

ASSESSMENT OF NUTRITION STATUS AS RELATED TO OSTEOPOROSIS IN BAHA UNIVERSITY . KINGDOM SAUDI ARABIA .

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ABSTRACT: *This study aims to find correlation between the dietary consumption pattern and osteoporosis disease affecting different individuals in Baha University–Saudi Arabian kingdom. The study included a number of 140 cases (105 students and 35 female employees).*

The nutritional status for the girls included data about calcium (mmol/L), hemoglobin concentration (g/dl), glucose level, liver function , kidney function, lipid concentration and anthropometric measurements : height, weight , body mass index (BMI) wered measured .

A questionnaire schedule was given to the girls and employees to assess their demographic data, obtained diets and beverages, food and fads and habits, nutritional knowledge as well as their acquaintance with diabetics and food regime.

The results revealed the following:

1- The percentage of ostopenia cases was high being (25.7 and 34.3) for students and employees respectively.

2 – The intake of milk and milk products was low in ostopenia compared to normal so the calcium level in blood was low.

3 – The intake of phosphorus and vitamin D by students and employees was low compared to the normal level group, which were (29.7, 26.7 and 67.9, 78.3) & (40.6, 32.2 and 71.00,79.4)% of RDA respectively.

4 – The intake of nutrients by inflicted group with ostopenia was below normal for (protein) and (vitamin A) while increased for carbohydrate than the RDA.

5- intake of vitamin C was less than RDA in case of ostopenia group which was 52.47, 41.4% for students and employee respectively due to low fruits consumption.

6- Decrease of practice sport and exposure to sunrays daily was recorded for normal and non-ostopenia subjects.

6 – The result showed that the percentage of Hgb was linglur (17.54 g/dl) than that of ostopenia (11.65 g/dl) students

Key Words: *Osteoporosis - SXA – vitamin D – Anthropometr - ostopenia*

INTRODUCTION

Osteoporosis is a major cause of morbidity and mortality through its association with age-related fractures. Although most effort in fracture

prevention has been directed at retarding the rate of age-related bone loss, and reducing the frequency and severity of trauma among elderly people, evidence is growing that peak bone mass is an important contributor to bone strength during later life (*Cooper et al., 2008*).

One in two women and one in five men suffer from osteoporotic fractures after the age of 50. Enabling children and young people to develop strong bones and achieve their maximum potential bone mass will help prevent undue bone loss and osteoporosis in later life. Although 70-80% of peak bone mass is genetically determined, the remainder is determined by dietary and environmental factors (*More, 2008*).

Throughout the life cycle the skeleton requires optimum development and maintenance of its integrity to prevent fracture. Bones break because the loads placed on them exceed the ability of the bone to absorb the energy involved (*Lanham, 2008*).

Calcium is important for bone health. Over the last 15 years, reference calcium intakes in Western countries have been revised upwards for maximizing bone mass at skeletal maturity and for prevention of osteoporotic fractures (*Lee and Jiang, 2008*).

Cashman (2007) showed that calcium is required for normal growth and development as well as maintenance of the skeleton. Vitamin D is also essential for intestinal calcium absorption, and plays central role in maintaining calcium homeostasis and skeletal integrity.

Subjects and Methods

Subjects

A number of 140 students and employees in Kingdom Saudi Arabia, university Albaha, Faculty of Education participated in this study. For analysis of results, cases were divided in two groups :

A - Students (19 – 25) years old .

B – Employees (25 – 60) years old .

Methods :

Anthropometric measurements :

The weight and height were measured for each participant (volunteer). Weight was determined to the nearest 0.5 kilogram. The height was taken to nearest centimeter. Since there are no local standard, for weight or height, for age considering Saudi people, the weight / height for age of each case was compared with that published in the RDA (1989) .

Body mass index (BMI) :

Body mass index was used as indication of the body status. It was calculated from dividing weight in kilograms by height in meters squared (kg/m^2) according to method reported by *Ostetriche et al., (2000)* .

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Analysis of dietary recall data :

Dietary information about consumed daily diet by each participant was assessed by a computer program being calculated in the Unit of Special Nature, Home Economic Faculty, Minufiya University, and nutrients intakes compared with the RDA (1989) values.

