ORIGINAL ARTICLE - PUBLIC HEALTH

A CROSS-SECTIONAL STUDY TO DETERMINE THE AVERAGE MENOPAUSAL AGE AND ITS ASSOCIATED FACTORS IN ALAMADHI, REDHILLS

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Abstract

INTRODUCTION : Menopause is the permanent cessation of menstruation at the end of fertile reproductive life due to loss of follicular function of ovary. It is the point of time when last and final menstruation occurs. Clinically confirmed by stoppage of menstruation(amenorrhea) for 12months without any other pathology.

OBJECTIVES : To determine the average age at which women attain natural menopause and to assess the factors influencing the onset of menopause among women in Alamadhi, Redhills.

METHODLOGY : A cross sectional study was conducted in Alamadhi, Redhills. 150 postmenopausal women were included in the study during the period between July 13 2021 and October 13 2021. After obtaining informed consent from the participants, details were collected by face-to face interview using semi structured questionnaire designed for the study.

RESULTS: Average age of menopause is 47.33 years. Consumption of carrot and green leafy vegetables, mother's menopausal age, age of puberty, age of marriage, number of conceptions affected menopausal age.

CONCLUSION: This study illustrated that menstrual and fertility factors have influence on menopausal age while socioeconomic factors were not effective. Identifying menopausal age and its determining factors may modify the menopausal status of women and the management of perimenopausal period.

INTRODUCTION

Menopause is the permanent cessation of menstruation at the end of fertile reproductive life due to loss of follicular function of ovaries. It is the point of time when last and final menstruation occurs. Clinically confirmed by stoppage of menstruation (amenorrhea) for 12months without any other pathology. Artificial menopause is the cessation of menstruation following either surgical removal of both ovaries or iatrogenic cessation of ovarian function (e.g. chemotherapy or radiation). Pre-menopause refers to period prior to menopause, post-menopause refers to period after menopause and perimenopause refers to period around menopause (40-55 years). Climacteric period is the period of time during which a woman passes from the reproductive to the non-reproductive stage and this phase covers 5-10 years on either side of menopause. The major consequences of menopause are related primarily to estrogen deficiency. Principle health concerns of menopausal women include vasomotor symptoms, vaginal dryness, urogenital atrophy, osteoporosis, cardiovascular diseases, cancer, cognitive decline and sexual problems.

A women's age at menopause may affect the type and severity of her menopausal symptoms. Early menopause is associated with increased risk of cardiovascular and osteoporosis. Delayed menopause is associated with increased risk of breast and endometrial cancer. Smoking, nulliparity and low socioeconomic status is associated with early menopause, whereas higher socioeconomic status, higher number of total pregnancies, prolonged breast feeding and use of oral contraceptive pills is associated with delayed menopause.

The age of menopause ranges between 45-55 years all over the world, average age being 50 years. Factors determining the age of attainment of natural menopause vary between different populations and even among different ethnic groups. Detection of the average age at menopause is of great importance in planning health services for postmenopausal women.

OBJECTIVES

1. To determine the average age at which women attain natural menopause.

2. To assess the factors influencing the onset of menopause among women in Alamadhi, Redhills.

METHODOLOGY

STUDY DESIGN : Cross sectional study

STUDY PLACE : Alamadhi, Redhills

STUDY PERIOD : 4 months (From July 13 2021 to October 13 2021)

STUDY POPULATION : Postmenopausal women

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INCLUSION CRITERIA :

1. Women who have attained menopause within past 5 years.

2. Women who have given consent for the study.

EXCLUSION CRITERIA :

1. Artificial menopause were excluded.

SAMPLE SIZE :

According to the study done by Ozdemir, O., & Cöl, M. (2004). The age at menopause and associated factors at the health center area in Ankara, Turkey. Maturitas, 49(3), 211–219 , prevalence of natural menopause was 72.8%. Sample size was calculated with p- 72.8%, q- 27.2% with relative precision of 11%, sample required for the study was calculated as Sample size n =4pq/d2, n= 139 (with non- response rate of 10%). But 150 participants were interviewed in our study.

SAMPLING METHOD : Purposive sampling

STUDY TOOL:

Questionnaire was developed in English with the help of 6 members who were well-versed in menopausal study. Questionnaire contains parameters of name, age, address, weight, socioeconomic status, intake of carrot and green leafy vegetables, diet type, menopausal age, mothers menopausal age, age of puberty, age of marriage, consanguinity of marriage, number of conceptions, duration of breast feeding, family planning, socio-economic status and other health problems like PCOD, thyroid & fibroid uterus.

