

The Nursing Homes Structure and the Prevalence of Falling Down Among Old Adults in Three of Nursing Homes in Palestine

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Abstract

Background: Fall is a sudden, unintentional change in position causing an individual to land at a lower level.

Aim: This study will find out the relationship between the nursing home structure and prevalence of falling down in nursing homes.

Method: Face to face Questionnaire for collecting information has been conducted after survey some previous studies dealing with the same subject.

Result: The highest percentage of falling down among the studied sample of old adults was related to polypharmacology by proportion of 79.4%.

Conclusion: This study concludes that there is a high prevalence of injuries post falling down in the Palestinian nursing homes. The most frequent falling down was related to polypharmacology by proportion of 79.4%.

Keywords: *older adult, nursing home, physical disabilities, polypharmacology, head injury, bruises, soft tissue injury, Dementia, osteoporosis.*

I. INTRODUCTION AND BACKGROUND

Fall was defined as a staff-reported incident of a person, who had slipped or stumbled and fallen, collapsed or had fallen off, for example, a bed, chair or wheelchair, or was found on the floor (13).

Falling down is a common problem among old adults as a result of age-related physiological changes such as muscle weakness, visual impairment, and balance problems. The incidence of falls and fall related injury increase with advancing age compared to children, older person are more likely to hospitalized and die as a result of a fall (Fuller, 2000). Each year about one out of three people older than age 65 years who is living in the community falls; this rate increases with advanced age and is higher among people who are living in institutional settings (11). Furthermore, as the population ages, the number of fall-related injuries will likely continue to increase unless prevention strategies can be successfully implemented (4). In addition, the structure of the nursing homes and lack of safety measures may increase the incidence of falling down among old adults in nursing homes.

Although now a day there is a positive vision toward having nursing homes in the country, we still have dearth information about falling down among old adult. And, the relationship between the nursing homes structure and physical disabilities in Palestinian nursing homes was not explored.

The risk factors responsible for a fall can be intrinsic (i.e., age-related physiologic changes, diseases, and medications) or extrinsic (i.e., environmental hazards). It is essential to remember that a single fall may have multiple causes, and repeated falls may each have a different etiology. Thus, it is critical to evaluate each occurrence separately(6).

Approximately half of nursing home residents fall annually, a proportion that is two to three times that of community residents. About 4% of falls occurring each year result in fractures, and 11% result in soft tissue and other types of injuries. Other consequences of falling include loss of function, self-imposed functional limitations caused by fear of falling, and discouragement of activity by care providers. Higher healthcare costs are another potentially serious consequence of falling; annual expenditures for fall-related fractures in the community alone are in the billions of dollars, whereas noninjurious falls can increase the costs of nursing home care because of staff time required for assessment, observation, and reporting(5).

Falls are a common and complex geriatric syndrome that cause considerable mortality, morbidity, reduced functioning, and premature nursing home admission(11). Falls are extremely common among older adults. Each year about one out of three people older than age 65 years who is living in the community falls; this rate increases with advanced age and is higher among people who are living in institutional settings (10).

From 30 to 40 percent of community-dwelling adults older than 65 years fall each year. Rates are higher in nursing home residents and hospitalized patients. The incidence of falls rises steadily from middle age and

peaks in persons older than 80 years. Between 20 and 30 percent of older adults who fall suffer serious injuries such as hip fractures and head trauma(1).

Muscle weakness and walking or gait problems are the most common causes of falls among nursing home residents. These problems account for about 24% of the falls in nursing homes. Hazards in the nursing home cause 16% to 27% of falls among residents. Such hazards include wet floors, poor lighting, incorrect bed height, and improperly fitted or maintained wheelchairs Medications can increase the risk of falls and fall-related injuries. Drugs that affect the central nervous system, such as sedatives and anti-anxiety drugs, are of particular concern Other causes of falls include difficulty in moving from one place to another (for example, from the bed to a chair), poor foot care poorly fitting shoes, and improper or incorrect use of walking aids(8).

