Effectiveness of an Instructional Program up on Osteoporotic Patients Concerning Prevention of Fractures in Al-Musaib General Hospital

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Abstract: *Osteoporosis is a progressive skeletal disease characterized by low bone mineral density (BMD) with a consequent increase in bone fragility and susceptibility to fracture of the hip, spinal vertebrae, and wrist. An osteoporosis-related fracture (i.e., fragility fracture), particularly those of the hip and spine, is an independent predictor of subsequent fracture and associated with increased morbidity and mortality.* <u>*Objectives:*</u> *The main aim of the study is to determine the effectiveness of an instructional program on the knowledge of Osteoporotic Patients Concerning Prevention of Fractures.* <u>*Methodology:*</u> *A quasi- experimental design was used in the present study with the application of a pre-tests/ post-tests approach for the study group and control group after implementation of instructional program. The period of the study was from 16th of October 2016 to 10th of June 2017. The program and instruments were constructed by the researcher for the purpose of the study.Non-probability (convenience) sample of (40) osteoporotic patients were selected from Al-Musaib General Hospital. The study sample in this research was divided into two groups; (20) osteoporotic patients for the study, which was exposed to the health education program, and (20) osteoporotic patients for control group.The study group was exposed to an instructional program, while the control group was not exposed to the program.The groups were almost matched relative to their characteristics. The study instrument is composed of two main parts: Part I. The socio- demographic characteristics of the patients, Part II. Knowledge of osteoporotic patients regarding prevention fractures. This part consists of 124 items. Validity of the study instrument was determined through a panel of experts and reliability of the instrument was determined through (test – retest) method. The analysis of the data used was descriptive statistics and statistical inferential, in order to find the differences between the study group and the controlgroup.* <u>*Results:*</u> *The study findings indicate that there are highly significant differences between pre and post-tests in the experimental group in overall main domains regarding osteporotic patient's knowledge concerning prevention fractures.* <u>*Conclusion:*</u> *The study concludes that the effectiveness of an instructional program regarding osteoporotic patients' knowledge, which is concerned with prevention fractures, is positive at a high rate.* <u>*Recommendation:*</u> *The researcher recommends that special education programs should be carried out for the medical staff, specifically, for the nurses who are working with osteoporotic patients in the orthopedic wards to raise their awareness toward one of the most important complications of the osteoporosis which is fractures so the can educate patients.*

Keywords: Effectiveness, Instructional Program, Osteoporotic Patients, Prevention Fractures.

1. Introduction

Osteoporosis is a potentially debilitating disease that presents itself in excessive bone loss, usually during aging and results in fragile bones. Osteoporosis can be broken down into two words, the "osteo" means bone and the "porosis" which means porous or having pores. Osteoporosis refers to a disease causing the bone structure to become more open and porous resulting in fractures [1]. As one age, bone mass tends to decline due to a variety of factors. Osteoporosis or osteopenia which is an early warning sign, signals an imbalance in the remodeling signal. Too much bone is broken down and too little new bone is built back this leads to brittle bones which are prone to fracture. A combination of causes is often to blame for bone loss. The body is constantly at work breaking down and rebuilding the bones. Specialized bones called osteoblast pull calcium, magnesium and phosphorous from the blood to build bone mass. Usually the body does not show any symptoms of osteoporosis until a fracture occurs or a vertebra collapses causing a loss of height and a hump in the back[2]. Fractures and their complications are the relevant clinical sequelae of osteoporosis. The most common fractures are those of the vertebrae (spine), proximal femur (hip), and distal forearm (wrist). However, most fractures in older adults are due at least in part to low bone mass, even when they result from considerable trauma. A recent fracture at any major skeletal site in an adult older than 50 years of age should be considered a significant sign for the diagnosis of osteoporosis and provides a sense of urgency for further assessment and treatment. The most notable exceptions are those of the fingers, toes, face, and skull, which are primarily related to trauma rather than underlying bone strength. Fractures may be followed by full recovery or by chronic pain, disability, and death. There aretwo main goals have to be fulfilled in order to prevent osteoporosis-related fractures: first, the occurrence of events that lead to high-energy or low-energy injury must be prevented second, the severity of osteoporosis has to be diminished[3]. In order to effectively prevent osteoporosis-related fractures, one must aim to prevent both osteoporosis, as well as the events and circumstances that may lead to injury, ultimately resulting in fracture. Among all the osteoporotic fractures that can occur, hip fractures are associated with a severe decrease in quality of life and high mortality. Prevention of osteoporosis should ideally begin in childhood, aiming to achieve high peak bone mass accompanied by an inherently healthy lifestyle throughout life, in order to minimize bone loss during middle and third age, and in parallel to avoid or diminish other fracture risk factors. There are numerous fracture risk

