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## PRESCRIPTION PATTERN OF MEDICATION IN THE ELDERLY RESIDING IN NURSING HOMES IN TEHRAN

**Abstract: Objective:** This study aimed to investigate prescription patterns for older people in nursing homes of Tehran.

**Methods:** In this cross-sectional study, the data of 170 older people, sampled random cluster gathering method, using medical records, questionnaires and interview with nurses and physicians.

**Results:** The mean average age of the sample was 79.75. 64.7% of them were female. 62.4% received more than 5 types of medicines. The mean number of medicines was 7.55 with the ranging of 1-19 drugs. The most medicine forms used by older people were: tablets 98.2%, injection medicines 20.6 %, drops 13.5%, syrup 8.8%, sprays 6.5%, ointments and suppositories 2.9%. There was not a significant relationship between participating in geriatric educational course And the mean numbers of the prescribed medications ( $P>0.05$ ), as well as between covering by health insurance specialty in medicine and the mean of the numbers of mediations ( $P>0.05$ ). There was a significant relationship between having insurance and the mean number of prescribed medicine ( $P<0.05$ ).

**Conclusion:** Developing educational programs on geriatric pharmacology general practitioners and more supervision on residential care homes practices may have affects on prescription pattern.

**Key words:** Prescription pattern, elderly, Medication

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## Introduction

The elderly population is growing in our society<sup>1</sup>. The elderly are the largest consumers of medication as compared with other age groups. Chronic diseases and taking several medications in addition to physiologic changes of aging cause them to be vulnerable to medication complications<sup>2</sup>. The possibility of drug-drug interaction increases with more medications. Inappropriate and wrong use of medications is another problem. Inappropriate prescription of medications can increase their adverse reactions. The clinician should consider several factors before prescribing medications including drug-drug, drug-food and drug-disease interactions. Furthermore, patient's awareness of the reason for prescription and its complications should be considered. It is expected that health care providers realize the way these factors affect the outcome of medical treatment in the elderly. It is estimated that 6 million old people live in Iran<sup>2</sup> and the majority of our health care resources are spent on providing major medications for them. Provision of financial resources for and producing pharmaceuticals are our main priorities in healthcare plan, but the problem of providing medication will always trouble patients due to problems in prescribing and consuming medication<sup>3</sup>. Consuming medication has increased in the today's society especially in the elderly. Although the elderly comprise a relatively low proportion of the whole population, they approximately use 40% of the prescribed medication. People older than 65 years old consume 4 times as much medication as other age groups, and their complicated medical conditions involve multidrug treatments.

This situation increases complications, which are sometimes irreversible for the elderly<sup>4</sup>. There are few studies on the prescription patterns, its costs and load in Iran. Recognizing prescription patterns in the elderly residing in the nursing homes, who are the more vulnerable group of the elderly, can present an estimate of medication consumption patterns and common diseases among them. This picture can be helpful in macro planning at prevention, treatment and budgeting levels for Ministry of Health. This study aimed to determine the patterns of medication prescription in the elderly residing in the nursing homes, recognize the problems and deficiencies, and recommend strategies to train physicians and raise public awareness to modify medication consumption patterns so that a positive step is taken toward better provision of medication needs of this age group. The results of this study can reveal the patterns of medication prescription in the nursing homes of Tehran, which is one of the most important information sources regarding medication prescription for the elderly and its possible deficiencies. It can also draw the attention of the authorities to more efficient training of physicians regarding pharmacology of the elderly and establish an appropriate relationship with and transfer information to them.

## Methodology

This descriptive-analytical study was conducted as a cross-sectional study using a researcher-made questionnaire filled out in the nursing homes of Tehran. Given that almost all the elderly residing in the nursing homes use different kinds of medication (at least 90%) and considering possible dropouts, 170 old people were enrolled. Two-stage cluster random sampling was used. First, a list of all the nursing homes licensed by Welfare Organization in Tehran was prepared and each home was considered a cluster. Then, of the nursing homes located in one municipal district with similar addresses, one cluster was selected randomly. After that, some elderly people were randomly selected from each cluster. If that sampling did not provide the quota of that district, another nursing home was randomly selected until the total calculated samples were selected. Inclusion criteria were age over 60 years, residing in the nursing home, and signing the written consent form by the elderly or their family. Data were collected using a researcher-made questionnaire in two parts of demographics and consumed medication based on the registered data and prescriptions in their record files. The questionnaire was sent to 8 faculty members of pharmacology and geriatrics after the research team prepared it. Their comments were collected and the questionnaire was modified and finalized accordingly. In the next step, necessary permissions were obtained from managers of the center. Patients who were willing to participate were enrolled after being briefed about the objectives of the study and signing written consent forms by themselves and their family. Data collection method included registering information in the questionnaires using patient's record files and interviewing nurses and attending physicians in case of ambiguity by a trained questioner. Data were analyzed using descriptive tests of mean and frequency, and inferential tests of Chi-square, t- test and Fisher's exact test in SPSS software 16. P value of <0.05 was considered significant.

## Results

In this study, 170 old people residing in the nursing homes participated. The age groups of 60-74, 75-90 and older than 90 years-old was comprised 21.8%, 65.9%, and 12.4%, respectively. The study population, 64.7% were female and 35.3% were male.