Each year, at least 10 percent of older people have a serious injury caused by a fall, such as a fracture, joint dislocation, or severe head injury. Such falls and the injuries they cause are associated with pain, loss of confidence, and restricted activity (15).

People living in nursing homes are considered to have a high fracture risk. Several researchers in Europe and North America have reported a much higher hip fracture incidence in institutionalized elderly persons than in the general population (12). Most fractures among older adults are caused by falls and the most common are fractures of the spine, hip, forearm, leg, ankle, pelvis, upper arm, and hand (2).

Risk factors are either intrinsic or extrinsic. Intrinsic means demographic and health factors such as advanced age, chronic disease or disability. Extrinsic means the physical and socioeconomic environment, such as an older adult taking four or more prescription medications, poor lighting or lack of bathroom safety equipment. Because some risk factors cannot be changed, the focus of fall-prevention activities is on modifiable risk factors (16).

The main aims of this current study are to estimate the prevalence of falling down among old adult who are resident in the nursing homes, find out the nursing home structures that contribute falling down among old adults, and to determine the physical abilities of the old adult that can contribute falling down in nursing home.

II. METHODOLOGY

A. *Research Design:*

Descriptive surveying design is used based on face to face interview with old adults who are resident in the north Palestinian nursing homes.

B. *Research Sample:*

The study sample consist of 34 old adult who are resident in three nursing homes in Palestinian, (Charitable Society Committee in Jenin, Red Crescent committee in Nablus, and Grandfathers Home in Tulkarm).

C. *Data Collection Process:*

The questionnaire is based on factors derived from previous studies. The questionnaire allowed for confidentiality, in an effort to encourage more honest responses. The study conducted at three nursing homes in North Palestine (Charitable Society Committee in Jenin, Red Crescent committee in Nablus, and Grandfathers Home in Tulkarm.).

D. *Instrumentation:*

After reviewing literatures about falling down among old adults in nursing homes, a questionnaire was build up for collecting data; the questionnaire is organized into four parts:

Part one: Include independent variable (age, Gender , Educational level, year of study ,marital status ,place of residence, years of residency at nursing home, number of children, chronic illnesses, living situation)

Part two: type of injuries that the old adult experience and how many times.

Part three: the physical disabilities that may contribute injury

Part four: the structure design of the nursing home and the availability of safety measure.

E. *Statistical analysis*

The collected data for this study were analyzed and tabulated using the Statistical Package for Social Sciences (SPSS) software. The results of the research showed the prevalence of old adults who had different types of injuries in relation to their physical disabilities, and the structure of the nursing home. In addition to prevalence of how many times that the old adults experience injury, and examine the relationship between chronic illnesses and type of injuries that they exposed to.

To ensure the reliability, Cronbach's coefficient alpha was estimated to test the internal consistency among the items included in each of the formative scales. The resulting alpha values for this study are (0.853), which are acceptable according to Nunnally and Bernstein's (1994) guidelines for exploratory research.

III. RESULTS

As shown in table 1 the studied sample consists of 34 old adults (50% n=17) males and (50% n=17) females whose ages were (26.5% n=9) 65-70 years old, (41.2% n=14) 71-75 years old, and (32.4% n=11) above 76 years old. (23.5% n=8) of the sample had been in nursing home less than one year, (35.3% n=12) their residency was from 1-3 years, while (41.2% n=14) of them spend more than 3 years at the nursing homes. Most of the population sample had chronic illnesses as shown in the table, who had neurological disorders were (70.6% n=24), (64.7% n=22) had diabetes mellitus, (50% n=17) had cardiovascular disorders, and who had musculoskeletal disorders were (41.2% n=14).

