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## Predictors of Fear of Falling among Community Dwelling Older Adults in Mansoura City, Egypt

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**Abstract:** Fear of falling (FOF) is a common health problem facing older adults. Investigating its predictors can help in prevention of fall and fear of falling. **Objective:** To determine the predictors of fear of falling among community dwelling older adults in Mansoura city. **Design:** Descriptive cross-sectional design was used. **Settings:** The study was conducted in urban and rural areas affiliated to Mansoura city. **Subjects:** 528 older adults' residents in selected urban and rural areas using systemic random sample were included in the study. **Tools:** Four tools were used: Socio demographic and Clinical Data Structured Interview Schedule, Katz and Akpom Scale, the Modified Falls Efficacy Scale (MFES), and Berge Balance scale. **Results:** FOF is prevailing among 64.4% of community dwelling older adults. FOF is higher among older adults with advanced age, females, chronic diseases, suffering from visual & hearing impairments, use of assistive devices and have moderate to high fall risk. **Conclusion:** Fear of falling was prevalent among community dwelling older adults. **Recommendations:** Assessment of fear of falling frequently and screening for those at higher risk of developing fear of falling and fall. Education programs should be implemented for elders in different sectors in Mansura.

**Key Word:** Fear of falling, older adults, rural & urban areas, Predictors of fear of falling.

### INTRODUCTION

Falls are one of the most common and widely recognized serious health issues and the leading cause of morbidity and mortality among the elderly. In U.S.A around 30% of elderly 65years and more experienced one fall ever year, and half are repetitive falls <sup>(1)</sup>. In 2014, it was estimated that 29.0 million older Americans fell in the previous 12 months <sup>(2)</sup>. Also, a study done in Turkey reported that the incidence of falls in nursing homes ranges between 33% to 48.7 % <sup>(3)</sup>. In Mansoura, Egypt, a study done by Mohamed 2012 revealed that the prevalence rate of falls in the past year among the studied elderly was 41.2% <sup>(4)</sup>. While, in institutional settings in Alexandria, the prevalence was 89.9% with a higher percent among those living in governmental homes than those in private one <sup>(5)</sup>.

Psychological trauma as fear of falling is the most serious complication of falls. Fear of falling (FOF) has emerged as an important public health problem leading to greater disability among elders <sup>(6)</sup>. In U.S.A, fear of falling is a common problem among older people, with an incidence ranging from 21% to 85 % <sup>(7)</sup>. In Alexandria 2008, a study conducted in Assisted Living Facilities (governmental & private) reported that the majority of residents experienced moderate to severe level of fear of falling <sup>(8)</sup>.

Fear of fall is also called as post-fall syndrome, or post fall phobia and is defined as a fearful anticipation of a fall <sup>(9)</sup>. Fear of falling is a lack of self-confidence that one is able to avoid falls while doing everyday activities <sup>(10)</sup>. Fear of falling can make people stay away from specific activities in their daily life, regardless if they are physically able.

Previous studies have proposed that fear of falling is associated with restrictions in performing activities, depression, an increased risk of actual falling and reduced health-related quality of life <sup>(11-13)</sup>. Advanced age, being females, low educational level, living alone, decreased mobility, impaired balance, decreased ADLs and/ or IADLs functioning, and increased physical dysfunction were reported to be the causes of fear of falling among elders <sup>(15)</sup>. Elderly with fear of falling walk slower and take shorter steps, and have gait imbalance and using assistive devices for mobility as cane or walker <sup>(16)</sup>.

Several studies reported that fear of falling had moderate to high positive associations with previous falls. Moreover, poor self-rated health, presence of chronic conditions, medication use, visual impairment and auditory impairment are also other contributing factors <sup>(1, 6, 17)</sup>. Conversely, fear of fall was a common problem noticed in elderly individuals who have never experienced a fall. So, the absence of a history of falls does not preclude the possibility of being at risk of falling <sup>(17)</sup>. In U.S.A, it was reported from various studies that the prevalence rate of fear of falling in elderly people ranged between 12 and 65 % among those who have not fallen and 28 and 95 % among previous fallers <sup>(18)</sup>. Therefore, understanding the predictors of fear of falling is necessary to screen for high risk individuals, and to develop interventions to prevent or treat fear of falling.