Bone mineral densitometry (BMD):

Single-energy X-ray absorptiometry (SXA) is the most accurate (automatic, mechanical) way to measure BMD. It uses two different X-ray beams to estimate bone density in the spine and hip. Strong, dense bones allow less of the X-ray beam to pass through them. The amounts of each X-ray beam that are blocked by bone and soft tissue are compared to each other. SXA can measure as little as 2% of bone loss per year. It is a fast method and uses very low doses of radiation. Bone mineral densitometry was obtained by using a measured electronic SXA for students and employees .

The questionnaire included some sheets (acts) as follows :

- 1 – The first one was for health status .
- 2 – The second one for food habits . It included : Food like and dislike .
- 3 – The third one for the diseases and handicaps of participants.

Hemoglobin level: Hemoglobin concentration (Hgb g/ dl), was assessed in a 10ml venous blood samples taken from each girl by qualified nurses in a tube containing anticoagulant (1 cm of EDTA solution and stored in the refrigerator. Determinations carried out in the laboratory of the Clinical Pathology Department, Assiut University Hospital using electronic LTD, luton, Beds Coulter counter –T660 as described by King and Fauker (1973) .

Determination of serum glucose: Serum glucose level was analyzed by colorimetric procedures kits developed by Diamond Diagnostics Kits, Cairo, Egypt according to Trinder (1969) .

Statistical analysis :

Statistical analysis of data has been performed using computer program (SPSS, 1996) .

RESULTS AND DISCUSSION

The results of table (1) indicated that (74.3 % and 65.71%) of students and employees were normal ,while cases suffering of ostopenia were 25.7 % of students and 34.3 of employees as percent of total sample.

Data of table (2) show the anthropometric measurement of students (19-25) years old and employees (25-60) years old . It could be noticed that the mean weight was normal for students and ostopenia employees. But for non ostopenia employee weight seems to be more being over than the osteopenia. The height recorded for total sample was similar to normal . Moreover the mean of body mass index (BMI) was also similar to normal for groups except for non ostopenia employee (over weight).

Table (1): Distribution of studied subjects according to Bona Mineral Densitometry

Categories parameters	Student (No – 105)			Employee (N – 35)			Color dexa	Ready dexa
	No	No %	Mean 6SD	No	No %	Mean 6SD		
Osteoporosis	-	-	-	-	-	-	Red	< 60
Osteopenia	27	25.7	70611.28	12	34.3	6569.5	yellow	>61-<90
Normal	78	74.3	95615.1	23	65.71	94614.9	green	>90
Total	105	100	-	35	100	-	-	-
T. value	0.025			2.466			-	-
P-value	0.006**			0.015*			-	-

* P< 0.05 ** P<0.01
 *** P<0.001 NS: Not significant

Table (2) : Mean ± SD of age, family income and anthropometric indices

Categories Parameters	Student (No – 105)		Employee (N – 35)	
	Ostopenia	Non- ostopenia	Ostopenia	Non- ostopenia
	(no-27) Mean ± SD	(no-78) Mean ± SD	(no-12) Mean ± SD	(no-23) Mean ± SD
Age (years)	23±4.38	21.5±1.95	35.58 ± 4.99	37.95 ± 8.99
t-value	2.717		0.844	
p-value	0.008**		0.405	
Family income (s.r)	944.6±314.5	870.7±3.502	1454.27± 347.3	1339.13± 308.57
t-value	1.076		1.003	
p-value	0.284		0.324	
Weight (kg)	60±11.32	62.9±9.63	61.67 ± 6.85	71.52 ± 12.28
t-value	1.249		2.566	
p-value	0.215		0.015*	
Height (cm)	160.3±6.54	162.1±9.2	160.33 ± 6.21	159.78 ± 4.400
t-value	1.514		0.305	
p-value	0.133		0.763	
BMI (kg/cm ²)	22.3±5.24	23.2±3.8	23.98 ± 2.97	28.07 ± 4.89
t-value	1.989		2.638	
p-value	0.325		0.013*	

* P< 0.05 ** P<0.01
 *** P<0.001 NS: Not significant

The results of table (3) show the mean ± SD blood analysis for samples cases). The highest means were recorded for non-ostopenia employees for calcium (2.07 ± 0.47) compared to ostopenia employees (1.966 ± 0.149)mmol. Also the results of the same table (3) indicated that most of students were suffering from decrease of (Hgb), for non- ostopenia employees it was very high significantly (p<0.01) more compared with ostopenia group (12.54± 0.791 and 11.65± 0.3205) g/dl respectively .

