

## Assessment of The Use of Poly pharmacy in Geriatric Patients With Multimorbidity In Kirkuk, Iraq

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### ABSTRACT

**Objective** This study is designed to assess the polypharmacy use by elderly patients having multimorbidity in Kirkuk, Iraq **Methodology.** This descriptive cross sectional study conducted over one year period (1 January - 31 December, 2017) with 105 adults (75 females and 30 males) aged  $\geq 65$  years, who attended outpatient clinic of the Geriatric Medicine Department in Azadi Teaching Hospital in Kirkuk Province in Iraq. Patients with  $\geq 2$  considered as multimorbidity subjects and patients taking  $>5$  medications considered as polypharmacy subjects. Data were collected directly from the patients by face-to-face interview technique **Results** The mean age was  $70.49 \pm 3.88$  years. The most common diseases were Hypertension and diabetes mellitus (n: 105, 100%). It was determined that (n: 95, 90.5%) of patients aged 65 to 74 years and (n: 10, 9.5%) of patients aged 75 to 82 years had multimorbidity, the difference between the two age groups was statistically significant. The mean number of drugs used by participants was  $7.3 \pm 1.1$  drug/ day, the highest polypharmacy was 6,7 and 8 drugs per day (n: 31, 29.52%), (n: 30, 28.57%) and (n: 30, 28.57%) respectively. There was a statistical significant increase in polypharmacy with the increase in the multimorbidity. **Conclusion** The prevalence of polypharmacy in multimorbid elderly patients was very high.

**Keywords** Multimorbidity, Polypharmacy, Patients  $\geq 65$  years, Kirkuk, Iraq.

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## المخلص

هدف الدراسة صممت هذه الدراسة لتقييم تعدد الادوية عند المرضى المسنين الذين لديهم امراض متعددة في كركوك, العراق طريقة البحث دراسة وصفية مقطعية أجريت على مدى سنة واحدة (1 كانون ثاني – 31 كانون أول, 2017), 105 مريض (75 أنث و 30 ذكور) أعمارهم  $65 \leq$  سنة راجعوا العيادة الاستشارية لطب المسنين في مستشفى آزادي التعليمي في محافظة كركوك, العراق. المرضى المصابون بمرضين او اكثر اعتبروا متعددي الامراض والمرضى الذين يتناولون خمسة ادوية او اكثر اعتبروا متعددي الادوية, البيانات أستحصلت من المرضى أنفسهم بطريقة مباشرة النتائج معدل العمر كان  $3,88 \pm 70,49$  سنة. أكثر الامراض شيوعا كان ارتفاع ضغط الدم وداء السكري (عدد 105, 100%). أظهرت النتائج ان (عدد 95, 90,5%) من المرضى الذين تتراوح اعمارهم بين 65-74 سنة و (عدد 10, 9,5%) من المرضى الذين تتراوح اعمارهم بين 75-82 سنة لديهم أمراض متعددة ولقد كان هناك فرق ذو دلالة أحصائية معنوية بين المجموعتين. معدل استخدام الادوية بين المرضى كان  $1,1 \pm 7,3$  دواء/ اليوم, أعلى تعدد ادوية كان 6, 7 و 8 دواء باليوم (عدد 31, 29,52%), (عدد 30, 28,57%) و (عدد 30, 28,57%) على التوالي. كانت هناك زيادة ذات دلالة أحصائية معنوية في تعدد الادوية مع زيادة تعدد الامراض الاستنتاجان نقشي تعدد الادوية عند المرضى كبار السن متعددي الامراض كان عالياً جداً. **الكلمات الدالة:** تعدد الامراض, تعدد الادوية, المرضى  $65 \leq$  سنة, كركوك, العراق

## 1. Introduction

In a report issued by united nations in 2015, department of economic and social affairs reported that the population aged more than 60 years is expected to grow up by 56% worldwide between 2015 and 2030, and those over the age of 65 years will account for more than half of the world's population by the year 2030 [1].

Getting older is frequently accompanied by chronic diseases, comorbidity and polypharmacy. Multimorbidity is defined as the co-existence of at least two chronic diseases. Multimorbidity in elderly people has been expected to range from 55% to 98% depending on data sources (2). Multimorbidity certainly leads to the use of multiple drugs. Because chronic diseases affect different organs and systems, more than one drug is prescribed to elderly people who receive health services from different specialty areas for different conditions (3).

The use of a number of different medications at the same time is defined as polypharmacy, in the studies, the use of five or more drugs is generally established as polypharmacy (4).

The presence of multiple chronic conditions increases chances of the complexity of therapeutic management for both physicians and patients, and affects negatively health outcomes. Multimorbidity is always associated with decreased quality of life, mobility and functional ability as well as increases in number of admission to hospital, physiological distress, use of health care supplies, mortality and costs [5].