### AIM OF THE STUDY

The aim of this study was to determine the predictors of fear of falling among community dwelling older adults in Mansoura city.

**Research question:**

What are the predictors of fear of falling among community dwelling older adults in Mansoura city?

**MATERIALS AND METHOD**

**MATERIALS**

**Design:** Descriptive cross-sectional design was used in this study.

**Setting:** The study was conducted in urban and rural areas affiliated to Mansoura city. From urban areas, four health centers out of twelve were selected namely El-Hawar health center, Sandowb center, Toriel center and Gedela center. While From rural health units, four villages out of sixty were selected namely Badaway village, Meet Badr Khamis village, Meet Ali village and Nekita village

**Subjects:** Sample size was calculated using MedCalc statistical program (<https://www.medcalc.org/>). A previous study<sup>(20)</sup> revealed that at least 25% of elderly reported fear of falls. With alpha error of 5%, study power of 80% and effect size of 5%, the total sample is 528. Based on Egyptian population statistical analysis for Dakhelia governorate 2017, the study sample was distributed proportionally between the urban and rural areas affiliated to Mansoura city with 46% urban and 54% rural. From urban areas, four health centers out of twelve were selected by systematic random sample (every third) namely El-Hawar health center 21% (53 elders), Sandowb center 46% (111 elders), Toriel center 7% (18 elders) and Gedela center 24% (60 elders). The total number of elders included was 242 elders. From rural health units, four villages out of sixty were selected by systematic random sample (every fifteenth) namely; Bada way village 37 % (106 elders), Meet Badr Khamis village 19% (56 elders), Meet Ali village 20 % (58 elders) and Nekita village 23% (66 elders). The total numbers of elders included was 286 elders. Elders were chosen from the family records by a systematic random sample.

Elderly who fulfill the following criteria were included in the study:

- Age 60 years and above
- Able to comprehend and communicate.
- Fallers or non-fallers.

**The exclusion criteria were as follows:**

- Bedridden elders or those dependent on a wheelchair.
- Elders have neurological conditions (stroke, Alzheimer disease) or with mental illnesses

**Tools of data collection:**

Three tools were used for data collection:

**Tool I: Socio demographic and Clinical Data Structured Interview Schedule:** This tool was developed by the researchers based on relevant literature and included the following items:

- Socio-demographic characteristics of the elderly person such as age, sex, marital status, level of education, occupation before retirement, income and living condition.
- Health history: type of chronic disease, hearing, vision and mobility status.
- Fall History: past history of falls, times, last fall and its consequences.

**Tool II: Katz and Akpom Scale (1976):**

This scale was developed by Katz and Akpom (1976)<sup>(21)</sup>, it is used to assess the degree of dependency in performing activities of daily living (ADL). It was translated into Arabic language and validated by (Melis and El Shazly 1999)<sup>(22)</sup>. The scale includes grooming, toileting, eating, dressing, bathing and mobility. The activities of daily living are measured and scored according to the individual's actual performance. A score from one to three was assigned to each level of dependency with the total score 18. A score of 6 is assigned for those who are independent; score from 7 to 12 is assigned for those who are partially dependent and score from 13 to 18 is assigned for those who are totally dependent.

**Tool III: Berge Balance scale:**

It was used to assess the balance of elderly persons (**Berg and Woo-Daphine, 1995**)<sup>(23)</sup>. This scale was translated into Arabic language and tested for its content validity and reliability (r= 0.95) by **Mohamed (2012)**<sup>(4)</sup>. The scale consists of 14 items graded 0 - 4 scale, which includes: sitting to standing, standing unsupported, sitting with back unsupported but feet supported on floor, standing to sitting, transfers, standing unsupported with eyes closed, standing unsupported with feet together, reaching in foreword with outstretched arm while standing, pick up object from the floor on standing position, turning to look behind over left and right shoulders while standing, turning 360 degree, placing alternate foot on step or stool while standing unsupported, standing unsupported in one foot on front, standing on one leg.

The total score is 56 and categorized as follows:

- 41 - 56 low fall risk.
- 21 – 40 medium fall risk.
- 0 – 20 high fall risk.

