

# Research Paper: Comparing Comorbid Profile and the Pattern of Non-psychiatric Medicine Use Between Elderly and Non-elderly Patients With Schizophrenia



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## ABSTRACT

**Objectives:** Patients with schizophrenia receive psychiatric medications for many years, and their comorbid profile in old age remains unclear. Moreover, their pattern of non-psychiatric medicine use is of importance. Rehabilitation is crucial in patients with schizophrenia because it improves their strengths and life skills to live independently. These issues are essential in terms of polypharmacy among them, and its associated adverse effects.

**Methods:** The present cross-sectional study investigated 131 patients with schizophrenia referring to Razi Hospital who were selected by a convenience sampling method. The subjects' medical records were evaluated in terms of comorbid disorders and non-psychiatric medicine use patterns. Their demographic data were also collected by a separate questionnaire.

**Results:** The frequency of schizophrenia disorder was higher in males aged  $\geq 65$  years. The comorbidity frequency of non-psychiatric disorders was significantly higher in the elderly, compared to non-elderly patients. The most prevalent comorbid disorders in the elderly were musculoskeletal, cardiovascular, and metabolic disorders; and in the non-elderly neurological, hematological, and digestive diseases. The prevalence of non-psychiatric medicine intake was significantly higher in the elderly. The prevalence of non-psychiatric medicine use in the elderly (e.g. aspirin, heart disease medications, hypertension medications, etc.) and non-elderly patients (e.g. anemia medications, antibiotics, anticonvulsants, etc.) was not similar.

**Discussion:** In schizophrenic patients, the old age period is associated with more comorbid disorders, compared to their healthy counterparts. Such comorbid profile is similar to other patients; e.g. the most prevalent comorbidities were musculoskeletal, cardiovascular, and metabolic disorders. Polypharmacy is a medical problem in the elderly, with numerous adverse effects. The adjunct consumption of psychiatric medications with the non-psychiatric ones highlights the vital phenomena of drug interactions and associated adverse effects of polypharmacy.

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## Highlights

- In schizophrenia patients, the old age is associated with more comorbid disorders.
- The most prevalent comorbidities in schizophrenic patients are musculoskeletal, cardiovascular, and metabolic disorders.
- Polypharmacy is a medical problem in the elderly, with numerous adverse effects.
- The adjunct consumption of psychiatric medications with the non-psychiatric ones highlights the vital phenomena of drug interactions and associated adverse effects of polypharmacy.

## Plain Language Summary

Old age is a risk factor in patients with schizophrenia, because compared with the younger patients they may have other mental and physical problems. The most common diseases among older patients with schizophrenia are musculoskeletal, cardiovascular, and metabolic disorders. Using different medications concurrently is a problem in older people, leading to many side effects, which should be considered by the healthcare staff.

### 1. Introduction

**S**chizophrenia disorder is characterized by acute episodes, that often consequence with improved symptoms [1]. Schizophrenia in the elderly population is categorized by either an early onset, and middle-age or old age experienced symptoms (early-onset schizophrenia), or late-onset type (the disease must be initiated in later life; i.e. the age of 45 years or above) [2]. Moreover, rehabilitation is crucial in patients with schizophrenia, because it improves their strengths and life skills to live independently. On the other hand, according to the World Health Organization (WHO), 7 out of every 1000 adult individuals, mostly in the age group of 15-35 years suffer from schizophrenia [2].

Various biopsychological disorders are often accompanied by schizophrenia. The odds of developing such conditions are higher among the elderly. Moreover, there are greater chances of hypertension, obesity, type 2 diabetes, and dyslipidemia development in patients suffering from schizophrenia [3]. Evidence suggests the increasing survival of elderly patients with mental illnesses, which will probably continue growing in the future. However, research studies highlighted the age-related health issues in this population, including cognitive impairments [4].

As a result, schizophrenic patients receive a high amount of antipsychotic drugs for a significant proportion of their lifetime; numerous adverse effects are associated with such long-term pharmacotherapy. Thus, investigating its

prevalence and related clinical factors in patients suffering from schizophrenia is inevitable [5]. However, data on such issues in patients suffering from this disease in old ages are limited, and most investigators focused on the young sufferers. The available data on the long-term risk-benefit ratio in patients with schizophrenia receiving antipsychotic treatment is controversial.

Some studies investigated the long-term effects of antipsychotics [1]. The elderly population is at higher risk for the adverse effects of antipsychotics such as metabolic syndrome, falls, and parkinsonism. Prior research has extensively reported the desirable effects and safety of antipsychotics on schizophrenia middle-aged and old patients. However, some scholars determined that these medications induced various side effects in the aforementioned age groups (both serious and mild) [6].

