Dietary Behaviors among Women with Osteoporosis at Merjan Teaching Hospital in Hilla City

السلوكيات الغذائية بين النساء المصابات بهشاشة العظام في مستشفى مرجان التعليمي في مدينة الحلة

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المستخلص:

الهدف : تقييم الخصائص الاجتماعية والإنجابية ،و السلوكيات الغذائية الصحية بين النساء المصابات بالهشاشة ،تحديد العلاقة بين الخصائص الاجتماعية ، والإنجابية والسلوكيات الغذائية.

المنهجية : اجريت دراسة وصفية تحليلية على عينة غير احتمالية (غرضيه) من (90) امرأة تعاني من الهشاشة حضرت إلى وحدة DEXA في مستشفى مرجان التعليمي في مدينة الحلة ، استخدمت الاستبانة كأداة لجمع البيانات، و تتكون من ثلاثة اجزاء الخصائص الاجتماعية ، الإنجابية ، السلوكيات الغذائية الصحية . للفترة من 9 شباط -20 نيسان 2014 تم إجراء الدراسة الاستطلاعية لاختبار ثبات الاستبانة وجرى صدق المحتوى من خلال (19) خبير واستخدام الإحصاء الوصفي والاستدلالي في تحليل البيانات.

النتائج: أظهرت نتائج الدراسة أن (36.7٪) من النساء معدل أعمارهن بين (50-59) سنة و (44.4٪) لايعرفن القراءة والكتابة و (74.4٪) ربات بيوت و(60٪) مقيمات في المدينة و (52.2٪) ضمن مستوى اقتصادي واطئ و(22.2٪) تعاني من زيادة في الوزن وهذا حسب مؤشر كتلة الجسم و(60٪) يعانون من السمنة المفرطة في فئات مختلفة ، بالنسبة للمعلومات الإنجابية، (58.9٪) اول حيض كان بعمر (11 -12) عاما ، (49.3٪) بلغن سن مابعد الانجاب عند(45-49) سنة ، (36.6٪) عدد مرات الحمل(7-9)، (39٪) عدد مرات الولادة (4-6) ، (67.1٪) أرضعت طفلها من الثدي ، (53.7٪) استعملن الموانع الهرمونية.و هناك علاقة معنوية بين السلوكيات الغذائية والخصائص الاجتماعية في مهنة المرأة والحالة الاقتصادية (P≤ 0.05).

التوصيات : أوصت الدراسة بعمل برامج تعليمية في وقت مبكر في سن المراهقة للحصول على ذروة الكتلة العظمية، والتثقيف الصحي لجميع النساء حول هشاشة العظام والوقاية منه من خلال التغذية والتمارين الرياضية، وتشجيع للنساء اللواتي لديهن عوامل خطر أو في سن الخمسين للقيام بفحص DEXA .

Abstract

Objectives: to assess Socio Demographic, Reproductive Characteristics, and healthy dietary behaviors. among women with osteoporosis . To determine the relationship between the socio demographic characteristics, reproductive data and dietary related behaviors.

Methodology: A descriptive analytic design was conducted on Non- Probability (purposive sample) of (90) women who have suffering from osteoporosis attend to (DEXADual-Energy X-ray Absorptiometry) unit in Merjan Teaching Hospital in Hilla City. A questionnaire has been used as a tool of data collection and consists of three part ;including : Socio Demographic, Reproductive Characteristics, and dietary behaviors, for the period of 9th of February to April 20th 2014.A pilot study has been carried out to test the reliability of the questionnaire and content validity has been carried out through the (19)experts. Descriptive and inferential statistical analyses are used to analyze the data .

Results: The results of the study reveal that (36.7%) of women aged (50 - 59) years with **Mean ± SD(52.46 ± 11.70)**,(44.4%) were not read and write ; Not employed were(74.4%); (60%)their resident in urban; (52.2%) low socio economic status , (22.2%) were in overweight and (60%) obese in different classes. And concerning reproductive information (58.9%)their age of menarche (11-12) years , (49.3%) their age at menopause (45-49)years,(36.6%)having (7-9)times of pregnancy, (39%)having (4-6) time of deliveries and (67.1%) with breast feeding and (53.7%) use hormonal contraceptive. . There is significant relationship P≤ 0.05 between dietary behaviors and socio demographic characteristics in women occupation and socio economic status.