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From results tables (4) it was found that level of Alp& GOT were better for non- ostopenia than that of the ostopenia students & employees. Empolyees were higher than that of the students considering and GOT.

Table (3): Mean ± SD Serum analysis for student and employee

Categories Parameters	Student (No – 105)		Employee (N – 35)	
	Ostopenia	Non- Ostopenia	Ostopenia	Non- Ostopenia
	(no-27) Mean ± SD	(no-78) Mean ± SD	(no-12) Mean ± SD	(no-23) Mean ± SD
Glucose (mmol/L)	6.77± .719	6.7±.63	6.708± 0.687	6.73
t-value	0.093		0.156	
p-value	0.926		0.866	
Ca (mmol/L)	1.71± .25	1.99± .21	1.966± 0.1496	2.07± .47
t-value	5.611		0.793	
p-value	0.000***		0.433	
Hgb g/dL*	10.6± 1.70	10.3± 2.31	11.65± 0.3205	12.54± .791
t-value	0.671		0.3068	
p-value	0.50		0.001**	
Urea (mmol/L)	3.06± 1.03	3.01± .83	2.633± 0.5821	5.59± 1.366
t-value	0.281		6.992	
p-value	0.779		0.000***	
Uric acid (umol)	273.3± 55.6	274.9± 50	244.5± 47.980	288.13± 73.85
t-value	0.139		1.842	
p-value	0.889		0.075	

* P< 0.05 ** P<0.01
 *** P<0.001 NS: Not significant * In blood

Table (4): Mean ± SD liver function for student and employee

Categories Parameters	Student (No – 105)		Employee (N – 35)	
	Ostopenia	Non- Ostopenia	Ostopenia	Non- Ostopenia
	(no-27) Mean ± SD	(no-78) Mean ± SD	(no-12) Mean ± SD	(no-23) Mean ± SD
GPT (u/L)	38.62±6.88	40.4±5.86	31.25±2.562	37.43±5.50
t-value	1.327		3.668	
p-value	0.187		0.001**	
ALP (u/L)	66.96±8.83	63.9±9.64	68.58±13.905	64.30±8.41
t-value	1.447		1.137	
p-value	0.151		0.264	
GOT (u/L)	20.09±4.14	18.96±3.97	24.50±5.838	20.13±2.24
t-value	1.253		3.199	
p-value	0.213		0.003**	

* P< 0.05 ** P<0.01
 *** P<0.001 NS: Not significant

As indicated from results of table (5) triglycerides, LDL and were lower and HDL raostly higher for students compared with employee with different levels of significance, this may be affected by the less age in the first case. Difference due to inflicting with ostopenia was less evident.

Table (5): Mean \pm SD lipids fractions for student and employee

Categories parameters	Student (No – 105)		Employee (N – 35)	
	Ostopenia	Non- Ostopenia	Ostopenia	Non- Ostopenia
	(no-27) Mean \pm SD	(no-78) Mean \pm SD	(no-12) Mean \pm SD	(no-23) Mean \pm SD
CHL (mmol/L)	3.72 \pm .97	4.16 \pm .93	3.425 \pm 0.325	3.50 \pm 0.57
t-value	2.069		0.466	
p-value	0.041*		0.644	
TG (mmol/L)	0.71 \pm .42	0.86 \pm .49	2.05 \pm .1730	1.51 \pm 0.409
t-value	1.461		4.390	
p-value	0.47		0.000***	
HDL (mmol/L)	0.90 \pm .25	0.85 \pm .33	0.8583 \pm .1782	0.94 \pm .31
t-value	0.617		0.908	
p-value	0.539		0.370	
LDL (mmol/L)	1.71 \pm .812	1.78 \pm .58	2.85 \pm .347	2.190 \pm 0.708
t-value	0.439		2.871	
p-value	0.661		0.007**	
vLDLI (mmol/L)	0.14 \pm .083	0.44 \pm .95	0.3933 \pm .7253	0.32 \pm .10
t-value	1.653		2.056	
p-value	0.101		0.048	

* P< 0.05

** P<0.01

*** P<0.001

NS: Not significant

Data of table (6) show the nutrients intakes by student and employee. Protein intake was evidently low when compared with the recommend dietary intake (RDA , 1989), for ostopenia & non- ostopenia students it was (86.78 % , 94.6) of RDA while for the employee was (84.2 % ,96.9 %) of RDA respectively; lowest limit was recorded for ostopenia subjects. This result agree with *Mardon et al., (2008)* showed that low energy and protein intake has been suggested to contribute to the increased incidence of ostopenia in the elderly. However, the impact of dietary protein on bone health is still a matter of debate.

