Faculty of Home Economics

Nutrition and Food Sciences

Article Type
Original Article

Author Affiliation:

[1] Department of Nutrition and Food Sciences, Faculty of Home Economics, Menoufia University, Shibin El Kom, Egypt
[2] Consultant Orthopedic Surgery, AL Haram Hospital, Ministry of Health, Giza, Egypt

Corresponding author:
Heba Abd El Zaher
hebasaad356@gmail. com
Mobile: +2 01025529810

Study Osteoporosis among Women and its Relationship to the Nutritional Status

Authors
Nehad El-tahan[1], Hosam El-Din Abd El latif[2], Heba Abd El Zaher[1]

Abstract:

This study aimed to study the relationship between bone status and nutritional parameters. One hundred women with osteoporosis were divided into two groups according to their ages; a group was between 31-50 (48 members), and a group was between the range of 51-60 (52 members). Data of research was collected through a questionnaire. The anthropometric measurement (including weight, height, and BMI), food habits, and health status were determined. The results showed that. The total number of samples was married, the higher percentage of the study sample from urban, the education status recorded the highest percentage of the sample was in reads and writes. Most of the samples had more pregnancies (2, 3, 4, and 5), the menopause period was before the age of 40, and suffering from obesity with not playing sports. Protein, fiber, calcium, magnesium, and vitamins (C, B1, B2, and D) were lower in both groups when compared with DRI, while Zinc and vitamin A were decreased in the first group as compared with DRI and were lower than the second group. The other nutrients in both groups were higher than DRI. There were significant changes between both groups in hemoglobin, serum bone-specific alkaline phosphatase, serum calcium, phosphorus, urinary calcium, and creatinine, while there is no significant between both groups for the other medical analysis. So, women must pay attention to consuming calcium-rich foods with increasing physical activity to promote optimal bone formation, especially in the early stages of their lives.

Introduction

Osteoporosis is a disease that affects many millions of people around the world, is a health condition that weakens bones, making them fragile and more likely to break. It develops slowly over several years and is often only diagnosed when a fall or sudden impact causes a bone to break (fracture) [1].The trouble is osteoporosis is a "silent disease ,"because there are no symptoms prior to a fracture.The most common injuries in people with osteoporosis are broken wrist and broken hip [2]. Osteoporotic bone breaks are most likely to occur in the hip, spine or wrist, but other bones can break too. In addition to causing permanent pain, osteoporosis causes some patients to lose height. Osteoporosis is more likely to occur in people who have older age, gender, and endocrine disorders as estrogen deficiencies in Women. Women typically suffer estrogen deficiencies during perimenopause and menopause, genetics, and ethnicity are associated with osteoporosis. Also, reduced sunlight exposure, environmental factors, dietary conditions as calcium deficiencies (low calcium intake), and a lifelong lack of calcium plays a role in the development of osteoporosis. Low calcium intake contributes to diminished bone density, early bone loss and an increased risk of fractures, poor living habits [3] [4]. Good nutrition and regular exercise are essential for keeping bones healthy throughout life. Women between the ages of 18 and 50 need 1,000 milligrams of calcium a day. This daily amount increases to 1,200 milligrams when women turn 50 and men turn 70. Vitamin D improves the body's ability to absorb calcium and improves bone health. Maintaining a healthy lifestyle can reduce the degree of bone loss [5] [6] [7]. Therefore, in this research, it aimed to investigate the bone status of women and its relationship to the nutritional status and other factors

Subjects and methods
Subjects
A total 100 women with osteoporosis enrolled in this study. The polytheists were among the visitors to the orthopedic clinic at Tamiya Central Hospital in Fayoum. Participants divided into two groups of females according their age, one group was between the range of 31-50 (48 members) and the other group was between the ranges of 51-60 (52 members). All women who were non-pregnant, non-lactating residing in Fayoum. The present study started in January 2020 and ended in January 2021.
Methods
The instrument of this study consisted of a structured interviewing questionnaire: Interviews were held with the patients using questionnaire sheet that were designed to collect data concerned about food habits, and anthropometric measurements as follows: The first one was for 24 hours' recall, the second one was for social data which include demographic data as age, sex, education level, and income. The third one for anthropometric measurements. The fourth sheet includes food habits it includes. Number of meals per day, what are the main meals, all the characteristics related to food habits. The fifth one is used for collected data about healthy status.
Socio-economic

The socio-economic data include education level; total income sources foods were collected by questionnaire through an interview.

