

Assessment of Awareness Regarding Osteoporosis among Elderly at Makkah Al-Moukarama

Nahed Said Ayoub^{1,2} And Hala Yehia Sayed³

¹Faculty of nursing, Umm Al Qura University, Makkah, KSA.

² Faculty of Nursing, Mansoura University, Egypt.

³Nursing sciences and research department, Faculty of nursing, Umm Al Qura University, Makkah, KSA.

Corresponding author: Nahed Said Ayoub1

Abstract:Background : Osteoporosis is a progressive skeletal disease characterized by low bone mass and loss of bone tissue, manifested clinically by skeletal fractures. There are multiple risk factors for osteoporosis which increasing age, Genetics factor, menopause, some medication, personal habits including diet, exercise, and smoking. The best long-term approach to osteoporosis is prevention. Osteoporosis prevention requires adequate diet with calcium and vitamin D, regular physical activity, and avoiding smoking and excessive alcohol drinking. There is a need to educate people as well as healthcare providers about the need to reduce the incidence of the osteoporosis. **Aim:** This study aims to assess degree of elderly awareness toward osteoporosis. **Subjects and methods:** The study subjects include 500 elderly, 323 elderly female and 177 elderly male aged 60 years and above, able to communicate, and willing to participate in the study. They are attending in the outpatient clinics at a selected hospital in Makkah Al-Mukarramah . For a period of two months start from 1-1-1437h to 1-3- 1438h . And assessment interview sheet for assessing awareness of elderly toward osteoporosis to collect needed data was used. **Results:** 64% of the study subjects are female, 74% of the study subjects were young old. 60% the subject had excellent degree of awareness. There is statistical significant different between age, marital status, education level, work before retirement, the name of the clinic, cortisone, age of menopause, menopause naturally, practice exercise, walking, football, swimming, total activities daily living (ADL) and total instrument activities daily living (IADL). while there is no statistical significant different between gender, current of work, respiratory disease, endocrine disease, gastrointestinal tract problem, neurological system, cardiovascular, cancer, treatment of thyroid hormone,

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I. Introduction:

Osteoporosis is a serious disabling disease affecting approximately 10% of the United States population and 10% of the Saudi Arabia population have osteoporosis with an estimated (2.5 million) is 50 years of age or over and 2% (450 000) is 70 or over in 2016 and twenty-two million women and 5.5 million men of the European Union population have osteoporosis in 2017It is more prevalent among women than men⁽¹⁻⁷⁾.

Osteoporosis is a condition of decreased bone mass, which leads to fragile bones that increased risk for fractures. Bones are made up of proteins, minerals, and vitamins constituting the cells which build the living, dynamic and integral bone tissues, and it has the ability to grow and fix itself, the two essential minerals for normal bone formation are calcium and phosphate , the bones become more porous, fragile, and breakable due to the loss of calcium. The term "porosis" means porous, normal bone marrow has small holes within it, but a bone with osteoporosis will have much larger holes⁽⁸⁻¹³⁾.

Osteoporosis is occurred between the ages of 45 and 55 years for women and between the ages of 55 and 75 years for men. According to the national osteoporosis foundation there is 10 million Americans have osteoporosis and 34 million have low bone mass, regarding the occurrence of osteoporosis at Saudi Arabia the ministry of health reported that the rate of osteoporosis among women and men over the age of 60 has reached 30% in the kingdom⁽¹⁴⁻¹⁸⁾.

Osteoporosis is mostly asymptomatic and it might not be diagnosed until the fracture occurrence, it is called a silent disease. This disease causes increase of health care expenses, as it cause physical and psychological complications and decreased quality of life, all of there have negative effects on the individual, his/her family and the society. For that it is known as a major general health problem^(19, 20).

Bone loss is a natural part of aging, but not everyone will lose enough bone density to develop osteoporosis but. There are sever of risk factor as races, increase age, family history of osteoporosis, previous history of bone fractures, low body mass index, menopause under the age 45, calcium and vitamin D deficiencies, low physical activity^(21- 23).

Saudi Arabia is currently entering uncharted territory in relation to the magnitude of its aging population. Recent research and data show that there has been a substantial change in Saudi Arabia's age structure due to an increase in life expectancy and a decline in fertility rates. This phenomenon can be attributed to fluctuations in birth and death rates. The proportion of people in Saudi Arabia aged 60 or more is predicted to be 25% of the total population of 40 million by the end of 2050. Moreover, the number of people aged 80 or more is expected to reach 1.6 million or 4% of the country's total population in the same period^(17, 18, 24).