TABLE I. DEMOGRAPHIC DETAILS OF THE SAMPLE (N=34)

Participant' Characteristics		n	%
Gender	Male	17	50.0
	Female	17	50.0
Age	65-70years	9	26.5
	71-75years	14	41.2
	Above 75years	11	32.4
City	Tulkarm	4	11.8
	Jenin	15	44.1
	Nablus	15	44.1
Years of Residency at Home Nursing	< 1 year	8	23.5
	1-3 years	12	35.3
	>3 years	14	41.2
Chronic Illness	DM	22	64.7
	Cardiovascular	17	50.0
	Neurological	24	70.6
	Musculoskeletal	14	41.2

Table 2 shows the distribution of type of injuries in relation to its frequency in the nursing homes, 23.5% n=8 of old adults had head trauma for one time as a result of falling down, and 14.7% n=5 had it for two times. 41.2% n= 14 had fracture for one time, 11.8% n=4 had fracture for two times while 5.9% n=2 had it more than two times. The third type of injuries which is common between old adults were bruises 32.3% n=11 develop bruises post falling down, 35.3% n=12 for two times, and 14.7% n=5 had bruises more than two times.

TABLE 2. THE DISTRIBUTION OF TYPE OF INJURIES VARIABLE IN RELATION TO THE FREQUENCY OF OCCURRENCE. (N=34)

Type of Injuries	None		Once		2times		>2times	
	n	(%)	n	(%)	n	(%)	n	(%)
Head trauma	21	(61.8)	8	(23.5)	5	(14.7)	0	(0.0)
Fracture	14	(41.2)	14	(41.2)	4	(11.8)	2	(5.9)
Bruises	6	(17.6)	11	(32.4)	12	(35.3)	5	(14.7)

Table 3 shows the distribution of old adults according to their physical disabilities which can contribute falling down in nursing home; 67.6% n=23 with muscle weakness, 73.5% n=25 had gait disability, and the same proportion had balance problems, 64.7% n=22 had postural hypotension, 52.9% n=18 had visual impairment, 79.4% n= 27 were taking multiple medication, 23.5% n=8 had Parkinson disease, 29.4% n=10 had dementia, and 32.4% n=11 had D/M neuropathy.

TABLE 3. THE DISTRIBUTION OF PHYSICAL DISABILITIES VARIABLE IN RELATION TO ITS OCCURRENCE. (N=34)

Physical Disabilities	n	(%)
Muscle weakness	23	(67.6)
Gait	25	(73.5)
Balance problem	25	(73.5)
Postural hypotension	22	(64.7)
Visual impairment	18	(52.9)
Multiple medication	27	(79.4)
Parkinson	8	(23.5)
Dementia	10	(29.4)
D/M neuropathy	11	(32.4)

TABLE 4. THE DISTRIBUTION OF AVAILABILITY OF SAFETY NURSING HOME MEASURES AND ITS EFFICIENCY. (N=34)

Nurses' Home Characteristics	n	%
Adequate Lightness	23	(67.6)
Changes in floor services	20	(58.8)
Bathroom design	20	(58.8)
Grab bars in bathroom	23	(67.6)
Wide doors	24	(70.6)
Height of the sink	22	(64.7)
Adequate spaces between corridors	20	(58.8)
Stairs bars	13	(38.2)
Availability of elevator inside the nursing home	18	(52.9)
Availability of assistance when walk	21	(61.8)
Room spaces are adequate enough	27	(79.4)
Availability of assistive devices	23	(67.6)

The distribution of safety measure s availability in nurses' homes according to the residents reports about its availability, 67.6% n=23 reported that there is adequate lightness, grab bars in bathroom are available, and there are availability of assistive devices. 58.8% n= 20 said there were changes in floor services and the same number reported that there is a suitable bathroom design, and said that there is adequate spaces between corridors. 70.6% n= 24 agree that there are wide doors in nurses' home, and 55.9% n= 19 said that the floor is maintained. 38.2% n= 13 said that the stairs bars are available, while 64.7% n= 22 said that the height of the sinks are suitable for them. 61.8% n= 21 said that there are assistance when walk, 79.4% n=27 agree about the presence of adequate room spaces in nurses' home.