Recommendations: Implement educational programs as early as in adolescence to obtain peak bone mass, health education to all women about the osteoporosis and its prevention through nutrition and exercise, and encourage the women who has any risk factors or at age of 50 years old to do Dexa examination .

Key words: Osteoporosis , Dietary behaviors, DEXA, Menopause, BMI.

Introduction:

Osteoporosis is major public health problem affecting one in three women over the age of fifty. Decreased bone density associated with osteoporosis makes bones brittle, and spinal fractures affect one in every three women, wrist and hip fractures affect one in every six, This leads to rapid deterioration in health and often death. The older women's league reports that 90% of hip fractures are due to osteoporosis. Half of the women who suffer hip fractures lose the ability to walk independently and up to one third become totally dependent [(1)].

The World Health Organization defines osteoporosis as a body mass density (BMD) at the hip or spine that is less than or equal to 2.5 standard deviations below the young normal mean reference population [(2)].

Methodology:

A descriptive analytic design was conducted on non- probability (purposive sample) of (90) women who have suffering from osteoporosis attend to DEXA unit in Merjan Teaching Hospital in Hilla City. A questionnaire has been used as a tool of data collection for the period 0f 9th of February to April 20th 2014 and consists of three part ; including: Socio Demographic (4)items, economic Status (5) items, reproductive characteristics (6 items), causes and predisposing factors of osteoporosis include (BMI) finally dietary behaviors which consist of (12) items. These items are rated according to three level likert scale (always ,sometimes , never)and scored (3,2,1)[(3)]..Pilot study was carried out between(1st February 2013, to 8 th February 2014),on (10)women who have osteoporosis attend to DEXA unit in Merjan Teaching Hospital in Hilla City .

and content validity was carried out through 19 experts. Descriptive and inferential statistical analyses were used to analyze the data. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 10.). Reliability Coefficient for the pilot study were calculated by the following formula :

$$\text{Actual value} = 1 - \frac{\text{no. of non coincidences items}}{\text{no. of all items} * \text{sample size of pilot study}} * 100$$

Table (1):Reliability Coefficient of the Pilot Study

Reliability Coefficients	Actual values
Inter Examiners	**0.96** (12:320)
intra examiner	**0.95** (17:320)

Results:

Table (2): Distribution of Socio Demographic Characteristics of (90)Women with Osteoporosis .

Variables	Groups	F.	%	Cum. Percent
Age	< 20	2	2.2	2.2
	20 - 29	2	2.2	4.4
	30 - 39	8	8.9	13.3
	40 - 49	14	15.6	28.9
	50 - 59	33	36.7	65.6
	60 - 69	26	28.9	94.4
	70 >	5	5.6	100
	Mean ± SD	52.46 ± 11.70		
Educational level	Illiterate	40	44.4	44.4
	Read – write	3	3.3	47.8
	Primary	10	11.1	58.9
	Secondary	18	20	78.9
	Institute & College	19	21.1	100
Occupation	Employed	23	25.6	25.6
	Not employed	67	74.4	100
Residency	Urban	54	60	60
	Rural	36	40	100

F. =Frequency %=Percentage Cum. Percent= Cumulative Percent

Table (1) shows the highest percentage (36.7%) of the sample were at the age (50 – 69) yrs., with mean age and standard deviation (52.46 ± 11.70).The highest percentage (44.4%) were illustrated low levels of education. The highest percentage (74.4%) of the sample was housewives. The highest percentage (60%) of the sample was urban resident.

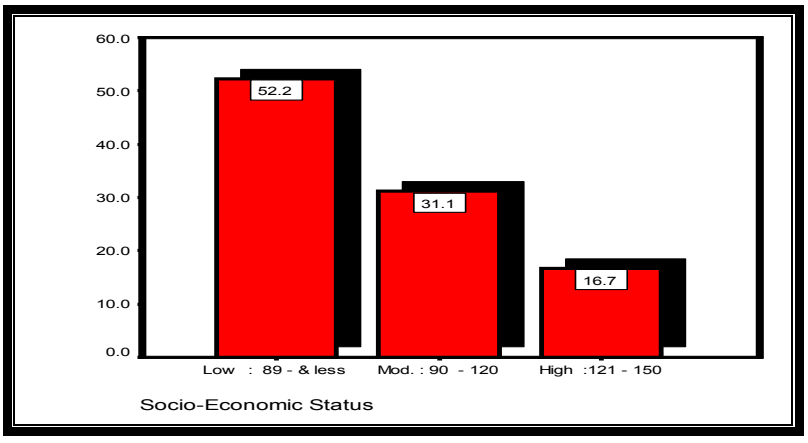

Figure (1): Bar Chart for the Socioeconomic Status of the Studied Sample

Figure (1) The highest percentage (52.2%) of the study sample is within low socioeconomic status and (31.1%) within moderate status, and (16.7%) within high socioeconomic status.