The elderly is the greater than chance of having osteoporosis although osteoporosis cannot be treated, it can be prevented to a great extent. The results of studies show that there is a relationship between several health behaviors and decreased risk of occurrence of osteoporosis. Healthy life style, following good nutrition, practicing exercise and preventing falls are among these behaviors⁽¹⁹⁾.

It should be noted that prevention should be started at the time of bone formation called ossification, process by which new bone is produced. Ossification begins about the third month of fetal life and continued during adolescence and adult periods. Studies have shown that planning for osteoporosis prevention and raising elderly awareness requires sufficient information about people health knowledge, beliefs and also awareness toward of osteoporosis symptoms can help in early diagnosis of the disease. These can encourage help-seeking behaviors and decrease disease complications⁽²⁵⁻²⁸⁾.

Prevention early detection of osteoporosis, early diagnosis and adequate treatment require sufficient awareness elderly toward the disease and its prevention in the community, especially among women; therefore, the present study was aimed to assess the awareness of elderly regarding osteoporosis at Makkah al-mukarramah.

II. Subjects and methods

Research design

A descriptive design was used in this study.

Research setting

The study was conducted in outpatient clinics at the selected hospital in Makkah al- Moukarama.

Sampling

The study subjects include all elderly patient visit outpatient clinics at the selected hospital, their total number was 500 for a period of two months start from (1-1-1437h to 1-3-1438h and fulfilling the inclusion criteria.

Inclusion criteria include:

- (1) Aged 60 years and above.
- (2) Able to communicate.
- (3) Willing to participate in the study.

III. Tools of data collection:

Four tools were used in this study; first tool is assessment interview sheet for assessing awareness of elderly toward osteoporosis (this tool was developed by the researcher after review of literature). The second tool is (Katz ADL)⁽²⁹⁾. The Katz index of activities of daily living was used to assess abilities of the elderly to perform activities of daily living. The scale included six main activities of daily living. Bathing, dressing, feeding, transfers, continence, and ambulation. The six different functions are measured and scored according to the individual's actual performance of these functions. They were categorized into three levels of dependency and the total score range from 0-18. Total grade of activities of daily living (IADA). (1), fully independent= score 0 to 6 points, (2), partially dependent= score 7 to 12 points and (3), totally dependent = scored 13 to 18.

The third tool is assessment of degree of elderly performance regarding instrumental activities of daily living ((IADL). The Lawton instrumental activities of daily living scale (Lawton IADL)⁽³⁰⁾ is an appropriate instrument to assess independent living skills in eight domains of function, it includes the ability to use telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, ability to handle finances, responsibility for own medication. The total score ranges from (0 to 16). Where the less score indicate high function, dependency to 16 that indicate full independency. The Total score of instrumental activities of daily living (IADL) was categorized into totally dependent where total score range from (0-7), partially dependent (8-12) and independent (13-16).

The fourth tool is awareness of the elderly regarding osteoporosis; this tool was developed by researchers. It includes 22 questions regarding (definition, most common site, symptoms, diet, and exposure to sunlight, exercise and prevention. The answer is either Yes that = 2 grades or No = 1 grade for each question. Total scores for elderly's awareness were depended on the numbers of grades the patient obtained regarding all questions. The total score was computed out of 44 it was the maximum grade; minimum grade was 0. The total score of awareness were categorized as: Fair = less than 60%, good = 60-75 and excellent 75-100.

Pilot study

Pilot study was conducted on 10 elderly from the outpatient clinic from selected hospital at Makkah, in order to evaluate the clarity; applicability of the tools, accordingly the necessary modifications was done. These patients were not included in the study sample.

Field work

An official approval to conduct the study was obtained from the administration of selected hospital at Makkah al-Mukarramah to collect the study **Sample**.

The actual field work was carried out for two months and starting from (1-1-1438H to 1-3-1438H) for data collection. Data were collected 3 day/week at outpatientclinic for 8 weeks; the clinics were (family medicine, oncology, cardiology, medical, endocrine, chestneurology). The purpose of the study was explained to the elderly people. The assessment sheets (Assessment interview sheet for assessing awareness of elderly toward osteoporosis) were filled out by the researcher, the average time need to completion the assessment sheet around is 10-15 minutes.

