MOSUL JOURNAL OF NURSING
Online ISSN: 2663-0311 - Print ISSN: 2311-8784
Website: https://mjn.mosuljournals.com

RESEARCH ARTICLE

Association between risk for fall and socio-demographic attributes among diabetic elderly patients

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ABSTRACT

Background: With advancing age, we notice that the functional and physiological capacity of the musculoskeletal and nervous systems begins to decline gradually, which has a noticeable impact on the motor activity. This age-related deterioration significantly contributes to falls and frequent falls among the elderly. 1160 elderly people die daily as a result of falls, and thus falls become one of the most important public health problems in several countries of the world.

Aims of the study: to find out corelation between the risk of falls and the social and demographic characteristics of elderly diabetic patients aged 60 years and over.

Methodology: A correlation design was conducted to study the association between risk for fall and socio-demographic attributes among elderly diabetic patients at In the Endocrinology and Diabetes Center affiliated to Al-Hussein Teaching Hospital in Al-Muthanna Governorate from 18 / December /2021 to 1 /April /2022. A non-probability (purposive) sample of 107 elderly diabetic patients from Diabetes center. To measure the association between risk for fall and socio demographic attributes, the researcher used a questionnaire that consist of (7) items related to socio demographic attributes and to measure the risk for fall the researcher used the berg balance scale that included (14) items . To analyze the results, the researcher used descriptive statistics (frequencies, percentage, mean, standard deviation) and inferential statistics (hi-squared) test was used.

Results: (37.4%) of participants within the age group (60-64) years old. (49.5%) was men, (50.5%) was women. Illiterate (33.6%), (64.5%) of the participants are married, (37.4%) are unemployed, (94.4%) are live with family and (59.8%) are live in Urban. (48.6%) of participants have moderate risk for fall. There was significant relationship between the risk of fall with age, occupation, place of residency.

Conclusion: The study concluded that some of socio- demographic characteristic such as age, and occupation and place of residency Increase the risk of falling among elderly diabetic patients while there is no association between the risk of fall and with gender, level of education, marital status, living status among elderly diabetic patients.

Recommendations: The study recommended the importance of implementing educational programs on fall prevention in all centers visited by the elderly and the elderly home, because the country lacks such programs to reduce the incidence of falls. Conducting more research on the topic of falls to detect the risk factors of falls among the elderly to reduce these cases.

Keywords: Risk for fall, socio demographic attributes, diabetic, elderly patients

Received: 02 March 2022, Accepted: 26 May 2022, Available online: 28 August 2022

INTRODUCTION

With advancing age, we notice that the functional and physiological capacity of the musculoskeletal and nervous systems begins to decline gradually, which has a noticeable impact on the motor activity. This decline in functional and physiological ability related to age contributes significantly to exposure to falls and frequent falls among the elderly (Hamed et al., 2018).

With age, the number of associated diseases increases, which can increase the risk of falling among the elderly. These diseases have been divided into four categories: the first category is neurological diseases (cerebral apoplexy), the second category is the musculoskeletal system (osteoporosis and arthritis), the third category is cardiovascular diseases (orthostatic hypotension), and other diseases (diabetes, sleep disturbance) consider the fourth category (Ali Seif Rabiei, 2021).

Injuries are considered a public health problem in society, and in turn, they are splits into two parts: intentional and unintended injuries. Intentional injuries such as suicide and murder, but unintended injuries include drowning, burning, road accidents, poisoning and falling. The seventh and most common cause among the elderly is unintentional injuries. According to what the World Health Organization has shown, falls were considered the main and second cause of death among the elderly (Joseph et al., 2019).

Approximately 424,000 falls that lead to death occur each year, which approximately 1,160 elderly, people per day die as a result of falls, According to a report from the World Health Organization. Thus, the fall becomes one of the main general problems that many countries suffer from at the world. The incidence of falls increases with age, and the incidence of falls mostly occurs at the age of 60 and above among the elderly, and this is what previous studies have found (Kantow et al., 2021).

