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The Prevalence of Chronic Diseases and Drug Use Among Geriatric Cases in Ardesen County of Rize Province

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ABSTRACT

Objective: This study aimed to evaluate the prevalence of chronic diseases and drug use among geriatric cases in Ardesen County of Rize Province.

Methods: A cross-sectional and descriptive correlational study including 482 elderly was conducted between March and June 2014. Data were collected using the personal information form via face-to-face interviews. All data were analyzed as percentages using the chi-square test.

Results: In this study, 97.9% of the elderly had chronic diseases and 52.9% were in the 65-74-year age group. The most frequent chronic diseases included those of the cardiovascular system (74.3%). In addition, 49% of the group used three or four medications daily, and 99.2% took their medications orally. However, these medications caused gastrointestinal problems for 24.3% of the subjects. For 44.6% of the elderly, the most challenging aspect regarding their medications was forgetting to take them. Sex, age, profession, monthly income level, and social security status affected the duration of the chronic diseases of the elderly, whereas age, marital status, educational level, profession, social security coverage, and the people with whom they lived affected the number of medications used daily by this group ($p<0.05$).

Conclusion: Preventive measures should focus on reducing risk factors related to the development of chronic diseases and the drugs used to treat them.

Keywords: Chronic disease, drug use, aged, prevalence

Introduction

In 2015, the elderly population comprised 8.5% of the total population of the world, and it continues to increase (1). The World Health Organization defines "elderly" as individuals who are aged ≥65 years (2). In 2015, the elderly population of Turkey was 6,495,239, i.e., 8.2% of the total population. The Turkish Statistical Institute reported that the lifespan in 2015 for females at birth was 80.7 years and for males was 75.3 years, whereas by 2023, it would be 10.2% for females and males. These estimates indicate that the number of elderly will increase, and Turkey will have a very aged population (1).

As a person ages, the immune system weakens, thereby increasing one's vulnerability to chronic diseases (3). The World Health Organization estimates that 60% (38 million) of deaths worldwide occur because of chronic diseases. Cardiovascular system (CVS) diseases, cancers, chronic respiratory tract diseases, and diabetes rank in the first place as causes of death (2). Chronic diseases afflict 422,000 people in Turkey and cause nearly 86% of deaths. In Turkey, the most common chronic diseases include CVS diseases (40.3%), cancer (20.0%), respiratory system diseases (11.1%), and endocrine system diseases (5.0%) (4).

Studies indicate that 70%-90% of elderly suffer from one or more chronic diseases (4-6). Ninety percent of individuals aged ≥65 years have one chronic disease, 35% have two, 23% have three, and 15% have four (7). Individuals with

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more than one chronic disease can experience dysfunctions in sensory abilities and social skills, which may later require special care and rehabilitation (3, 5). Seventy-five percent of healthcare expenses of the world can be attributed to chronic diseases, with expenses approaching nearly one trillion dollars. These expenses represent an increasing burden, which threatens the healthcare systems of many nations (2, 8).

As stated earlier, aging process and onset of chronic diseases may lead to long-term and multiple medication use (9-11). In a study conducted in the United States of America-Mexico border region with subjects having an average age of 71.4 years, 72.4% of the subjects used five or more drugs, whereas 46.2% had a risk for drug-drug interactions (12). In the study with 3,005 subjects, Qato et al. (13) found that 29% of subjects aged 75-85 years used at least five or more medications, 81% used at least one prescription drug, and 46% using prescription drugs also took unprescribed medications (13). In Turkey, the most commonly used drugs among the elderly were CVS medications (26.7%), analgesics and nonsteroid antiinflammatory medications (20.8%), gastrointestinal system (GIS) medications (12%), and endocrine system medications (10.6%) (4).

Multiple drug use; drug interactions; changes in drug absorption, metabolism, and elimination; and drug adverse effects owing to cognitive problems such as forgetfulness, are two to three times more likely to occur among the elderly population compared with the young population (9-10). In addition, multiple drug use (polypharmacy) increases the risk for numerous negative health consequences in the elderly. Specifically, the burden of taking multiple medications has been associated with greater healthcare expenses and an increased risk for adverse drug events, drug interactions, medication nonadherence, reduced functional capacity, and multiple geriatric syndromes (6, 9). Furthermore, medication noncompliance varies between 21% and 55% among the elderly and occurs more often among those who take more than three medications, who have more than one prescription, and who live alone (10, 14, 15). Therefore, the elderly who have chronic diseases and use multiple drugs to manage their diseases require support for their treatment, care needs, and monitoring of medications (16).