factors, including age, gender, race, lifestyle and concomitant medical conditions, which either can or cannot be modified, to a greater or lesser degree. Falls consist a previously under estimated risk factor, responsible for a large percentage of fractures. International and national strategies aimed at public awareness, early identification of those at increased risk for fracture and preventive or therapeutic intervention may succeed in subduing the currently increasing prevalence of osteoporotic fractures[4].

2. Methodology

A quasi- experimental design was used in the present study with the application of a pre-tests/ post-tests approach for the study group and control group after implementation of instructional program. The period of the study was from 16th of October 2016 to 10th of June 2017. The program and instruments were constructed by the researcher for the purpose of the study.Non-probability (convenience) sample of (40) osteoporotic patients were selected from Al-Musaib General Hospital. The study sample in this research was divided into two groups; (20) osteoporotic patients for the study, which was exposed to the health education program, and (20) osteoporotic patients for control group.The study group was exposed to an instructional program, while the control group was not exposed to the program.The groups were almost matched relative to their characteristics. The study instrument is composed of two main parts: Part I. The socio- demographic characteristics of the patients, Part II. Knowledge of osteoporotic patients regarding prevention fractures. This part consists of 124 items. Validity of the study instrument was determined through a panel of experts and reliability of the instrument was determined through (test – retest) method. The analysis of the data used was descriptive statistics and statistical inferential, in order to find the differences between the study group and the controlgroup.

Ethical consideration
Verbal consent from each woman of the study sample was obtained and the participation was confidential and voluntary, the information was for research purposes only.

3. Results

Table 1: Distribution of participants' socio-demographic characteristics of the sample

List	Gender	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
1	Male	8	40	9	45
	Female	12	60	11	55
	Total	20	100	20	100
2	Age	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	40-49	4	20	3	15
	50-59	8	40	7	35
	60-69	7	35	8	40
	70-79	1	5	2	10
	Total	20	100	20	100
3	Education level	Study Group		Control Group	
	Not read and write	6	30	6	30
	Just read	1	5	2	10
	Read and write	0	0	0	0
	Primary	4	20	4	20
	Intermediate	2	10	4	20
	Secondary	2	10	1	5
	Graduated	3	15	2	10
	Post Graduated	2	10	1	5
	Total	20	100	20	100
4	Marital Status	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	Single	0	0	1	5
	Married	16	80	15	75
	Widow	4	20	4	20
	Total	20	100	20	100
5	Occupation	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	Employee	7	35	4	20
	Housewife	7	35	9	45
	Retired	1	5	4	20
	Free career	4	20	3	15
	Other	1	5	0	0
	Total	20	100	20	100
6	Residency	Study Group		Control Group	
	Urban	15	75	14	70
	Rural	5	25	6	30
	Total	20	100	20	100
7	Monthly Income	Study Group		Control Group	
	Insufficient	6	30	6	30
	Somewhat sufficient	8	40	1	5
	Sufficient	6	30	13	65
	Total	20	100	20	100
8	Blood Group	Study Group		Control Group	
	A^+	2	10	3	15
	B^+	1	5	3	15
	AB^+	0	0	1	5
	O^+	17	85	13	65
	Total	20	100	20	100
9	BMI	Study Group		Control Group	
	18.5-24.9	5	25	6	30
	25-29.9	10	50	10	50
	Above 30	5	25	4	20
	Total	20	100	20	100
10	Go On Diet	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	No	6	30	3	15
	Yes	14	70	17	85
	Total	20	100	20	100
11	Height Loss	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	No	9	45	12	60
	Yes	11	55	8	40
	Total	20	100	20	100
12	Fracture History	Study Group		Control Group	
	No	9	45	12	60
	Yes	11	55	8	40
	Total	20	100	20	100