Statistical design

Obtained data reviewed, prepared for computer entry coded analyzed and tabulated descriptive statistics (frequencies & percentage) as well as tests of significance (chi square test) and t-test were done using computer program SPSS.

Ethical consideration

Ethical approval was obtained from the research ethics committee. Oral consent from the elderly to participate in the study was obtained after explanation of the study purpose. Confidentiality of the collected data was maintained. Privacy of the study sample was assured.

IV. Results

Main findings of the present study included four parts: the first part is socio-demographic characteristics of the studied subject. The second part is medical history of the studied subject: (A) Presence of disease and (B) Medical factors affecting occurrence of osteoporosis. The third part is life style pattern of the studied subject. The fourth part is degree of awareness of the studied subject.

Part 1: socio-demographic characteristics of the studied subject.

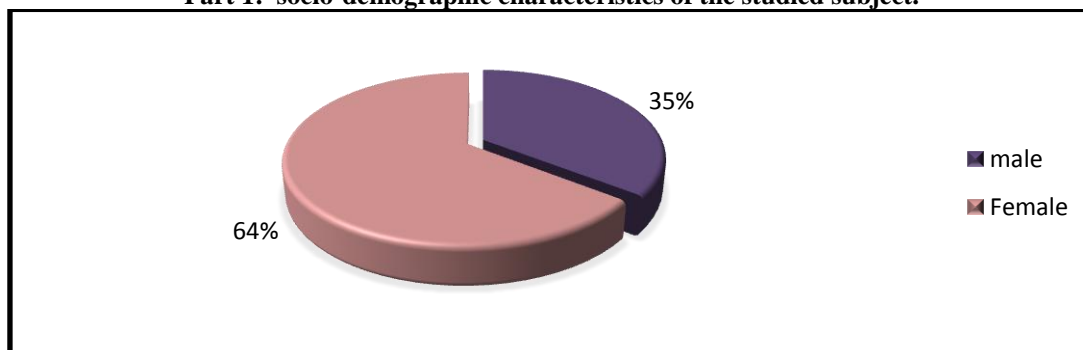


Figure (1): Distribution of the studied subject according to their gender.

Figure 1: This figure shows that 64% of the study subjects are female, while 35% are male.

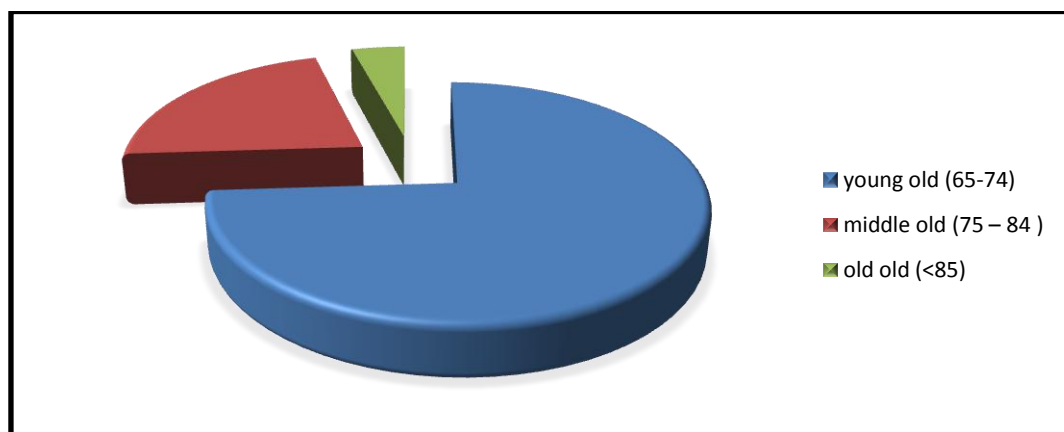


Figure (2): Distribution of the studied subject according to their age group.

Figure 2: This figure shows that the majority of the studied subjects were 74% young old, while 22% of them were middle old, while old-old were represent by 4% only .

Part 2: Medical history of the studied subject.

A – Presence of disease

Figure (3): Distribution of the studied subject according to their Presence of disease.