**Tool IV: The Modified Falls Efficacy Scale (MFES) :**

This scale designed by Tinetti et al (1990)<sup>(24)</sup> and modified by Buchner et al. (1993)<sup>(25)</sup>. The scale was translated into Arabic language by **Sharaf and Ibrahim**<sup>(8)</sup> and tested for its content validity and reliability (r= 0.70). The scale assesses the level of fear about the possibility of falling while performing 10 activities of daily living such as getting dressed and undressed, preparing meals, taking a bath or a shower, going up and down stairs , cleaning room , sitting or getting up from chair, opening door or replying telephone, shopping , lifting or bending to get something and walking outside. Each question is rated from 1 (not at all concerned) to 4 (severely concerned). The total score ranges from 10 to 40 and divided into;

- Not at all concerned from 1 to 10.
- Slightly concerned from 11 to 20 .
- Moderately concerned from 21 to 30.
- Very concerned from 31 to 40.

**METHOD**

- Approval to carry out the study from the responsible authorities was obtained.
- An official approval was obtained from the managers of the Family Medicine Centers in urban and rural areas after explaining the purpose of the study.

- The purpose of the study was explained to the administrators of each urban and rural health center.
- Tool I was tested for content validity by 5 experts in Gerontological nursing, Alexandria University, as a jury to test its content validity and the essential modifications were done.
- Arabic version of Tools II, III, IV were used in the study to measure elders' ability to perform ADLs, elders' balance and fear of falling.
- A pilot study was carried out on 20 elders' were selected from outpatient's clinic of specialized medical hospital Mansoura university to test clarity of the tools; and the approximate time needed for the interview ,necessary modifications were done.
- All family files kept at archive in each selected family health center were reviewed to identify elders included in the study and their address for home visit.
- The researchers arranged with Raeda Refia the schedule of home visit.
- Each older adult was interviewed in his / her own home to collect the necessary information using the study tools
- The data collected over a period of five months started from first of October 2017 to the last of March 2018.

#### **Ethical Considerations:**

Approval from faculty of nursing research ethic committee was obtained. Verbal consent from the subjects after clarification of the study purpose was obtained. Privacy and confidentiality was maintained.

#### **Data analysis:**

Using SPSS (Statistical Package for Social Sciences) version 20. Chi square to test the significance in bivariate analysis and crude odds ratios (COR) and their 95% CI were calculated. Variables significantly associated with FOF were entered into a multivariate logistic regression model using forward Wald method. Adjusted OR and their 95% CI were calculated.  $P \leq 0.05$  was considered statistically significant.

## **RESULTS**

#### **Socio-demographic characteristics of the study subjects:**

The studied subjects age ranged from 60 to 85 years with a mean age  $70.31 \pm 7.05$ . Females constituted 55.3% of the older adults. About 65.7% of older adults were married and 33.3% were widows. Regarding education, 46.8% of older adults were illiterates, 30.5% read & write, and 5.3 & 17.4% had basic education, secondary or higher education; respectively. The main occupations of community older adults were housewives 43.8% followed by employee (26.5%) and manual worker 19.2%. About 56.1% of elders had inadequate income. Regarding living condition, 65.9% of the study subjects living with their families (Data not shown in table).

The main diseases encountered by older adults were hypertension 70.8% followed by arthritis 40.0% and diabetes mellitus 39.2%. Respiratory and cardiac diseases constituted 17.6% and 13.8%; respectively. Other diseases as cancer, urological disorders and Parkinson's disease represented 18.7%. According to the physical status of elders, 55.9% of elders had poor vision, 15.2% suffered from difficult hearing and 16.3% need assistance in

movement. About 57.0% of older adults are independent in performing ADLs and 43.0% of them are partially dependent (data not shown in table).

**Table 1:** Shows that 40.3% of older adults had a history of falls; 53.1% fell once, 29.1% fell two and 17.9% three times. The causes of fall reported by older adults were slipping 44.1%, loss of balance 23.0%, feeling dizzy 18.3% and trip on floor 14.6%. Most of falls reported by 75.1% of older adults occurred inside the home at night. The health related consequences of falling reported by older adults were fractures & dislocation 55.9%, bruises 24.2%, wounds & bleeding 14.3%. About 74.2% of older adults experienced difficulty getting up alone after falling.