To our knowledge, this is the first study in Turkey that aimed to evaluate the prevalence of chronic diseases and drug use among the elderly population aged ≥65 years. Individuals who chose to participate were registered at the Family Medicine Unit in Ardesen County of Rize Province, Turkey.

Methods

Design

This was a cross-sectional and descriptive correlational study.

Subjects and Setting

This study was conducted between March and June 2014 with individuals aged ≥65 years who were registered at the Family Medicine Unit in Ardesen County of Rize Province in the Eastern Black Sea region of Turkey. The study subjects were recruited using the registration forms of the Family Medicine Unit.

The study population comprised 515 elderly subjects aged ≥65 years. No sampling was performed, and the whole population was targeted. However, the study was completed with 482 subjects because 12 had moved elsewhere owing to health problems, 15 were unable to answer the survey questions, and six refused to participate in the study. The participation rate was 93.5%.

The inclusion criteria were subjects aged ≥65 years; those able to speak Turkish; those who could orally communicate; those who could demonstrate orientation to persons, place, and time; and those who could confirm their willingness to participate in the study.

The exclusion criteria were subjects aged ≤65 years; those who could not speak Turkish; those who could not orally communicate; those who could not demonstrate orientation to persons, place, and time; and those who could not confirm their willingness to participate in the study.

Data Collection and Tools

Data for the study were collected using the personal information form via face-to-face interviews.

Personal Information Form

The personal information form was designed by the study researchers after reviewing relevant literature. The form comprised 17 questions related to sociodemographic characteristics (age, sex, marital status, education level, etc.), chronic disease (diagnosis and duration of the disease, etc.), and medications (number of medications used daily, route of drug administration, etc.).

Procedure

After the subjects received a detailed explanation regarding the purpose of the study, the researchers completed the personal information form during face-to-face interviews. The form was administered in two ways. For 376 subjects aged ≥65 years who could visit the Family Medicine Unit, the researchers conducted face-to-face interviews in a private room to complete the form. Furthermore, for 106 subjects who could not visit the unit during the data collection phase, the researchers conducted the interviews during home visits. Questions in the personal information form were read by researchers to the elderly, and the answers received were recorded. Completion of the form took approximately 30 min.

Statistical Analysis

All analyses were conducted using the Statistical Package for the Social Sciences for Windows version 21.0 (IBM Corporation, Somers, NY, USA). Numbers, percentages, and chi-square test were used for data analyses. Results with p values of <0.05 were considered to be significant, and the confidence interval was set at 95%.

Ethical Considerations

The study was approved by the Karadeniz Technical University Faculty of Medicine Ethics Council (2014/38), and official permission was obtained from the Rize Public Health Directorate of the Turkish Republic. All the subjects were informed regarding the aims and procedures of the study, and they gave written consent. The study conformed to the principles of the Declaration of Helsinki.

Results

The study results revealed that 53.1% of subjects were females, 52.9% belonged to the 65-74-year age group, 52.3% were married, 41.1% graduated from primary schools, 73.7% were retired, 50% had an income equal to expenses, 47.1% belonged to the state retirement fund for civil servants, and 39.4% lived with other family members.

This study also found that 97.9% of the subjects had chronic diseases, with 74.3% having CVS diseases, 40.7% having endocrine system diseases, 35.1% having musculoskeletal disorders, 51.1% having a chronic disease for >16 years, and 74.5% experiencing difficulties in performing activities of daily living (Table 1).

Moreover, the results revealed that nearly half of the study subjects (49%) used 3-4 medications on a daily basis. Nearly all of the subjects (99.2%) took medications orally, and 39.8% of them had health complaints owing to the drugs they used. GIS symptoms accounted for 24.3% of the total complaints. However, subjects stated that forgetting to take their medication was their most challenging aspect regarding medications (44.6%; Table 2).

Our study found statistically significant differences between the duration of chronic diseases and sex, age, profession, monthly income level, and social security coverage ($p<0.05$; Table 3).