DATA COLLECTION METHOD:

After obtaining written and informed consent from the women who have attained menopause within past 5 years in Alamadhi, Redhills. At the start of interview, the purpose of the study was explained to the women under study. All information was collected from the study participants by One to One Interview method using Closed ended questionnaires. Questions were read out to the study subjects in exactly the same order as listed in the questionnaire and sufficient time was given to the subject to respond. If the respondent did not understand the questions, it was repeated in the same manner without probing for the answer. If the respondent was still doubtful about the answer, it was recorded as 'No'. At the end of the interview, postmenopausal women under study was aware of the average menopausal age and factors influencing the onset of menopause.

DATA ANALYSIS :

After collecting, the data was compiled and entered in Microsoft Excel Sheet. Analysis was done using SPSS software version 16. All continuous variables were expressed as Mean and Standard Deviation. All categorical variables were expressed as Percentages and Proportions. The test considered significant if p value <0.05, at 95% confidence

interval.

DATA ANALYSIS AND INTERPRETATION

MENOPAUSAL AGE FREQUENCY

Mean menopausal age among the study population is approximately 47.33 years, 95% confidence interval = 46.646 to 48.034. The study showed that, out of the 150 women interviewed, 88 women attained menopause at normal menopausal age i.e. between 47 and 53 years constituting 58.7%; 61 women attained menopause < 47 years constituting 40.7% which is earlier than the normal menopausal age; 1 woman attained menopause after 53 years constituting 0.7% of the total women under study.

Table 1: Frequency of menopausal age

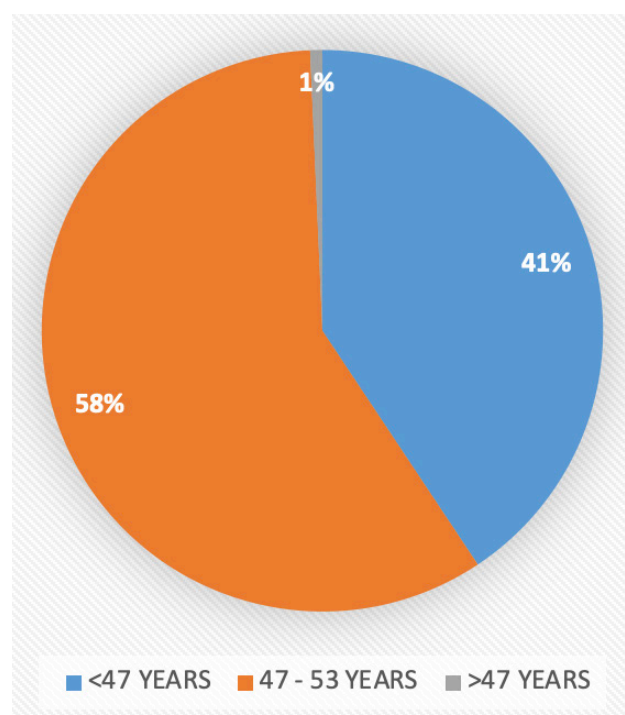| Menopausal Age	Frequency	Percent
< 47 years	61	40.7%
47-53 years	88	58.7%
> 53 years	1	0.7%
Total	**150**	**100.0%**

Figure 1 : Frequency of menopausal age

Table 2 : Distribution of menstrual, fertility and socio economic factors

Parameters		Frequency	Percent
Intake of Carrot & Vegetables	Yes	127	84.66%
	No	23	15.34%
Diet Type	Veg	6	4%
	Non-Veg	144	96%
Mothers Menopausal Age	< 47 Years	42	28%
	> 47 Years	108	72%
Age of Puberty	< 14 Years	63	42%
	> 14 Years	87	58%
Age of Marriage	< 20 Years	122	81.34%
	> 20 Years	28	18.66%
Consanguinity of Marriage	Yes	86	57.3%
	No	64	42.7%
Number of Conceptions	≤ 3	61	40.66%
	> 3	89	59.33%
Duration of Breast Feeding in Single Pregnancy	< 6 Months	30	20%
	> 6 Months	120	80%
Family Planning (Tubectomy)	Yes	81	54%
	No	69	46%
Socio Economic Status (Pareek's Classification)	Upper	7	4.66%
	Upper Middle	15	10%
	Middle	26	17.33%
	Lower Middle	40	26.67%
	Lower	62	41.33%
Other Health Problems	Pcod	6	4%
	Thyroid Disorder	10	6.66%
	Fibroid Uterus	16	10.66%
	No Problem	118	78.66%

