were menstruating and the differences appeared to initiate in Groups II &III, wherein 76.3% of women in Group II and 38.7% of women in Group III mentioned to have menstruation. A marked reduction was seen in Group IV among whom 5.3% claimed to have menstruation. This age can be considered as a cut-off for complete cessation of reproductive capacity. The table also presents a profile of change in the frequency of menstrual appearance in different age groups. The occurrence of menstruation provides a clear picture of the shift in the frequency following the age. It can be seen that 93.1% of Group I menstruated monthly while 67.6% of women from Group II menstruated. This figure dropped significantly to 20.3%in Group III who had monthly discharge, this explicitly explains the inception of the menopause. Therefore, it is evident that irregularity of menstruation increases with age starting from 35 years and ending at 50-55 years wherein 2.3% of women claimed to have menstruation monthly. The frequency of occurrence varied from once in 2 months to once in 6 months.**(Landgren et al., 2004 and Chavez MacGregor et al., 2008)**

Table 3: Stages of Menopause: Per cent of Women in Different Stages of Menopause, According to Age Groups

Age Groups	Stages of Menopause (%)		
	Pre-menopause	**Peri-menopause**	**Post menopause**
Group I (35-39) (n=145)	134(92.4)	10(6.9)	1(0.7)
Group II (40-44) (n=176)	112(63.6)	21(11.9)	43(24.4)
Group III (45-49) (n=168)	30(17.9)	34(20.2)	104(61.9)
Group IV (50-55) (n=261)	4(1.5)	4(3.8)	247(94.6)

Menopause stages were determined based on the regularity of menstrual cycles. Women who reported having their monthly cycles were classified as pre-menopause, who reported continuing their menstrual cycle once in 2 months, 3 months, and 6 months were classified as Peri-menopause while those who didn't get their cycles for 12 months or more as Postmenopause. The missing cycles indicate the change in the cycle length.

It is evident from Table 3, that a higher percentage of women i.e.94.6% attained menopause in group IV whereas 61.9% in group III and 24.4% attained it in group II. In older age groups i.e. group IV, an insignificant percent (3.8%) were in the perimenopause stage compared to other age groups. 20.2% in Group III and 11.9% in Group II were in the pre-menopause stage. This also indicates that the transition starts from the age 35 years. Supporting studies conducted from various regions of India indicate menopausal age to lie between 46 to 50 years **(Kripalini et al., 2005 and Chavez MacGregor et al., 2008).** A similar age of menopause has been also reported in other developing countries **(Sonja et al., 2005 ,Chedraui et al., 2008 and Palacious et al., 2010) .** However, studies from developed countries like the US and London reported the age of menopause to be more than 50 to 51.4 years**. (Gold E. B. 2000 and Palacious et al., 2010)** .

Figure 1: Cumulative Frequency of Age at Which Menopause Occurred in Study Population
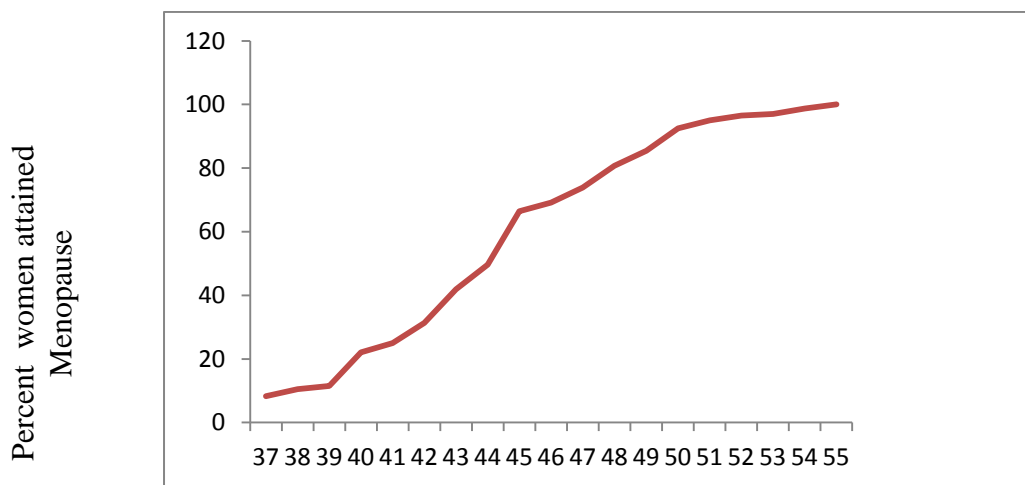
- ❖ Mean age at menopause   - 44.4±4.54 years
- ❖ Median age at menopause - 45 years