Table (7) show the mean \pm SD of vitamins intakes by students and employees, it was shown that the mean of vitamin A intake was (475 \pm 166.6, 464.9 \pm 177.1 and 578.33 \pm 54.74 , 04.7 \pm 133.1) for ostopenia and non-ostopenia student and employee respectively, also it was less than daily requirements (800 mg)

Moreover, from results of table (7) it was observed that intakes vitamin C and vitamin D were less than 100 % of RDA which was the case also for vitamin B₁ and vitamin B₂.

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Table (6) : Mean ± SD of macronutrients intake

Categories Parameters	Student (No – 105)		Employee (N – 35)	
	Osteopenia	Non- Osteopenia	Osteopenia	Non- Osteopenia
	(no-27) Mean ± SD	(no-78) Mean ± SD	(no-12) Mean ± SD	(no-23) Mean ± SD
Total protein (g)	39.92± 7.26	43.52± 5.50	38.75± 8.79	44.65± 6.90
t-value	2.688		2.185	
p-value	0.008**		0.036	
RDA %	86.78	94.6	84.2	96.6
Lipid	36.59± 6.2	36.36± 5.4	36.58± 6.22	36.39± 5.66
t-value	0.154		0.092	
p-value	0.878		0.927	
RDA %	54.9	54.6	54.9	54.6
CHO	220.3± 44.5	187± 39.12	276.58± 57.2	267.8± 52
t-value	3.670		0.455	
p-value	0.000***		0.652	
RDA %	73.4	62.3	92.2	89.3
Energy	1370.1± 99	1249.326182.5	1517.2± 234.2	1577.316182.65
t-value	1.075		1.004	
p-value	0.184		0.324	
RDA %	68.5	62.46	75.86	78.9
Fiber	5.8± 3.9	3.8± 1.9	4.4± 2.3	3.9± 1.9

* P< 0.05 ** P<0.01
 *** P<0.001 NS: Not significant

Table (7): Mean ± SD of vitamins intake

Categories Parameters	Student (No – 105)		Employee (N – 35)	
	Osteopenia	Non- Osteopenia	Osteopenia	Non- Osteopenia
	(no-27) Mean ± SD	(no-78) Mean ± SD	(no-12) Mean ± SD	(no-23) Mean ± SD
Thiamin (mg)	0.70±.24	0.66±.29	0.70±.20	0.756±.25
t-value	0.626		0.669	
p-value	0.432		0.500*	
RDA %	63.6	69.1	63.6	68.7
Riboflavin (mg)	0.71±.15	0.82±.12	0.816±.307	0.773±.24
t-value	1.811		0.783	
p-value	0.073		0.439	
RDA %	64.5	74.5	74.2	70.3
Vitamin C (mg)	34.11±9.02	38.05±11.7	26.9±5.24	34.8±6.2
t-value	1.776		3.629	
p-value	0.079		0.001**	
RDA %	52.4	59.2	41.4	53.5
Vitamin A (mcg)	475±166.6	494.9±177.1	578.3±54.7	604±133.1
t-value	0.264		6.798	
p-value	0.792		0.000***	
RDA %	59.4	61.75	72.3	75.6
Vitamin D	6.79±1.6	6.46±2.06	7.82±1.54	6.30±1.89
t-value	0.448		2.407	
p-value	0.485		0.022*	
RDA %	67.9	71	78.3	79.4

* P< 0.05 ** P<0.01
 *** P<0.001 NS: Not significant

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These data agree with *Vatanparast et al., (2005)* they showed that adequate dietary calcium intake, appropriate intakes of vegetables and fruit have a beneficial effect on bones in boys aged 8-20 y. Underreporting of dietary intake by girls may explain why this effect was not apparent in girls.