Daily dietary data Dietary intakes of energy, proteins and other nutrients will be assessed by the 24-h recall method, which is a well-established tool. Long-term calcium intake was assessed using the Food Frequency Questionnaire (FFQ) method [8].

Anthropometric measurements

It contains weight, and height according to [9].Body Mass Index (BMI) was obtained by calculating weight in kilograms/square height in meters (kg/m2). In the case of the body mass index was greater than 27 and underweight lower than 16 [10].

Health History

Health history include current health complaints and disease, and history of disease were collected chronic illnesses, and reproductive history including the number of children, duration of breast feeding, menopausal status and age at menopause.

Food Habits

Information about food habits of studied persons were collected during an interview with the patients and including method of meals cooking, number of daily meals, drinks, fruit, type of fat used, salt, sugar preference and source of nutritional information

Laboratory analysis

A fasting blood sample was collected and estimated for hemoglobin, serum protein, serum albumin, serum bone specific alkaline phosphatase were determined according to the methods of [11] [12] [13] [14].

Respectively. The serum calcium, phosphorus, and zinc were carried out by the method of [15]. While Urinary calcium and creatinine were estimated by the methods of [16] [17].

Statistical analysis

Means and standard deviations of each variable were calculated. Frequency distribution and percentage of nutrients consumption of the sample compared to the RDA was done. Frequency distribution and percentage of anthropometric measurements of sample compared to the standard was also done. The data was computerized according to SPSS program [18].

Results and Discussion

Data given in table (1) presented the percentage distribution of the osteoporosis women according to marital status, it could be noticed that the total number of samples was in married (84.62%), (83.33%) for females age (51-60) and (31-50) respectively. For the residence, the higher percentage of the study sample from urban (68.75%), (67.31%) for females age (31-50) and (51-60) respectively. where the minority were from rural, it was (31.25%), (32.69%) for females age (31-50) and (51-60) respectively. From the same table, it was found that the education status recorded the highest percentage of sample was in reads and writes 73.08% for Females age (51-60) and 70.84% for females age (31-50) on the other hand, the secondary recorded 25%for females age (31-50) and 23.08% for Females age (51-60) while for university education were (4.16%), (3.84%) for females age (31-50) and (51-60) respectively. Socioeconomic status (SES) has been reported to be associated with a variety

of both acute and chronic diseases. Recent studies suggest that a relationship may exist between SES and osteoporosis it was reported that lower education and/or income were associated with lower BMD in elderly [19].

Table (1): Percentage distribution of social status for osteoporosis women.

Social status		Females Age (31-50) (n=48		Females Age (51-60) (n=52)	
		Frequency	percent	Frequency	Percent
Marital Status	Single	3	6.25%	2	3.85%
	Married	40	83.33%	44	84.62%
	Widower	5	10.42%	6	11.53%
Residence	Rural	15	31.25%	17	32.69%
	Urban	33	68.75%	35	67.31%
Education	Reads and writes	34	70.84%	38	73.08%
	Secondary	12	25%	12	23.08%
	University	2	4.16%	2	3.84%

The results of table (2) healthy status for patient with osteoporosis. it was suffering in a constipation It was found that increased of the female's age (31-50) and age (51-60), it was (95.83%), (94.23%) respectively. as well as the increase in pregnancies 2, 3, 4 and 5, and the percentages were (4.16%), (41.67%), (41.67%) and (12.5%) of the females age (31-50), also the percentages were (5.77%), (32.69%), (48.08%) and (13.46%) Females age (51-60) respectively. Regarding the menopause period, before the age of 40, an increase (77.08%) was found Females age (31-50) as well as (76.92%) Females age (51-60). Has been found (52.08%) Females age (31-50) it was suffering Obesity and (67.30%) Females age (51-60) it was suffering Obesity also. When asked about play sports it could be noticed that the total number of samples was in no play sports 100% for females age (31-50) and age (51-60). This result indicates a distortion in bone health behavior, as well as a lack of proper osteoporosis education and instruction from healthcare providers. Some systemic conditions such as cardiovascular disease, diabetes mellitus, preterm birth, respiratory disease and systemic infections are related to osteoporosis [20].