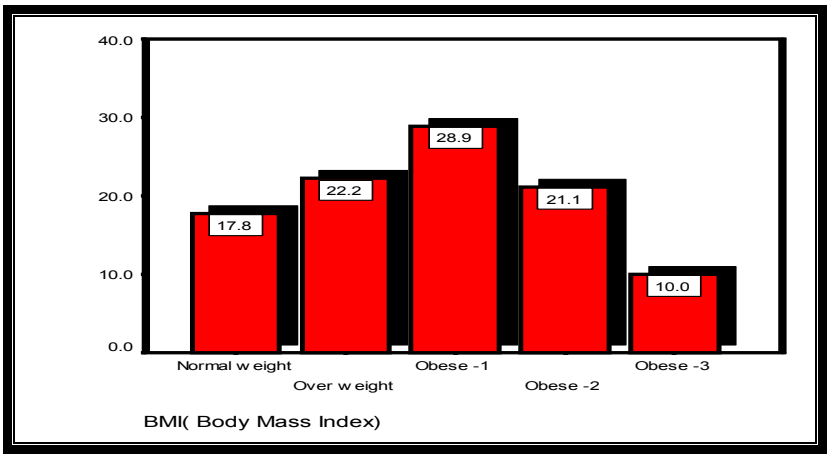

Figure (2): Bar Charts for the distribution of the Percentages of the Observed Frequencies of Body Mass Index

Figure (2) shows The highest percentage (28.9%) of the study samples is within obesities groups, then followed within overweight group, (22.2%) and the remaining within normal group (17.8%).

Table (3): Distribution of Reproductive Information variables

Reproductive Variables	Groups	F.	%	Cum. Percent
Age at Menarche	11 - 12	53	58.9	58.9
	13 - 14	28	31.1	90
	15 - 16	9	10	100
	Total	90	100	--
Age at Menopause	< 40	4	5.6	5.6
	40 - 44	14	19.7	25.4
	45 - 49	35	49.3	74.6
	50 >	18	25.4	100
	Total	71	100	-
Gravidity	1 - 3	15	18.3	18.3
	4 - 6	23	28	46.3
	7 - 9	30	36.6	82.9
	10 - 12	10	12.2	95.1
	13 - 15	4	4.9	100
	Total	82	100	-
Parity	1 - 3	24	29.3	29.3
	4 - 6	32	39	68.3
	7 - 9	18	22	90.2
	10 - 12	8	9.8	100
	Total	82	100	-
Previous Breast Feeding	Yes	55	67.1	67.1
	No	27	32.9	100
	Total	82	100	-
Use Hormonal Contraceptive (pills or injection)	Yes	44	53.7	53.7
	No	38	46.3	100
	Total	82	100	-

F.=Frequency, %=Percentage, Cum .Percent=Cumulative Percent

Table (2) shows the highest percentage (58.9%) of study samples their age at Menarche", were (11 – 12) years, (49.3%) of study samples their Age at Menopause were (45 – 49) years,

(36.6%) within gravidity (7 - 9) pregnancies, (39.0%) within (4 - 6) deliveries, (67.1%) within breast feeding previously, and (53.7%) use hormonal contraceptive.

Table (4):Distribution of the studied responding of Dietary Behaviors among Women with Osteoporosis with comparison significant