The incidence of falls among the elderly Different from country to country. The prevalence of falls in the Americas ranges from (20%) in Canada to (35%) in Chile for older adults living in the community. For the European community, the prevalence of falls ranged between (28.4%) Two years ago, at England and among the Irish, the rate of falls last year was (19.4%). (10%) to (35%) is the prevalence of falls last year in Brazil (Santos et al., 2018).

Falls that happen to the elderly often lead to serious injuries, lack of movement and loss of independence. Problems with movement, balance, and loss of muscle strength may increase the risk of falls among adults. Because of the high rate of falls and the long-term effects and high costs they cause, all of this will affect the health system, increasingly, with the progression of time. Itis expected that the incidence of falls will increase in the next twenty years, and with it, the costs of health care related to it (Florence et al., 2018).

Most of the injuries that occur to the elderly caused by falls. Approximately 40% of hospital admissions are due to falls among the elderly. And the most prevalent damages related to the fall of the elderly are bruises, scratches, pain and fractures, and it includes a fence in the upper and lower extremities and the hip, and in severe cases, the injury is in the head area. Frequent falls among the elderly lead to dangerous problems, so it has become necessary to make more efforts to reduce their occurrence among the elderly (Sharif et al., 2018).

Even if the fall does not lead to physical damage, it may be long-term damages such as psychological problems ,including gloominess and fear of falling, and consequently daily and social activities are restricted, and consequently the health and functional status of the elderly will deteriorate, and the incidence of falls may increase in the future (Chang & Do, 2015a).

The causes of falls can be divided into intrinsic causes (due to the subject) and extrinsic causes (due to the environment). The intrinsic causes divided into physiological changes related to age and disease states. extrinsic causes include environmental reasons, including lack of lighting, slippery lands, and stumbling (Gazibara et al., 2017).

The social and demographic characteristics, including age, social status, and employment status, have a direct impact and contribute significantly to the quality of life among the elderly and Research has given importance to these characteristics as a risk factor that can cause falls (Kantow et al., 2021). Here, the research question was whether social-demographic factors (age, gender, living situation, place of residence, employment status, educational level and marital status) could increase the risk of falls. In Iraq, there is Lack of researches about subject of falls among the elderly, and therefore, this study aimed at:

The relationship between the risk of falls and the social and demographic characteristics of elderly diabetic patients aged 60 years and over.

METHOD

Ethical approval

Ethical approval was obtained from the required authorities and the ethical committee of the College of Nursing, University of Baghdad. Study samples completed the questionnaire without asking for any identifying information about them. Written consent was obtained and the participants were assured that the results of this questionnaire are used for study purposes only and patient can refusal to participate in the study.

Study design and setting

To achieve the research objectives, a correlation design was used to study the association between risk for falls, socio-demographic attributes among elderly diabetic patients at in the Endocrinology, and Diabetes Center affiliated to Al-Hussein Teaching Hospital in Al-Muthanna Governorate during period from (18 of December 2021 to 1 April 2022).

Sample of study

Minimum sample size was (130) patients after using the equation to calculate the required number (sample size calculator). Ten patients eliminate from study for the pilot. Eight of the patients refused to participate in research, two patient excluded because he had a foot amputation, and three excluded for using a wheelchair. The rest (107) for the study implementation, (53) males and (54) females for those who went to the center during the time of the study period and met the study criteria and agreed to participate in the study. Type of the sample was a non-probability (Purposive) sample to ensure that the data obtained from the study is accurate. Criteria for selecting of the sample have been established by the researcher and includes Inclusion criteria: a) Diabetic patients 60 years and over. b) Type two diabetes patients. c) The sample members should be able to move independently. d) Older people who use crutches they can participate in the study. The reliability test was used to determine the accuracy of the questionnaire and scale of the study, was calculated by using Cranach's Alpha, the result was (0.80) for questionnaire (0.81) for scale which means that the study instrument Can be used in measuring the study phenomenon at any time. The 12 experts those have 5 years and more expertise in their field of work determined the validity of the questionnaire and study scale.