**Table 2:** Shows that 25.9% of elderly were at high risk for falls, 25.8% were at moderate risk and 48.3% of older adults were at low risk. Accordingly, the overall prevalence of fear of falls is 64.4% among the community dwelling older adults. 36.4% of older adults were severely concerned about fear of fall, 28.0% were moderately concerned about fear of fall, 26.9% were mildly concerned about fear of fall and 8.7% were not concerned about fear of falling at all.

**Table 3:** Reveals that Fear of falling is significantly higher in elders aged 85 years and more than those 60 years to less than 74 (COR=11.4 and 1 ; respectively). Fear of falls is significantly higher in females compared to males (COR=5.1), widow (COR=5.2), illiterate compared to those secondary and higher education (COR=1.7), housewives compared to those employee (COR=2.8), elderly living relatives and those living alone (COR=6.3 and 3.3; respectively).

**Table 4:** Shows that the presence of morbidities is associated with increased fear of falls, COR were for hypertension (3.0), diabetes mellitus (2.9), cardiac disorders (2.0), musculoskeletal disorders (2.1), parkinsonism (6.2), hearing (3.3) and vision impairment (2.0) respectively. As well, fear of falls is higher among partially dependent older adults compared to those independent in performing activities of daily living (COR=9.0). Moreover, the use of assistive devices as eye glasses, hearing aids and use of cane are associated with increased fear of falls (COR =2.7, 13.6 and 30.5; respectively). Older adults who have history of previous fall are associated with increased fear of falls (COR =6.1) and fear of falls is higher among older adults who have moderate and high fall risks compared to those have low falls risk (COR=2.8 and 176.4).

**Table 5:** Shows that the independent predictors of fear of falling are older age (AOR=7.1), females (AOR= 3.4), widow (AOR=2.1), housewives, farmers (AOR=0.6 and 0.01 respectively), presence of hypertension (AOR=2.7), diabetes mellitus (AOR=2.3), cardiac disorders (AOR=3.9), the use of eye glasses (AOR=2.5), hearing aids (AOR=16.5), and cane (AOR=31.3). Also, moderate falls risk (AOR=2.5) and high fall risk (AOR=107.2) were among the predictors of fear of falls.

Table1.Distribution of the study subjects in Mansoura city according to their history of fall.

History of fall	Number of older adults	
	n = 528	%
Previous history of fall		
Yes	213	40.3
No	315	59.7
Number of previous falls:	(n=213)	
One	113	53.1
Two	62	29.1
Three or more	38	17.9
Causes of previous fall:		
Slip	94	44.1
Loss of balance	49	23.0
Feeling dizzy	39	18.3
Trip	31	14.6
Location of previous fall :		
Inside the home	160	75.1
Outside the home	53	24.9
Time of previous fall:		
At night	139	65.3
Day time	74	34.7
Health related consequences of falling*		
Fracture & dislocation	119	55.9
Bruise	52	24.2
Wound & Bleeding	31	14.3
Experiencing difficulty getting up alone after falling		
Yes	158	74.2
No	55	25.8

\* More than one answer

Table (2) Distribution of the study subjects in Mansoura city according to their risk for falls and fear of falling.

Items	Number of older adults	
	n= 528	%
Risk of falls (Using Berg Balance Scale):		
Low risk	255	48.3
Moderate risk	136	25.8
High risk	137	25.9
Concern about fear of falling:		
-Not at all concerned	46	8.7
-Slightly concerned	142	26.9
-Moderate concerned	148	28.0
- Very concerned	192	36.4

Table (3) Relation between socio-demographic characteristics of the study subjects and fear of falling.