Table (2): Healthy status for patient with osteoporosis.

Health Status		Patient Age (31-50) (n=48)		Patient Age (51-60) (n=52)	
		Frequency	percent	Frequency	Percent
How many pregnancies	2	2	4.16%	3	5.77%
	3	20	41.67%	17	32.69%
	4	20	41.67%	25	48.08%
	5	6	12.5%	7	13.46%
Do you suffer in a constipation	Yes	46	95.83%	49	94.23%
	No	2	4.17%	3	5.77%
Menopause	Before the age of 40	37	77.08%	40	76.92%

Health Status		Patient Age (31-50) (n=48)		Patient Age (51-60) (n=52)	
		Frequency	percent	Frequency	Percent
	After the age of 40	11	22.92%	12	23.08%
Is it hereditary?	Yes	30	62.5%	32	61.54%
	No	18	37.5%	20	38.46%
	Obesity	25	52.08%	35	67.30%
	Diabetes	5	10.42%	10	19.23%
Are you suffering from	Heart	4	8.33%	2	3.85%
	Kidney	2	4.17%	0	0
	Other disease	12	25%	5	9.62%
Do you play sports	Yes	0	0	0	0
	No	48	100%	52	100%

Table (3) shows that the anthropometric measurements for women. It could be found that there were significant differences between the both groups in height, weight and BMI. From the results, BMI was about 36 kg/m² for the first group and about 38 kg/m² for the second group and this mean according to [21] who showed that BMI is most commonly used to measure body fatness and they reported that overweight (not obese), if BMI is 25.0 to 29.9. Class 1 (low-risk) obesity, if BMI is 30.0 to 34.9. Class 2 (moderate-risk) obesity, if BMI is 35.0 to 39.9. Class 3 (high-risk) obesity, if BMI is equal to or greater than 40.0. Some earlier studies have shown that excess adipose tissue may not protect against fracture. Adipocytes and osteoblasts originate from a common progenitor, pluripotential mesenchymal stromal cells, and their differentiation is regulated through the peroxisome proliferator-activated receptor (PPAR)-γ pathway [22].2.72

Table (3): Anthropometric Measurements for patient with osteoporosis.

Anthropometric Measurements	Patient Age (31-50) (n=48)	Patient Age (51-60) (n=52)
Height (cm)	156.88 ±7.22 [b]	164.76 ±3.21 [a]
Weight (kg)	94.64 ±8.39 [b]	103.76 ±10.35 [a]
BMI(kg/m²)	36.97 ±7.43 [b]	38.15 ±7.08 [a]

Values are mean ± SD. Means under the same row bearing different superscript letters are different significantly (p<0.05).

The results of table (4) reported that food habits for the bone status. In connection with main meal, the main meal was dinner which recorded (66.66%), (65.39%) for females age (31-50) and females age (51-60) respectively. 35.42% and 34.62% for females age (31-50) and females age (51-60) respectively were eating fruit. With regard to drink milk the higher percentage of the study sample from (87.5%), (86.54%) for females age (31-50) and females age (51-60) respectively wasn't drinking milk. Studies investigating the association between dairy intake and the risk of low BMD in adults. One study observed a 1.7–3% lower hip BMD in young and postmenopausal women with lower milk intake during childhood and

adolescence. A second study described a positive relationship between baseline milk consumption and milk combined with yogurt or cheese and the percentage of trochanter BMD change, but only in vitamin D–supplemented women. The last study showed a positive correlation when the baseline milk intake and BMD at the radius were studied in women aged >65 y. Also, a positive association between the consumption of milk during infancy and adolescence and hip BMD in adulthood and between the intake of milk after 65 y of age and BMD change at the radius [24][25] [26]. Studies have shown that over the past four decades, consumption of food eaten away from home has also risen alarmingly. It is well known that eating out may lead to low calcium intake and increases the risk of osteoporosis because of large portion sizes and increased energy density of foods [23].

Table (4): Food habits for patient with osteoporosis.

