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RESEARCH

EVALUATION OF HOME ACCIDENTS AND FALL BEHAVIORS OF ELDERLY

ABSTRACT

Introduction: This study was conducted to evaluate home accidents sustained by the elderly in previous year by using the questionnaire develop by the researcher and also evaluate the fall behavior of the elderly using the "falls behavioral scale" included 175 elderly residents in the Ovacık district of Kırıkkale province, Turkey.

Materials and Method: The "Falls Behavioral Scale for the Elderly" was employed as the data collection tool. Data were analyzed using standard deviation, arithmetic mean, and the student's t-test to compare the two groups and analysis of variance to compare multiple groups.

Results: More than half of the elderly (59.4%) sustained home accidents in the previous year, and elderly who sustained fall accidents (70.2%) and those who sustained accidents in the kitchen (31.7%) ranked in first place. The mean score of the elderly' fall behavior was 2.85 points on a four-point scale. The falls behavior of the elderly indicated significant differences in terms of the type and place of accidents ($p<0.05$). When group averages were evaluated, the elderly that sustained cuts or home accidents in the kitchen had higher scores on the Falls Behavioral Scale compared with other groups.

Conclusion: The mean score on the Falls Behavioral Scale was higher for women, college graduates, have single child, and those living alone.

Key Words: Aged; Accident, Home; Accidental Falls



ARAŞTIRMA

YAŞLILARIN EV KAZASI GEÇİRME DURUMLARININ VE DÜŞME DAVRANIŞLARININ DEĞERLENDİRİLMESİ

Öz

Giriş: Yaşlıların son bir yıl içerisinde ev kazası geçirme durumlarını belirlenmesi ve düşme davranışlarının düşme davranışları ölçeğine göre değerlendirilmesini amaçlayan bu çalışmaya Kırıkkale ili, Ovacık mahallesinde ikamet eden 175 yaşlı katılmıştır.

Gereç ve Yöntem: Çalışmada veri toplama aracı olarak "Yaşlılar İçin Düşme Davranışları Ölçeği" kullanılmıştır. Verilerin çözümlenmesinde standart sapma, aritmetik ortalama, ikili gruplar için t testi, ikiden daha fazla grup için ise varyans analizi kullanılmıştır.

Bulgular: Yaşlıların yarından fazlasının (%59.4) son bir yıl içinde ev kazası geçirdiği, düşme kazası geçirenlerin (70.2) ve mutfakta kaza geçirenlerin (%31.7) ilk sırada yer aldığı belirlenmiştir. Yaşlıların düşme davranışlarının ortalaması 4'lü ölçekte 2,85 olarak belirlenmiştir. Yaşlıların düşme davranışlarının kaza tipi ve kaza alanı değişkenlerine göre anlamlı bir farklılık göstermiştir ($p<0,05$). Grup ortalamaları incelendiğinde kesik sonucu yaralananların ve mutfakta kaza geçirenlerin düşme davranışları ortalamasının diğer gruplara göre daha yüksek olduğu belirlenmiştir.

Sonuç: Kadınların, yüksekökol mezunlarının, tek çocuğu olanların, yalnız yaşayanların düşme davranışlarının ortalaması diğer gruplara göre daha yüksek bulunmuştur.

Anahtar Sözcükler: Yaşlı, Ev kazası, Düşme

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Received: 17/12/2015

Accepted: 04/07/2016

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INTRODUCTION

The increase in life standards due to advances in science and technology; decreases in fertility rates, preventable diseases, and mortality; more independence in activities; increase in the quality of life; and an increase in the life expectancy after birth have led to an increase in the elderly population worldwide (1). Due to changes occurring in this process, an elderly individual becomes more likely to encounter health problems and risks more frequently and differently than those encountered at younger ages (2).

Physical, psychological, and social deficiencies; problems in muscular and skeletal systems; and a decrease in sensory and motor functions are all factors that contribute to the elderly's dependence on other people. These factors also increase the risk of accidents in this specific population (3). In particular, the population aged 65 years and over is at an increased risk of sustaining home accidents. Falls are a serious health concern in the elderly population (4), and one-third of the elderly people experience fall accidents once or more in a year (5,6).