	Total	FOF N 528(%)	Significance	COR(95%CI)
Overall	528	430(64.4)		
Age: 60-	239	120(50.2)	$\chi^2=19.5, P \leq 0.001$	1(r)
75-	214	151(70.6)		2.4(1.6-3.6)
85 & more	75	69(92.0)		11.4(4.6-30.4)
Sex: Male	236	105(44.5)	$\chi^2=73.7, P \leq 0.001$	1(r)
Female	292	235(80.5)		5.1(3.4-7.7)
Marital status:			$\chi^2=54.2, P \leq 0.001$	
Married	347	185(53.3)		1(r)
Widow*	181	155(85.6)	5.2(3.2-8.6)	
Education:			$\chi^2=4.5, P=0.03$	
Illiterate	247	170(68.8)		1.7(1.01-2.9)
Read & write	161	101(62.7)		1.3(0.7-2.3)
Basic education	28	17(60.7)		1.2(0.5-3.1)
Secondary & Higher	92	52(56.5)	1(r)	
Occupation before retirement:			$\chi^2=3.5, P=0.06$	
Housewives	231	186(80.5)		2.8(1.7-4.7)
Employee	140	83(59.3)		1(r)
Unskilled workers	69	42(60.9)		1.1(0.6-2.0)
Skilled workers	52	23(44.2)		0.5(0.3-1.1)
Farmers	36	6(16.7)		0.14(0.1-0.4)
Living with:			$\chi^2=43.1, P \leq 0.001$	
Family	348	187(53.7)		1(r)
Relatives	117	103(88.0)		6.3(3.4-12.1)
Alone	63	50(79.4)	$\chi^2=14.4, P \leq 0.001$	3.3(1.7-6.7)

\*Including 3 single & 2 divorced

**Table (4) Relation between presence of morbidities of the study subjects and fear of falling.**

	Total	FOF N(%)	Significance	COR(95%CI)
<b>Hypertension:</b>				
Yes	374	269(71.9)	$\chi^2=31.7, P\leq 0.001$	3.0(2-4.6)
No	154	71(46.1)		
<b>Diabetes mellitus:</b>				
Yes	207	162(78.3)	$\chi^2=28.6, P\leq 0.001$	2.9(1.9-4.4)
No	321	178(55.5)		
<b>Cardiac disorders:</b>				
Yes	73	56(76.7)	$\chi^2=5.6, P=0.02$	2.0(1.1-3.7)
No	455	284(62.4)		
<b>Musculoskeletal disorders:</b>				
Yes	211	157(74.4)	$\chi^2=15.4, P\leq 0.001$	2.1(1.4-3.2)
No	217	183(57.7)		
<b>Parkinsonism:</b>				
Yes	34	31(91.2)	$\chi^2=11.4, P\leq 0.001$	6.2(1.8-25.8)
No	494	309(62.6)		
<b>Hearing impairment:</b>				
Yes	80	67(83.8)	$\chi^2=15.4, P\leq 0.001$	3.3(1.7-6.5)
No	448	273(60.9)		
<b>Vision impairment:</b>				
Yes	295	211(71.5)	$\chi^2=14.8, P\leq 0.001$	2.0(1.4-3.0)
No	233	129(55.4)		
<b>Use of assistive devices:</b>				
<b>Eye glasses:</b>				
Yes	231	177(76.6)	$\chi^2=26.8, P\leq 0.001$	2.7(1.8-4.0)
No	297	163(54.9)		
<b>Hearing aids:</b>				
Yes	24	23(95.8)	$\chi^2=10.8, P\leq 0.001$	13.6(1.9-272.2)
No	504	317(62.9)		
<b>Cane:</b>				
Yes	86	84(97.7)	$\chi^2=49.6, P\leq 0.001$	30.5(7.3-181.6)
No	442	256(57.9)		
<b>Previous falls:</b>				
Yes	213	183(85.9)	$\chi^2=72.1, P\leq 0.001$	6.1(3.9-9.8)
No	315	157(49.8)		
<b>Activities of daily living (ADL):</b>				
Independent	301	139(46.2)	$\chi^2=101.3, P\leq 0.001$	9.0(5.5-14.8)
Partially dependent	227	201(88.5)		
<b>Berg Balance Scale:</b>				
Low falls risk	255	111(43.5)	$\chi^2=21.9, P\leq 0.001$	1(r)
Moderate falls risk	136	93(68.4)		
High falls risk	137	136(99.3)		

COR=Crude odds ratio    CI=Confidence interval    r=reference category

Table (5) Logistic regression analysis of independent predictors of fear of falling of the study subjects.