Furthermore, statistically significant differences existed among the number of drugs used on a daily basis, age, marital status, educational level, profession, social security coverage, and the people with whom the subjects lived ($p<0.05$; Table 4).

Table 1. Chronic disease characteristics of the study subjects (n=482)

Chronic disease characteristics	n	%
Presence of chronic disease		
Yes	472	97.9
No	10	2.1
Chronic diseases* (n=472)		
Cardiovascular	358	74.3
Endocrine	196	40.7
Musculoskeletal	169	35.1
Urinary	127	26.3
Gastrointestinal	121	25.1
Respiratory	116	24.1
Cerebrovascular	62	12.9
Hematologic	57	11.8
Oncologic	54	11.2
Skin	54	11.2
Duration of the disease		
1-5 years	34	7.2
6-10 years	73	15.5
11-15 years	124	26.3
≥16 years	241	51.1
Difficulties owing to chronic disease* (n=472)		
Difficulties in performing daily activities**	359	74.5
Being a burden on others	162	33.6
Difficulties in maintaining family-profession roles	73	15.2

* n increased with more than one answer.
**Daily activities included cooking, bathing, dressing, climbing up and down stairs, cutting nails, shopping, transportation, and making phone calls.

Discussion

Aging is an inevitable process and is generally accompanied by chronic diseases. Corrao et al. (17) found a prevalence of chronic disease in 55%-98% of people aged >65 years, and 97.9% of the elderly had chronic diseases. The current study revealed that chronic diseases were observed more often in low- and middle-income countries (2), and the elderly living in rural areas were more prone to developing chronic diseases (18). The elderly also tend to be less healthy and exhibit a higher prevalence of diseases with comorbidities and complications.

As aging progresses, major changes occur in the body, which may result in CVS diseases. Strollo et al. (2014) reported that the prevalence of endocrine system diseases, particularly diabetes, increases with a less active life style, which occurs owing to physical and mental changes among the elderly. These diseases often develop into a more serious healthcare problem, particularly for those aged ≥65 years (19). The incidence of musculoskeletal disorders also increases with age, thereby leading to a decrease in the physical functions of the elderly (20). Similar to other studies, this study found that the elderly primarily had CVS diseases (74.3%), endocrine system diseases (40.7%), and musculoskeletal disorders (35.1%). Additional research by Catak et al. (21) detected the prevalence rate of CVS diseases to be 58.7%, musculoskeletal disorders to be 35.4%, and endocrine system diseases to be 20.5%. Harugeri et al. (22) identified the prevalence rate of hypertension to be 41.5% and diabetes to be as 34%. Zaveri et al. (23) reported the prevalence rate of CVS to be 59.9%, respiratory system diseases to be 22.8%, and diabetes to be as 12.3%. Ellitt et al. (24) found the prevalence rate of circulatory system

Table 2. Medication characteristics of the study subjects (n=482)

Medication characteristics	n	%
Number of daily medications		
1-2	67	13.8
3-4	236	49.0
5-6	157	32.6
≥7	22	4.6
Route of drug administration		
Oral	478	99.2
Subcutaneous	87	18.0
Respiratory	76	15.8
Topical	70	14.5
Intraocular	60	12.4
Intramuscular	34	7.0
Medication adverse effects		
Yes	192	39.8
No	290	60.2
Complaints about medications* (n=192)		
Gastrointestinal	117	24.3
Skin	34	7.1
Cerebrovascular	33	6.8
Musculoskeletal	20	4.1
Endocrine	19	3.9
Cardiovascular, respiratory, psychiatric	10	1.8
Difficulties with using medications* (n=482)		
Forgetting to take medications	215	44.6
Obligation to use equivalent drugs	186	38.6
Difficulty in administering medications	178	36.9
Confusing drugs to be taken	137	28.4
Inability to find medications at a pharmacy	123	25.5
Experiencing adverse effects when more than one drug is taken	121	25.1
Inability to take medications on time	114	23.7
Difficulty in swallowing drugs	84	17.4
Difficulty with dose adjustment	77	16.0
Difficulty in continuing to take drugs as prescribed	58	12.0

*n increased with more than one answer.

diseases to be 54% and endocrine-metabolic system diseases to be 17.6%, and Wimmer et al. (25) identified the prevalence rate of CVS diseases to be 82.2% and arthritis to be 36.8% (25).