Data collection procedures

The researcher formed a questionnaire according to the review of relevant literature and study. The researcher had gathered the data for questionnaire (constructive) by using the interview method and the researcher used questions for the questionnaire from category Closed-Ended Questions in which the respondents are asked to choose from given alternatives. To collect the patient's demographic data, the researcher used the demographic data form. This form consists of (7) items; they are (age, gender, level of education, marital status, occupation, living situation and place of Residency). Assessment of the risk for falls between the elderly the researcher used the Berg balance scale, which consists of 14 items. (Cut – off point) It reveals who likely to fall according to the distribution of the following points: 0-20 means high risk of fall and 21-40 means moderate risk of fall and 41-56 it means there is a low risk of fall. Permission obtained from the author. In regards to the scale of study, the researcher used the observation method. The researcher observed the implementation of the items of the scale by the patient and then gave the appropriate score according to what the patient did and according to the division of the scale scores from (0-4). The (0) indicates the patient's inability to perform the task and (4) indicates the patient's ability to perform the task completely in a specific time. Therefor the maximum test score is 56 points.

Statistical analysis

The data were analyzed using the program SPSS version 25. Descriptive statistics (frequencies, percentage, arithmetic mean, standard deviation), and inferential statistics (hi-squared test) was used to identify the association between the risk for fall and socio-demographics characteristic with a significance level of $p<0.05$.

RESULTS

Table (1): shows Information about the socio-demographic characteristics of the study sample, where we note that (37.4%) of the participants within the first age group (60-64) years old (the mean age of the study sample was 67.73± 7.001). in relation to the gender the percentages were very close: 53 (49.5%) for men, 54 (50.5%) for women.

In respect to the level of education, the high percentage (33.6%) of patients are not able to read or write (Illiterate). Concerning to The study

subjects' marital status indicates that (64.5%) of the study, subjects are married. Regarding to occupation status (37.4%) of the study sample are unemployed and (26.2%) of study samples, they were Self-employed Between office work and manual work. In respect to Living Situation the high percentage 101 (94.4%) of study, subjects are Live with Family. in relation to the place of Residency the high percentage (59.8%) of study, subjects are live in Urban.

Table (3) reveals that there is a non-significant relationship between the risk of fall of the study sample and their Gender, marital status, level of education, and Living situation at p-value more than 0.05. While there is a significant association between the risk of fall of the study sample and their Age, Occupation and place of residency at p-value less than 0.05.

Table (2) show the scale used to assess balance and risk of falls among the elderly where represents the range from 21- 40 moderate fall risk which constitutes the highest percentage (48.6%) of the study sample and

while (0-20) represent study samples at high risk for fall and their ratio was (29.9%) while range (41-56) The participants are considered to have a low fall risk represented by (21.5%).

Table 1. Demographic characteristics related to participants. (N=107).

Variable	Groups	Freq.	%
Age Groups	60-64	40	37.4
	65-69	29	27.1
	70-74	25	23.4
	75-79	6	5.6
	80-84	2	1.9
	85-89	2	1.9
	90-94	3	2.8
	Total	107	100.0
	Mean ± SD 67.73± 7.001 yrs.		
Gender	Male	53	49.5
	Female	54	50.5
	Total	107	100.0
level of education	Illiterate	36	33.6
	Read and write	14	13.1
	Primary School	21	19.6
	High School	17	15.9
	Institute	11	10.3
	College Graduate or Postgraduate	8	7.5
	Total	107	100.0
Marital Status	Single	6	5.6
	Married	69	64.5
	Widower	31	29.0
	Divorced	1	0.9
	Total	107	100.0
Occupation	Retired	39	36.4
	Self-employed	28	26.2
	Unemployed	40	37.4
	Total	107	100.0
Living Situation	Live with Family	101	94.4
	Live alone	6	5.6

	Total	**107**	**100.0**
Residency	**Urban**	**64**	**59.8**
	Rural	**43**	**40.2**
	Total	**107**	**100.0**