The cumulative frequency of age at which menopause was attained was pursued in figure 1. 50% of women had attained menopause at the age of 50 years, while 71to79% of women attained it at 53and54 years. However, the remaining 20% of women attained 55 years. Therefore, the mean age at natural menopause of the participants was found to be 44.4±4.54 years and median age was 45 years. The menopause age found for the study population has been in accordance with studies reported from other regions. **(WHO,1996)**.

Table 4: Menopause Status of the Study Population

Menopause Details	<40yr	41-45yr	46-50yr	51-55yr
Age at Menopause – (Frequency %)	88(22.2)	177(44.5)	103(25.9)	30(7.5)
Mean age at Menopause(n=750)	44.4±4.54			
Median age at Menopause(n=750)	45yrs			
Mean Menstruating Years(n=392)	31.2±4.48			

The percentage of women who attained natural menopause at different ages is presented in Table 5. It can be concluded that 44.5% of women attained menopause between 41-45 years while 22.2% and 25.9% had menopausal age below< 40 years and 46-50 years which confirms the menopause age in the study population. Menstruating years were computed to study the total cycles a woman experiences during her lifetime. Menstrual disturbances are an important cause of women's ill health. Therefore, importance has been given to the assessment of menstrual regularity and characteristics among populations. Data on the nature of variability in the menstrual cycle is limited. "Menstruating years is the lifetime cumulative number of menstrual cycles a woman experiences" This indicates menstrual activity and reproductive health. In our study, we used it as a means to assess the probable menstrual activity that would alter in women due to various lifestyle factors. The literature points to a variety of factors influencing menstruating years. It is evident that Table 5 also exhibits the mean menstruating years of the study population which was 31.2±4.48, this was computed considering 12 cycles per year. Other studies reported the mean menstruating cycles as 34.**(Stefanic et al., 1998**)

Table 5. Weight Status of Women Participants According to their Age Group

Current Age	CED (%)	Under Weight (%)	Normal but Low (%)	Normal Weight (%)	Over weight (%)	Obese Class-I (%)	Obese Class-II (%)	Obese Class-III (%)
Group I (35-39yr)	Nil	4(2.8)	11(2.8)	39(26.9)	65(44.8)	26(17.9)	Nil	Nil
Group II (40-44yr)	3(1.7)	2(1.1)	18(10.2)	47(26.7)	83(47.2)	23(13.1)	Nil	Nil
Group III (45-49yr)	3(1.7)	7(4.2)	10(6.0)	36(21.4)	88(52.4)	24(14.3)	Nil	Nil
Group IV (50-55yr)	2(0.8)	4(1.5)	17(6.5)	58(22.2)	138(52.9)	40(15.3)	2(0.8)	Nil

*CED – Chronic Energy Deficiency

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It is seen from table (6) that the prevalence of overweight was high, 44.8 to 52.9% of women from different age groups were overweight and 13 to 18% were obese and categorized in class I obesity. It is also important to mention that 21 to 26.9% were in the normal category. Further, it is interesting to note that there is a marked shift in weight status in women between age groups, the younger women were in normal and below normal weight status while those in 45 to 55 years exhibited a shift to overweight. It is obvious from the data that there is a gradual increase in prevalence of overweight from 35 to 55 years i.e. it increased from 44.8 to 53% across the age groups. A similar observation has been reported by other authors **(Simkin-Silverman et al.,2003,**
Palacious et al., 2010 and Wing et al.,1991) . The percent of women in the underweight category was very small less than 4 percent.