Food habits		Age (31-50) (n=48)		Age (51-60) (n=52)	
		Frequency	Percent	Frequency	Percent
The main meal	Breakfast	2	4.17%	3	5.77%
	Lunch	14	29.17%	15	28.84%
	Dinner	32	66.66%	34	65.39%
How many times a week do you fish	0	29	60.42%	31	59.61%
	1	15	31.25%	15	28.85%
	2	4	8.33%	6	11.54%
Do you eat fruit	Yes	17	35.42%	18	34.62%
	No	31	64.58%	34	65.38%
Do you drink milk	Yes	6	12.5%	7	13.46%
	No	42	87.5%	45	86.54%
Do you drink	Tea	14	29.17%	16	30.77%
	Coffee	21	43.75%	19	36.54%
	Anise	6	12.5%	6	11.54%
	Nescafe	7	14.58%	11	21.15%
	Soft drink	40	83.33%	37	71.15%
How many soft drinks per week	1	15	31.25%	17	32.69%
	2	18	37.5%	10	19.23%
	3	7	14.58%	10	19.23%
Do you have a snack	Yes	33	68.75%	35	67.31%
	No	15	31.25%	17	32.69%

The results of table (5) showed all nutrients intake of the second group who was females with age (51-60) were significantly higher than the first group who female with age (31-50). Protein, fiber, iron, calcium, magnesium and vitamins (C, B1, B2 and D) were lower in both groups when compared with DRI while Zinc and vitamin A were decreased in the first group as compared with DRI and were lower than the second group. The other nutrients in both groups were higher than DRI. Severe calcium deficiency causes rickets in children and osteomalcia in adults, they are more likely to be caused by shortage of vitamin (D) than by a

lack of calcium in the diet Vitamin (D) is necessary for the absorption of calcium. Excess of certain minerals (Fe, P, and K & Na) may cause intoxication. For (Fe) caused nausea, vomiting, diarrhea, rapid, heartbeat, weak pulse, and shock, for excess (P) may draw calcium out of the body in being excreted, for (K): Muscular weakness and vomiting for (Na): edema and acute hypertension. Zinc deficiencies can lead to a variety of health effects, such as diarrhea, cold symptoms, rash, vision problems, or weight loss. They may also order other tests to rule out other conditions or vitamin deficiencies. The deficiency of vitamin (D) causes a vitamin (D) results in a failure to absorb calcium and softening of the bones. In adults an inadequate supply of vitamin (D) causes osteomalacis. A deficiency of cyanocobalamin causes pernicious anemia of the recommendation there for much care should be given for the consumption of dairy products as rich sources in vitamin (D), and also calcium as well carrots as cheap source of carotene [24][25] [26].

Table (5): The mean and standard deviation of nutrients intakes compared with RDI for patient with osteoporosis.

Nutrients intake	Females (n=48) Age (31-50)	DRI%	Females (n=48) Age (51-60)	DRI%
Energy (Kcal/day)	2197.53 [b] ±12.94	109.87%	2611.20 [a] ±22.96	130.56%
Protein (g/ day)	53.49 [b] ±11.43	81.05%	63.56 [a] ±10.76	96.30%
Total fat (g/ day)	71.17 [b] ±3.07	117.63%	85.39 [a] ±5.12	141.14%
Fiber (g/ day)	4.52 [b] ±0.98	18.08%	5.39 [a] ±1.65	21.56%
Carbohydrate (g/ day)	335.76 [b] ±10.32	258.27%	397.13 [a] ±12.87	305.48%
Sodium (mg/ day)	1695.64 [b] ±18.54	113.04%	2088.5 [a] ±21.97	160.65%
Potassium (mg/ day)	1566 [b] ±15.54	333.19%	1901.63 [a] ±24.32	404.60%
Calcium (mg/ day)	415.00 [b] ±21.76	51.87%	519.20 [a] ±16.96	51.92%
Phosphorus (mg/ day)	804.52 [b] ±35.31	138.71%	964.97± [a] 32.94	166.37%
Magnesium (mg/ day)	122.19 [b] ±11.33	46.11%	146.62 [a] ±9.32	55.33%
Iron (mg/ day)	5.66 [a] ±1.86	70.00%	4.50 [b] ±0.99	90.01%
Zinc (mg/ day)	6.49 [a] ±0.65	95.44%	6.98 [a] ±0.32	102.64%
Cupper (mg/ day)	760 [b] ±11.62	108.57%	900 [a] ±21.22	128.57%
Vitamin. A (mg/ day)	440.34 [b] ±32.94	88.07%	566.41 [a] ±32.94	113.28%
Vitamin. C (mg/ day)	40.52 [b] ±5.73	67.53%	52.79 [a] ±6.72	87.98%
Vitamin.B1 (mg/ day)	0.77 [b] ±0.07	70%	0.94 [a] ±0.09	85.45%
Vitamin.B2 (mg/ day)	0.66 [b] ±0.03	60%	0.815 [a] ±0.04	74.09%
Vitamin D (IU/day)	103.58 [b] ±10.94	17.26	202.27 [a] ±11.34	33.71
Selenium	81.21 [b] ±8.32	180.46%	98.79 [a] ±5.72	219.53%