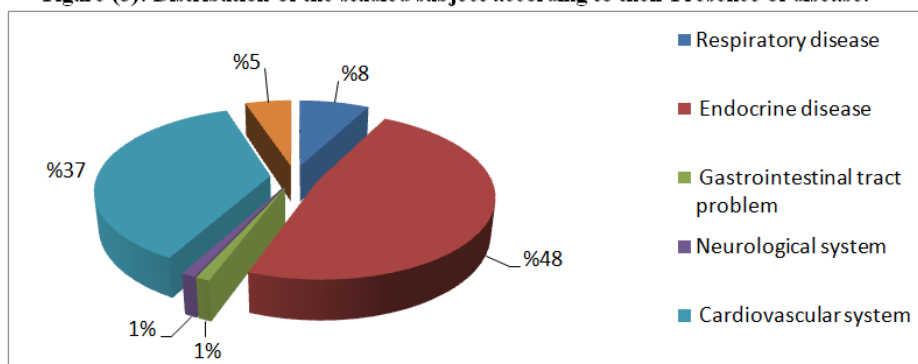


Figure 3: This figure shows that about the half of the studied subjects were 48% endocrine, followed by 37 %cardiovascular, 8%respiratory, 5% cancer while gastrointestinal tract problem, neurological were both represented by 1% for each.

B-medical factors affecting occurrence of osteoporosis.

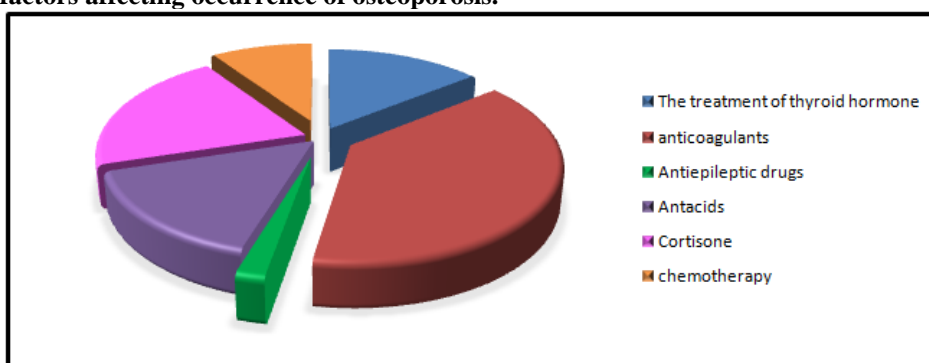


Figure (4): Distribution of the studied subject according to their type medication received.

Figure 4: This figure shows that 39% of the studied subjects received anticoagulants, followed by 21% received cortisone, while 15% received antacids, 14% the treatment of thyroid hormone, followed by and chemotherapy 9% and antiepileptic 2%.

Part 3: Life style pattern of studied sample

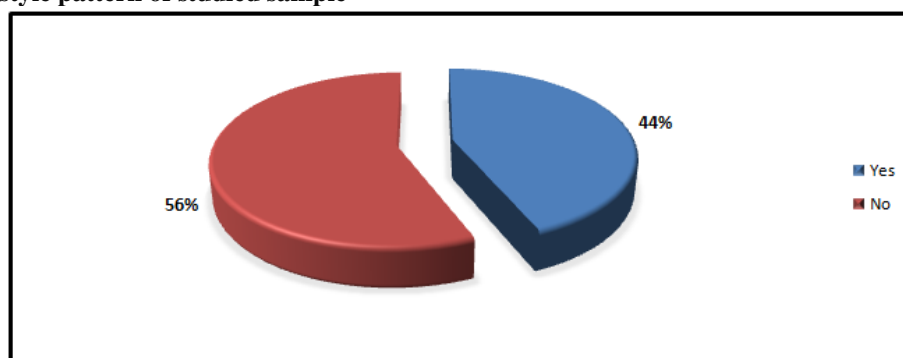


Figure (5): Distribution of the studied subject according of their practicing exercise.

Figure 5: This figure shows that 44% of the studied subjects were practice exercise, while 56% did not practicing exercise.