The current study determined that 51.1% of the subjects had chronic diseases for >16 years. We first believed that the many years of illness may have occurred because of an inadequate access to health checkups as regular health examinations might provide earlier diagnoses and treatment. However, we realized that many elderly individuals are accustomed to living with chronic diseases. Furthermore, because chronic diseases are characterized by slow progression and long duration, the clinical manifestation and burden disproportionally affect the elderly (18).

The literature has also reported that the elderly experience difficulties in performing activities of daily living. These changes often occur owing to a decline in physical abilities, sensory losses, and chronic diseases (21, 26, 27). Yazıcı and Kalaycı (27) determined that the elderly with at least one chronic disease (67.4%) and using five and more drugs (19.6%) were semi- and completely dependent for activities of daily living such as taking a bath (62.8%) and going to the bathroom (52.9%) (27).

Studies also indicate that the elderly are prescribed many drugs to relieve symptoms of chronic diseases (28). This current study found that 49% of the subjects took 3-4 drugs daily, whereas 32.6% of them took 5-6 drugs on a daily basis. Rozenfeld et al. (29) reported that the average number of drugs used by the elderly was 3.7. Similar to our study, Arslan and Eser (30) found that 35% of the elderly used 5-6 drugs daily, Solmaz and Akın (31) identified that 46.5% of the elderly used three and more drugs daily, and Catak et al. (21) found that 26.5% of the elderly used five and more drugs. Most of our study subjects (99.2%) took their drugs orally. Wimmer et al. (25) also reported that the most common route of drug intake for the elderly was the oral route (98.2%).

Adverse effects caused by medications are often observed among elderly patients (6). In this study, 60.2% of the subjects did not experience any adverse effects of the medications; however, 39.8% of them did experience adverse effects, and the most common ones were associated with GIS (24.3%), skin (7.1%), and the cerebrovascular system (6.8%). Arslan and Eser (30) reported that 73.3% of the elderly did not have any adverse effects because of the drugs they used; however, 26.7% of them had stomach complaints as the drug adverse effect. Harugari et al. (28) reported that the most common adverse effects among the elderly using medications were gastrointestinal tract defects, bleeding and coagulation disorders, and CVS diseases (28). Camargo et al. (2006) reported that as the number of drugs used by the elderly increased, the prevalence of adverse effects also increased (32).

When elderly patients use more than one drug, it is particularly important for them to take their medication at the appointed times to ensure the treatment efficacy (33). Arslan and Eser (30) and Demirbag and Timur (34) revealed that 65% and 24% of the elderly, respectively, forgot to take their medications.

This study determined that the duration of chronic diseases was affected by sex and age. Corrao et al. (17) reported that women live longer and outnumber men. In contrast, older women develop more chronic diseases, and being female,

Table 3. Chronic disease duration of the subjects according to sociodemographic characteristics (n=472)

	Disease duration					
Sociodemographic characteristics	**1-5 years n (%)**	**6-10 years n (%)**	**11-15 years n (%)**	**≥16 years n (%)**	**Total n (%)**	**χ^2 p**
Sex						
Female	16 (47.1)	48 (65.8)	79 (63.7)	105 (43.6)	248 (52.5)	19.504
Male	18 (52.9)	25 (34.3)	45 (36.3)	136 (56.4)	224 (47.5)	0.000
Age						
65-74 years	21 (61.8)	55 (75.3)	72 (58.1)	103 (42.7)	251 (53.2)	36.964
75-84 years	9 (26.5)	17 (23.3)	48 (38.7)	109 (45.2)	183 (38.8)	0.000
≥85 years	4 (11.8)	1 (1.4)	4 (3.2)	29 (12.0)	38 (8.1)	-
Employment status						
Retired	14 (41.2)	25 (34.3)	30 (24.2)	50 (20.8)	119 (25.2)	10.372
Housewife	20 (58.8)	48 (65.8)	94 (75.8)	191 (79.3)	353 (74.8)	0.016
Monthly income level						
Income higher than expenses	8 (23.5)	4 (5.5)	9 (7.3)	14 (5.8)	35 (7.4)	17.882
Income equal to expenses	8 (23.5)	34 (46.6)	63 (50.8)	95 (39.4)	200 (42.4)	0.007
Income lower than expenses	18 (52.9)	35 (48.0)	52 (41.9)	132 (54.8)	237 (50.2)	-
Social security coverage						
State retirement fund for civil servants	25 (73.5)	33 (45.2)	47 (37.9)	112 (46.5)	217 (46.0)	56.161
State retirement fund for artisans and self-employed individuals	6 (17.7)	17 (23.3)	32 (25.8)	39 (16.2)	94 (19.9)	0.000
State retirement fund for workers/laborers	1 (2.9)	23 (31.5)	41 (33.1)	53 (22.0)	118 (25.0)	-
Private insurance	2 (5.9)	-	4 (3.2)	37 (15.4)	43 (9.1)	-