13	Hormonal Drug	Study Group		Control Group	
	No	19	95	19	95
	Yes	1	5	1	5
	Total	20	100	20	100
14	C and D Supplement	Study Group		Control Group	
	No	15	75	19	95
	Yes	5	25	1	5
	Total	20	100	20	100
15	How many years you have osteoporosis	Study Group		Control Group	
	1-5	10	50	9	45
	6-10	6	30	8	40
	11-15	4	20	3	15
	Total	20	100	20	100
16	Family History	Study Group		Control Group	
	No	11	55	14	70
	Yes	9	45	6	30
	Total	20	100	20	100
17	Kidney Disease	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	No	17	85	18	90
	Yes	3	15	2	10
	Total	20	100	20	100
18	HT	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	No	5	25	10	50
	Yes	15	75	10	50
	Total	20	100	20	100
19	Thyroid and Parathyroid Disease	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	No	19	95	19	95
	Yes	1	5	1	5
	Total	20	100	20	100
20	Cancer	Study Group		Control Group	
	No	20	100	19	95
	Yes	0	0	1	5
	Total	20	100	20	100
21	Respiratory disease	Study Group		Control Group	
	No	15	75	13	65
	Yes	5	25	7	35
	Total	20	100	20	100
22	Rumatoide Arthritis	Study Group		Control Group	
	No	17	85	18	90
	Yes	3	15	2	10
	Total	20	100	20	100
23	D.M.	Study Group		Control Group	
	No	4	20	1	5
	Yes	16	80	19	95
	Total	20	100	20	100
24	Smoking	Study Group		Control Group	
	No	12	60	14	70
	Yes	8	40	6	30
	Total	20	100	20	100
25	Years Of	Study Group		Control Group	

	Smoking	Frequency	Percent	Frequency	Percent
	No Smoking	12	60	14	70
	1-5	0	0	0	0
	6-10	2	10	2	10
	11-20	2	10	1	5
	+20	4	20	3	15
	Total	20	100	20	100
26	Drinking	Study Group		Control Group	
		Frequency	Percent	Frequency	Percent
	No	19	95	19	95
	Yes	1	5	1	5
	Total	20	100	20	100
27	Beverages	Study Group		Control Group	
	No	12	60	14	70
	Yes	8	40	6	30
	Total	20	100	20	100

F: Frequency, %: Percentage

The descriptive analysis of the sample in table (1) for both groups shows that more than half of the sample were females with (60%) of study group and (55%) of control group and (40%) of the patients were in age (50-59) followed by those who are aged (60-69) with (35%) on the other hand the (40%) of control group aged (60-69) followed by (35%) for those between (50-59). Regarding educational level, (30%) of the patients for both groups were couldn't read and write followed by (20%) are elementary school graduates.

Most of the participants in the study group are married (80 %), and a smaller proportion of the married participants in the control group (75%). There are equal numbers each of housewives (35%) and employee (35%) in the study group and (45 %) of participants are housewives in the control group. The majority of participants in the study group live in urban areas (75 %) and a smaller number of participants in the control group also live in urban areas (70 %).

About (45%) participants in the study group have somewhat sufficient monthly income. While in the control group, most of participants have a sufficient monthly income (65 %). Most of participants in the study group with O^+ blood group (85%). While in the control group, (65 %) of participants also have a O^+ blood group. There are equal numbers of participants in each of the study and control groups (50 %) with BMI (25-29.9) kg/m^2. The majority of participants in the study group go on diet (70 %) and a larger number of participants in the control group also go on diet (85 %).