Data present is table (8) show minerals intakes by ostopenin & non-ostopenin individuals groups . It could be noticed that the intake of calcium was respectively low (738.5 ± 247.9 , 897.3 ± 267.6 and 655.83 ± 108.4 , 764.8 ± 131.8)mg/dl by student and employee respectively, being less than of the RDA. Moreover, the intake of phosphorus, iron and zinc were less than 100% of the RDA .

Table (8): Mean \pm SD of Minerals intake

Categories Parameters	Student (No – 105)		Employee (N – 35)	
	Ostopenia	Non- Ostopenia	Ostopenia	Non- Ostopenia
	(no-27) Mean \pm SD	(no-78) Mean \pm SD	(no-12) Mean \pm SD	(no-23) Mean \pm SD
Calcium (mg)	738.5 \pm 247.9	897.3 \pm 267.6	655.8 \pm 108.4	764.8 \pm 131.8
t-value	2.708		2.458	
p-value	0.008**		0.019*	
RDA %	61.54	74.8	54.6	63.7
Phosphorus (mg)	355.9 \pm 171.9	372.5 \pm 158.2	320.8 \pm 58.2	386.9 \pm 98.3
t-value	0.459		0.957	
p-value	0.647		0.346	
RDA %	29.7	40.6	26.7	32.2
Total iron (mg)	10.1 \pm 1.35	10.7 \pm 1.76	11.50 \pm 1.03	9.18 \pm 1.92
t-value	1.147		0.3568	
p-value	0.254		0.000***	
RDA %	67.6	75.3	76.7	81.2
Zinc (mg)	7.50 \pm 2.04	6.74 \pm .93	6.49 \pm 2.38	5.98 \pm 1.55
t-value	1.726		0.757	
p-value	0.087		0.454	
RDA %	62.5	64.5	54.08	58.2

* P< 0.05

** P<0.01

*** P<0.001

NS: Not significant

Table (9) showed that evidently high percentage of ostopenia students and employees suffer from malabsorption were (18.2% to 58.3%) of total sample. Also there were increase in numbers of their family that suffer from osteoporosis (51.3 to 77.7%) of total sample .

Table (10) also showed that most sample of students and employees preferred cola and pepsi (64.1 to 83.3%) with lower intake of milk and milk products (17.4 to 55.5%).

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Table 9

Table 9 cont

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Table 10

Table (11) show the correlation coefficients between anthropometric indices and nutrients intakes which revealed that:

1 – There was positive significant correlation between weight and carbohydrates, and phosphorus while it was negative with iron carbohydrate and phosphorus and vitamin D.

2 – Positive significant correlation was found between BMI and phosphorus (0.176) P<0.05.

3 – There are positive significant correlations between age and each of carbohydrate (P<0.01) calcium (p<0.01) and phosphorus (p<0.05).

Table (11) : Mean correlation between nutrient intake and anthropometric

	Age	Income	Weight	Height	BMI
Protein	-0.071	-0.102	-0.044	0.056	-0.014
Lipid	0.006	0.219**	0.076	-0.087	0.034
Carbohydrate	0.496**	0.450**	0.259**	0.048	0.161
Calcium	-0.299**	-0.065	0.087	0.043	0.026
Phosphorus	0.198*	0.163	0.178**	0.005	0.176*
Iron	-0.172*	-0.380**	-0.218**	0.155	-0.243**
Zinc	-0.102	-0.147	-0.070	0.102	-0.211*
Vit . B1	0.091	0.061	0.063	0.000	0.054
Vit . B2	0.127	0.038	-0.47	-0.231**	-0.066
Vit . C	-0.127	-0.177*	0.47	-0.080	0.035
Vit . D	-0.030	0.079	-0.271**	0.144	-0.174*
Vit . A	0.103	0.041	-0.243**	-0.090	-0.153

* p < 0.05 significant ** p < 0.01 high significant *** p < 0.001 very high significant -- negative correlation coefficient BMI : Body mass index

Table (12) show the correlation coefficient between mineral intakes some blood analysis. Result indicated that:

1 - There are a positive significant correlations for calcium intake from one side and Hgb from the other side.

2 – There are positive high significant correlation between iron and Hgb (p < 0.001).