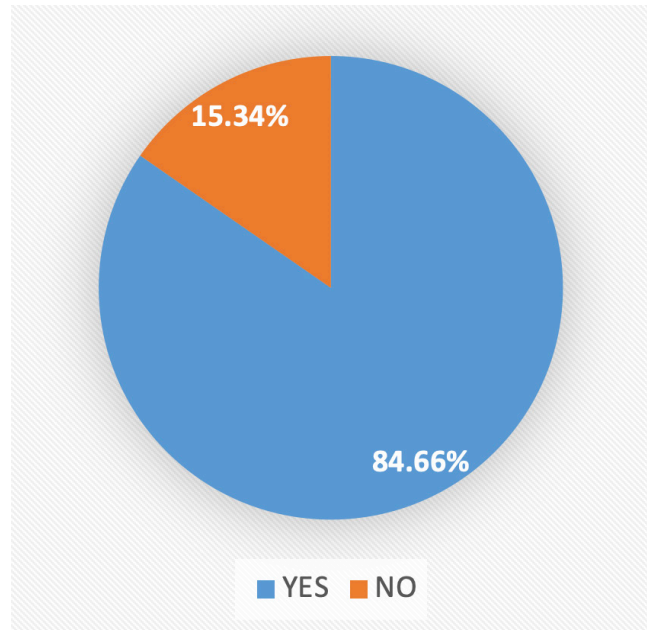**CARROT AND GREEN VEGETABLES INTAKE FREQUENCY**

Figure 2 : Intake of carrot and green leafy vegetables

Out of 150 subjects, 127(84.66%) consumed carrot and green leafy vegetables more than twice a week and 23(15.34%) did not consume carrot and green leafy vegetables more than twice a week.
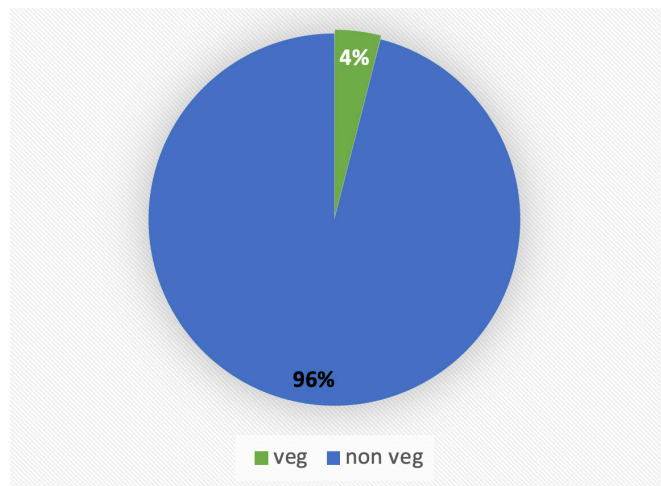
FREQUENCY OF VEG AND NON-VEG

Figure 3 : Frequency of veg and non veg

Out of 150 subjects, 144(96%) were non vegetarians and 6(4%) were vegetarians.

MOTHER'S MENOPAUSAL AGE FREQUENCY

Out of 150 subjects, 108(72%) mothers of women under study attained menopause ≥47 years of age and 42(28%) mothers of women under study attained menopause <47 years of age.
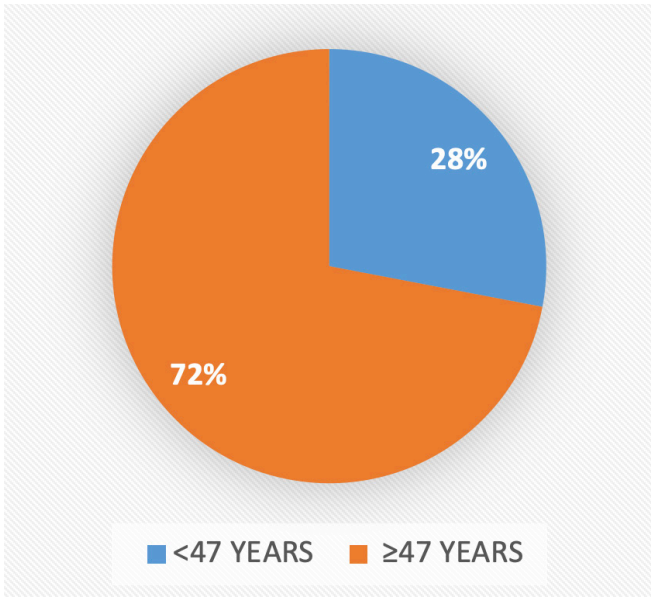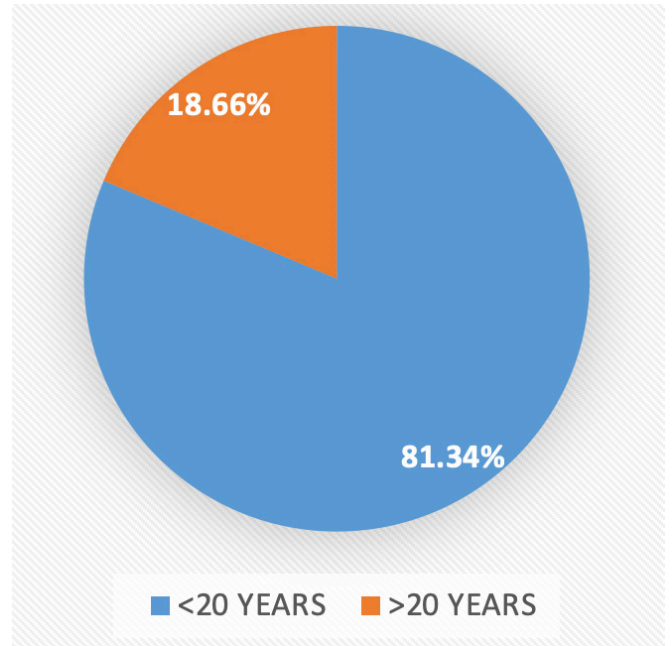
Figure 4 : Frequency of menopausal age