Dietary Behaviors	Scoring Levels	No.	%	MS	SD	RS	Ass.
Drinking milk or yogurt (3cups)/Day	Never	35	38.9	1.88	0.8	62.7	F
	Sometimes	31	34.4				
	Always	24	26.7				
Eating dairy derivatives (cheeses and other)	Never	11	12.2	2.03	0.53	67.7	P
	Sometimes	65	72.2				
	Always	14	15.6				
Avoid Soft drinks	Never	23	25.6	2.16	0.81	72.0	P
	Sometimes	30	33.3				
	Always	37	41.1				
Avoid red meat	Never	14	15.6	2.16	0.67	72.0	P
	Sometimes	48	53.3				
	Always	28	31.1				
Avoid fast food	Never	8	8.9	2.53	0.66	84.3	P
	Sometimes	26	28.9				
	Always	56	62.2				
Avoid salty food & pickles	Never	28	31.1	1.98	0.78	66.0	F
	Sometimes	36	40.0				
	Always	26	28.9				
Eating fruits	Never	5	5.6	2.48	0.6	82.7	P
	Sometimes	37	41.1				
	Always	48	53.3				
Avoid smoking	Never	10	11.1	2.48	0.69	82.7	P
	Sometimes	27	30.0				
	Always	53	58.9				
Eating vegetables (dark leaves)	Never	4	4.4	2.54	0.58	84.7	P
	Sometimes	33	36.7				
	Always	53	58.9				
Eating Nuts as Almond and Walnuts	Never	31	34.4	1.8	0.67	60.0	F
	Sometimes	46	51.1				
	Always	13	14.4				
Taking medical plants soy intake, Ginseng	Never	90	100	1.0	0.0	33.3	F
	Sometimes	0	0.0				
	Always	0	0.0				
Avoid tea or coffee	Never	44	48.9	1.56	0.58	52.0	F
	Sometimes	42	46.7				
	Always	4	4.4				

MS=Mean of Scores, **SD**=Standard deviation; **RS**=Relative sufficiency, Ass: Assessment, P=pass assessment; F= failure assessment, No.: Number, % percent

Table (4) shows the highest percentage (**38.9**%) of study samples **Never Drinking milk or yogurt (3cups)/Day . (72.2%)** of study samples were **Sometimes Eating dairy derivatives (cheeses and other**), (**41.1%)** of study samples were **Always Avoid Soft drinks**, (**53.3**%) of study samples were **Sometimes Avoid red meat** ,(**62.2**%) of study samples were **Always Avoid fast food**, (**40.0**%) of study samples were **Sometimes Avoid salty food & pickles**, (**53.3**%) of study samples were **Always Eating fruits** ,(**58.9**%) of study samples were **Always Avoid smoking**, (**58.9**%) of study samples were **Always Eating vegetables(dark leaves**), (**51.1%)** of study samples were **Sometimes Eating Nuts as Almond and Walnuts** , **(100**%) of study samples were **Taking medical plants soy intake, Ginseng** , **(48.9**%) of study

samples were **Never Avoid tea or coffee** . subjects responses of dietary behaviors among women with Osteoporosis, some of items were reported failure assessment, such as (drinking milk or yogurt (3cups)/day, avoid salty food & pickles, eating nuts as almond and walnuts, taking medical plants soy intake, ginseng, and avoid tea or coffee), and they are accounted 5(41.67%) items, while the left over items were reported pass assessments. In addition to that, some of pass assessments are registered close to critical cutoff point, and that indicating a large fading are concerned with women's behaviors related with their dietary indeed .

Table (5):Summary Statistics of the studied responding of Dietary Behaviors among Women with Osteoporosis

Health Behaviors	No.	Min.	Max.	GMS	SD	RS	Ass.
Dietary Behaviors	90	1.50	2.58	2.049	0.236	68.3	Mod.

No.: Number, Min: Minimum, Max: mum, SD SD=Standard deviation; RS=Relative sufficiency, Ass: Assessment,

Table (5) shows the summarizes of the subjects at the dietary behavior responses through calculating minimum, maximum mean of score, grand mean of score (G.M.S.), standard deviation (SD), relative sufficiency (RS), and scoring by (Bad, Moderate, and Good) through the intervals ("33.33 - 55.54", "55.55 - 77.76", and "77.77 - 100") respectively, and that dietary part reported moderate level of assessment .

Table (6): Relationships for Healthy Dietary Behavior Factors and Demographical Characteristics variables

Demographical Characteristics variables	Dietary Behaviors		
	C.C.	Sig.	C.S.
Age Groups	0.139	0.940	NS
Educational level	0.246	0.213	SN
Occupation	0.265	0.000	SH
Residency	0.131	0.211	SN
Socio-Economic Status	0.296	0.013	S

HS: Highly Significant. S: Sig. at P<0.05; NS: Non Sig., C.S: comparative significant C.C.: Contingency Coefficients

Table (6) shows regarding to the relationship between women's dietary behaviors and socio-demographic characteristics variables, the results has reported high significant (p: **0.000)** relationship with occupation and significant (p: **0.013)** with socioeconomic status, since significant correlation ships were obtained in at least at P<0.05, while non significant relationship has obtained with age group, educational level, and residency).