Significant critical gaps exist in the comorbidity disorders and polypharmacy effects in older patients suffering from schizophrenia. Therefore, the present research was conducted to address such issues by determining the comorbid profile and the pattern of non-psychiatric medicine use between elderly and non-elderly patients with schizophrenia. The result of the present research may provide further information for the development of novel strategies in the treatment of these patients.

### 2. Methods

The present cross-sectional study was performed at Razi Hospital, Tehran City, Iran, in 2019. A total of 395 pa-

tients were selected by a convenience sampling method. The samples were then divided into two groups of elderly (males: 76; females: 55) and non-elderly (males: 196, females: 68) patients with schizophrenia. The elderly population comprised of all patients aged  $\geq 65$  years, and the non-elderly group consisted of patients aged  $\leq 65$  years (the participants of the two groups were matched with each other). All procedures performed in the study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Also, informed consent was obtained from all study participants. The inclusion criteria were being in the aforementioned age ranges; being diagnosed with schizophrenia by a psychiatrist and following the diagnosing criteria of Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition (DSM-5), being hospitalized in Razi Psychiatric Hospital, and diagnosed with schizophrenia for at least two years; receiving antipsychotics polypharmacy, like Largactil (500 mg/d). The exclusion criteria consisted of the lack of access to the complete medical record of the patient at the healthcare center and incomplete demographic data questionnaires.

The study participants' demographic characteristics were collected using a demographic data questionnaire. Additionally, their medical records were evaluated in terms of comorbid disorders and non-psychiatric medicine use patterns (polypharmacy). The obtained data were analyzed in SPSS by descriptive tests, including frequency and percentage, to present between-group differences of polypharmacy and the comorbidity profiles.

### 3. Results

The study was conducted on 395 patients diagnosed with schizophrenia. According to Table 1, the frequency of schizophrenia disorder was higher in males aged  $\geq 65$  years. The data presented in Table 2 suggest that the comorbidity frequency of non-psychiatric disorders was

higher in the elderly, compared to non-elderly patients. Table 2 also reveals that the most prevalent comorbid disorders in the elderly subjects were musculoskeletal, cardiovascular, and metabolic disorders; whereas, neurological, respiratory, and dermatological diseases had the least frequency rates among them. In addition, the data presented in Table 2 demonstrate that the frequency of non-psychiatric polypharmacy was more considerable in the subjects older than 65 years. Eventually, as Table 2, the frequency of comorbid non-psychiatric disorders was higher in patients aged  $\geq 65$  years. As Table 3 reflects, the prevalence of non-psychiatric medicine use was mainly higher in elderly patients. Table 4 indicates that the distribution frequency of non-psychiatric medicine types in the elderly (e.g. aspirin, heart disease medications, hypertension medications, etc.) and non-elderly patients (e.g. anemia medications, antibiotics, anticonvulsants, etc.) was not similar.

### 4. Discussion

The current study explored the comorbid profile and the pattern of non-psychiatric medicine use (polypharmacy) between elderly and non-elderly patients with schizophrenia. The achieved demographic data of the studied subjects suggested that out of 395 surveyed patients, the number of male and female schizophrenic patients aged  $\geq 65$  years were 76(58.2%), and 55(41.98%), respectively. The same rate was 196(74.24%) for male and 68(25.76%) for female patients with  $\leq 65$  years of age. Therefore, the frequency rate of schizophrenia disorder was higher in males aged  $\geq 65$  years. This finding is consistent with prior evidence, suggesting gender differences in terms of age [7].

In addition, the frequency of non-psychiatric disorders was higher in the elderly, compared to non-elderly patients. This is because 103(78.63%) schizophrenia patients of  $\geq 65$  years and only 22(8.33%) schizophrenia patients aged  $\leq 65$  years were diagnosed with non-psychiatric comorbidities. Cohen et al. reported similar findings in this area. They highlighted extensive medical care require-

**Table 1.** The gender-wise frequency of study subjects

Variables		No. (%)	
		Schizophrenia Patients $\geq 65$ Years	Schizophrenia Patients $\leq 65$ Years
Gender	Male	76 (58.2)	196 (74.24)
	Female	55 (41.98)	68 (25.76)
Total		131 (100)	264 (100)

**Table 2.** The frequency of non-psychiatric disorders, their types, as well as polypharmacy and comorbid non-psychiatric disorders

