

Evaluation of Diabetic Patients' Knowledge to Cutoff Osteoporosis at Diabetes Center in Duhok City

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ABSTRACT

Background: Patients with T1DM had two to six fold greater of fractures hazard compared to healthy individuals, with the dangerous being highest in T1DM females. In a recent study examining the factors that influence bone break hazards in T1DM adult persons, about 50% of the participants said they had at least one fracture after being diagnosed with diabetes. With comparison of non-diabetic persons, those with T2DM get a 1.2- to 3-fold high prevalence of breakage, especially hip fractures and moreover forearm and leg fracture. Break incidence appear higher in people with a BMI of less than 30 kg/m² comparing to obese people, and does not appear to differentiate much by gender. Longer duration of diabetes, poor levels of physical activity, sugar and systemically corticosteroid usage, and advancing ages are all linked to an increased fracture risk in T2DM patients. Falls are another cause of fractures, particularly in diabetic women.

Aims: The present study conducted to evaluate the patients' knowledge to put off osteoporosis among a sample from a diabetes center in Duhok city.

Methodology: A descriptive design aimed to evaluate diabetic patients' knowledge from 25 November 2020 to 26 June 2021. In order to get reliable data and a representative sample, a nonprobability (accidental) sample of 27 patients were selected from the diabetes center of Azadi teaching hospital in Duhok city. The statistical data analysis approaches used in order to analyze and assess the results of the study under the application of the statistical package (SPSS) ver. (22.0). Descriptive statistical data analysis and inferential data analysis were used to analyze the finding of the present study

Results: The finding of the present study shows female were more than male, constituted 19 (70.4%). The distribution of the gender variable is coincident in the study, as it is high of females, age was between (50- 60) and constituted 12 (44.4%). With regard to the marital status, most of the participants were married and constituted 23(85.2%). Regarding the educational level, most of the participants do not read and write (illiterate) and constituted 12 (44.4%). Most of the participants had low knowledge score of Relative sufficiency coefficient (RS%) less than (33.34) about osteoporosis.

Conclusion: Most of the participants were suffer from type two diabetes mellitus and most of them who visit a diabetes center had minimum knowledge toward osteoporosis. Instructional programs with a large sample should be designed for all diabetic patients with both types of diabetes to improve their knowledge about osteoporosis.

Keywords: Evaluation, Diabetic patients, Knowledge, Cutoff, Osteoporosis.

INTRODUCTION

Diabetes mellitus is becoming more frequent around the world, according to the International Diabetes Federation (IDF) 2017, with its repercussions accounting for sixty to seventy percent of diabetes-related medical care costs. In 2017, diabetes was estimated to affect 8.4% of people aged 20 to 90, with that number likely to rise to 9.9% by 2045. In addition to the well-known renal and cardiovascular issues (1). An increased risk of fragility fractures has lately been recognized as a key consequence of both T1DM and T2DM (2).

Diabetes mellitus has been linked to deteriorated bone quality and an elevated risk of bone breaks (3). Furthermore, improved clinical management can reduce diabetes osteopathy, as breakage risk is higher in diabetic patient with impaired blood sugar control than to diabetic patients that is well-managed (4). Individuals with T1DM have a total disaster of the pancreatic β -cells, as well as low levels of insulin-like growth factor 1 (IGF1). In addition to osteogenesis, low IGF1 levels and a lack of insulin, among other pancreatic anabolic hormones, restrict the end conversion of mesenchymal stem cells (MSCs) into osteoblasts (5).

As a result, bone growth is inhibited at a young age, resulting in an insufficient accumulation of maximum bone density (6-7). T2DM, on the other hand, has a negative impact on bone health in advanced disease, when a number of factors such as insulinopenia, high blood sugar, the development of advanced glycation end products (AGEs), inflammatory processes, and micro - vascular disease all work together to negatively impact bone structure and mechanical characteristics (2-8).

Osteoporosis is a frequent and unnoticed condition until it is compounded by fractures. Over the course of their lives, 50 percent of women and 20 percent of men over the age of 50 are expected to suffer an osteoporosis-related fracture. These fractures result in lifelong damage, lower quality of life, and a greater rate of death, putting a strain on both the case's and the

nation's financial resources. Osteoporosis can be detected and treated well before a fracture occurs. As a result, primary healthcare workers should be trained in osteoporosis prevention, detection, and therapy (9).