(Freq.): Frequency, (%): Percentage, (N): number of samples, (S.D): Stander Deviation

Table (2) Distribution of the study sample according to (Cut – off point) for berg balance scale

Berg Balance Scale	Groups	Freq.	Percent
Berg Balance Scale	(High fall risk) 0-20	32	29.9
	(Medium fall risk) 21-40	52	48.6
	(Low fall risk) 41-56	23	21.5
	Total	107	100.0

Table (3): Corelation between risk for falls with their Sample Socio-Demographical Characteristics

Main Domain	Demographical variable X risk for falls	Chi-square	D f	P-Value	C.S.(*)
Demographical variables	**Age**	**51.639**	**12**	**0.000**	**HS**
	Gender	**4.869**	**2**	**0.088**	**NS**
	Educational level	**10.203**	**10**	**0.423**	**NS**
	Marital Status	**6.339**	**6**	**0.386**	**NS**
	Occupation	**10.533**	**4**	**0.005**	**HS**
	Living Situation	**0.096**	**2**	**0.953**	**NS**
	Residency	**12.895**	**2**	**0.002**	**HS**

(HS): Highly Significant at P<0.05, (NS): Non Significant at P>0.05, (C.S): correlation significant, (D f): degree of freedom

DISCUSSION

Table No. (1) Analyzes the data related to properties sociodemographic of (107) elderly diabetic patients. The mean age of the patients was (67.73± 7.001) years which ranged from (60-94) years and the highest percentage was found in the age group (60-64) years.

This result was close to the result of the study conducted by (Valderrama-Hinds et al., 2018), which found that the mean age of study participants was (69.6± 0.18). Another study conducted found in their study that the majority of elderly patients are in the age group (60-64years) with an average age (64.6± 5.5) for study group and (64.5±5.4) for control group (Taheri-Kharameh et al., 2019).

Respect to the gender of the samples participants in the research, the results indicated that the percentages were very close: 53 (49.5%) for men, 54 (50.5%) for women. This result is in agreement with some other research that found the ratio between men and women was close and their study conducted in the many countries such as Russia, India, Ghana, Africa, China and Mexico, indicated that (51.2%) of participants was women and (48.8%) was men (Williams et al., 2015).

On the educational level, the results of the study showed that 33.6% of the study participants were from Illiterate (Not able to read or write). This result was similar to a study conducted in china by Zhao et al., (2020) , in which they stated that most of the elderly was Illiterate (Not able to read or write) and the percentage was (41.7%) . the most

recent studies conducted in India by Muhammad et al., (2021) indicate that the about three-fourth of the older participants in the study had no formal education (Illiterate).

As for the marital status, the results indicated that (64.5%) of the sample participating in the study were married. This result is analogous with results some studies who stated that (62.5%) of the samples, participant in the study were married (Rashedi et al., 2019). In addition, a research conducted in Vietnam by Nguyen et al., 92019) their found that (67.7 %) of the samples in the study were married.

Occupation status, the results showed that 37.4% of the participants in the study they were unemployed. This result is analogous with the result of some studies such as study that conducted in Egypt stated that most of the participants were unemployed (Elsamahy et al., 2019).

Regarding the living situation, the results showed that study participants were 94.4% live with family, while 5.6% of participants were live alone. Study conducted by Du et al., (2017) confirmed that 23.0% of the total participants live alone and that 77.0% of the study sample live with family this result was close to the results of the current search. Also anther study conducted by Yeong et al., (2016) who indicated that (18.6%) live alone while (81.4%) live with family.

As for the Place of Residency, the results indicated that 59.8% of the participants in the study were reside in urban and 40.2% of the participants were reside in Rural. These results are close to a study conducted in Indonesia who reported that 52.1% of study participants were reside in urban (Pengpid & Peltzer, 2018).