	B	P	AOR(95%CI)
Age: 60-	-		1(r)
75-	0.4	0.2	1.5(0.8-2.7)
85 & more	1.96	0.008	7.1(1.7-30.0)
Sex: Male	-		1(r)
Female	1.2	0.009	3.4(1.4-8.7)
Marital status:			
Married	-		1(r)
Widow	0.8	0.03	2.1(1.1-4.2)
Occupation:			
Employee	-		1(r)
Housewives	-0.5	0.3	0.6(0.2-1.5)
Skilled workers	-0.9	0.1	0.4(0.1-1.1)
Unskilled workers	0.1	0.9	1.1(0.5-2.4)
Farmers	-4.2	≤0.001	0.01(0.002-0.1)
Hypertension:			
Yes	1.01	0.001	2.7(1.5-4.9)
No	-		1(r)
Diabetes mellitus:			
Yes	0.8	0.005	2.3(1.3-4.1)
No	-		1(r)
Cardiac disorders:			
Yes	1.4	0.003	3.9(1.6-9.4)
No	-		1(r)
Eye glasses:			
Yes	0.9	0.001	2.5(1.4-4.5)
No	-		1(r)
Hearing aids:			
Yes	2.8	0.014	16.5(1.8-152.9)
No	-		1(r)
Use of cane:			
Yes	3.4	≤0.001	31.3(4.5-216.5)
No	-		1(r)
Berg Balance Scale:			
Low falls risk	-		1(r)
Moderate falls risk	0.9	0.003	2.5(1.4-4.6)
High falls risk	4.7	≤0.001	107.2(11.8-977.9)
Constant			-2.4
Model $\chi^2$			$\chi^2=319.4, P<0.001$
% correctly predicted			83%

## DISCUSSION

Fear of falling (FOF) is one of the most important clinical features influencing older adults and a common health problem encountered them in later life <sup>(25)</sup>. Fear of falling is a common in elderly individuals who have never experienced a fall. This proposes extra factors, other than past experience of falling, might be related to developing a fear of falling <sup>(17)</sup>. The present study results indicated that fear of falling is a common concern for older adults living in Mansoura city and prevalent among them with the percent of 64.4%. The approximate percent 60% was reported in other study conducted in Japan 2011 <sup>(26)</sup>. On the other hand, high percent 95.6 % was reported in other study conducted in Thailand 2015 <sup>(27)</sup> among community dwelling older adults. The variation in percent may be interpreted as the present study included sample from rural and urban areas, while the study of Japanese involved older adults living in urban, suburban, and rural areas.

Comparing the result of the present study with other studies conducted in community services for older adults. There is approximate percent with the result of the study conducted in Turkey 2016 <sup>(28)</sup> denoted that 72.1% of older adults resided in nursing homes had fear of falling. Whereas, low percent was reported in Alexandria 2008 <sup>(8)</sup> as 48.6% of older adults resided in Assisted Living Facilities had fear of

fall. This contradiction may be due to differences in sample size and settings.

Fear of falling might be an outcome of a previous experience of falling and could be considered as "post-fall syndrome" <sup>(17)</sup>. This is in the same line with the results of the present study denoted that previous fall had a significant relation with the fear of fall (Table 4). Fear of falling can lead to negative outcomes as avoidance or restriction of older adults' activities which put them at an increased risk of physical reconditioning and disability. This may also result in future falls. Also, fear of falling has been associated with several physical difficulties as gait, balance disturbances, and decreased mobility that predispose the older adults to fall <sup>(29)</sup>.

This spiral relation between fear of falling, falls and declining in functional ability can be confirmed by the result of the present study, nearly half of older adults who were partially dependent in performing activities of daily living (ADLs) and half of them who had moderate to high fall risk due to impaired balance developed fear of fall (Table 3). A significant relation was noted between moderate and high fall risk, the ability of older adults to perform (ADLs) and fear of falling (Table 4). This is in accordance with the study

conducted in Canada 2008<sup>(30)</sup> reported that high levels of fear of falling are associated with an increased risk of falling through avoidance of activity and reconditioning. On the other hand, it was reported by Otaki M et al 2015<sup>(31)</sup> that no correlation was observed between functional Independence measure scores and intensity of fear of falling. The difference of this result and the result of the present study may be claimed to the difference in the studied subjects as the study of Otaki M et al included older adults suffered from dementia.