In Asia, bone fragility is under-recognized, in those individuals who are in danger of broken bones. In pastoral regions and densely populated nations for example India and China, the situation is more significant, where most of the people who live in pastoral regions (60 percent Chinese), have lower access to diagnostics and treatment compared to metropolitan regions. This suggests that the number of people with osteoporosis is undetected in pastoral areas throughout the Asian countries (10). Urbanization, as in other parts of Asia, seems to be connected to a rise in the frequency of fractures as a result of a sedentary lifestyle, increased inside life, and less exposure to the sun (11).

Advancing years, oral antidiabetic medications, and nutritional deficiencies are possible causes for lower bone quality, while a higher body mass index had shown to prevent females from losing bone density. A comparison study on a bigger size is needed, and it is expected to provide a clearer picture of the dangers and association between T2DM and bone fragility (12)

Despite bone density being unaltered or indeed better among individuals with T2DM, T2DM is linked to a higher fractures incidence. The causes seem to be probably a combination of factors, including the length of diabetes, uncontrolled blood glucose, an increased chance of falls because of low blood sugar, low bone mass, weak bones, and drug interactions, all of which can increase the chance of osteoporosis and broken bones (13). However, there has been very little scientific research on the effects of hyperglycemia and some diabetes drugs on bones health and fractures hazard (14)

When compared to healthy females, younger females with T2DM have lower bone resorption. Regardless of the length of DM, this much-decreased bone regeneration phase started rather

quickly in younger females. Knowing the earliest etiology of abnormal bone resorption could be essential in creating diabetic osteopathy prevention methods (15). Now, it is critical to view bone breaks as another diabetes effect, to identify diabetes bone complaint as a distinct etiology, and to emphasize the need for effective monitoring and prevention efforts in greater depth (16).

MATERIALS AND METHODS

The study carried out at diabetes center in Azady teaching hospital of Duhok Governorate.

A descriptive design aimed to evaluate diabetic patients' knowledge from 25 November 2020 to 26 June 2021. In order to get reliable data and a representative sample, a nonprobability (accidental) sample of 27 patients were selected from the diabetes center of Azadi teaching hospital.

The study instrument was constructed depending on literature reviews and previous studies related to diabetes management and osteoporosis prevention in diabetic patients. It is a questionnaire format for the research purpose and composed of three parts. Part one consists of fourteen items which include: age, gender, marital status, educational level, family income, diabetes duration, diabetes type, methods for treating their diabetes, family history of diabetes, use of calcium and vitamin D supplements, body mass index (BMI), smoking status, other chronic diseases, and alcohol drinking. Part two consists of (16) items on patients' knowledge about the causes, symptoms and risk factors of Osteoporosis, and part three consists of (9) items on patients' knowledge about prevention, diagnosis and treatment of osteoporosis) related to formed questionnaire's multiple-choice questions (MCQ) along studied periods. To make the instrument more valid, it was presented to a panel of (12) experts in the different fields. The results of reviewing the questionnaire by the experts revealed that all of the experts are agreed since it was clear and adequate for the measurement of the study. Minor changes were performed on a few items, such as a simple rewrite of their text. Reliability of the questionnaire was used to determine the accuracy of the questionnaire since the results showed a very high level of stability and internal consistency of principle parts concerning item's responses' of the questionnaire.

The study has received formal ethical approval from the University of Baghdad's College of Nursing's Scientific Research Ethical Committee. All participants have signed a consent form indicating their willingness to take part in the research.

Statistical analysis: The statistical data analysis approaches were used in order to analyze and assess the results of the study under the application of the statistical package (SPSS) ver. (22.0):

Descriptive statistical data analysis including. Observed Frequencies, Percents, Mean of score (MS), Grand Mean of Score (GMS), Global Mean of Score (GMS), Standard Deviation (SD), Pooled Standard Deviation (PSD), Relative Sufficiency (RS%), and

Percentile (Grand/or Global) Relative Sufficiency (PGRS%), as well as scoring scales of two categories, such that (True, and False), with integer numbers (1, and 0).

Assessments intervals Scored by: [L: Low (0.00 – 33.33)]; [M: Moderate (33.34 – 66.66)]; [H: High (66.67 – 100)]. Inferential data analysis: Contingency Coefficients and Analysis of Covariance were used in the present study.