Figure 6 : Frequency of marital age

FREQUENCY OF AGE OF PUBERTY

Figure 5 :Frequency of age of puberty
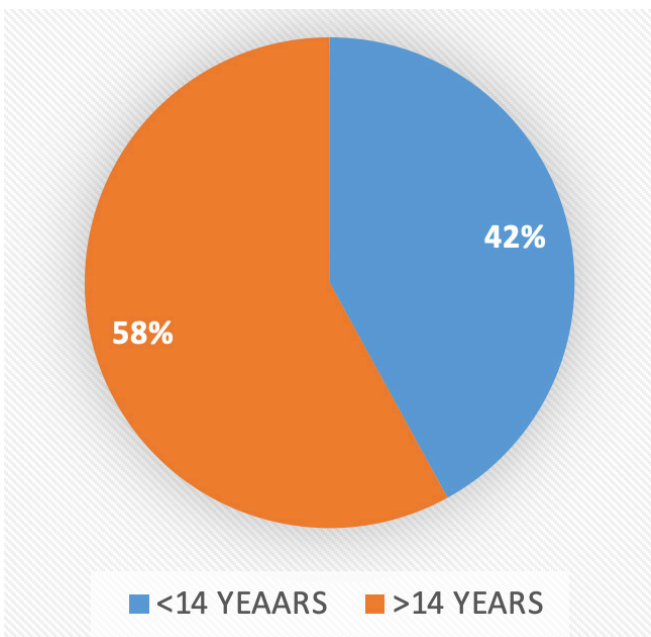
CONSANGUINITY FREQUENCY

Figure 7 : Frequency of consanguinity

Out of 150 subjects, 87(58%) attained puberty more than 14 years of age and 63(42%) attained puberty less than 14 years of age.

Out of 150 subjects, 86(57.3%) had consanguineous type of marriage and 64(42.7%) had non consanguineous type of marriage.

MARITAL AGE FREQUENCY

Out of 150 subjects, 122(81.34%) were married below 20 years of age and 28(18.66%) were married above 20 years of age.
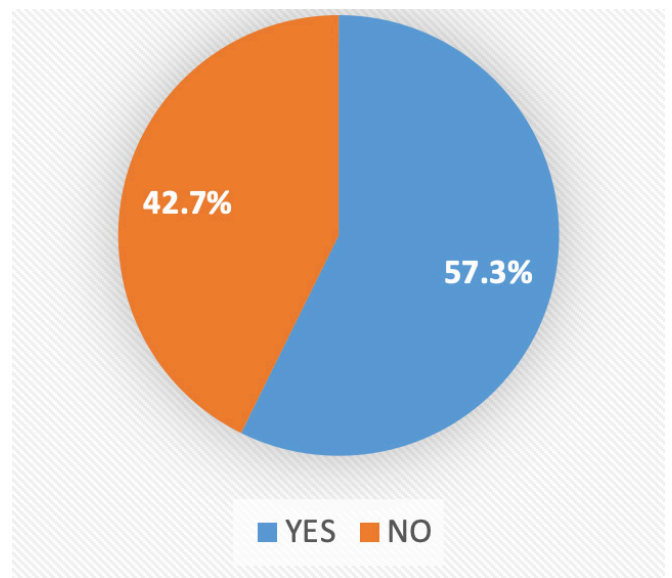
CONCEPTION FREQUENCY

Out of 150 subjects, 89(59.33%) had more than 3 conceptions and 61(40.67%) had ≤3 conceptions.
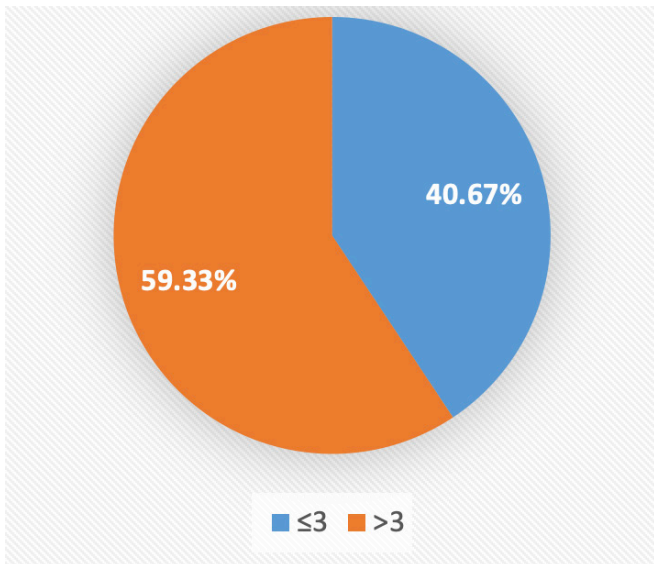
Figure 8 : Frequency of conception