The distribution of chronic illness among nurses' home residence in relation to their gender is shown in table 5. 66.7% n=8 males had diabetic mellitus and 33.3% n=4 were females, 41.25 n=7 males had cardiovascular problems while 58.8% n=10 were females. Who had neurological disorders were 60% n=6 and 40% n=4 were females, 60% n=12 males had musculoskeletal diseases, and 40% n=8 females.

TABLE 5 : THE DISTRIBUTION OF THE CHRONIC ILLNESSES ACCORDING TO THE GENDER VARIABLE. (N=34)

Chronic illness according to gender variable		n	%
Diabetic Mellitus	Male	8	66.7
	Female	4	33.3
Cardiovascular	Male	7	41.2
	Female	10	58.8
Neurological	Male	6	60
	Female	4	40
Musculoskeletal	Male	12	60
	Female	8	40

TABLE 6: THE INCIDENCE OF INJURY IN RELATION TO THE TYPE OF CHRONIC ILLNESS THAT THE NURSING HOME RESIDENT MAY HAVE. (N=34)

Chronic Illness	Type of Injuries	Once	2times	>2times
		n (%)	n (%)	n (%)
Diabetic Mellitus	Head trauma	1 (2.9)	3 (8.8)	0 (0.0)
	Fracture	7 (20.6)	3 (8.8)	0 (0.0)
	Bruises	2 (5.9)	6 (17.6)	2 (5.9)
Cardiovascular	Head trauma	2 (5.9)	4 (11.8)	0 (0.0)
	Fracture	11 (32.4)	3 (8.8)	1 (2.9)
	Bruises	5 (14.7)	7 (20.6)	3 (8.8)
Neurological	Head trauma	2 (5.9)	2 (5.9)	0 (0.0)
	Fracture	5 (14.7)	0 (0.0)	0 (0.0)
	Bruises	2 (5.9)	4 (11.8)	2 (5.9)
Musculoskeletal	Head trauma	4 (11.8)	3 (8.8)	0 (0.0)
	Fracture	11 (32.4)	3 (8.8)	1 (2.9)
	Bruises	6 (17.6)	9 (26.5)	2 (5.9)

The frequency of falling down among old adults in relation to the nurses' home residence and type of chronic illnesses. The nurses' home residence who had diabetic mellitus 2.9% n= 1 of them developed head

trauma for one time, 8.8% n=3 of them had head trauma two times. 20.6% n=7 had fracture for one time, and 8.8% n=3 of them had a fracture for two times. 5.9% n=2 developed bruises once, 17.6% n=6 developed it for two times, and 5.9% n=2 had bruises more than two times.

5.9% n=2 of old adults who had cardiovascular illness developed head trauma for one time, 11.8% n=4 of them had a head trauma two times, 32.4% n=11 of old adults had fractures for one time, 8.8% n=3 of them had a fracture two times, and 2.9% n=1 had fracture more than two times. 14.7% n=5 of elderly who had cardiovascular illness developed one time bruises, 20.6% n=7 of them had bruises two times, and 8.85 n=3 had it more than two times.

Who had neurological disorders 5.9% n=2 of them developed head trauma for one time, and the same proportion had it for two times. 14.7% n=5 had fracture for one time. 5.9% n=2 of elderly developed one time bruises, while 11.8% n=4 of them had bruises two times, and 5.9% n=2 developed bruises more than two times.

11.8% n=4 of old adults who had musculoskeletal disorders developed head trauma for one time, 8.8% n=3 of them had it for two times. 32.4% n=11 of old adults had fracture for one time, 8.8% n=3 of them had two times, and 2.9% n=1 had fracture more than two times. 17.6% n=6 of elderly who had musculoskeletal disorder developed bruises for one time, 26.5% n=9 of them had bruises for two times, while 5.9% n=2 had bruises more than two times.

Table 7 shows the frequency of injuries in relation to the nurses' home characteristics. 20.6% n=7 of old adults had one time of head trauma even there were adequate light in the nursing home, 35.1% n=12 had fracture for one time, and who developed bruises even of adequate light 38.3% n=11 for two times.