Table 6: Prevalence of Abdominal Obesity in Study Population (N=750)

Age Groups	WHR (%)	
	Normal($\leq$0.8)	Abnormal ($\geq$0.8)
Group I(35-39yr)	89(61.4)	56(38.6)
Group II(40-44yr)	98(55.7)	78(44.3)
Group III(45-49yr)	89(53.0)	79(47.0)
Group IV(50-55yr)	111(42.5)	150(57.5)

*WHR-Waist to Hip Ratio

The waist hip ratio (WHR) which is considered as predictor of abdominal obesity in the South East Asian population **(Prasad et.al.,2011, Laraia et.al.,2004)** [l]is presented in Table (7).Abdominal obesity is of common occurrence, data reported from other parts of Karnataka indicated a mean WHR of 1.08±0.13 among female adults.**(Laraia et. al.,2004).**In our study, 38.6% to 57.5% of women from Groups I to IV had WHR of more than 0.8 indicating the prevalence of central obesity. A gradual but marked increase in percent occurrence of central obesity was noted at each age group. However, it can be said that a considerable percentage (40-60%) of women had WHR within normal cut-off levels.

Table 7: Mean Nutrient Intake of Selected Subjects (N=120)

Nutrients	Age Groups (Mean±SD)			
	Group I (n=30)	Group II (n=30)	Group III (n=30)	Group IV (n=30)
Energy(Kcal)	1806±246.882	1785±271.684	1623±146.614	1881±338.098
AEI*	2172	2172	2080	2172
Protein(g)	47.2±10.692	50.1±10.736	45.8±8.512	52.5±8.860
Fat(g)	57.1±6.255	58.5±5.687	48.8±8.652	57.1±7.975
Calcium(mg)	526.3±180.250	522.6±179.913	497.3±52.339	601.5±117.430
Iron(mg)	20.6±7.667	24.8±8.425	19.6±2.813	24.4±6.671
β-Carotene(μg)	1356.7±62.315	1086.9±455.379	1374.5±200.467	1449±498.501

*AEI- Average Energy Intake

The mean nutrient intake was found to be essentially similar across the age group however the intake among Group III was considerably less. The average energy intake also given for comparison was 2172 Kcal for all age groups except for Group III where in AEI was 2080; less intake in this group is evident. Protein intake was also found to vary among women from different age groups. Women from Group III consumed markedly less amount of protein. It is imperative to comment here that the results of the food intake is based on 24 hrs. recall method collected for one day hence the present results can be considered as an overall pattern of consumption by women across the age groups.

Table 8: Classification of Menopause Symptoms Based on their Frequency of Occurrenc in Different Age Groups

Symptoms	Group I (35-39 yrs) (n=145)	Group II (40-44yrs) (n=176)	Group III (45-49yrs) (n=168)	Group IV (50-55yrs) (n=261)
Constant Symptoms	Headache Loss of hair Pain in knees Pain in lower Back	Headache Loss of hair Insomnia Pain in knees Pain in lower Back	Headache Loss of hair Insomnia Pain in knees Pain in lower Back	Headache Loss of hair Insomnia Pain in knees Pain in lower Back
Usual Symptoms	Insomnia Burning feet Breast fullness Frequent urination Achy joints	Loss of balance Frequent urination Urge Incontinence Achy joints	Burning Feet Loss of Balance Crawling ant sensation Night sweats Frequent urination Urge Incontinence Dry skin	Burning Feet Crawling ant sensation Loss of Balance Frequent urination Urge Incontinence Dry skin
Occasional symptoms	Loss of Balance Tingling of Feet Night sweats Urge Incontinence Stress Incontinence Itching of Vagina	Painful muscle Burning Feet Water retention Breast Fullness Tingling of Feet Hot flushes Night sweats Stress incontinence Dry skin	Painful muscle Water retention Tingling of feet Change in body odour Breast fullness Hot flushes Stress incontinence Itching of vagina	Painful muscle Tingling of feet Hot flushes Night sweats Stress incontinence Change in nails Vaginal dryness Itching of vagina Increase in facial hair
Others	Painful muscle Crawling ant sensation Water retention Breast swelling and tenderness Hot flushes Change in nail Increase in facial hair Vaginal dryness Dry skin, Change in body odor	Crawling ant sensation Change in body odour Breast swelling &tender Change in nails Vaginal dryness Itching of vagina Increase in facial hair	Breast swelling & tender Change in nails Vaginal dryness Increase in facial hair	Water retention Change in body odour Breast fullness Breast swelling & tenderness