Table (7): Relationship between Reproductive Information Variables and Dietary Behaviors

Reproductive Information variables	Dietary Behaviors		
	C.C.	Sig.	C.S.
Age at Menarche	0.054	0.878	NS
Age at Menopause	0.140	0.700	SN
Gravidity	0.108	0.914	SN
Parity	0.120	0.751	SN
Previous Breast Feeding	0.042	0.701	SN
Use Hormonal Contraceptive	0.008	0.941	SN

HS: Highly Significant. S: Significant. at P<0.05; NS: Not Significant, C.S: comparative significant C.C.: Contingency Coefficients

Table (7) shows regarding to the relationship between women's dietary behaviors and reproductive variables , the results has reported no significant relationships were obtained at P>0.05 between reproductive variables with age at menarche, age at menopause , gravidity, parity, previous breast feeding , and the use of hormonal contraceptive and dietary behaviors.

Discussion :

Socio Demographic Characteristics:

Age: The present study has reported that the highest percentage (36.7%) of the study sample is at age group ranged (50 - 59) years old with mean age and standard deviation (52.46 ± 11.70) as shown in table (2) .This finding is consistent with studies done in the North America it was estimated that 1 in 3 women over the age of 50 worldwide have osteoporosis [(4)] . demonstrated a significant correlation between age and osteoporosis p<0.001,as the age increases, osteoporotic cases increase[(5)].

Educational level: The highest percentage (44.4%)of study sample was illiterate as shown in table (2). This finding is consistent with studies in Palestine- Nablus in a comparative study, stated that illiterate women were higher risk of developing osteoporosis than school educated [(6)]**.** The same as in the present study which indicated that that illiterate women have lack of awareness to the risk factors regarding osteoporosis than those of educated ones. The majority of the study sample housewives and they were estimated (74.4%) of the total sample. The prevalence of osteoporosis among housewives was significantly higher than others, OR= 2.041(CI=1.19, 3.50) [(7)]. The majority of the osteoporosis among women which was represented in urban residency, and estimated (60%) of the total sample ,while the rural were (40%)of them. A comparative study reported that the majority of the osteoporosis (18.2%) were from urban areas, while the rest (9.2%) were from the rural areas [(8)].

Socio-Economic Status The present study in figure (1) shows that the highest percentage (52.2%) of the study sample is

within low socioeconomic status. The results consistent with the results of, Farahmand & colleagues (2000) who found in their study that low income levels and unemployment have been associated with a greater risk of hip fracture[9]. also agree with Navarro, (2009) who assess the possible association between poverty and osteoporosis and/or fragility fractures in a population of postmenopausal women, they found that postmenopausal women with low SES had lower values of BMD at the lumbar spine, a higher prevalence of densitometry osteoporosis, and a higher prevalence of total and vertebral fractures[10].

Body Mass Index: The highest percentage (60%) of the study sample is within obesity groups, then followed within overweight group (22.2%) and the remaining within normal group (17.8%) as shown in Fig. (2) . A study result shows that overweight/ obesity and underweight are both risk factors for fractures at different sites[11].

Reproductive Information:

The results of the study shows that the highest percentage(58.9%) of women with osteoporosis their age at menarche were at (11-12)years. Astudy indicates that age at menarche may have a long-term association with fracture risk, with effects lasting into the postmenopausal years[12]. The present study was consistent with study that stated the findings 15.7% of osteoporotic women reported age at menarche at < 13 years compared to 4.4% at age ≥ 13 years[5]. Relative to age at menopause the highest percentage (49.3%)were at age of (45-49)years. The current study was in agreement with the study results in Babylon that indicates (34.3%) of osteoporosis were female at menopause[13]. His found that menopause is a major risk factor for osteoporosis. The incidence of fractures increases by about 40% with menopause in developing countries[14]

Regarding to pregnancies the highest percentage (36.6%) of study sample have (7-9) pregnancies , this results agree with His found that osteoporosis and osteopenia are common among postmenopausal Saudi Arabian women, the causative factors are pregnancy[15]. Black & others (2000) showed that markers of bone re-sorption increased gradually during normal pregnancy through the 28th week, whereas markers of bone formation remained stable through the 28th week, and then increased markedly by the 36th week[16] . Regarding to parity the highest percentage (39%) having (4-6)deliveries , this results consistent with , A study stated that parity of more than 3 was shown as risk factor in both populations and it remained significant (P < 0.05) in osteoporotic Iranian and Indian women[17]**.** (67.1%) of them within breast feeding , the present study consistent with results of a study that found lactation for more than six months was associated with increased risk of osteoporosis[18] .