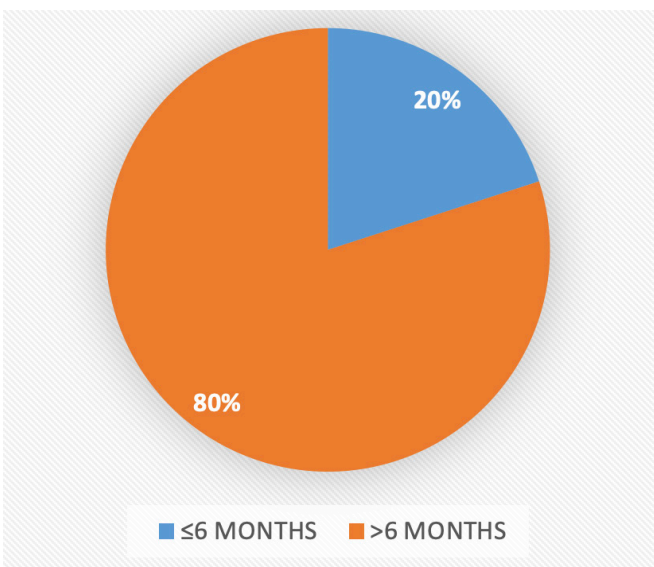## DURATION OF BREAST FEEDING FREQUENCY IN EACH CHILD

Figure 9 : Frequency of duration of breast feeding

Out of 150 subjects, 120(80%) had breastfed the baby for more than 6 months and 30(20%) had breast the baby for less than 6 months.

FAMILY PLANNING (TUBECTOMY) FREQUENCY

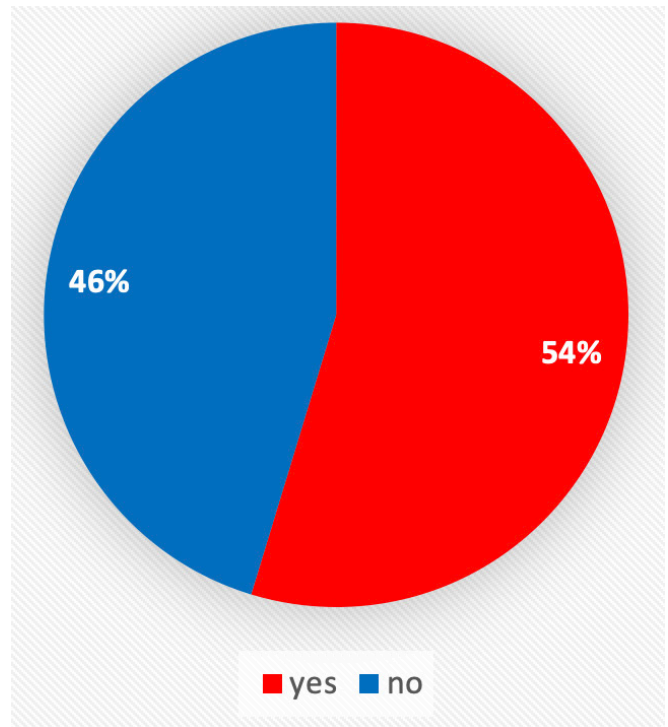Out of 150 subjects, 81(54%) had done tubectomy and 69(46%) hadn't done tubectomy.

Figure 10 : Frequency of tubectomy
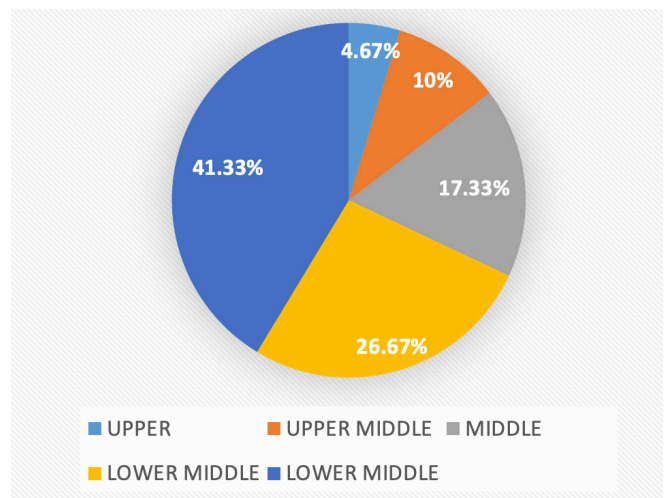
SOCIO-ECONOMIC STATUS FREQUENCY

Figure 11 : Frequency of tubectomy

Out of 150 subjects, 7(4.67%) were in upper class, 15(10%) were in upper middle class, 26(17.33%) were in middle class, 40(26.67%) were in lower middle class, 62(41.33%) were in lower class of Pareeks's classification of socioeconomic status.