The risk of falls, increases with the increasing number of individual risk factors. Older bones are often less dense, more brittle, and break more easily. A simple fall can become a serious, disabling injury that limits independence (7,8).

Research has revealed that many home accidents are preventable (10,11). Therefore, this study was conducted to evaluate home accidents sustained by the elderly in previous year by using the questionnaire developed by the researcher and also evaluate the fall behavior of the elderly using the "falls behavioral scale".

MATERIALS AND METHODS

With the goal of evaluating home accidents according to the Falls Behavioral Scale people 65 years and over, residing in the Ovacık district of Kırıkkale, are included. 1300 elderly people in the neighborhood where the information was obtained from the Ovacık district Headman. Ovacık district is Kırıkkale center and socio-economic status is above the middle level. A maximum of 1300 elderly people were identified residing at the study site, and thus, sample size was calculated using the formula $(n = N \cdot s^2 \cdot Z^2 / ((N-1) \cdot d^2 + s^2 \cdot Z^2))$ that is recommended for quantitative studies and finite population (12). In this formula, population size (N) was 1300, standard deviation calculated with the first 30 questionnaires was $s=0,7$; effect size was $d=0.10$; theoretical value correspon-

ding to $s=0.05$ significance level was $z_{0.05}=1.96$; and minimum sample size calculated with this formula was 165 people. Considering missing and not returning questionnaires, a total of 180 questionnaires were distributed and 175 questionnaires were evaluated. Only five elderly individuals refused to participate in the study. People who reserve list were included in the sample.

Information on names, addresses, etc. of the 1300 elderly people was obtained from the records of the Ovacık district headman. Systematic sampling, a probability sampling method, was employed to create a study sample that comprised 175 elderly people. 1300 a list was prepared giving a number to each of the elderly. Individuals with systematic sampling within the framework of sample rate in the list and addresses have been determined taking into account the record numbers. This is a cross-sectional study evaluating home accidents in Ovacık district of Kırıkkale.

A questionnaire was used as the data collection tool. The questionnaire included questions about gender, age, education level, income, home accident status, the type of accident, the area of accident, and the "Falls Behavioral Scale for the Elderly," which was originally developed by Clemson et al. (13) and adapted to the case of Turkey by Uymaz Eksi and Nahcivan, was utilized (14).

Falls Behavioral Scale for the Elderly

This scale comprises 30 items and 10 dimensions. These include Cognitive Adaptations (6 items), Protective Mobility (5 items), Avoidance (5 items), Awareness (4 items), Pace (2 items), Practical Strategies (3 items), Displacing Activities (1 item), Being Observant (1 item), Changes in level (2 items), and Getting to the phone (1 item). Each expression is rated on a four-point Likert scale (from 1 to 4), anchored at 1=never, 2=sometimes, 3=often, and 4=always. The scores obtained from the subscales and total scores range between 1 and 4 points, where in high scores indicate safe and protective behaviors and low scores indicate risky behaviors. Six items (7, 8, 9, 10, 19, and 23) in this scale are in reverse order and thus need to be recoded before calculation. The scores of an individual on each item are summed and divided by the total number of items to yield a total scale score ranging between 1 and 4 points.

The comparison between scale items and individual characteristics and activities of daily living was conducted using the t-test for two groups and analysis of variance between more than two groups. The analysis of variance as a result of the presence of significant differences for the source of differ-



ence in a binary Comparison Test (post-hoc tests) Tukey's test was applied. On the other hand, the scale's reliability was determined using Cronbach's Alpha coefficient, which was calculated as 0.858.

Study data were collected from through face-to-face interviews with elderly from community by considering the questionnaire form developed by the study team between 8 April and 8 May 2015.

Data obtained through questionnaires were analyzed using SPSS 18.0 for Windows software.

The study protocol was approved by the Hacettepe University Research Ethics Committee and informed consent

was obtained from all individuals who agreed to participate the study

RESULTS

Distribution of the elderly according to various individual characteristics is presented in Table 1. Accordingly, females comprise slightly more than half (56.6%) of the elderly (n=175). People in the 71–75 age group (33.1%), primary school graduates (38.9%), people with an income of 892–1500 TL (44.6%), people having three children (29.7%), those living with their spouses (40.6%), homeowners

Table 1— Distribution of the Participants According to Individuals Characteristics.