older, and having a low socioeconomic level are associated with multimorbidity and an increased risk for hospitalization. Studies have reported that as an individual ages, the number of chronic diseases increases owing to decreased physical, psychological, and social abilities (6, 35, 36). Majeed (37) found a correlation among chronic disease prevalence, sex, and age. Furthermore, the duration of chronic diseases of the elderly was affected by profession, monthly income level, and social security coverage. Regarding the employment status of the elderly, approximately 40% of females and 24.5% of males are unable to work (38). Majeed (37) also detected a correlation between chronic disease prevalence and profession. An individual's standard of living will most likely affect their health status. Lawlor et al. (39) reported that a low economic level reduced the ability of the elderly to cope with an illness and disease.

The current study indicated that age affected the number of medications taken daily. A study (40) reported that the ratio of drug use increases over time, and on an average, women aged 70 years take 3.8 drugs compared with men of the same age who take 3.5 drugs. Similar to our study, Kutsal et al. (41) demonstrated a significant difference between the number of medications taken daily and age. In addition, Heuberger et al. (42) demonstrated that the prevalence of polypharmacy among their subjects was 43.4%; with 51.1% of them using five or more medications and 38.2% using et least two drugs on a daily basis. Another factor that affected daily drug use of the elderly was marital status. Similar to our study, Haider et al. (43) found a significant correlation between the number of medications taken daily and marital status.

The literature suggests that socioeconomic factors are closely associated with the health status and medication use by the elderly (44, 45). Our study found that educational level, social security coverage, and profession affected the number of medications taken daily, and Haider et al. (43) discovered a significant correlation between the number of medications taken daily by the elderly and their educational level. The same study also determined that the number of drugs taken by the elderly with a low educational level was 4.6 and that as their educational level increased, this number decreased. Hence, social security coverage was associated with medication use (43). Kim et al. (46) assessed predominately housewives and retirees and confirmed that social security coverage was associated with multiple medication use, and the elderly with this insurance were three times more likely to be associated with polypharmacy. Rosa et al. (47) suggested that retirees and housewives were almost eight times more likely to present with morbidities regarding drug-related problems.

Economic, political, and social changes in our society affect the family and the support they provide. In this study, the

Table 4. Number of daily medications used of the study subjects according to sociodemographic characteristics (n=482)