When man getting older, the body undergoes several physiological changes that can affect the distribution, metabolism, and excretion of drugs. These changes are a reduction in renal clearance, liver size, and lean body mass, also hepatic enzymes activity and serum albumin may be decreased in association with the presence of chronic diseases. The most clinically importance of these changes is the decrease in renal clearance, which results in reduced excretion of water soluble drugs. This is particularly important for medications with a narrow therapeutic window (ratio of desired effect to toxic effect), like digoxin, lithium, and gentamicin, in addition to changes in pharmacokinetics, older people are also more susceptible to the effects of some drugs, particularly those that act on the central nervous system, such as benzodiazepines, which are related to an increase in postural influence and hazard of falls [6].

Polypharmacy is widespread in older people, about 20% of people over 70 years old take five or more medications [7]. In the past, polypharmacy implied unsuitable prescribing, but now this is not necessarily true, because all of the prescribed drugs may have an appropriate indication. Polypharmacy is associated with increases in many side effects, including drug interactions, adverse drug reactions, falls, multiple hospital admissions, long time of hospital stay, re-admission rate soon after discharge and high mortality rate. However, these effects may result from polypharmacy can be considered as a marker of multiple pathology or ill-health of elderly patients who are subjected more to polypharmacy [8].

The aim of this study is to assess and evaluate the polypharmacy use by elderly patients having multimorbidity in Kirkuk, Iraq.

## 2. Patients and Methods

This study is a cross sectional and descriptive study, conducted with 105 adults (75 females and 30 males) aged  $\geq 65$  years, who attended outpatient clinic of the Geriatric Medicine Department in Azadi Teaching Hospital in Kirkuk Province in Iraq, over one year period between (1 January -31 December, 2017). Data were collected directly from the patients by face-to-face interview technique.

Data collected includes demographic data: age, sex, residency and body mass index, data also included questions about the current health problems, a list of the medications in use. Patients with  $\geq 2$  considered as multimorbidity subjects and patients taking  $>5$  medications considered as polypharmacy subjects.

The study was approved by the Medical Ethical Committee, Knowledge Management and Research Section Training and Human Development Department, Kirkuk Health Directorate; the reference number of the approval is 31626 in 7/10/2019.

Statistical analysis was performed using SPSS for Windows (release 22; SPSS Inc., Chicago, IL, USA). Calculation of the p value was achieved using the z test for 2 population proportions and t test for 2 means.

## 3. Results and Calculations

A total of 105 elderly people including 75 females (71.4%) and 30 males (28.6%) participated in this study. The mean age of the participants was 70.49 (minimum = 65; maximum = 82;  $SD = 3.88$ ). Participants had a mean number of chronic illnesses of 2.7 (minimum = 2, maximum = 5,  $SD = 0.77$ , median = 3) per patient, **Table 1** details the number and ratio of chronic diseases.

**Table 1:** Details the Number of Chronic Diseases in Participants.

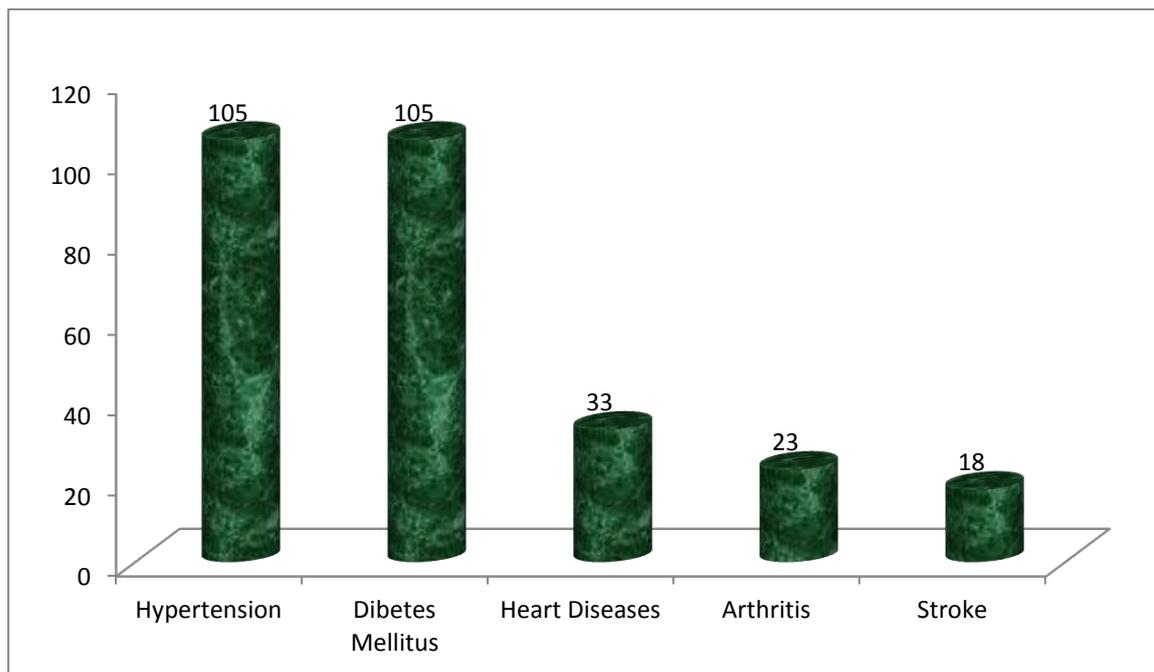
No. of Chronic Diseases	No. of Participants	%
2	49	46.7
3	40	38.1
4	14	13.3
5	2	1.9