Through the data analysis of distribution of the study sample according to (Cut – off point) for berg balance scale the table (2), The results of study found that the highest percentage of participants in the study (48.6%) had a moderate risk for fall, (29.9%) had a high risk for fall and (21.5%) had a low risk for fall. From the researcher's point of view, the reason behind the emergence of the highest percentage of participants in the category of moderate and high risk of falling are that the participants in the study suffer from more than one disease, use of more than one medication and the lack of regular exercise by the participants in the study, all these factors make a person vulnerable to falling at a moderate to high rate. Valentina et al., (2019) they found in a study conducted in Indonesia that (20.5%) had a high risk for falls, (35.9%) had a moderate risk for falls and (43.6%) had a low risk for fall (.Valentina et al., 2019).

As for the association between the risk for fall and their socio-demographic characteristics of elderly diabetic patients, the study showed as in Table (3) there are significant association between the risk for fall and with age (the p-value of age was 0.000). The Cruz et al., (2016) supported this result, found that there were significant relationship between the risk for falls and with their age. Chang & Do, (2015b) Also they found there is significantly associated between the age with falls in both genders.

As for gender, the results found that there was no significant association between the risk for fall of the study participants and their gender (the p-value of gender was 0.088). The interpretation of this result is that the gender being male or female does not increase the risk of falls because both sexes have the same medical conditions, use the same number of prescribed medications, and do not engage in physical activity. This result is analogous to the result of a study conducted by Lim et al., (2021) that they found there were no significant associations between the risk of fall and with gender.

In related to the educational level, the results found that there is no significant association among the risk for fall of the samples participants in the study and their educational level (the p-value of level of education was 0.423). The Study conducted in Indonesia by Susilowardani et al., (2020) found that there were no significant relationship among the risk for falls with their level of education.

In related to marital status, the results found that there is no significant association among the risk for fall of the individuals of the study sample and their marital status (the p-value of marital status was 0.386). Gale et al., (2018) they found in their study were no significant associations between the risk for falls with their marital status.

In respect to occupation status the results, found that there is significant relationship among the risk for fall of the individuals of the study sample and their occupation (the p-value of occupation status was 0.005). This result is similar to the result of study conducted by Kamińska et al., (2015) and anther study performed by Paliwal et al., (2017) who showed that their a significant association among the risk for fall and occupation.

Regarded to the living Situation, the results found that there is no significant relationship among the risk for fall of the individuals of the study sample and their living status (the p-value of marital status was 0.953). The researchers Mouodi et al.,

(2016) they found in their study the significantly relationship between fall and elderly who live alone. Interpretation of the result because most of the study participants are elderly people who lives with family.

In related to place of residence the result show that high significant association among the risk for fall and place of residency for study participants from elderly. In a study conducted by Carrasco et al., (2020) they reached a similar result, as there is a significant relationship between the risk of falling and the place of residence.

CONCLUSION

The study concluded that the some of socio-demographic characteristic such as age, and occupation and place of residency Increase the risk of falling among elderly diabetic patients. There is a significant relationship between risk for fall and with age, occupation and place of residency while there is no association among gender, level of education, marital status, living status with risk of fall among elderly.

RECOMMENDATIONS:

1. Conducting introductory courses or seminars on the subject of falls, risk factors and the consequences for the elderly from the age of 60 and over in all centers for the elderly.

2. Conducting introductory courses or seminars on the topic of fall prevention in all centers for the elderly and nursing homes on a regular basis.

3. Conducting educational programs on the fall prevention in all centers visited by the elderly and the elderly home, because the country lacks such programs to reduce the incidence of falls.

4. Conducting more research on the topic of falls to detect risk factors of falls among the elderly because the country lacks such research.

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES
This study was completed following obtaining Consent from the University of Baghdad.

FUNDING
This research did not receive any grant from Funding agencies in the public, commercial, or Non-profit sectors.

AUTHOR'S CONTRIBUTIONS
Study concept, Writing, Reviewing the final Edition by all authors.

DISCLOSURE STATEMENT: The authors report no conflict of interest.

ACKNOWLEDGEMENTS
We thank the anonymous referees for their useful
suggestions.

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https://doi.org/10.1016/j.gerinurse.2021.07.007