Values are mean ± SD. Means under the same row bearing different superscript letters are different significantly (p<0.05).

Table (6): Medial analysis for patient with osteoporosis. It was noticed that there were significant changes between both groups in hemoglobin, serum bone specific alkaline phosphatase, serum calcium, phosphorus, urinary calcium and creatinine. While there is no significant between both groups for the other medical analysis. The risk of fracture from

osteoporosis increases with age. There are approximately 1.5 million osteoporotic fractures per year reported in women and men in the US, including over 300,000 hip fractures [27]. Calcium is a vital component of bone architecture and is required for deposition of bone mineral throughout life. Although the body stores more than 99% of its calcium in the bones and teeth, it is also found in the extracellular fluid (ECF) or plasma. It is the levels of plasma calcium that dictate calcium balance. If the plasma level decreases, bone resorption increases to restore plasma levels. Adequate intake of calcium is necessary to maintain this balance. Calcium is absorbed in the small intestines with the aid of vitamin D. Excretion of calcium is primarily through the kidneys, although there is minor fecal loss [28]. Increased urinary calcium excretion and bone loss appear to be linked, and these subjects seem to suffer from a peculiar form of osteoporosis. Consequently, urinary calcium excretion should be measured in osteoporotic patients in order to identify those patients reporting this specific alteration [29].

Table (6): The mean and standard deviations of laboratory investigation for patient with osteoporosis.

Parameters	Females (n=48) Age (31-50)		Females (n=52) Age (51-60)	
	Mean± SD	% of normal	Mean± SD	% of normal
Hemoglobin(g/dl)	10.50 [b] ±1.54	79.25%	12.71 [a] ±1.53	94.15%
Serum protein(g/dl)	6.70 [a] ±6.55	95.71%	6.76 [a] ± 6.43	96.57%
Serum albumin (ALB) (g/dl)	3.53 [b] ±0.48	80.22%	3.92 [a] ± .45	89.1%
Serum bone specific alkaline phosphatase μg/L	56.65 [b] ±27.66	128.75%	62.79 [a] ±28.33	205.46%
Serum calcium (mg/dl)	12.45 [b] ±3.04	133.15%	17.24 [a] ±2.37	184.38%
S. phosphorus (mg/dl)	3.18 [b] ±0.79	80.5%	3.93 [a] ±.82	99.49%
Zinc (μgm/100ml)	67.45 [a] ±0.16	53.96%	68.76 [a] ±.16	55.01%
Urinary calcium(mg/d)	220.65 [b] ±30.92	110.32%	275.02 [a] ±28.99	137.51%
Creatinine	0.91 [b] ±0.07	87.1%	0.98 [a] ±0.23	93.78%

Values are mean ± SD. Means under the same row bearing different superscript letters are different significantly (p<0.05).

Conclusions

Osteoporosis is a disease characterized by low bone mass, deterioration of bone tissue, and disruption of bone microarchitecture: It can lead to compromised bone strength and increased risk of fractures. The results showed that Low magnesium and vitamin D intake with a lifelong lack of calcium plays a role in developing osteoporosis—eating disorders. Severely restricting food intake and being underweight weakens bone in both women groups. Data showed that high body weight or BMI is correlated with high bone mass and that reductions in body weight may cause bone loss. So dietary factors that decrease the risk of osteoporosis include consuming calcium-rich foods such as milk and dairy products to

promote optimal bone formation and lean meat or beans each day to provide the protein bones need. Also, have five or more servings of fruits and vegetables each day to provide vitamin C, magnesium, vitamin K, vitamin D, and potassium to strengthen bones with increasing physical activity to strengthen the bone.