Variable	Group	Number (f)	Percentage (%)
Gender	Female	99	56.6
	Male	76	43.4
Age	65–70	43	24.6
	71–75	58	33.1
	76–80	41	23.4
	81–85	23	13.1
	86 and above	10	5.8
Education status	Primary School	68	38.9
	Secondary School	55	31.4
	High school	27	15.4
	College	25	14.3
Monthly income (TL)	891 and below (minimum wage)	34	19.4
	892–1500	78	44.6
	1501–2250	29	16.6
	2251–3000	19	10.9
	3001 and above	15	8.5
Number of children	None	4	2.3
	One	18	10.3
	Two	36	20.6
	Three	52	29.7
	Four	33	18.8
	Five and above	32	18.3
People living together	Alone	33	18.8
	With spouse	71	40.6
	Spouse and children	28	16.0
	With children	43	24.6
House property	Homeowner	134	76.6
	Tenant	41	23.4
Health insurance	Health Card for Uninsured People in Turkey (HCUPT)	12	6.9
	Retirement Fund	69	39.4
	Social Security Institution for Self-employed	35	20.0
	Social Security Institution for Employee	59	33.7
Total		175	100.0



ers (76.6%), and the elderly covered under the insurance of the government retirement fund (38.0%) constituted the major groups.

More than half of the elderly participating in the study (59.4%) sustained home accidents in the previous year. The elderly who sustained home falls (70.2%) ranked first among the elderly who sustained home accidents followed by accidents due to a slippery floor 20.2% of the elderly. In terms of the causes of accidents, carelessness (54.8%) ranked first among other causes. The kitchen was reported as the accident location by 31.7% of the elderly. Most elderly people did not

visit any health center after the accident (43.3%), and the majority reported spontaneous recovery (76.0%).

According to which the mean score of the elderly was 2.85 points on a four-point scale. Older people from “cognitive adaptation” dimensions =3.34, the protective mobility subscale =2.77, the Avoidance subscale =2.99, the Awareness subscale =3:19, pace sub-dimension =2.04 practical strategies sub-dimension =2.32, the displacing activities=1.79, being observant subscales =2.68, =2.68 changes in level dimensions, the dimensions getting to the Phone =2.24 the average score received. The lowest average among the subscales “dis-

Table 2— Comparison of the Participants’ Falls Behaviors with Various Individual Characteristics

Variable	Group	\bar{X}	s.d.	t/F	p
Gender	Female	2.91	0.39	2.666	0.009*
	Male	2.74	0.45		
Age	65–70	2.89	0.46	0.393	0.814
	71–75	2.81	0.39		
	76–80	2.79	0.45		
	81–85	2.88	0.39		
	86 and above	2.87	0.47		
Education status	Primary school	2.81 ^b	0.41	7.869	<0.001
	Secondary school	2.72 ^b	0.41		
	High school	2.84 ^b	0.50		
	College	3.19 ^a	0.19		
Monthly income (TL)	891 and below (minimum wage)	2.76	0.35	1.915	0.110
	892–1500	2.80	0.43		
	1501–2250	2.90	0.41		
	2251–3000	2.83	0.52		
	3001 and above	3.09	0.38		
Number of children	None	2.68 ^b	0.49	2.519	0.031*
	One	3.09 ^a	0.26		
	Two	2.94 ^a	0.39		
	Three	2.74 ^b	0.46		
	Four	2.80 ^{ab}	0.43		
	Five and above	2.80 ^{ab}	0.43		
People living together	Alone	3.06 ^a	0.32	4.125	0.007*
	With spouse	2.79 ^b	0.46		
	Spouse and children	2.85 ^b	0.44		
	With children	2.74 ^b	0.39		
House property	Homeowner	2.87 ^b	0.43	1.521	0.133
	Tenant	2.75 ^b	0.40		
Health insurance	Health Card for Uninsured People in Turkey (HCUPT)	2.72	0.26	0.443	0.723
	Retirement Fund	2.85	0.47		
	Social Security Institution for Self-employed	2.81	0.36		
	Social Security Institution for Employee	2.86	0.44		

*<0.05 a.b.c.: the differences between groups with different letters are important. (p<0.05)

The between-group differences in average is made arrangements giving the letter a group which is the largest



placing activities “ dimension of (=1.79), the highest average “cognitive adaptation” size (=3.34) was found.