Results showed that only 6.5% of the elderly used fewer than 3 medications, 31.2% used 3-5 and 62.4% used more than 5 medications with the standard deviation of 4.206 and mode=4, ranging from 1 to 19. The mean number of prescribed medication was 7.47 in men and 7.59 in women; t test did not show a significant difference between the two groups in terms of mean number of medication ( $p=0.855$ ). The

mean number of prescribed medication in different age groups was 8.57 for 60-74 year-old group, 7.47 for 75-90 year-old group and 6.14 for the older-than-90 group. Analysis of variance of the prescribed medication for different age groups did not show a significant difference between the mean number of medication among different age groups ( $P=0.102$ ). As for different forms of medication, tablets ranked first with 98.2% followed by injections (20.6%), drops (13.5%), syrups (8.8%), sprays (6.5%), ointments and suppositories (2.9%). According to ATC, CNS medications were the most prevalent (68.2%), followed by vitamins and minerals (66.5%), and cardiovascular (64.7%) (Table 1 and figure 1). Our study showed that in general, medication was more frequently prescribed for the age group of 75-90 years old as compared with other groups, but Chi-square test showed no significant difference.

**Table 1. Frequency distribution of medication groups in the elderly people residing in the nursing homes**

Percentage	Frequency	Medication group
68.2	116	Central nervous system drugs
66.5	113	Vitamins/minerals/electrolytes
64.7	110	Cardio vascular drugs
44.1	75	Blood products/modifiers/volume expanders
35.3	60	Gastrointestinal drugs
17.1	29	System-hormonal drugs
13.5	23	Antimicrobials drugs
10	17	Genitourinary drugs
8.9	15	Respiratory tract drugs
7.1	12	Sensory organs drugs
1.2	2	Oncolytic agents

The most commonly used medications in this study were vitamins (81.2%), aspirin (37.46%), and alprozolam (22.35%) (Table 2).

**Table 2- The distribution frequency of the medication type used by the residing elderly**

Percentage of the patient using the medication	Number of the patients using the medication	Medication
81.2	138	Vitamins
37.46	64	ASPRIN
22.35	38	Alprazolam

Percentage of the patient using the medication	Number of the patients using the medication	Medication
21.76	37	CALCIUM-D
17.64	30	Atrovastatin
17.05	29	Lozartan
16.4	28	Nitrocontin
11.18	19	Atenolol
10.6	18	Triamtran-H
9.4	16	Captopril

**Table 3. Comparison of mean number of medication prescribed by two groups of trained and untrained physicians**

Passing training courses for geriatric health	Number of visited elderly	Maximum number of medication	Minimum number of medication	Mean number of prescribed medication	S.E	SD	P-Value
Positive	52	19	2	8.56	0.652	4.700	0.054
Negative	118	19	1	7.10	0.360	3.908	

Comparison of the number of prescribed medication between these two groups using t test showed no significant relationship between passing the training course and the number of prescribed medication (0.054). Of course, this figure is borderline significant and judgment about it requires further studies. Table 4 shows comparison of the mean number of prescribed medication between people with insurance coverage and those without, which was 7.76 and 6.41, respectively. Independent t test showed a significant relationship between the two groups. (P=0.050)

**Table 4. Comparison of the mean number of prescribed medication between people with insurance coverage and those without in the elderly residing in the nursing homes of Tehran**

Insurance	Frequency	Mean number of prescribed medication	S.E	P-Value
Yes	143	7.76	0.366	0.050*
No	27	6.14	0.568	

## *Discussion*

With the improvement of health care and control of diseases, life expectancy has increased and the elderly population is on the rise. This increase is accompanied with complications of several chronic diseases and increased medication consumption per capita, which consumes a major part of Iran's healthcare resources. Different studies regarding medication use in the elderly during different periods have shown that medical therapy in this group is one of the important health issues in the world<sup>5-7</sup>.

The present study revealed that mean number of prescribed medication for the elderly residing in the nursing homes was 7.55, which is in line with the findings in the U.S that showed the figure of 7.5<sup>6</sup>. We did not observe a significant relationship between mean number of medication and participant's sex or age. This finding agrees with that of Alard et al. (1995). A study in Australia showed that each male resident of the nursing homes consumes<sup>7</sup> medications on average<sup>8</sup> and another study in the U.S. reported medications and that polypharmacy was more prevalent in women.<sup>9</sup> Our study showed that CNS medication were the most common type with 68.2%, followed by vitamins and minerals (66.5%), cardiovascular medication (64.7%), anti-coagulants (44.1%) and GI medication (35.3%).

In most studies, cardiovascular, CNS and analgesic medications are the most common. A study from Malaysia reported cardiovascular, CNS and neuromuscular medications as the most common in order.<sup>10</sup> CNS drugs were the most common in Danish and Swedish elderly,<sup>11-13</sup> and cardiovascular and CNS drugs were the most common in Finnish elderly.<sup>14</sup> A study on the elderly living in Tehran showed that cardiovascular and neurology medications were the most common.<sup>15</sup> Shojaie (2010) studied the elderly covered by Treatment Service Insurance of Tehran reported cardiovascular medications as the most common.<sup>16</sup>

We did not observe a significant difference between the mean of prescribed medication by the physicians who had passed geriatric health courses and those who did not. Furthermore, comparison of the mean number of medications prescribed for the elderly with and without insurance showed that those with insurance were prescribed more medications. The results of the present study show that although mean number of prescribed medication in Iran is the same as that of other countries, it does not reduce the importance of the fact that high consumption of medications by the elderly especially those in the nursing homes who are more vulnerable, can cause many problems in the health care system. Furthermore, the frequency of CNS medications prescribed for the elderly at nursing homes was higher in our study while other studies generally reported cardiovascular medications as the most frequent. This issue deserves further studies. Moreover, it is necessary that content and method of teaching pharmacology at geriatric health courses be revised to reduce the number of medication prescribed by physicians. Increased supervision on the method of prescribing medication for the residing elderly can improve medication consumption in the elderly population in the society.

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