Additionally, more than a half of participants in the study group reported that the they had height loss (55 %). The control group is reported (40%) of participants had height loss. More than half of the participants in the study group had face fractures (55 %). On the other hand, exactly (40%) of participants in the control group had face fractures. Both groups have the same percentage for the use of hormonal therapy (5%). Exactly quarter of the study group were using Ca^+ and vitamin D supplements so just (5%) of the control group were using Ca^+ and vitamin D supplements.

Half of the participants in the study group suffer from osteoporosis for a period of (1-5) years (50%) and a smaller proportion of the participants in the control group (45%) for the same period. About (45%) participants in the study group have family history with osteoporosis. While in the control group, (30%) of participants have a family history with osteoporosis.

Moreover (15%) of participants in the study had experienced kidney disease and the control groups reported there are (10%) had experienced kidney disease. However, about a (75%) of participants in the study group reported that they had experienced Hypertension, and a smaller proportion of participants in the control group also experienced Hypertension (50 %).

About (5%) of participants in both the groups reported that they had thyroid and parathyroid Disease, and the same percentage have had cancer in only control group. A quarter of study group suffering from respiratory disease and a larger proportion for those in the control group who also

reported that (35%) suffering from respiratory disease. There are (15%) of participants in the study group suffering from rheumatoid arthritis. While just (10%) of participants in the control group suffering from this disease.

The majority of participants in the study group had experienced diabetes mellitus and a larger proportion for those in the control group who also reported that (95%) had experienced diabetes mellitus.

Ultimately, (40%) of participants in the study group who reported that they are smokers and (30%) for control group. On the other hand, (20%) of smokers in the study group smoked for more than 20 years and a smaller proportion for those in the control group who also reported that (15%). The both groups have only (5%) of participants who were drinking alcohol.

About (40%) of participants in the study group were dinking beverages. While in the control group, just (30 %) of participants were dinking beverages also.

Table 2: Level of knowledge pre and post test scores for study and control groups

Knowledge	Study Group (N=20)					Control Group (N=20)				
	M.	t	df	p-value	Sig.	M.	t	df	p-value	Sig.
Pre-test	200.7500	-20.795-	19	.000	HS	194.8000	-1.473-	19	.157	NS
Post-test	335.5500					195.9000				

This table shows the levels of total knowledge among participants towards prevention osteoporosis related fracture which reveals that osteoporotic patients had low to moderate knowledge about prevent osteoporosis related fractures for both groups (50%) at pre-test results. The post-test results indicate that all osteoporotic patients in the study group were having high level of knowledge about prevent osteoporosis related fractures (100%), while the osteoporotic patients in control group were holding low to moderate level of knowledge about prevent osteoporosis related fractures (50%) for low and the same for moderate.

Table 3: Significant Differences in osteoporotic patients' Knowledge towards prevention osteoporosis related fracture Pre & Post- Test for Study and Control Groups

Knowledge	Mean	T	df	P-value	sig
Post-test (study group)	335.5500	24.494	38	.000	HS
Post-test (control group)	195.9000				

This table reveals the effectiveness of instructional program of knowledge prevention osteoporosis related fracture, the results refer to highly significant difference among osteoporotic patients' knowledge in the study group at p-value= 0.00 respectively, and there is no significant difference among osteoporotic patients' knowledge in the control group at p-value= 0.05 respectively.

Table 4: Comparison of significance between the periods of post-tests related to patients' knowledge of the study and control groups

Group	Pre-Test			Post-Test		
	Low	Moderate	High	Low	Moderate	High
	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
Study	10 (50%)	10 (50%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	20 (100%)
	M.S 1.50	S.D. .51299		M.S 3.00	S.D. 0.00	
Control	10 (50%)	10 (50%)	0 (0.0%)	10 (50%)	10 (50%)	20 (100%)
	M.S 1.50	S.D. .51299		M.S 1.50	S.D. .51299	

There is a significant difference between the study and control groups regarding the results of the post-test at p-value = 0.00.