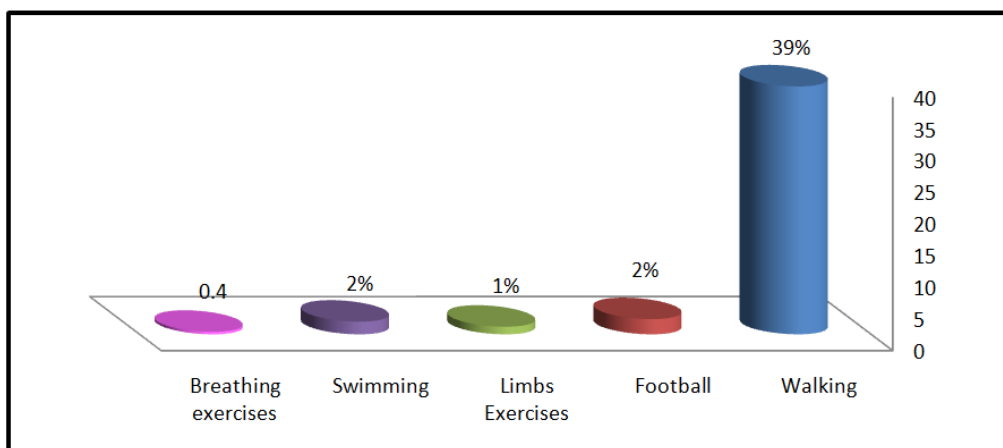


Figure (6): Distribution of the studied subject according type of exercise.

Figure 6: this figure shows that walking is the most common exercise practices by the studied subject 39% at the least exercise was swimming 2%, while football, lime exercises and breathing exercises represented by 2%, 1%, 2% and 0.4% respectively.

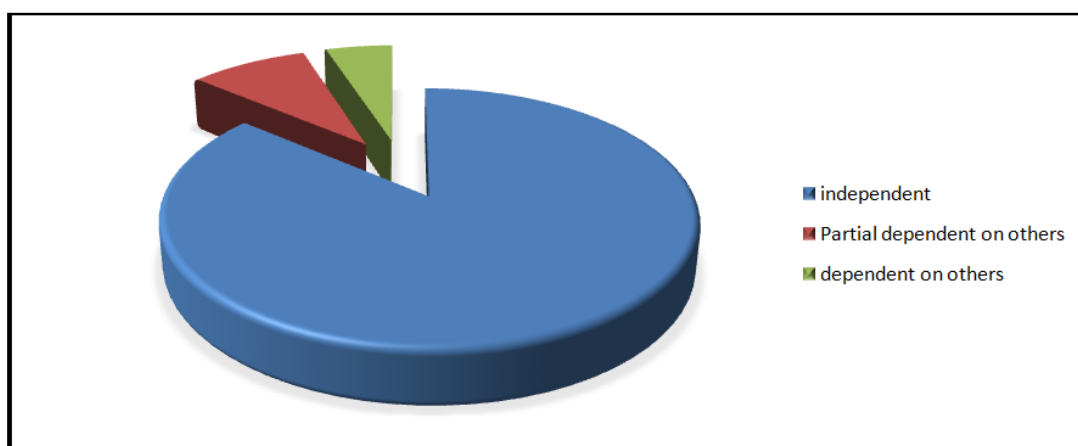


Figure (7): Distribution of the studied subject according to total score of the activities of daily living (ADLs).

Figure 7: This figure shows that majority of the studied subject were independent, in performing ADLs 86%, while partial dependent were represented by 9% and only 5% were dependent.

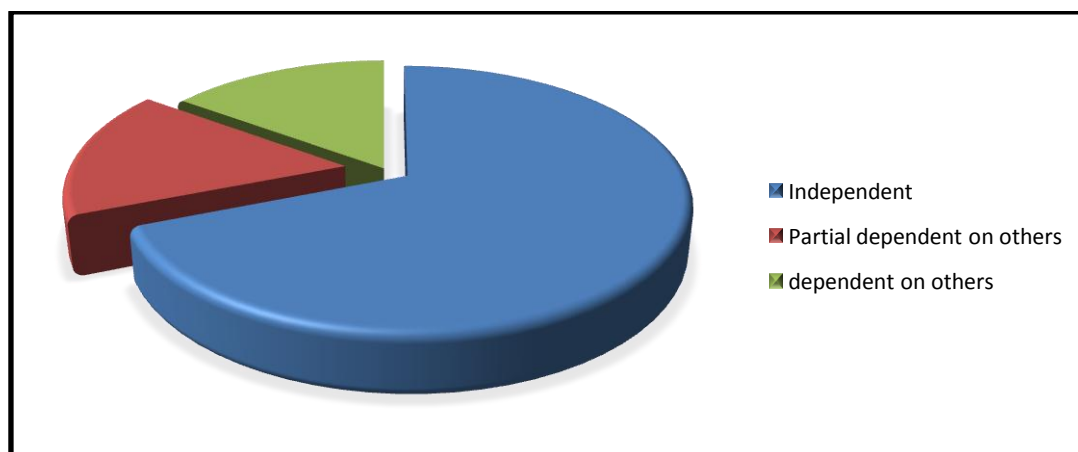


Figure (8): Distribution of the studied subject according to total score of the instrumental activities of daily living (IADLs).