RESULTS

This study included 27 diabetic patients whose aged range from 20-60years the mean and standard deviation of their ages was 45.96 ± 10.0 years.

The patients were distributed into four age groups.

Table (1) shows the distribution of Studied Socio-Demographical Characteristics Variables (SDCv.).The results shows female more than male,, constituted 19 (70.4%). The distribution of the gender variable is coincident in the studied groups, as it is high of females, age was between (50- 60) and constituted 12 (44.4%). With regard to the marital status, most of the participants were married and constituted 23(85.2%). Regarding the educational level, most of the participants do not read and write (illiterate) and constituted 12 (44.4%).

Table (2) shows that most of the participants had low knowledge score of Relative sufficiency coefficient (RS%) less than (33.34) in 10 items about risk factors, causes, and symptoms of osteoporosis to moderate knowledge score of RS% between (33.34 – 66.66)] in 8 items of multiple choice questions.

Table 1: Distribution of the studied groups according to Sociodemographic characteristics variable (SDCv.)

SDCv.	Classes	No.	%
Gender	Male	8	29.6
	Female	19	70.4
Age Groups	20 _	3	11.1
	30 _	3	11.1
	40 _	9	33.3
	50 _ 60	12	44.4
	Mean ± SD	45.96 ± 10.0	
Marital status	Married	23	85.2
	Widowed	4	14.8
Instructional level	Does not read or write	12	44.4
	Primary	7	25.9
	Intermediate	0	0
	Secondary	2	7.4
	Institute or College	6	22.2
Family income	Sufficient	7	25.9
	Middle	7	25.9
	Insufficient	13	48.1

Table 2: Patients' knowledge about the causes, symptoms and risk factors for Osteoporosis

MCQ Items	No.	Study			
		MS	SD	RS%	Ass.
To strengthen bones, it is recommended that a person exercise at a moderate level of intensity for at least 30 minutes a day over the course of a period of time	27	0.56	0.51	56	M
Which of the following activities is the best way to reduce a person's chance of developing osteoporosis?	27	0.33	0.48	33	L
Which of the following activities is the best way to reduce a person's chance of developing osteoporosis?	27	0.56	0.51	56	M
Which of the following activities is the best way to reduce your risk of falling?	27	0.37	0.49	37	M
Men and women between the ages of 18 and 70 need calcium on a daily basis	27	0.19	0.40	19	L
Which of the following food sources is rich in calcium?	27	0.52	0.51	52	M
The following food sources are all rich in calcium except	27	0.22	0.42	22	L
Which of the following food sources is the best source of calcium?	27	0.15	0.36	15	L
When should a person take calcium supplements?	27	0.22	0.42	22	L
Which vitamin improves your body's ability to absorb calcium?	27	0.22	0.42	22	L
It is recommended that adults get vitamin D per day on	27	0.11	0.32	11	L
The main source of vitamin D is	27	0.56	0.51	56	M
The right time to be exposed to the sun in the summer to get vitamin D is usually before	27	0.11	0.32	11	L
Which of the following areas of the body when exposed to sunlight will give better results for obtaining vitamin D?	27	0.00	0.00	0	L
Osteoporosis can be diagnosed by	27	0.44	0.51	44	M
If the patient is taking medication to treat osteoporosis, what does he need with the medication?	27	0.19	0.40	19	L

Table 3: Patients' knowledge about prevention, diagnosis and treatment of osteoporosis

MCQ Items	No.	Study			
		MS	SD	RS%	Ass.
Which of the following food sources is the best source of calcium?	27	0.15	0.36	15	L
When should a person take calcium supplements?	27	0.22	0.42	22	L
Which vitamin improves your body's ability to absorb calcium?	27	0.22	0.42	22	L
It is recommended that adults get vitamin D per day on	27	0.11	0.32	11	L
The main source of vitamin D is	27	0.56	0.51	56	M
The right time to be exposed to the sun in the summer to get vitamin D is usually before	27	0.11	0.32	11	L
Which of the following areas of the body when exposed to sunlight will give better results for obtaining vitamin D?	27	0.00	0.00	0	L
Osteoporosis can be diagnosed by	27	0.44	0.51	44	M
If the patient is taking medication to treat osteoporosis, what does he need with the medication?	27	0.19	0.40	19	L

Combination of all probable pair wised. Ass.= Assessment, M.S. = Mean of Score. Evaluation Intervals Scoring Scales of Relative Sufficiency Coefficient (RS%): [L: Low (0.00 – 33.33)]; [M: Moderate (33.34 – 66.66)]; [H: High (66.67 – 100)]. Testing are based on McNemar Test.