4. Discussion

The analysis of findings in table (1) reveals that more than half of both groups (control and study) were female. These results agree with findings of Chan (2007)[5], who found the high percentage of his study sample were female.

Based on the study results (table 1), (40%) of the patients were in age (50-59) followed by those who are aged (60-69) with (35%) on the other hand the (40%) of control group aged (60-69) followed by (35%) for those between (50-59). These findings are supported by a study conducted by Barbara (2014)[6] which stated that mean age of 62.8 years old. The current finding is also supported with findings of Sarah et. al (2015)[7] who reported that more of the sample was at age group of The mean age of 49.92 ±7.75 years (range 40–76 years).

Regarding educational level, (30%) of the patients for both groups were couldn't read and write followed by (20%) are elementary school graduates. These findings agree with a study of Geller and Derman (2010)[8] who stated in his study that (26%) of the patients doesn't complete their elementary school or cannot read and write. Additional support is found by the findings of Hammoudeh et al. (2015)[9] who found that (20.9%)of participants have no education and (29.1%) with elementary school education. The results in table (1) reveal that most of the participants in the study group are married (80 %), and a smaller proportion of the married participants in the control group (75%). The current finding is consistent with the study of Barbara (2014)[6] who reported similar results thatmarried (53%). Based on the study results in table (1), There are equal numbers each of housewives (35%) and employee (35%) in the study group and (45 %) of participants were housewives in the control group. This finding agrees with a study done by Geller and Derman (2010)[8] who showed that his sample were (57%) unemployed (housewife) and (25%) were employed.

The results revealed that the majority of participants in the study group live in urban areas (75 %) and a smaller number of participants in the control group also live in urban areas (70 %). This finding agreed with a study established by Elsabagh et. al (2015) [10] who stated that (65.7%)of participants were living in urban areas.Based on the study results, about (45%) participants in the study group have somewhat sufficient monthly income. While in the control group, most of participants have a sufficient monthly income (65 %). This finding agree with a study done by Sadighe et.al (2013) [11] who indicated 52.9% of them stated that their monthly incomes is between half to one million Tumans(somewhat sufficient monthly income) that's totally agree with findings of the study group. This finding agreed with a study established by Elsabagh et. al (2015)[10] who stated that (53.2%) had enough but not saving income.Based on the study results,

There are equal numbers of participants in each of the study and control groups (50 %) with BMI (25-29.9) kg/m². This finding agrees with a study done by Midi (2008)[12] who indicated the mean of BMI is (25.5) kg/m².These results agree with findings of Elsabagh et. al (2015)[10], who found that (20%) of participants with mean Body Mass Index was 29.52 ± 5.77. Additionally,this findingagrees with Geller and Derman (2010)[8]who found that (32%) participantswith Body Mass Index (25-29.9) kg/m². More than a half of participants in the study group reported that they had height loss (55 %). The control group is reported (40%) of participants had height loss. This finding agrees with a study done by Gorial et al (2013)[13] who indicated (42.2%) of women and (39.9%) of men had height loss.Based on the study results, more than half of the participants in the study group had face fractures (55 %). On the other hand, exactly (40%) of participants in the control group had face fractures. This finding agrees with a study done by Hammoudeh et al. (2015)[9] who indicated (34.9%) of the participants had face fractures. Additional support is found by Gorial et al (2013)[13] who found that (54.4%) of the participants had have fractures.

The current results reveal that exactly quarter of the study group were using Ca+ and vitamin D supplements so just (5%) of the control group were using Ca+ and vitamin D supplements. This finding agrees with a study done by Midi (2008)[12] who showed that (15.7%) of participant took Ca supplement and (4.9) took vitamin D supplement.