References

1- Jane, E.K. and Jasminka, Z. I. *Nutrition in Bone Health Revisited: A Story beyond Calcium*: A review., (2013), 715:737.

2- Ferdous, H.S. Afsana, F. b. Qureshi, N. K. and Rouf, R.S. *Osteoporosis: A Review*. Birdem. Medical Journal., (2015), Vol. 5, No. 1.

3- De Laet, C. Kanis, J.A. and Oden, A. *Body mass index as a predictor of fracture risk*: A meta-analysis. Osteoporos. Int., (2005), 16:1330-38.

4- Khadilkar, A.V. and Mandlik, R.M. *Epidemiology and treatment of osteoporosis in women*: An Indian perspective. International journal of women's health., (2015),7:841.

5- Bárbara, S. E. and Lígia, A. M. *Nutritional aspects of the prevention and treatment of osteoporosis*: A review., (2010), 54(2):179-85.

6- Kaptoge, S. Welch, A. and McTaggart, A. *Effects of dietary nutrients and food groups on bone loss from the proximal femur in men and women in the 7th and 8th decades of age*. Osteoporos. Int., (2013), 14:418-28.

7- Shivani, S. Kelsey, M. M. Douglas, P. K. Katherine, L. T. and Marian, T. H. *Dairy Intake Is Protective against Bone Loss in Older Vitamin D Supplement Users*: The Framingham Study., (2017), 147(4): 645–652.

8- Wilson, P. and Horwath, C. *Validation of a short food frequency questionnaire for assessment of dietary calcium intake in women*. Eur. J. Clin. Nutr., (1996), 50:220–228.

9- Jellife, D. B. *Assessment of nutritional status of community*. W1d. H1th .org. mono ser., (1966), 53.

10- Geoffrey, P. W. *Nutrition A Health Promotion Approach*. Lst.ed, Edward Arnold PLC. London Sydney Auckland PP., (1995).

11- Drabkin, D. L. *The standardization of hemoglobin measurement*. Am. J. Med. Sci., (1949), 217:710.

12- Henry, R. J. *Clinical Chemistry: Principles and Techniques*. 2nd Edition, Hagerstoun (MD), ROW P. 882 Harper and Publishers, New York Philadelphia., (1974).

13- Doumas, B. T. Watson, W. A., and Biggs, H. G. Albumin standards and the measurement of serum albumin with bromcresol green. Jan., (1971), 31(1):87-96.

14- Cadeau, B.J. and Malkin, A. A relative heat stability test for the identification of serum alkaline phosphatase isoenzymes. Clin.Chim.Acta., (1973), 45:235–242.

15- AOAC, Official method of analysis of the association of official analytical chemistry. Washington, C, USA, fifteenth edition., (1990).

16- Baginski, E.S. *Method of calcium determination*. Clin .Chem. Acta., (1973), 46:49.

17- Bohmer , H. *Micro- determination of creatinine*. Clin. Chem. Acta., (1971), 32:81-85.

18- SPSS: *Statistical package for social science*, computer software, ver.10. SPSS Company. London, UK. Statistics version 10. Copyright 1995 Analytical software windows version 95., (1998).

19- Bowman, S.A. *Socioeconomic characteristics, dietary and lifestyle patterns, and health and weight status of older adults in NHANES*, 1999–2002: A comparison of Caucasians and African Americans. National Health and Nutrition Examination Survey Journal of Nutrition for the Elderly., (2009),28:30–46.

20- Wactawski, W. J. *Periodontal diseases and osteoporosis*: *Association and mechanisms. Ann. Periodontol*., (2001), 6(1):197–208.

21- Weid, I.R. Relationships among body mass, its components, and bone. Bone., (2002), 31:547-555.

22- Rosen, C. J. and Bouxsein, M.L. *Mechanisms of disease*: Is osteoporosis the obesity of bone? Nat. Clin.Pract.Rheumatol., (2006), 35–43.

23- Cauley, J. A. Chalhoub, D. Kassem, A. M. and Fuleihan, G.E.H. *Geographic and ethnic disparities in osteoporotic fractures* .Nat. Rev. Endocrinol., (2014), 1(6):338–51.

24- Li, G. Thabane, L. Papaioannou, A. Ioannidis, G. Levine, M. A .and Adachi, J. D. An overview of osteoporosis and frailty in the elderly. BMC Musculoskelet Disord., (2017), 18(1):46.