Table (3) shows that most of the participants had low knowledge score of RS% less than (33.34) in the most items of multiple choice questions about prevention, diagnosis and treatment of osteoporosis

DISCUSSION

With regard to gender the results shows female more than male, as in table (1). The researcher confirms that the number of female assignment in the hospitals as general more than male because the system in our country by increase number of female in health institute through increased acceptance of female more than male there for the present study is find the female more than male. The study finding is in agreement with the result of Ha et al, (17) conducted their study about the effects of an educational self-efficacy intervention on osteoporosis prevention and diabetes self-management among adults with type 2 diabetes mellitus, they find that majority of participants were female constituted (60%).

In contrast, the findings of Sanz-Nogués, et al. (18) conducted their study to assess Knowledge, Perceptions, and Concerns of Diabetes-Associated Complications Among Individuals Living with Type 1 and Type 2 Diabetes Mellitus, they discovered that the male gender outnumbered the female gender by 62 (56.4%) to 48 (43.6%) respectively.

The distribution of the age groups, age was between (50-60) in this study. The study finding is similar to the result of Bhurosy and Jeewon (19), who conducted their study about the effectiveness of a theory-driven nutritional education program in improving calcium intake among older Mauritian adults, their finding indicated that the majority of adults in the intervention group were aged from (51-60) constituted (19.0%).

The result of the present study dissimilar with the result of Karimifar et al, (20) conducted their study to assess evaluation of bone loss in diabetic postmenopausal women, and ages of participant women were over 60 years. The mean age of the participants was 69 (SD 7.5) with a range of (50–82) years.

With regard to the marital status, most of the participants were married and constituted 23(85.2%). The results of the present study is consistent with the study of Emam et al., (21) conducted their study about Improvement of women's knowledge, attitude and practice regarding osteoporosis after an interventional educational program, who mentioned that two thirds of participants are married constituted (70.0%).

Regarding the educational level, most of the participants do not read and write (illiterate) and constituted 12 (44.4%). The study finding supported with the study of Fahmy et al (22) in Egypt, conducted their study about the effectiveness of the educational program on osteoporosis knowledge and Beliefs among older adult people and find more of the participants were illiterate, constituting 141 (70.5%).

The finding is inconsistent with the study of Ha et al, (17) they mentioned in their study that most of the participants were with a middle school education accounted (60%).

Related to the family income, most of the participants had insufficient family income, accounted 13 (48.1%). The study finding is in agreement with the result of Abdulameer and others (23) they

find that most of the participants constituted 330 (73.3%) had less than Malaysian ringgit (RM) 2000 monthly income and most of the participants were not working constituted 258 (57.3%).

Tables (2 and 3) shows the descriptive statistics of the study to the participants' knowledge about osteoporosis items along studied periods. The mean score of patients' knowledge shows that there is a low level of awareness about risk factors, causes, symptoms, diagnosis, treatment, and prevention of osteoporosis for patient with diabetes mellitus.

The researcher interprets the reasons for inadequate knowledge for most participants about osteoporosis disease at baseline, also most of them didn't have enough knowledge about exercises and physical activities that strengthen bones and increase bone mineral density to avoid the disease. Another interpretation of the finding maybe most of the participants didn't have enough knowledge about the benefits of calcium for bone health, and the sources of foods that contain calcium and vitamin D and the relationships between them.

The result of the present study agreement with the finding of Ishtaya and others (24) they stated that, the majority of participants incorrectly answered 19 out of 32 questions of osteoporosis knowledge test (OKT) scale. The mean OKT score was 13.5 ± 4.2 indicating poor osteoporosis – related knowledge for diabetic patients.

CONCLUSION

Most of the participants were suffer from type two diabetes mellitus and most of them who visit a diabetes center had minimum knowledge toward osteoporosis. Instructional programs with a large sample should be designed for all diabetic patients with both types of diabetes to improve their knowledge about osteoporosis.

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