The bathroom design contributes head injury for 11.8% n=4 of nursing home residents for one time, and the same proportion develop two times head trauma, who develop fracture are 29.4% n=10 for one time. The residents who had bruises are 23.5% n=8 for one time.

Grab bars in bathroom availability didn't prevent head injuries, 15.7% n=5 had head trauma for one time, and who developed fracture were 32.4% n=11 for one time, 23.5% n=8 had bruises for one time although the availability of grab bars in bathroom, 20.6% n=7 developed bruises for two times.

17.6% n=6 of old adult had head trauma for one time even of the availability of wide doors, 38.3% n=11 of old adult had fracture for one time even of available wide doors, and 26.5% n=9 had bruises for two times.

Even of the appropriate height of the sink 32.4% n=11 had fracture for one time, 23.5% n=8 of old adult had bruises for one time, and the same number had bruises for two times,

Although the adequate spaces between corridors, who developed fracture for one time were 29.4% n=10 for one time, 23.5% n=8 developed bruises.

29.4% n=10 of old adult had fracture for one time even of available strain bars, and 2.9% n=1 for two times, and 11.8% n=4 of old adult had bruises for two times.

11.8% n=4 of old adult had head trauma for two times even of the availability of assistance when walk. 38.2% of n=13 old adult had fracture for one time, 23.5% n=8 of old adult had bruises for one time even of available assistance when walk, and the same proportion had bruises for two times.

Who had head trauma for one time even of room space are adequate enough were 20.6% n=7, 35.3% n=12 of old adult had fracture for one time, and 32.4% n=11 of old adult had bruises for one time.

14.7% n=5 had head trauma for one time although the availability of assistive devices, 38.2% of old adult had fracture for one time even of available assistive device, and 29.4% of old adult had bruises for one time even of available assistive device.

TABLE 7: THE INCIDENCE OF INJURIES IN RELATION TO THE NURSES' HOME CHARACTERISTICS. (N=34)

Nurses' Characteristics	Home	Type of Injuries	Once n (%)	2times n (%)	>2times n (%)
Adequate lightness		Head trauma	7 (20.6)	4 (11.8)	0 (0.0)
		Fracture	12 (35.1)	4 (11.8)	2 (5.9)
		Bruises	8 (23.5)	11 (38.3)	5 (14.7)
Changes in floor services		Head trauma	2 (5.9)	3 (8.8)	0 (0.0)
		Fracture	9 (26.5)	4 (11.8)	1 (2.9)
		Bruises	7 (20.6)	7 (20.6)	3 (8.8)
Bathroom design		Head trauma	4 (11.8)	4 (11.8)	0 (0.0)
		Fracture	10 (29.4)	4 (11.8)	1 (2.9)
		Bruises	8 (23.5)	7 (20.6)	3 (8.8)
Grab bars in bathroom		Head trauma	5 (15.7)	4 (11.8)	0 (0.0)
		Fracture	11 (32.4)	4 (11.8)	1 (2.9)
		Bruises	9 (26.5)	7 (20.6)	3 (8.8)
Wide doors		Head trauma	6 (17.6)	4 (11.8)	0 (0.0)
		Fracture	11 (38.3)	4 (11.8)	2 (5.9)
		Bruises	8 (23.5)	9 (26.5)	5 (14.7)
Height of the sink		Head trauma	3 (8.8)	4 (11.8)	0 (0.0)
		Fracture	11 (32.4)	4 (11.8)	2 (5.9)
		Bruises	8 (23.5)	8 (23.5)	4 (11.8)
Adequate spaces between corridors		Head trauma	3 (8.8)	4 (11.8)	0 (0.0)
		Fracture	10 (29.4)	4 (11.8)	2 (5.9)
		Bruises	8 (23.5)	7 (20.6)	4 (11.8)
Stairs bars		Head trauma	1 (2.9)	3 (8.8)	0 (0.0)
		Fracture	10 (29.4)	1 (2.9)	0 (0.0)
		Bruises	3 (8.8)	4 (11.8)	3 (8.8)
Availability of assistance when walk		Head trauma	3 (8.8)	4 (11.8)	0 (0.0)
		Fracture	13 (38.2)	4 (11.8)	1 (2.9)
		Bruises	8 (23.5)	8 (23.5)	2 (5.9)
Room spaces are adequate enough		Head trauma	7 (20.6)	4 (11.8)	0 (0.0)
		Fracture	12 (35.3)	4 (11.8)	2 (5.9)
		Bruises	11 (32.4)	11 (32.4)	4 (11.8)
Availability of assistive devices		Head trauma	5 (14.7)	4 (11.8)	0 (0.0)
		Fracture	13 (38.2)	4 (11.8)	1 (2.9)
		Bruises	10 (29.4)	9 (26.5)	2 (5.9)