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It was considered useful to identify the inception of the menopausal changes in the categorical age groups. This pattern also helps to know the symptomatic pattern of menopause and how it differs among the population. The cut-off levels of occurrences of each symptom reported by the selected women were established based on the lowest and highest rates of occurrence.

It was observed that some of the symptoms featured constantly among woman included in the study, while other symptoms appeared less frequently therefore, it was considered worthwhile to label the symptoms under "Constant", "Usual" "Occasional" and "Others" depending on their frequencies. It is pertinent to comment here that, there is a need to organize comprehensively the pattern of occurrence of different symptoms during the entire period of menopause. This approach would benefit to identify confidently the onset of menopause.

The symptoms are presented as constant symptoms, usual symptoms, occasional symptoms, and others. Headache, loss of hair, pain in knees, and low back pain were constant symptoms in all the age groups starting from 35 years. Insomnia was an added constant symptom for 40 years and continued to remain till 55 years. Based on these it can be inferred that symptoms related to insomnia start to appear at 35 years as a usual symptom and increase in its frequency. Usual symptoms are also important because they occurred along with constant symptoms and appeared in the climacteric age group. The different symptoms under this category increased in numbers from 45 years onwards. Insomnia was found to be a usual symptom at 35 years and shifted to constant symptoms at 40 years. The other usual symptoms were burning feet, breast fullness, frequent urination, and achy joints in the younger group which slightly altered at 40-44 years with an addition of loss of balance and urge incontinence. Nevertheless, the number of symptoms increased at 45-55 years. The additional symptoms found were burning feet, crawling ant sensation, night sweats, and dry skin. The list of symptoms appearing occasionally is very wide and includes hot flashes, night sweats, water retention, and painful muscles. This list also increased with an increase in age.

It is worthwhile to mention here that night sweats and hot flashes are considered as indicators of menopause in general as reported by others (**Punyahotra et al., 1997,Dutt et.al., 2012**) and however, we did not find these to occur in every participant. Therefore, it is felt that a rethinking /revision of the symptoms is required to diagnose the inception of menopause. Further, it is also realized that no single symptom can be considered as an indicator of menopause. Diagnosis should depend on the regularity of menstruation along with constant symptoms as indicators of menopause. It is difficult to mention whether this pattern of occurrence would have a relationship to population characteristics. We also identified a long list of symptoms that appeared in our population i.e. less than 10%, these occurred in different combinations along with constant, usual, and occasional symptoms. Other symptoms independently could be of less importance in identifying the onset of menopause. Several research reports indicated that the symptoms appearing during menopausal age are also associated with the aging process. Therefore, some of the problems which have a direct association with aging were considered for investigation and their occurrence was compared across the age groups.

CONCLUSION

Menopause symptoms vary enormously among population, so an attempt was made to classify the symptoms systematically to have a useful tool to identify the onset of menopause. Menopause age is influenced by a variety of biosocial and physiological factors, notably the

number of pregnancies, age at last pregnancy, and irregularity in menstruation. The psychological and physiological changes associated with menopause have an impact on the food intake and food choices of menopausal women. Hence awareness should be created about the age of menopause, symptoms of menopause, importance of a well-balanced diet to help women approach health personnel to better manage the condition and reduce the distress

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