Table (12): Mean correlation between minerals intake and some blood analysis

	Ca	Hgb	Glucose	Cholesterol
Calcium	0.203*	0.261**	0.093	0.154
Phosphorus	0.075*	0.092	0.079	0.296**
Iron	-0.092	0.283**	0.133	0.091
Zinc	0.106*	0.074	0.056	0.209*

* p < 0.05 significant ** p < 0.01 high significant *** p<0.001 very high significant -- negative correlation

These data agree with the study of *Chee et. al., (2003)* they showed that ingestion of high calcium skimmed milk was effective in reducing the rate of bone loss at clinically important lumbar spine and hip sites in postmenopausal Chinese women in Malaysia. Supplementing with milk had

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additional benefits of improving the serum 25-hydroxy vitamin D status of the subjects.

Recommendations:

Introduction of better nutrition practices which lead to dietary changes that favorably increase calcium in blood level through .

1 – Increase the consumption of drink milk and milk products and reduce the consumption of cola or pepsi products with meal .

2 – Limitation of intake of fibers .

3 – Encourage the consumption of fresh fruits and vegetables and fish .

4 – It must be see sun rays daily.

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تقييم الحالة الغذائية وارتباطها بمرض هشاشة العظام بالباحة - المملكة
العربية السعودية
هالة محمد علي وهبة

كلية التربية النوعية - قسم الاقتصاد المنزلي - جامعة المنوفية

الملخص العربي

أجريت هذه الدراسة للتعرف على العلاقة بين معدلات ونوعية الاستهلاك الغذائي ومرض هشاشة العظام في جامعة الباحة . تم اختبار مجموعة عشوائية من الطالبات كذلك مجموعة من الموظفات لتكون موضوع الدراسة لهذا البحث وقد شملت الدراسة على ١٤٠ حالة موزعة على التوالي (١٠٥) طالبة ، ٣٥ حالة من الموظفات بكلية التربية بالباحة بالمملكة العربية السعودية

وتم تقييم الحالة الغذائية لطالبات الكلية موضع الدراسة بتقدير نسبة الكالسيوم في الدم كذلك قياس كثافة العظام بالجهاز الخاص بذلك مع تقدير نسبة الهيموجلوبين ومجموعة من القيم مثل الجلوكوز وانزيمات الكبد والكلى ودهون الدم .

بالإضافة إلى عمل القياسات الجسمية المختلفة مثل الطول ، والوزن ودليل كتلة الجسم كما تناولت الدراسة استمارة استبيان للحصول على البيانات الهامة مثل الدخل - الحالة الاقتصادية والاجتماعية - العادات والمعتقدات الغذائية .

وبصفة عامة فقد أوضحت النتائج أن الحالة الغذائية للطالبات موضع الدراسة كانت منخفضة على الرغم من ارتفاع المستوى الاقتصادي والاجتماعي ومستوى الدخل . لذلك توصي الدراسة بأهمية تزويد الطالبات بوجبات غذائية غنية بعنصري الكالسيوم والفوسفور بالإضافة إلى ضرورة نشر برامج التثقيف الغذائي بين أولياء الأمور والمواطنين لما لها من أهمية لصحة ورفاهية الإنسان .

أوضحت الدراسة ما يلي :

١ - ارتفاع النسبة المئوية لمن لديهم استعداد لهشاشة العظام في هذا السن حيث كانت على التوالي للطالبات والموظفات ٢٥.٧% و ٣٤.٣% .