The current results reveal that half of the participants in the study group suffer from osteoporosis for a period of (1-5) years (50%) and a smaller proportion of the participants in the control group (45%) for the same period. This finding agrees with a study done by Hammoudeh et al. (2015)[9] who showed that (30.2%)of the participants suffer from osteoporosis for a period of (3-5) years.

The analysis of findings in table (1) reveals that About (45%) participants in the study group have family history with osteoporosis. While in the control group, (30%) of participants have a family history with osteoporosis.These results agree with findings of Chan (2007)[5], who found that (20%) of participants has family history with osteoporosis. Additional support is found by Hammoudeh et al. (2015)[9] who found that (31.4%) of participants has family history with osteoporosis too.

The findings of current study are agreed with Gorial et al (2013)[13] who indicated that (36.1%) of participants has family history with osteoporosis.Based on the study results (table 1), exactly (15%) of participants in the study had experienced kidney disease and the control groups reported there are (10%) had experienced kidney disease. These findings are supported by a study conducted by Nelson (2012)[14] which stated that (34.6) of his sample had experienced kidney disease.

The results reveal that about a (75%) of participants in the study group reported that they had experienced Hypertension, and a smaller proportion of participants in the control group also experienced Hypertension (50 %). These findings agree with a study of Nelson (2012)[14] who stated in his study that (85.4%) of participants reported that they had experienced Hypertension.

The results in table (1) reveal that About (5%) of participants in both the groups reported that they had thyroid and parathyroid Disease, and the same percentage have had cancer in only control group. The current finding is consistent with the study of Nelson (2012)[14] who reported that results (15.1%) of participantshad thyroid and parathyroid Disease. Based on the study results in table (1), (5%) of the sample in the control group had suffered from cancer. This finding agrees with a study done by Nelson (2012)[14] who showed that (7.2%) of his sample had have cancer.

A quarter of study group suffering from respiratory disease and a larger proportion for those in the control group who also reported that (35%) suffering from respiratory disease. This finding agreed with a study established by Nelson (2012)[14] who stated that (30%)of participants took bronchodilator drug.Based on the study results, there are (15%) of participants in the study group suffering from Rheumatoid arthritis. While just (10%) of participants in the control group suffering from this disease. This finding agrees with a study done by Nelson (2012)[14] who indicated

(5%) of participants suffering from Rheumatoid arthritis. Additional support is found by the findings of Mobini et al. (2012)[15] who observed that (32.3%) of the sample were suffering from Rheumatoid arthritis. This finding agrees with a study done by Taylor (2015)[16] who indicated (26%) of participants suffering from Rheumatoid arthritis.

The current results reveal that the majority of participants (80%) in the study group had experienced diabetes mellitus and a larger proportion for those in the control group who also reported that (95%) had experienced diabetes mellitus. This finding agrees with a study done by Nelson (2012)[14] who showed that the majority of his samplehad experienced diabetes mellitus.

Ultimately, (40%) of participants in the study group who reported that they are smokers and (30%) for control group. This finding agrees with a study done by Geller and Derman (2010)[8] who indicated (52%) of participants were smoking. This finding agrees with a study done by Taylor (2015)[16] who showed that (29%) of participants were smoking.Based on the study results, both groups have only (5%) of participants who were drinking alcohol.

This finding agrees with a study done by Midi (2008)[12] who indicated (8.82%) of participants were drinking alcohol. This finding agrees with a study done by Nelson (2012)[14] who showed that (4.7%) of his sample drink alcohol.

The results of this study show the levels of total knowledge among participants about prevention osteoporosis related fracture which reveals that osteoporotic patients had low to moderate knowledge about prevent osteoporosis related fractures for both groups (50%) at pre-test results. The post-test results indicate that all osteoporotic patients in the study group were having high level of knowledge about prevent osteoporosis related fractures (100%), while the osteoporotic patients in control group were holding low to moderate level of knowledge about prevent osteoporosis related fractures (50%) for low and the same for moderate.The results are also consistent with Xu, (2013)[17] whose study was shown that the majority of participants in the both groups ranged from poor to good level of knowledge in pretest and all the participants in the study group get excellent level of knowledge at post-test on the other hand the participant in the control group hold the same level of knowledge at posttest.