Figure 8: This figure shows that more than half of the subjects were independent in performing IADLs 69%, while partial dependent were represented by 16% and only 15% were dependent.

Part 4: Degree of awareness of the studied sample.

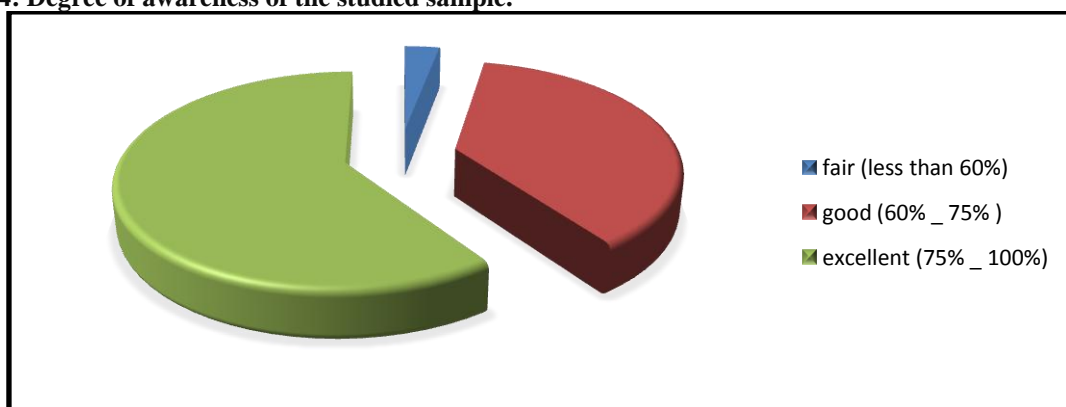


Figure 9: Distribution of the studied subject according to degree of awareness.

Figure 9: this figure shows that 60% the subject had excellent degree of awareness, while good and fair level of awareness were respected by 37% and 3% respectively.

Table (1): Relationship between life style pattern and their degree of awareness toward osteoporosis.

Life style pattern		Degree of awareness			total	Pearson Chi-Square	t-test
		fair	good	Excellent			
Smoking	Yes	0	44	60	104	4.958	0.084
	No	15	142	239	396		
The number of cigarettes/day	>10 cigarettes (11 - 20)	0	22	31	53	4.343	0.227
	(21- 30) cigarettes	0	5	9	14		
	(31- 40) cigarettes	0	17	16	33		
	+30 cigarettes	0	0	4	4		
Negative smoking	Yes	6	51	79	136	0.545	0.762
	No	9	91	160	260		
practice exercise	Yes	7	57	152	216	19.127	0.000*
	No	8	129	147	284		
Walking	yes	4	48	140	192	22.311	0.000*
	No	11	138	159	308		
Football	Yes	0	0	12	12	8.265	0.016*
	No	15	186	287	488		
Limbs Exercises	Yes	0	0	6	6	4.082	0.130
	No	15	186	293	494		
Swimming	Yes	2.2	3	7	12	8.151	0.017*
	No	13	183	292	488		

*level of significant ≤ 0.05

Table 1: This table shows that smoking had no statistical significant, the different with degree of awareness on the other hand. Practice exercise demonstrate, a state statistical significant, the different with degree of awareness except for lime exercise.

Table (2): Relationship between total scale of function abilities to (ADL & IADL) and their degree of awareness toward osteoporosis.

Function abilities		fair	Good	excellent	total	Pearson chi-square	t-test
Total activities Daily living (ADL)	independent	11	162	258	431	17.665	0.001*
	Partial dependent on others	0	14	30	44		
	dependent on others	4	10	11	25		
Total instrument activities daily living (IADL)	independent	8	129	209	346	3.129	0.037*
	Partial dependent on others	3	27	50	80		
	dependent on others	4	30	40	74		

*level of significant ≤ 0.05

Table 2: The table shows that there is a statistical significant different between total scale of function abilities to (ADL & IADL) with degree of awareness.