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- ٢ - عدم تناول الألبان ومنتجاتها بكثرة وبالتالي نقص الكالسيوم في الدم عن الطبيعي.
- ٣ - نقص الفوسفور وفيتامين D عن الاحتياجات حيث بلغت النسبة في الطالبات والموظفات على التوالي (٢٩.٧% و ٢٦.٧، ٦٧.٩% و ٧٨.٣%) و (٤٠.٦، ٣٢.٢ و ٧١.٠، ٩٧.٤%) من التوصيات الغذائية
- ٤ - مأخوذ العناصر الغذائية بواسطة المجموعة المعرضة للإصابة بهشاشة العظام كان أقل من الطبيعي (البروتين وفيتامين A) بينما كان مأخوذ الكاربوهيدرات أكبر من التوصيات الغذائية.
- ٥ - نقص فيتامين C عن الاحتياجات في المجموعة المصابة حيث بلغت النسبة كالتالي ٥٢.٤٧ و ٤١.٤ من التوصيات للطالبات والموظفات على التوالي نتيجة لقلة استهلاك الفواكه.
- ٥ - قلة ممارسة الرياضة وكذلك التعرض للشمس بين الطالبات والموظفات ٣٣.٣% و ٣٣.٣%
- ١٠.٢ و ٢١.٧% للمجموعات المعرضة وغير المعرضة للهشاشة على التوالي.
- ٦ - قلة نسبة الهيموجلوبين في الدم عن الطبيعي حيث كانت ١٠.٦ و ١١.٦٥ g/dl للطالبات المعرضات وغير المعرضات للهشاشة ١١.٦٥، ١٢.٥٤ g/dl للموظفات المعرضات وغير المعرضات للهشاشة على التوالي.
- هشاشة العظام - جهاز قياس كثافة العظام - فيتامين د - المقاييس الجسمية

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Hala M.A. Wahba

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Table (9) Distribution of studied sample according to health status.

parameters	Categories		Student (N – 105)				Employee (N – 35)			
			No - 27		No-78		No-12		No-23	
			osteopenia		Non-osteopenia		osteopenia		Non-osteopenia	
	No	No%	No	No%	No	No%	No	No%		
Do you suffer from shivering?										
yes	12	44.4	10	12.8	--	--	2	8.7		
No	6	22.2	53	67.9	7	58.3	7	30.4		
Sometimes	9	33.4	15	19.3	5	41.7	14	60.9		
Do you suffer from pains and joint inflammation?										
Yes	8	29.7	19	24.4	--	--	6	26.1		
No	12	44.4	39	50	6	50	2	8.7		
Sometimes	7	25.9	20	25.6	6	50	15	65.2		
Do you suffer from worry and nervousness?										
Yes	--	--	19	24.4	--	--	2	8.7		
No	11	40.7	39	50	4	33.3	9	39.1		
Sometimes	16	59.3	20	25.6	8	66.7	12	52.2		
Do you suffer from dental caries?										
Yes	19	70.429.	20	25.6	8	66.7	12	52.2		
No	8	6	58	74.4	4	33.3	11	47.8		
Do you suffer from hypertension?										
Yes	--	--	4	5.1	2	16.6	3	13.1		
No	27	100	74	94.9	10	83.4	20	86.9		
Do you suffer from irregular heart pulse?										
Yes	3	11.2	25	32.1	3	25	6	22.1		
No	18	66.6	33	42.3	7	58.3	9	39.1		
Sometimes	6	22.2	20	25.6	2	16.7	8	34.9		
Do you suffer from chronic constipation?										
Yes	19	70.4	20	25.6	5	41.7	10	43.5		
no	--	--	40	51.2	3	25	5	21.7		
Sometimes	8	29.6	18	23.2	4	33.3	8	34.9		
Do you suffer from mental disorder?										
Yes	11	40.7	30	38.4	8	66.7	11	47.8		
No	9	33.4	11	14.1	2	16.7	9	39.1		
Sometimes	7	25.9	37	47.5	2	16.6	3	13.1		
Do you suffer from back pains?										
Yes	20	74.7	5	6.4	7	58.3	13	56.5		
No	1	3.7	53	67.9	3	25	6	26.1		
Sometimes	6	21.6	20	25.7	2	16.7	4	17.4		