105

100%

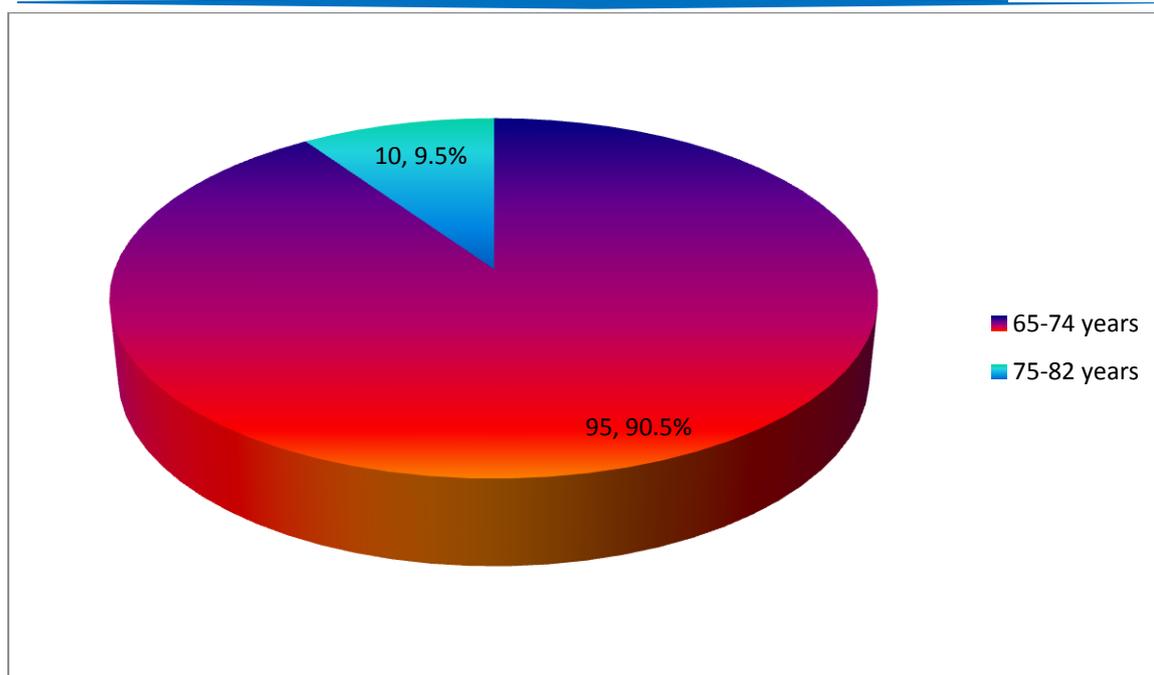
Hypertension and diabetes mellitus were found to be the most common disease which are found in all study sample patients ( $n: 105, 100\%$ ), heart diseases ranked second ( $n: 33, 31.4\%$ ), then arthritis ( $n: 23, 21.9\%$ ) and finally stroke ( $n: 18, 17.2\%$ ) as shown in

**1 .Figure**



**Figure 1:** Distribution of chronic diseases in study sample

The rate of distribution of multimorbidity by age group was evaluated. It was determined that ( $n: 95, 90.5\%$ ) of patients aged 65 to 74 years and ( $n: 10, 9.5\%$ ) of patients aged 75 to 82 years had multimorbidity, the difference between the two age groups was statistically significant ( $p < 0.01$ ) as shown in **Figure 2**.