25- El-Hajj, F. G. Chakhtoura, M. Cauley, J. A. and Chamoun, N. *Worldwide fracture prediction*.J. Clin. Densitom., (2017), 20(3):397–424.

26- Thom, T. Haase, N. and Rosamond, W .*Heart Disease and stroke statistics* – 2006 update:A report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation., (2006),113:85–151.

27- Bringhurst, F.R. and Demay, M.B. H*arrison's Principles of Internal Medicine*. 16th ed. II. New York: McGraw Medical Publishing Division. Bone and mineral metabolism in health and disease., (2005) ,2246–9.

28- Thom, T. Haase, N. and Rosamond, W. *Heart Disease and stroke statistics* – 2006 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation., (2006), 113:85–151.

29- Melaku, Y.A. Gill, T.K. Appleton, S.L. Taylor, A.W. Adams, R. and Shi, Z. Prospective associations of dietary and nutrient patterns with fracture risk: A 20-year follow-up study. Nutrients., (2017), 9:1198.

دراسة هشاشة العظام عند النساء وعلاقتها بالحالة التغذوية

نهاد الطحان¹، حسام الدين عبد اللطيف²، هبة عبد الظاهر¹

¹ قسم التغذية وعلوم الأطعمة .كلية الاقتصاد المنزلي .جامعة المنوفية، شبين الكوم، مصر

² استشاري جراحة العظام، مستشفى الهرم، وزارة الصحة، الجيزة، مصر

الملخص العربي:

هشـاشـة العظام هي حالة معقدة متعددة العوامل تتميز بانخفاض كتلة العظام ونقص في الهيكل العظمي الدقيق ، مما يؤدي إلى زيادة التعرض للكسـور. تبين هذه الدراسـة العلاقة بين حالة العظام والمعايير الغذائية. في هذه الدراسـة كانت تعاني 100 امرأة من هشـاشـة العظام. قسـمت المشـاركات إلى مجموعتين من الإناث حسـب أعمارهن ، تراوحت المجموعة بين 31-50 (48 عضـوة) والمجموعة تراوحت بين 51-60 (52 عضـوة) ، وتم جمع بيانات البحث من خلال الاسـتبيان. تم تحديد القياسـات البشـرية (بما في ذلك الوزن والطول ومؤشر كتلة الجسـم) والعادات الغذائية والحالة الصـحية. أظهرت النتائج أن العدد الإجمالي للعينات من المتزوجين ، وكانت النسـبة الأعلى لعينة الدراسـة من الحضرـ ، وسـجلت المسـتوي التعليمي للعينه أعلى نسـبة كانت ممن يجيد القراءة والكتابة. معظم العينات كان لديها حالات حمل أكثر (2 ، 3 ، 4 ، 5) ، فترة انقطاع الطمث كانت قبل سـن الأربعين وتعاني من السـمنة مع عدم ممارسـة الرياضة. كان البروتين والألياف والكالسيوم والمغنيسيوم والفيتامينات (C و B1 و B2 و D) أقل في كلا المجموعتين عند مقارنته بـــ DRI بينما انخفض الزنك وفيتامين A في المجموعة الأولى مقارنة بـــ DRI وكانا أقل من المجموعة الثانية . كانت العناصر الغذائية الأخرى أعلى في كلا المجموعتين من DRI. كانت هناك تغيرات معنوية بين المجموعتين في الهيموجلوبين ،مصل الفوسفاتاز القلوي النوعي ، الكالسيوم ، الفوسفور ، الكالسيوم البولي والكرياتينين بينما لا يوجد معنوي بين المجموعتين للتحاليل الطبية الأخرى. لـذلك ، يجب على النسـاء الانتباه إلى تناول الأطعمـة الغنيـة بالكالسـيوم مثل الحليب ومنتجات الألبان واللحوم الخالية من الدهون أو الفاصـوليا كل يوم والفواكه والخضرـوات مع زيادة النشـاط البدني لتعزيز التكوين الأمثل للعظام خاصة في المراحل المبكرة من حياتهم.

الكلمات المفتاحية: هشاشة العظام ، النساء ، الكالسيوم ، فيتامين د ، مصل الفوسفاتيز القلوي النوعي