The highest scores were observed on the following items: “I hold onto a handrail when I climb stairs” (=3.53); In contrast, the lowest scores were observed on the following items: “To reach something up high, I use the nearest chair, or whatever furniture is handy, to climb on” (=1.79); “I go out on windy days” (=1.79).

Results of the student’s t-test and analysis of variance for comparison of various individual characteristics on items in the Falls Behavioral Scale are presented in Table 2. Accordingly, gender, educational status, number of children, and people living together indicated significant influence ($p<0.05$). When group averages were evaluated, the mean score on the Falls Behavioral Scale was higher for women, college graduates, have single child and those living alone.

Results of the student’s t-test and analysis of variance comparing the elderly’s falls behaviors with home accidents are presented in Table 3. Accordingly, falls behavior significant differences were noted in terms of the type and place of

accident ($p<0.05$). When group averages were evaluated, those who sustained cuts or home accidents in the kitchen had higher scores on the Falls Behavioral Scale compared with other groups.

DISCUSSION

The determination of risky behaviors that cause home accidents and falls in elderly is important for raising individual awareness regarding home accidents and implementing preventive measures.

Thinking that it would be easy to remember questions about home accidents in the last year were asked in the study. More than half of the study participants (59.4%) sustained home accidents in the previous year. This rate was 29.0% in the study by Tortumluoğlu et al. (15). In his study, Tortumluoğlu (15) stated that the memory factor might be the reason for the low rate of home accidents. This rate was 34.3% in the study by Şahbaz and Tel (3), 20.6% in that by Doğan et al., (16) and 32.1% in that by Yörük (17). Different frequency rates recorded for home accidents can be attributed

Table 3— Comparison of the Participants’ Falls Behaviors with Various Parameters Related to Home Accidents

Variable	Group	\bar{X}	s.d.	t/F	p
Home accident history in the last year	Yes	2.84	0.42	0.017	0.998
	No	2.85	0.44		
Type of accident	Falls	2.78 ^b	0.40	3.259	0.043*
	Cuts	3.08 ^a	0.36		
	Burns-scalds	2.93 ^a	0.45		
Cause of accident	Carelessness	2.72	0.37	0.988	0.418
	Slippery floor	2.90	0.45		
	Insufficient illumination	2.78	0.45		
	Presence of objects on the floor	2.87	0.34		
	Lack of handrails in the bathrooms-toilets	2.65	0.37		
Place of accident	Kitchen	2.97 ^a	0.34	4.090	0.002*
	Bedroom	2.40 ^c	0.42		
	Bathing	2.76 ^b	0.34		
	Hallway	2.47 ^c	0.48		
	Stairs	2.76 ^b	0.36		
	Using toilet	2.96 ^a	0.44		
Place of admission after the accident	None	2.84	0.41	0.013	0.987
	Health care facility	2.83	0.43		
	Neighbors, relatives, friends, etc.	2.85	0.44		
Consequence of accident	Full recovery	2.86	0.41	0.742	0.479
	Treatment is continuing	2.81	0.38		
	Disability	2.58	0.76		

* $p<0.05$ a.b.c:the differences between groups with different letters are important: ($p<0.05$)

The between-group differences in average is made arrangements giving the letter a group which is the largest



to environmental rearrangements to reduce accidents, educational status, socioeconomic status, and individual differences. Information regarding home injuries was obtained from self-reports from elderly people, and the true prevalence of home injuries in the elderly population is unknown (16). Some national studies have reported wide variations in home injury rates, ranging between 23.8% and 65.3% in elderly people in Turkey (16,18).

Fall accidents are common and constitute a serious health problem (19). Fall accidents also ranked first among the study population who sustained home accidents (70.2%). Studies in the literature also mentioned falls as the most common type of accident in the elderly (15,18,20-23). These studies support the current findings. These findings also indicate that falls are widespread problems among the elderly.