**Figure 2:** Distribution of multimorbidity according to age groups.

**Table 2:** Frequency of polypharmacy

No. of Drugs used	Frequency Of Participants	% Of Participants
6	31	29.52
7	30	28.57
8	30	28.57
9	12	11.43
10	1	0.95
11	1	0.95
	<b>105</b>	<b>100</b>

The mean number of drugs used by participants daily was 7.3 (minimum = 6, maximum = 11,  $SD = 1.1$ ), the highest daily frequency of polypharmacy was 6, 7 and 8 drugs per day ( $n: 31, 29.52\%$ ), ( $n: 30, 28.57\%$ ) and ( $n: 30, 28.57\%$ ) respectively, while the lowest daily frequency of polypharmacy was 9,10 and 11 drugs per day ( $n: 12, 11.43\%$ ), ( $n: 1, 0.95\%$ ) and ( $n: 1, 0.95\%$ ) respectively, as shown in **Table 2**.

**Table 3:** Polypharmacy means versus different groups of patients multimorbidity

	Participants		Mean of Polypharmacy	SE
	Frequency	%		
<b>Group 1</b>	49	46.7	6.5	0.093
<b>Group 2</b>	40	38.1	7.85	0.1
<b>Group 3</b>	14	13.3	8.36	0.33
<b>Group 4</b>	2	1.9	9	0
	105	100%		

Group 1 included patients with 2 multimorbidity.

Group 2 included patients with 3 multimorbidity .

Group 3 included patients with 4 multimorbidity.

Group 3 included patients with 5 multimorbidity

There was a significant increase in polypharmacy with the increase in the multimorbidity.

As shown in **Table 3** the difference between polypharmacy means of groups 1 and 2, groups 1 and 3, groups 1 and 4, groups 2 and 4, was statistically significant ( $p < 0.01$ ), while the presence of statistical significance between groups 2 and 3 was at the level ( $p < 0.05$ ).

There were no statistical significant difference between groups 3 and 4.

#### 4. Discussion

Geriatric medicine physicians are familiar to managing multiple chronic conditions on a regular basis, multimorbidity is a very common, highly relevant concept for specialists working with old people [9]. Multimorbidity in elderly has been estimated to range from 55 to 98% and is highest in the very old, in women and individuals belonging to low socioeconomic classes [10].

Polypharmacy, the use of multiple medications by one individual, is more and more common among geriatric patients. Caring for the growing number of older people with complex drug regimens and multimorbidity presents an important argument and challenge in the coming years [11].

In this study, a total number of 105 elderly people including 75 females and 30 males. The mean age of the participants was 70.49 and the mean number of chronic illnesses was 2.7, while in study done in 2014, it shows that sex distribution was equal and mean age was 79.3 [12], another study in 2017 showed that 1/3 were male, 2/3 female and mean age was 85.10 [13].

Hypertension and diabetes mellitus were found in our study to be the most common disease in all study sample patients (n: 105, 100%). While in other study in 2017 showed that patients with polypharmacy were more likely to have a diagnosis of hypertension and about 1/2 of the patients were diabetic [13].

This study shows that the rate of multimorbidity was common (n: 95, 90.5%) in patients aged 65 to 74 years which is in agreement with a study done in Barcelona in 2019 by Marina et al. showed that the number of patients having multimorbidity aged 65–79 years was higher than those aged 80–94 years for both sexes [14].

The highest daily frequency of polypharmacy was 6, 7 and 8 drugs per day (n: 31, 29.52%), (n: 30, 28.57%) and (n: 30, 28.57%) respectively, these results are in concordance with the results of a study done in 2019 who stated that at least 45.9% from 65–79 year age group and 61.8% from the 80–94 year age group were prescribed 5 or more drugs [14].

There was a significant increase in polypharmacy with the increase in the multimorbidity, which is in convenience with the results of a study done by Marta Gutierrez Valencia et al. published in 2019 who stated that polypharmacy is highly prevalent in elderly due to the accumulation of chronic diseases and the presence of multiple prescriber [15].

In a summary, because the increase in the elderly population globally, physicians are increasingly providing care to more older people and hence multimorbidity and polypharmacy are common issues in geriatric medicine practice. The strength of the study is that it is conducted by direct interviews with elderly patients. In this study, we wanted to highlight attention to the fact that old people have polypharmacy. Rational prescription of medications is a very important part of providing care to elderly people. Because elderly people are more susceptible to drugs side effects and drug interactions, physicians should have a comprehensive drug history, review medications to reduce

polypharmacy and if necessary eliminate unnecessary medications to protect the health and prevent adverse drug reactions

## 5. Recommendations

We recommend and offer some guidelines to organize prescribing in older patients, which are as follows:

Carry out a regular medications review with all changes necessary to decrease polypharmacy and stop any drugs that are not indicated.

Prescribe new medications that have clear indications.

If possible, avoid or dose reduction of drugs with potential side effects in elderly patients like benzodiazepines for example.

Use once daily or once weekly formulations.

Consider non pharmacological treatment.

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