The Grand Mean knowledge for participants in the study group has increased significantly in the post-test of the study group due to receiving the instructional program, and according to this there is a significant difference between the study and control groups regarding the results of the post-test at p-value = 0.00.The results of Alexander, (2011)[18] showed differences about levels of knowledge related to prevention osteoporosis and its related fracture pre- & post guidelines implementation in the studied patients. The results illustrate that none of studied patients had adequate knowledge at pre-test. Also, none of them had adequate total knowledge about pre- instructional program, but the majority (98%) of them had adequate knowledge post instructional program respectively with highly statistically significant differences between them (P <0.001).

5. Conclusions

- The majority of the study sample in study and control group are female.
- The majority of the study sample in study and control group are within age group (50 – 59) and (60-69) years respectively.
- The majority of the sample in study and control groups are couldn't read and write and elementary school graduates respectively.
- The majority of study sample in the both groups are married, housewives, have somewhat sufficient monthly income and in the control group, most of participants have a sufficient monthly income, and live in urban areas. They almost have the same characteristics of the variables.
- The majority of participants in the study with O^+ blood group.
- The majority of participants in each of the study with BMI $(25-29.9)kg/m^2$.
- The majority of participants in the study go on diet.
- Most of participants in the study reported that they had height loss and face fractures.
- About (45%) participants in the study group and (30%) of the control group have family history with osteoporosis.
- The majority of participants in the study experienced hypertension and diabetes mellitus as chronic disease.
- About (40%) of participants in the study group who reported that they are smokers and (30%) for control group.
- About (40%) of participants in the study group were dinking beverages. While in the control group, just (30 %) of participants were dinking beverages also.
- The majority of the sample have poor knowledge about prevention osteoporosis related fractures before the instructional program.
- The knowledge of the patients regarding prevention osteoporosis related fractures has been improved after implementation of the instructional program in the study group as shown in the post test results in all of the domains.

6. Recommendations

1) Manual or booklet of instructions about prevention fractures should be published and delivered to osteoporotic patients.
2) Encourage the newly diagnosed person to learn more about their condition and provide the proper information via the media.
3) Special education programs should be carried out for the medical staff and specifically for the nurses who are working with osteoporotic patients in the orthopedic wards, to raise their awareness toward one of the most important complications of the osteoporosis which is fractures.
4) Encouraging nursing staff in the hospitals to participate in teaching the patients, providing, and maintaining the necessary information about prevention fractures through lectures and continuous education to the osteoporotic patients.

5) Further research on a larger sample should be carried out to estimate the incidence of osteoporosis and osteoporotic fractures in Iraq and induce the practical application of the instructions, precautions, management methods, preventive measurements and monitoring its impact on the long-term life style of the osteoporotic patients.

6) Further study for larger sample and longer period of time is needed to focus on the short-term and long-term effects of fractures on osteoporotic patients' life style and their quality of life.

7) Further education and rigorous clinical trials are needed to address the importance of early recognition and management of osteoporosis related fractures after being osteoporotic patient.

8) A prospective surveillance program integrated into the clinical setting is recommended as the emerging standard of care.

References

[1] Qalawa, S. A., Mohamed, M. A., & Aly, A. A. 2013: Pilot for the extent of women's knowledge regarding risk factors leading to osteoporosis. International Research Journal of Basic and Clinical Studies, Vol. (1) No.(4), Pp. 53-66.

[2] Buffum Taylor Rebecca (2011). What Causes Osteoporosis? And Why?. Living with osteoporosis, Retrieved Oct 24th, 2016 from: http://www.webmd.com/osteoporosis+features/causes

[3] Lewiecki EM, Laster AJ. 2006: Clinical review: clinical applications of vertebral fracture assessment by dual-energy x-ray absorptiometry. J Clin Endocrinol Metab: Vol. 91, No(11); Pp.4215–4222

[4] Dontas I.A. and Yiannakopoulos C.K.: Risk factors and prevention of osteoporo-sis-related fractures, Laboratory for Research of the Musculoskeletal System "Th. Garo-falides", School of Medicine, University of Athens, Greece: J Musculoskeletal Neuronal Interact 2007; Vol. (7), No. (3): Pp. 268-272.