V. Discussion

Osteoporosis (OP) is a systemic skeletal disorder, characterized by decreased bone mass and deterioration of the micro architecture of bone tissue, which leads to a higher risk of fragility and bone fractures. The disease usually remains undiagnosed until the first fracture is exhibited, and the fracture frequently involves the spine, hip, or wrist. Among these, hip fractures have mortality rates as high as 15-30%. The prevalence rate of hip fractures is about 1.66 million in the world annually, which has been predicted to increase four-fold by 2050 due to the rapid aging of the population globally⁽²⁴⁾. Osteoporosis has progressively become a worldwide public health problem, especially in elderly, which generates a substantial burden of morbidity and economic cost to society^(25, 26, 27, & 28).

Osteoporosis is a complicated condition resultant from various determinants affecting all races and ethnicities. Risk factors include both genetic components and environmental influences, which are implicated in considerable variation in the quality of the bone^(29 & 30). For instance, high age, low body mass, female gender, lack of physical activity, smoking, low calcium/vitamin D intake, and excessive alcohol intake are several frequently reported risk factors of osteoporosis. Awareness regarding risk factor that contributed of osteoporosis can decrease the occurrence of the diseases^(31, 32 & 33).

Moreover, a low educational status and inadequate health knowledge have been reported as possible contributing factors to several diseases, including rheumatoid arthritis and osteoporosis^(34, 35 & 36).

According the age of in **Smith & Wordworth (2005)**⁽³⁶⁾. They found risk for osteoporosis increases with age as BMD declines. Senile osteoporosis is most common in persons aged 70 years or older. In the same line with current study found the majority 74% of subject young old from 65-74 years old.

Also, similar in **(Oyoo et al., 2015)**⁽³⁷⁾ study were found the age distribution was 31- 95 years with majority being above the age of 60 years at 71.5%.

According to marital state and awareness, in⁽³⁸⁾ study was found, females were represented by 73% of the study, in contradict with present study as mention that there is statistical significant regarding gender and degree awareness ($p < 0.01$) about two-third of the subjects are female. Also, similar in⁽³⁷⁾ found that majority of sample female (89.3%).

According the age of menopausal in⁽³⁷⁾, study was found, post-menopausal (46.4%). While in current study were found in contrast majority 52% of study the age between 45-50.

According smoking effects in⁽³⁹⁾ study were found they examined smoking effects on bone state in men aged ≥ 65 years smoking effects on bone status after adjusting for age, height, weight, and number of cigarettes smoked daily, Smoking did not affect biochemical marker serum values for bone. In the same line in current study were found the majority of sample nonsmoking represented by 79%.

According Physical activities in⁽²⁴⁾, study was found positively associated with BMD. This effect was stronger with hip than with spine BMD. Weakly positive associations were found between consumption of dairy products and BMD at the two measurement sites. Low dietary calcium intake and poor physical activity together with advancing age since menopause were independent risk factors for low BMD. While in current study were found in contrast more than half 56%, they didn't practicing exercise. Also in⁽⁴⁰⁾, in Japan and showed that regular physical activity of women played a significant role in the prevention of osteoporosis.

According number of pregnancies, in⁽⁴¹⁾ study were found number of children, age and body mass index (BMI) were significantly associated with risk for neck of femur and lumbar spine osteoporosis ($P < 0.0001$), similar to current study were found more than one third 44% the mean number of pregnancy between 6-10 pregnancies.

According endocrine disease in⁽⁴²⁾, study was found, it has become apparent in recent years for diabetes mellitus (DM) are associated with an increased risk for osteoporosis-associated fractures. Similar to current study were found the nearly the half 48% of sample they have endocrine disease. According medication in⁽⁴³⁾ study was found heparin adversely affected bone density in about one third of exposed patients. Similar to current study were found more than one third 39% of sample they take anticoagulants medication.

VI. Conclusion

The present study concluded that there is a positive effect with high degree of awareness to prevent development of osteoporosis.

Recommendation

The current study recommended the following:

- Further studies to be conducted regard osteoporosis at Saudi Arabia to be more accounted with the size of the problem to high light this big problem.

- Providing health education program for raising the level of awareness toward osteoporosis disease among elderly person.
- An education programs to school children to develop their awareness regarding prevention of occurrence osteoporosis that must be stated from in childhood.

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