FREQUENCY OF OTHER HEALTH PROBLEMS

Out of 150 subjects, 118(78.66%) had no other health problems, 16(10.66%) had fibroid uterus, 10(6.66%) had thyroid disorder and 6 (4%) had PCOD.
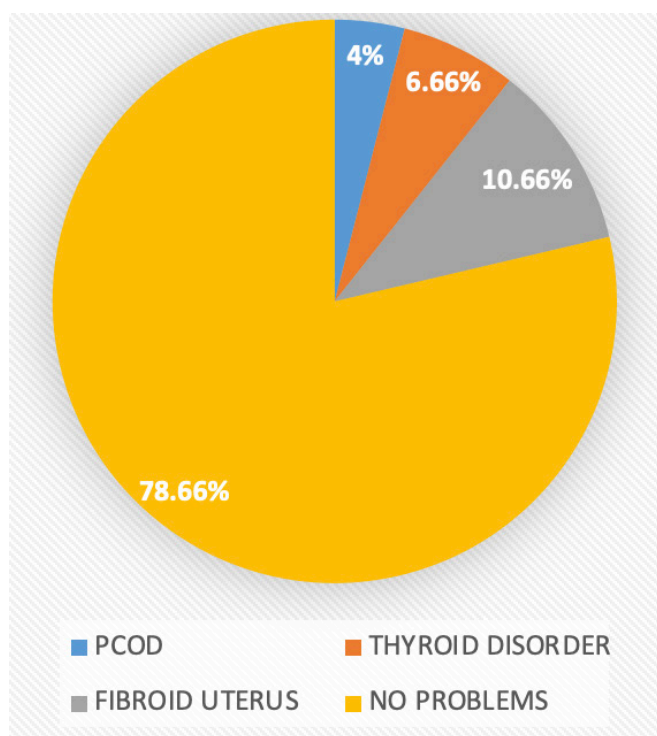
Figure 12 : Frequency of other health problems

ASSOCIATION OF MENSTRUAL, FERTILITY AND SOCIO ECONOMIC FACTORS WITH MENOPAUSAL AGE

Table 3 : Association of menstrual, fertility and socio economic factors with menopausal age

Parameters		Menopausal Age		Chi Square Value	P Value
		<47	≥47		
Intake of carrot and green leafy vegetables	Yes	45 (30%)	82 (54.66%)	9.39	0.002167
	No	16 (10.66%)	7 (4.66%)		
Diet type	Veg	1 (0.67%)	5 (3.33%)	1.49	0.221908
	Non Veg	60 (40%)	84 (56%)		
Mothers menopausal age	< 47 Years	39 (26%)	3 (2%)	65.84	<0.00001
	≥ 47 Years	22 (14.67%)	86 (57.33%)		
Age of puberty	< 14 Years	54 (36%)	9 (6%)	91.35	<0.00001
	> 14 Years	7 (4.67%)	80 (53.33%)		
Age of marriage	< 20 Years	58 (38.66%)	64 (42.66%)	12.8	0.000347
	> 20 Years	3 (2%)	25 (16.66%)		
Consanguinity	Yes	35 (23.33%)	51(34%)	0.000102	0.992849
	No	26 (17.33%)	38 (25.33%)		
Duration of breast feeding for each child.	≤ 6 Months	15 (10%)	15 (10%)	1.35	0.244608
	> 6 Months	46 (30.67%)	74 (49.33%)		

Parameters		Menopausal Age		Chi Square Value	P Value
		<47	≥47		
No of conceptions	≤ 3	37 (24.67%)	24 (16%)	17.02	0.000037
	> 3	24 (16%)	65 (43.33%)		
Family planning (tubectomy)	Yes	37 (24.66%)	44 (29.33%)	1.83	0.175719
	No	24 (16%)	45 (30%)		
Socioeconomic status (Pareek's classification)	Upper	3 (2%)	4 (2.66%)	1.77	0.4134
	Upper Middle	6 (4%)	9 (6%)		
	Middle	9 (6%)	17 (11.33%)		
	Lower Middle	14 (9.33%)	26 (17.33%)		
	Lower	29 (19.33%)	33 (22%)		
Other health problems	PCOD	3 (2%)	3 (2%)	2.45	0.486772
	Thyroid	3 (2%)	7 (4.66%)		
	Fibroid Uterus	9 (2%)	7 (4.66%)		
	No Problem	46 (30.66%)	72 (48%)		