[5] Chan Lu Tak Ruth: Knowledge, Beliefs, Preventive Behaviors and Preferred Information Sources associated with Osteoporosis among Chinese Nursing Students in Hong Kong. Thesis University of Hong Kong, college of Nursing, 2007.

[6] Barbara Resnick: f Osteoporosis, Falls, Fear of Falling and Efficacy Expectations on Exercise Among Community Dwelling Older Adults. NIH Public Access OrthopNurs. 2014; 33(5): 277–286.

[7] Sarah Sayed El-Tawab: Knowledge of osteoporosis among women in Alexandria (Egypt). Thesis, Alexandria University Rheumatology and Rehabilitation Department, Faculty of Medicine, 2015. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

[8] Stacie E. Geller and Richard Derman: knowledge, beliefs, and risk factors for osteoporosis among africanamerican and hispanicwomen.University of Illinois at Chicago, College of Medicine, 2010.

[9] Samer Hammoudeh1, Magdi Hassan Abdelrahman2, Prem Chandra3, Mohammed Hammoudeh2: An assessment of patients' knowledge of osteoporosis in Qatar. Qatar Foundation Journals, 2015; 13(3): 34-55

[10] Hala M. Elsabagh, Abdelaziz F. Aldeib, Salwa A. Atlam, Shimaa M. Saied: Osteoporosis knowledge and Health Beliefs among Employees of Tanta University. American Journal of Research Communication, 2015: Vol (12) 62: 113-117. This is an open access article (www.usa-journals.com)

[11] Sadighe Fayazi1, Ghazaleh basiri1*, Maryam Bagheri1, Mansoureh Arabi1, Hamed Tabesh2, Zeinab Rabiee3: Knowledge, attitude and practice of adults about osteoporosis prevention in Ahvaz. Jundishapur Journal Chronic Disease Care. 2013;2(3):18-25.

[12] Midi Tsat: The relationship between osteoporosis knowledge, beliefs, and dietary calcium intake among south Asian women in Auckland. Thesis, Auckland University, College of Nursing, 2008.

[13] Faiq I. Gorial 1, Nisreen D. Aubaese 2, Nibrass H. Husaeen 3:Prevalence and Associated Factors of Osteoporosis in Post-Menopausal Iraqi Women: A Cross- sectional Two Centers Study. International Journal of Modern Biology and Medicine, 2013, 3(1): 41-49.

[14] Nelson, Richard E.; Nebeker, Jonathan R.; Sauer, Brian C.; and LaFleur, Joanne: Factors associated with screening or treatment initiation among male United States veterans at risk for osteoporosis fracture" (2012). Public Health Resources. Paper 188. Retrvied at 3/3/2017 from: http://digitalcommons.unl.edu/publichealthresources/188.

[15] Maryam Mobini (MD) *1 Zahra Kashi (MD) 1 AsiehGhobadifar: Prevalence and associated factors of osteoporosis in female patients with rheumatoid arthritis. Medical SciencesJurnal, 2012; 21(9): 22-27.

[16] Taylor, H.(2015). Exercise for Osteoporosis Prevention: A Health Belief Model Guided Intervention. Retrieved at October 12, 2016;from http://libra.virginia.edu/catalog/libra-oa:9795

[17] ZhiJin Xu: AN OSTEOPOROSIS intervention program for chinese women— knowledge, self-efficacy, and intention. Dissertation, Temple University Graduate Board, Public Health, 2013.

[18] Alexander C.: The Development and Effectiveness of an Osteoporosis Prevention Education Intervention. Dissertation, University of Missouri, A Graduate School, 2011.