Table (9): Continue

parameters	Student (N – 105)		Employee (N – 35)					
	No - 27		No-78					
	osteopenia		Non-osteopenia					
	No	No%	No	No%				
Are there anyone of your family suffering from osteoporosis?								
Yes	21	77.7	40	51.3	9	75	14	60.9
No	6	22.3	38	48.7	3	25	9	39.1
Do you see Sun rays daily?								
Yes	11	40.7	45	57.7	6	50	7	30.4
No	9	33.3	8	10.2	4	33.3	5	21.7
Sometimes	7	25.9	25	32.1	2	16.7	11	47.8
Do you suffer from any of Endocrine disorders ?								
Yes	1	3.7	2	2.6	3	25	5	21.7
No	26	96.3	76	97.4	9	75	18	78.3
Do you suffer from malabsorption or digestion problem ?								
Yes	17	62.9	15	19.2	5	41.7	11	47.8
No	5	18.2	35	44.9	7	58.3	12	52.2
Sometimes	5	18.9	28	35.9	--	--		
Do you suffer from diabetes or gout ?								
Yes	2	7.5	1	1.3	3	25	4	17.4
No	25	92.5	77	98.7	9	75	19	82.6
Do you have any drugs (medicines) containing Cortisone ?								
Yes	3	11.1	5	6.4	1	8.3	2	8.7
No	24	88.9	73	93.6	11	91.7	21	91.3
Do you have antibiotics once a month ?								
Yes	12	44.4	20	25.6	4	33.3	9	39.1
No	7	25.9	10	12.8	1	8.3	7	30.4
Sometimes	8	29.7	48	61.6	7	58.4	7	30.5
Do you practice sport or exercise?								
Yes	16	59.2	25	32.1	3	25	5	21.7
No	8	29.6	30	38.4	5	41.7	12	52.2
Sometimes	3	11.2	23	29.5	4	33.3	6	26.1
Do you lose some teeth recent ?								
Yes	15	55.6	32	41.1	8	66.6	5	21.7
No	12	44.4	46	58.9	4	33.4	18	78.3
Do you have any drugs containing calcium ?								
Yes	2	7.4	--	--	4	33.4	6	26.1
no	25	92.6	78	100	8	66.6	17	73.9

Table (10) Distribution of studied sample according to food habits

Parameters	Student (N – 105)		Employee (N – 35)					
	No - 27		No-78		No-12		No-23	
	osteopenia		Non- osteopenia		osteopenia		Non- osteopenia	
	No	NO%	No	NO%	No	NO%	No	NO%
Do you keep to have tea after meals ?								
Yes	16	59.2	20	25.6	5	41.7	10	43.5
No	4	14.8	35	44.9	3	25	5	21.7
Sometimes	7	26	23	29.5	4	33.3	8	34.8
Do you have cola or Pepsi products with the meal ?								
Yes	20	74.1	50	64.1	10	83.3	19	82.6
No	4	14.8	15	19.2	2	16.7	4	17.4
Sometimes	3	11.1	13	16.7	--	--	--	--
Do you prefer salt foods ?								
Yes	12	44.4	20	25.6	6	50	9	39.1
No	7	26	45	57.7	4	33.3	10	43.5
Sometimes	8	29.6	13	16.8	2	16.7	4	17.4
Do you prefer caned food more than fresh ones ?								
Yes	15	55.5	41	52.7	5	41.7	8	34.9
No	5	18.5	6	7.6	3	25	9	39.1
Sometimes	7	26	31	39.7	4	33.3	6	26
Are you careful to have milk or milk products daily ?								
Yes	5	18.5	26	33.3	6	50	19	82.6
No	15	55.5	30	38.5	6	50	4	17.4
Sometimes	7	26	21	28.2	--	--	--	--
Did you have milk in your childhood ?								
Yes	20	74.1	50	64.1	4	33.3	15	65.2
No	2	7.4	5	6.4	7	58.3	1	4.3
Sometimes	5	18.5	23	29.5	1	8.4	7	30.5
Do your food contain animal fats (meat) ?								
Yes	9	33.3	20	25.6	7	58.3	13	56.5
No	10	37.1	18	23.1	--	--	2	8.7
Sometimes	8	29.6	40	51.3	5	41.7	8	34.8
Are you careful to have oranges or guavas after meal?								
Yes	11	40.7	29	37.2	4	33.3	5	21.7
No	16	59.3	30	38.5	6	50	13	56.5
Sometimes	--	--	19	24.3	2	16.7	5	21.8
Do you have fish ?								
Yes	19	70.3	51	65.4	5	41.7	8	34.9
No	2	7.4	5	6.4	7	58.3	15	65.2
Sometimes	6	22.3	22	28.2	--	--	--	--
What kind of bread do you prefer ?								
White	11	40.7	35	44.9	8	66.8	19	82.6
Brown	16	59.3	43	55.1	4	33.2	4	17.4
How much of bread do you have for a meal ?								
One	21	77.7	56	71.8	9	75	13	56.5
Two	6	22.3	22	28.2	3	25	10	43.5
Over two	--	--	--	--	--	--	--	--

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