Sociodemographic characteristics	Number of daily medications 1-2 n (%)	3-4 n (%)	5-6 n (%)	≥7 n (%)	Total n (%)	p
Age						
65-74 years	46 (68.7)	138 (58.5)	64 (40.8)	7 (31.8)	255 (52.9)	25.188
75-84 years	15 (22.4)	83 (35.2)	77 (49.0)	13 (59.1)	188 (39.0)	0.000
≥85 years	6 (9.0)	15 (6.4)	16 (10.2)	2 (9.1)	39 (8.1)	
Marital status						
Married	35 (52.2)	133 (56.4)	71 (45.2)	13 (59.1)	252 (52.3)	21.475
Widow	32 (47.8)	92 (39.0)	66 (42.0)	7 (31.8)	197 (40.9)	0.002
Divorced	-	11 (4.7)	20 (12.7)	2 (9.1)	33 (6.8)	-
Education status						
Illiterate	5 (7.5)	32 (13.6)	14 (8.9)	4 (18.2)	55 (11.4)	31.339
Literate	28 (41.8)	75 (31.8)	28 (17.8)	3 (13.6)	134 (27.8)	0.002
Primary school	26 (38.8)	88 (37.3)	71 (45.2)	13 (59.1)	198 (41.1)	-
High school	6 (9.0)	33 (14.0)	33 (21.0)	2 (9.1)	74 (15.4)	-
University	2 (3.0)	8 (3.4)	11 (7.0)	-	21 (4.4)	-
Employment status						
Retired	39 (58.2)	67 (28.4)	18 (11.5)	3 (13.6)	127 (26.3)	55.306
Housewife	28 (41.8)	169 (71.6)	139 (88.5)	19 (86.4)	355 (73.7)	0.000
Social security coverage						
State retirement fund for civil servants	62 (92.5)	121 (51.3)	39 (24.8)	5 (22.7)	227 (47.1)	116.703
State retirement fund for artisans and self-employed individuals	4 (6.0)	49 (20.8)	33 (21.0)	8 (36.4)	94 (19.5)	0.000
State retirement fund for workers/laborers	1 (1.5)	51 (21.6)	59 (37.6)	7 (31.8)	118 (24.5)	-
Private insurance	-	15 (6.4)	26 (16.6)	2 (9.1)	43 (8.9)	-
Person with whom the elderly lived						
Alone	12 (17.9)	23 (9.7)	9 (5.7)	-	44 (9.1)	29.281
With spouse	19 (28.4)	69 (29.2)	23 (14.6)	7 (31.8)	118 (24.5)	0.001
With spouse and children	13 (19.4)	64 (27.1)	47 (29.9)	6 (27.3)	130 (27.0)	-
With family members	23 (34.3)	80 (33.9)	78 (49.7)	9 (40.9)	190 (39.4)	-

number of medications taken daily by the elderly was affected by the person with whom they lived. Ozdemir (48) stated that the elderly who were married or did not live with children demonstrated a more positive and compliant medication use behavior, which could be explained by the possibility that spouses often support each other when medications need to be taken and that children may not offer this same level of support.

Study Limitations

This study has some limitations. The study findings may be generalized only to this specific group; thus. more studies with larger Turkish sample populations are warranted. However, we believe that the study will be a valuable resource to relevant studies in the future because it provides data regarding the prevalence of chronic diseases and drug use among the elderly population in our country.

Conclusion

The study results revealed that 53.1% of the subjects were females, 52.9% belonged to the 65-74-year age group, and 52.3% were married. This study also found that chronic diseases were present among nearly all the elderly aged ≥65 years. Thus, we can conclude that the prevalence of chronic diseases, particularly CVS diseases (74.3%), endocrine system diseases (40.7%), and musculoskeletal disorders (35.1%), is high among the Turkish elderly population, with 51.1% having a chronic disease for >16 years and 74.5% experiencing difficulties in performing activities of daily living. Furthermore, nearly half of the subjects took three to four medications daily, and their most challenging aspect "forgetting to take their medications." Nearly all of them (99.2%) took their medications orally, and 39.8% of them had health complaints owing to the drugs they used. Sex, age, profession, monthly

income level, and social security status affected the duration of the chronic diseases of the elderly, whereas age, marital status, educational level, profession, social security coverage, and the people with whom they lived affected the number of medications they used daily.

The elderly should be monitored by means of protection of CVS diseases, endocrine system diseases, and musculoskeletal disorders, early diagnosis, chronic disease management, and drug efficacy and adverse effects by organizing training programs on aspects mentioned. Sociodemographic characteristics of the elderly in this training program should also be considered. In addition, studies comparing sociodemographic characteristics of the elderly with difficulties caused by chronic diseases and drug use need to be conducted.

We believe that the study results will increase the awareness regarding chronic disease and drug use among geriatric cases. At the same time, these study results may be a guide for chronic disease and drug management; for planning, implementing, and monitoring of healthcare services; and for preparing prevention programs with regard to the adverse effects of chronic diseases and drugs.

Ethics Committee Approval: Ethic committee approval was received for this study from the ethics committee of Karadeniz Technical University School of Medicine (2014/38).

Informed Consent: Written informed consent was obtained from each participant.

Peer-review: Externally peer-reviewed.

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