In the present study, although previous falls had a significant relation with fear of falling, it was not documented as a predictor of developing fear of falling.. This is supported by the study of Bagley 2017<sup>(32)</sup>. Conversely, it was reported by Lach, H, 2001<sup>(15)</sup> that having two or more falls was a significant predictor of fear of falling and increased the risk four-fold. While, high risk for fall due to impaired balance is one of independent predictors of fear of falling among community dwelling older adults (Table 5). Considering the other aspect of fall that is the ability of older adults to get up after fall may interpret the result of the present study as the majority of older adults experiencing difficulty in getting up after a fall causing feeling of disability and social embarrassment (Table 1).

One of the health indexes that affected significantly fear of falling in the present study was living arrangement. The majority of community dwelling older adults who were widow or live alone developed fear of falling than those live with their families, a significant relation was recorded (Table 4). Older adults who live alone may feel insecure due to lack of assistance from others or their urgent need for care giver who is responsible for providing total physical care especially in cases of crises or emergency situations. In addition to the knowledge of older person about the harmful consequences of fall (Table 3). This result is in parallel line with the study of Zali 2017<sup>(33)</sup> who reported that fear of falling was considerably higher in lonely older adults than those live with others. The situation may be complicated in cases of presence of chronic diseases and physical limitation as poor vision, hearing and need assistance in walking as reported by most of older adults in the present study. A significant relation was noted between presence of hypertension, diabetes mellitus, cardiac diseases, musculoskeletal disorders, parkinsonism and fear of falling (Table 4). This is supported by the study of Kader Met al<sup>(34)</sup>. Also, it was noted in the present study that those older adults suffered from visual or hearing impairments, use assistive devices as cane, eye glasses and hearing aids developed fear of falling (Table 4). Presence of hypertension, D.M. cardiac diseases and use of assistive devices were considered predictors of fear of falling (Table 5). This is in accordance with other study<sup>(35)</sup> reported that predictors of fear of falling included health status, using eye glasses, age and gender.

Advancing age and female gender were reported as predictors of fear of falling in the present study (Table 5). This result is supported by the study of Lawson K. (2013)<sup>(36)</sup> reported that increased age was associated with the risk of fear of falling, and studies conducted by Suzuki et al. (2002)<sup>(37)</sup>, Talley 2008<sup>(38)</sup> and Bagley 2017<sup>(32)</sup> determined that older adult females have a greater tendency to

experience fear of falling, deeming female gender as a "significant predictor". This result of the present study can be justified as advanced age is accompanied by more deteriorating changes and frailty which may put the older adults at risk for fall and fear of falling. Also, female gender may trigger accelerated changes and general weakness in their musculoskeletal system resulting from osteoporosis<sup>(27)</sup>. On the other side, it was reported by Mann et al., (2006)<sup>(39)</sup> that advancing age is not a precursor to fear of falling and there are other factors contributed to fear of falling as physical and psychosocial attributes.

Other demographic characteristics of older adults that had a significant relation with the fear of falling were level of education and occupation. Illiterate older adults were experienced high fear of falling than others. A significant relation was noted (Table 3). This is supported by the result of Bagley 2017<sup>(32)</sup> indicated that people with lower levels of education reported more fear of falling. In Alexandria, it was reported by Sharaf and Ibrahim 2008<sup>(8)</sup> that there is a significant association between fear of falling and years of education. In relation to occupation before retirement, house wife and farmers were considered predictors of fear of falling among the study subjects of the present study (Table 5). This may be justified both occupations lead to imposed weakness resulting from sedentary life style in performing household activities or expected weakness resulting from excessive use induced by hard work as farmer work. So, both occupations can lead to the feeling of fear of falling in aging.

## CONCLUSION

From the present study it can be concluded that fear of falling was prevalent among elderly living in the community. Living alone, low education, history of previous fall, and the ability of older adults to perform ADLs were among the factors that had a significant relation with increased fear of falling. Predictors of fear of falling among older adults community dwelling were advanced age, female gender, presence of chronic diseases as hypertension, diabetes mellitus, cardiac diseases, use of assistive devices and impaired balance.

## RECOMMENDATIONS

Based on the results of the study, the following recommendations are suggested; Gerontological nurse should assess fall and fear of falling frequently and screen for those at highest risk of developing fear of falling in many settings including hospitals, home care, outpatient clinics and Assisted Living Facilities. Education programs should be implemented for older adults and their families in different sectors in Mansura district to decrease the incidence of fall and fear of falling.

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