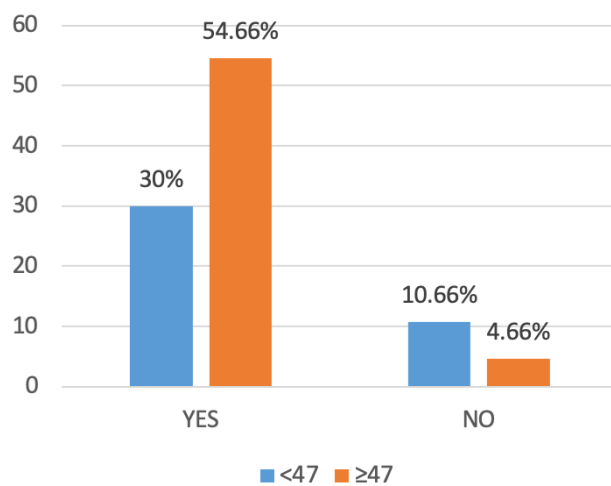## ASSOCIATION BETWEEN INTAKE OF GREEN AND YELLOW VEGETABLES AND MENOPAUSAL AGE

Figure 13 : Association between intake of green and yellow vegetables and menopausal age

Chi square = 9.39   p-value = 0.002167

There is significant association between consumption of carrot and green leafy vegetables and menopausal age.

Among the women who attained menopause ≥47 years, 54.66% consumed carrot and green leafy vegetables more than twice a week when compared to 4.66% who did not consume carrot and green leafy vegetables more than twice a week.

ASSOCIATION BETWEEN SUBJECTS MOTHER MENOPAUSAL AGE AND SUBJECTS MENOPAUSAL AGE
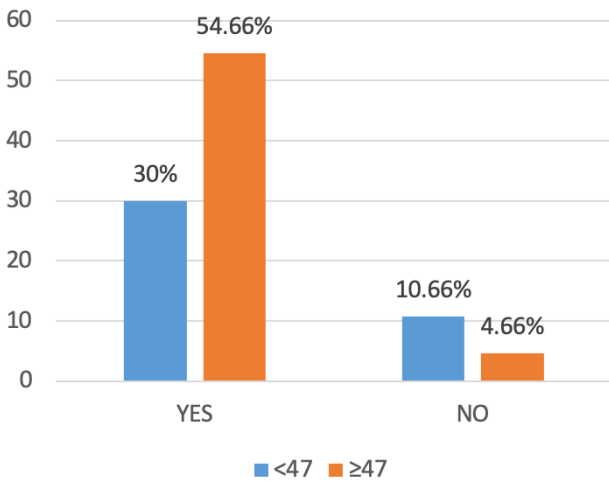

Figure 14 : Association between subject's mother menopausal age and subjects menopausal age

Chi-square = 65.84   p-value = <0.00001

There is significant association between subject's mother menopausal age and menopausal age of women under study.

Among the women who attained menopause ≥47 years, 57.33% subjects mother menopausal age is ≥47 years when compared to 2% whose subjects mother menopausal age <47years.
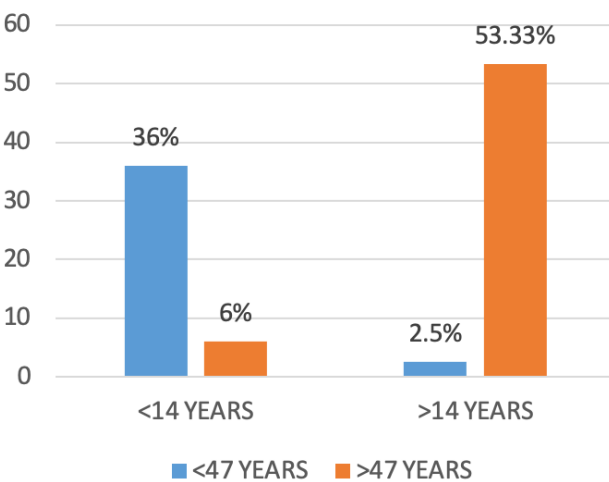
ASSOCIATION BETWEEN PUBERTAL AGE AND MENOPAUSAL AGE

Figure 15 : Association between pubertal age and menopausal age

Chi-square = 91.35   p-value = <0.00001

There is significant association between age at puberty and menopausal age.

Among the women who attained menopause ≥47 years, 53.33% attained puberty ≥14 years when compared to 6% who attained puberty <14 years.

ASSOCIATION BETWEEN AGE OF MARRIAGE AND MENOPAUSAL AGE
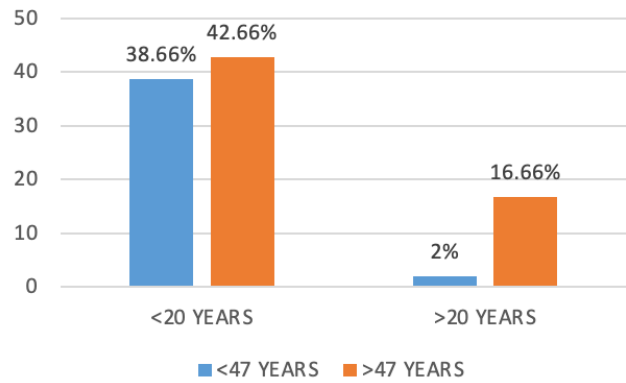

Figure 16 : Association between marital age and menopausal age

Chi-square = 12.8   p-value = 0.000347

There is significant association between age of marriage and menopausal age.