Although bedrooms and living rooms are the most common locations for accidents in general, the most serious accidents involving older people usually occur in the kitchen or on the stairs (23). Indeed, the accident location was the kitchen in 31.7% of elderly people who sustained home accidents. A higher rate of accidents in the kitchen can be explained by the fact that people spend more time in the kitchen while performing daily activities and use sharp objects that could cause accidents. According to a study by Clemson et al. (13), in which they analyzed home accidents and falls in people aged 65 and older, elderly people experienced falling mostly in bathrooms and restrooms.

In this study, most elderly did not visit any health center after the accident (43.3%), and the majority reported spontaneous recovery (76.0%). In the study by Tortumluoğlu (15) more than half of the elderly who sustained home accidents (56.6%) visited a healthcare facility. When descriptive statistics related to the elderly's opinions regarding items in the Falls Behavioral Scale are evaluated, the mean score was =2.85 points on a four-point scale. The lowest average among the subscales "displacing activities" dimension of (=1.79), the highest average "cognitive adaptation" size (=3.34) was found. This finding suggests that elderly people "sometimes" or "often" exhibit safe behaviors that could prevent falls. This value was 2.66 in the study by Uymaz Ekşi and Nahcivan (14). When statistics related to items were evaluated in this study, the highest scores were observed in the following items: "I hold onto a handrail when I climb stairs" (=3.53) Adoption of safe behaviors and focus on potential accidents would reduce the likelihood of sustaining home accidents. The lowest scores were observed in the following items that expressed unfavorable behavior compared with other items: "To reach something up high, I use the nearest chair, or what-

ever furniture is handy, to climb on" (=1.79); "I go out on windy days" (=1.79). Raising awareness among elderly people regarding fall risk behavior would positively impact fall prevention at home.

When group averages were evaluated, the mean score on the Falls Behavioral Scale was higher for women, college graduates, have single child, and those living alone. These findings suggest that women, college graduates, and elderly people living alone should significantly focus on fall accidents. Previous studies suggested that gender was a risk factor for falls and that females more frequently sustained fall accidents than males (16,24). That's why women are more anxious than men about fall. This result gives rise to thought that women get higher points from fall scale than men. The fact that elderly with higher education level get higher points from the scale can be resulted from they are more conscious on the subject due to their education level. It is known that elderly people who live alone experience more fall accident as then other people (25). That's why it can be thought that elderly people living alone realize that fact and try to be more careful about fall and also get higher points relatively to others from the scale. In some studies, elderly people living alone more commonly sustained home accidents (16,18). The finding that females and those living alone had higher mean scores on the Falls Behavioral Scale suggests that this group of elderly people are aware of home accidents and exert greater attention. Additional research is also needed to determine why women, college graduates, have single child, and those living alone had higher mean scores than others. According to the results of the student's t-test and analysis of variance comparing falls behavioral scores and parameters related to home accidents significant differences were observed in terms of the type and place of accident ($p < 0.05$). When group averages were evaluated, the elderly who sustained cuts or home accidents in the kitchen had higher scores on the Falls Behavioral Scale compared with other groups. This finding indicates that people having sustained cuts or accidents in the kitchen focus more on fall risk behaviors compared with other groups.

Limitations of the study are its lack of generalizability due to small sample size in categories. Further research is needed with a larger sample size of elderly people. Recall bias was another limitation because participants had to report home accidents experienced in the previous 12 months.

This study has drawn a number of conclusions. More than half of the elderly sustained home accidents in the previous year. Overall, the mean score of the elderly on the Falls Behavioral Scale was = 2.85 points on a four-point scale. The falls behavior of the elderly indicated significant differences in



terms of the type and place of accidents ($p < 0.05$). The mean score on the Falls Behavioral Scale was higher for women, college graduates, have single child, and those living alone.

Based on these findings; a few words could have been said for the future work. Home accidents happen frequently in old age, and home conditions must be arranged to prevent accidents. Improve environmental conditions against fall accidents, and thereby reduce the risk of such falls occurring in the home. In addition, elderly individuals and caregivers must be informed and educated regarding home accidents. Periodic safety checks might help identify risk factors and thus eliminate causes of many home accidents. Initial intake assessments should be conducted by those with training in assessing and screening for level of fall risk and contributing factors to prior falls. We suggest that a cohort study design could be employed in future research. We should consider the participation of all old people who are housebound. Further studies evaluating home accidents and falls behavior on larger groups can be encouraged in Turkey.

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