The results of the present study show (53.7%) using hormonal contraceptive as shown in table (3). This results agree with, Prior & other (2001), study reported positive and negative effects on bone mineral density (BMD) have been described as a result of the premenopausal use of oral contraceptives (OCs)[19] . No significant association were found between dietary behaviors and reproductive information at (P < 0.05) table 7.

Dietary Behaviors:

The study results in Table (4) show that some item were reported failure assessment in items (Drinking milk or yogurt (3cups) / Day, Avoid salty food and pickles, Eating Nuts as Almond and Walnuts, Avoid tea or coffee),which considered important in the prevention or reduction of osteoporosis, while other items gives pass assessment with high mean scores and RS, with high significant association among all items except in avoid soft drinks & smoking . Numerous studies provide evidence of a positive relationship between dietary calcium intake and BMD. Calcium absorption decline with age therefore ,recommendations for dietary intake of calcium are higher for adults age[20]. Adequate dietary calcium is essential for building denser ,stronger bones in the first three decades of life and for slowing the rates of bone loss in later years[21] .

Regarding Avoid Soft drinks: Libuda & others (2008),in their study reported that long-term consumption of caffeinated and un caffeinated soft drinks appears to have bone catabolic effects in girls. This effect is mainly mediated by the negative association with total protein intake and is not primarily based on milk[22]. Some studies indicate soft drinks (many of which contain phosphoric acid) may increase risk of osteoporosis, at least in women–others suggest soft drinks may displace calcium containing drinks from the diet rather than directly causing osteoporosis [23]**.**

Regarding Avoid red meat: Sellmeyer & colleagues ,2001) reported that animal protein appear to have a different effect on bone health than vegetable protein[24] . In study examining the ratio of animal vegetable protein intake in 9704 elderly white women concluded that an increase in vegetable protein intake and a decrease in animal protein intake reduced bone loss. In addition high dietary protein has found an association between diets high in animal protein and increased urinary calcium, and have been linked to an increase in fractures[25].

Regarding Avoid fast food: In a case – control study assessing an elderly Mediterranean population ,the researcher found that a high intake of polyunsaturated fat was associated with a higher risk of osteoporotic fractures[26].

Regarding Avoid Salty Food & Pickles: Astudy ,stated that high sodium intake also contributes to lower renal re-sorption of calcium and higher urinary calcium losses. Sodium causes an increase in renal calcium excretion. The mean urinary calcium loss is 1 mmol per 100 mmol sodium, If absorbed calcium is less than the amount needed to offset these obligatory calcium losses that are related to sodium intake, then bone mass will be negatively impacted[27].

Regarding Eating Vegetables and Fruits: Fruits and vegetables are key dietary sources of magnesium, potassium, vitamin C, vitamin K and foliate, adequate quantities of which have been associated with higher bone mineral density (BMD), de-creased bone loss with ageing or reduced risk of fracture[28].

Regarding Avoid smoking: Smoking also increases the risk of osteoporotic fractures. Studies of nearly 60,000 people in Canada, U.S.A., Europe, Australia and Japan show that smoking increases the risk of hip fracture by up to 1.5 times. Although the risk of fracture from smoking increases with age, cigarette smoke has an early effect on bones[29].

Regarding Eating Nuts as Almond and Walnuts: A study stated that regular

consumption of almonds, appeared to be significant protective factors in India against osteoporosis. Walnuts are high in beneficial omega-3 fatty acids, which are known to help prevent the type of bone loss that comes with aging , at the same time, the protein found in walnuts helps to build muscle, which is associated with stronger bones [17, 30].

Regarding the Avoid of Tea or Coffee: Common concern related to caffeine consumption is its potential effect on bone health. Because caffeine increases urine production, calcium, which is a component of the fluid, is lost. There is some evidence showing that caffeine, and specifically intake of caffeinated beverages, increases the amount of calcium lost in urine. This effect, however, has mainly been observed in postmenopausal women who consumed high amounts of caffeine over time [31].

Recommendations:

1- Educational programs as early as in adolescence to obtain peak bone mass.

2-Health education to all women about the osteoporosis and its prevention through nutrition and exercise.

3- Engorgement to women who has any risk factors or at age of 50 years old to do Dexa examination**.**

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