Among the women who attained menopause ≥47 years, 42.66% married within 20 years of age when compared to 16.66% who married after 20 years of age.

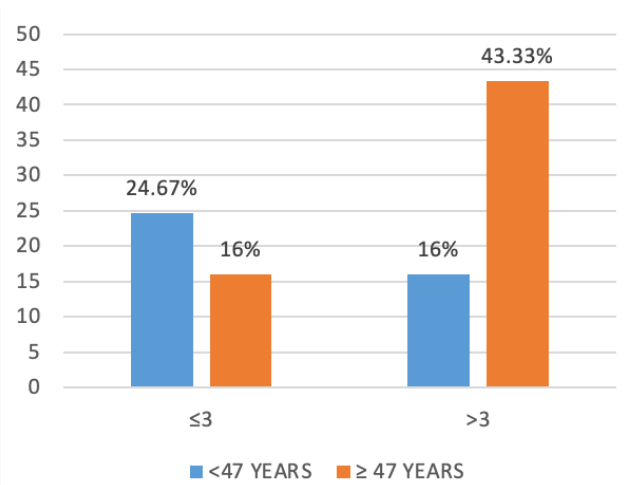## ASSOCIATION BETWEEN NUMBER OF CONCEPTIONS AND MENOPAUSAL AGE

Figure 17 : Association between number of conceptions and menopausal age

Chi-square =   17.02   p-value = 0.000037

There is significant association between number of conceptions and menopausal age.

Among the women who attained menopause ≥47 years, 43.33% had history of conceptions >3 when compared to 16% who had ≤3 conceptions.

DISCUSSION

The study was successfully carried out for a period of 4 months covering 150 women who have attained menopause within past 5 years and the following results were interpreted.

i) Mean menopausal age is found to be approximately 47years. In most of studies average age of menopause is between 47 to 52years. Average age of menopause in turkey is 47.4.[1] Average age of menopause in Iran is 47.6 years.[11] Average age of menopause in Puerto Rican women is 51.4years.[3] Average age of menopause in Greene county, New York is 50.1years.[9] Average age of menopause in UAE is 48 years.[12]

ii) 58.7% of women attained menopause at the normal menopausal age i.e. 47 to 53years.

iii) 54.66% of women consuming carrot and green leafy vegetables more than twice a week, attained menopause ≥47years.

iv) 71.33% of women who attained menopause ≥47 years was very similar to their mother's menopausal age. The studies (Oya Ozdemir et al, 2004, Rizk et al, 1998, Princci et al, 2016) indicated the presence of a positive correlation between the mothers' and the subjects' age at menopause.

v) 53.33% of women who attained puberty above 14 years, attained menopause ≥47 years. The study report by Oya Ozdemir et al, 2004 and Lin Li et al, 2012 also showed association between age of puberty and onset of menopause similar to our study.

vi) 42.66% of women who married before 20 years, attained menopause ≥47 years. Association between age of marriage and onset of menopause was not supported by any studies.

vii) 43.33% of women who had >3 conceptions, attained menopause ≥47 years. Association between number of conceptions and onset of menopause was also seen significant in Lin Li et al, 2012; Rizk et al, 1998; Sievert et al, 2001and Abdollahi et al, 2013.

From the study conducted, it is seen that fertility, menstrual and nutritional factors affect the age of onset of menopause; association of socio-economic factors with menopausal age is not significant.

CONCLUSION

• Consumption of carrot and green leafy vegetables prevents earlier menopause

• Mother's menopausal age equals the daughter's menopausal age.

• Later the age of puberty, later is the onset of menopause.

• Marriage between 18 and 20 years of age delays the onset of menopause.

• More the number of conceptions, later is the onset of menopause.

RECOMMENDATIONS

• Take carrot and green leafy vegetables more than twice a week.

• Efforts should be made to provide education about the menopause to all women in their respective communities, especially to those who are approaching their fifth decade to better prepare them for this change of life.

• Identifying menopausal age and its determining factors may modify the menopausal status of women and the management of peri-menopausal period

• Health problems should be detected and treated at an early stage. So regular health check-up is necessary.

LIMITATIONS

• The women, during their interview, were unable to recall their mother's menopausal age appropriately. So there is a recall bias.

• 150 women who were interviewed had not taken OCPs, which was coincidental, so the significance of OCPs over the menopausal age was not assessed.

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