IV. DISCUSSION

This study consists of all of old adults who are residents in three nursing homes in Palestine (N=34), there are many factors influence the number of old adult residency in nursing homes, such as religion norms and circumstances. Although of the sample number there is a high incidence of falling down among old adults in nurses' home, the most type of injury between old adults who are resident in nurses' home is fracture 41.2%. Which is consistent with previous studies, approximately 25% to 35% of people over the age of 65 years experience one or more falls each year. The consequences of falls among older adults are often devastating (14). Approximately 1 in 10 falls results in a serious injury, such as hip fracture, other fracture, subdural hematoma, other serious soft tissue injury, or head injury(15). And there are many variables which contribute falling down and cause injury, this study shows a high percentage of injuries between old adults as a result of having multi medications which was 79.4%.

Polypharmacy is regarded as an important risk factor for falling and several studies and meta-analyses have shown an increased fall risk in users of diuretics, type 1 antiarrhythmics, digoxin and psychotropic agents(3).

The second variables which also had a high prevalence in falling down are the gait and balance problems, this study shows that 73.5% of old adults had either gait problems or balance problems. The broad category of gait problems and weakness is the next commonest specific precipitating cause for falls 10-25% in most series (10).

Most of the nurses' home residents had chronic illnesses such as diabetes mellitus, cardiovascular disorders, neurological disorders, and musculoskeletal disorders which contribute in falling down, in this study shows that 32.4% of old adults who have cardiovascular problems developed fracture as a result of their disease, and the same proportion had also fracture as a result of musculoskeletal disorders. The Indian Health Services Portland Area, 2006 reported that people in nursing homes are generally more frail than older adults living in the community. They tend to be older, have more chronic illnesses, and have difficulty walking (8).

This study shows a high prevalence of injuries 79.4% in nurses' home despite the adequate spaces in the rooms, which is related to gait and balance problems among old adults. Gait and balance disorders 17% (10). Gait and balance impairments were a significant risk factor for falls, and were associated with about a threefold increased risk for falling.

In relation to the characteristics of the nurses' home it contribute the incidence of injuries, 38.2% of old adults had fracture although there are availability of assistance when walk, which may indicate that the personnel who are working in nurses' home are not qualified enough in caring for old adults, and also the same proportion 38.2% had fracture in spite of the availability of assistive devices which indicate lack of knowledge about using them. Which is confirmed in previous study that the use of assistive devices may reduce the risk for falling(7).

V. CONCLUSION AND RECOMMENDATIONS

There is a high prevalence of injuries as a result of falling down among old adults in three of the Palestinian nurses' homes. The most frequent type of injury is fracture with a proportion of 41.2%.

The highest percentage of falling down among the studied sample of old adults was related to polypharmacology by proportion of 79.4%, while 73.5% were as a result of balance problem and the same percentage for gait disorder. In addition to the relationship between the nursing home safety measures and the prevalence of injury among old adults.

Improving nursing homes safety measures can reduce the number of falling down among old adults, regular revision of medications must be performed, and build up educational programs for the staff who are caring for old adults in order to give an optimal care for them in which it contribute in decrease the risk of falling down.

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