Non-psychiatric Disorder	No. (%)	
	Schizophrenia Patients ≥65 Years	Schizophrenia Patients ≤65 Years
Yes	103 (78.63)	22 (8.33)
No	28 (21.37)	242 (91.67)
Total	131 (100)	264 (100)
Musculoskeletal disorders	72 (54.97)	12 (4.54)
Cardiovascular disorders	45 (35.35)	9 (3.40)
Metabolic disorders	34 (25.95)	8 (3.03)
Hematological disorders	31 (33.66)	6 (2.27)
Endocrine disorders	14 (10.69)	6 (2.27)
Digestive disorders	10 (7.63)	3 (1.14)
Neurological disorders	5 (3.82)	2 (0.75)
Respiratory disorders	1 (0.76)	1 (0.38)
Dermatological disorders	1 (0.76)	1 (0.38)
5 medications	12 (9.16)	0
4 medications	16 (12.21)	0
3 medications	20 (15.27)	1 (0.38)
2 medications	35 (26.71)	5 (1.89)
1 medication	23 (17.56)	17 (6.44)
No medications	25 (19.08)	241 (91.29)
Total	131 (100)	264 (100)
4 disorders	21 (16.03)	0
3 disorders	28 (21.38)	0
2 disorders	30 (22.90)	8 (3.03)
1 disorder	24 (18.32)	14 (5.30)
No disorder	28 (21.37)	242 (91.67)
Total	131 (100)	264 (100)

**Table 3.** The frequency of consuming non-psychiatric medications in the study subjects

Receiving Non-psychiatric Medications	No. (%)	
	Schizophrenia Patients ≥65 years	Schizophrenia Patients ≤65 years
Yes	106 (80.92)	23 (8.71)
No	25 (19.08)	241 (91.29)
Total	131 (100)	264 (100)

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**Table 4.** The frequency of non-psychiatric medication types in the study subjects

Non-psychiatric Medication Type	No. (%)		Non-psychiatric Medication Type	No. (%)	
	Schizophrenia Patients ≥65 Years			Schizophrenia Patients ≤65 years	
Aspirin	54 (41.22)		Anemia medications	10 (3.78)	
Heart disease medications	45 (34.35)		Antibiotics	5 (1.89)	
Lipid-lowering medications	32 (24.43)		Anticonvulsants	4 (1.51)	
Vitamin supplementations	21 (16.03)		Diabetes medications	4 (1.51)	
Anemia medications	14 (10.69)		Lipid-lowering medications	3 (1.14)	
Diabetes medications	13 (9.92)		Thyroid disorder medications	2 (0.76)	
Thyroid disorder medications	13 (9.92)		Heart disease medications	2 (0.76)	
Calcium supplementation	11 (8.40)		Hypertension medications	1 (0.38)	
Hypertension medications	9 (6.87)		Calcium supplementation	1 (0.38)	
Digestive diseases medications	8 (6.11)		Digestive diseases medications	1 (0.38)	
Parkinson's disease medications	5 (3.82)		Vitamin supplementations	1 (0.38)	
Respiratory medications	1 (0.76)				

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ments, as a result of high comorbid disorder rates in older schizophrenic patients. They also believed that significant medical comorbidities might contribute to a higher mortality rate in this group, compared to the general population [8]. Our results are also consistent with those of Jeste et al. who concluded that “elderly patients are especially likely to have comorbid disorders” [6]. These data reflect the necessity to consider and take adequate measures in terms of managing comorbidities in this population.

The obtained data revealed that the most prevalent comorbid disorders in the aging schizophrenia samples were musculoskeletal 72(54.97%), cardiovascular 45(35.35%), and metabolic disorders 34(25.95%); however, neurological 5(3.82), respiratory 1(0.76%), and dermatological 1(0.76%) diseases were least prevalent conditions among

them. These findings are in contrast with those of Jeste and colleagues. In their meta-analysis, they mainly signified substance abuse, cognitive impairment, and neurological disorders, as the comorbidities of this disorder [9]. On the other hand, the obtained results are consistent with those of Falkai et al., stating that the long-term consumption of antipsychotics may result in the development of metabolic syndrome in schizophrenia patients [10].

According to the results, the prevalence of comorbid non-psychiatric disorders was higher in patients aged ≥65 years (4 comorbid disorders: 21 people (16.03%)). Additionally, the prevalence of non-psychiatric medicine use was significantly higher in elderly patients (106 (80.92%)). These findings are in line with the prior research that indicated a correlation between polyphar-

macy and numerous adverse medical conditions [11-13]. The obtained data are also consistent with the study by Mannucci et al. that documented an association between polypharmacy (the constant use of  $\geq 5$  medications) and prescription and intake errors; poor compliance; expanded risks of drug-drug interactions; adverse related effects; re-hospitalization; and even mortality [14].

We also investigated the distribution frequency of non-psychiatric medicine types in the elderly (e.g. aspirin: 54 (41.22%), heart disease medications: 45(34.35%), lipid-lowering medications: 32(24.43%)) and non-elderly schizophrenia patients (e.g. anemia medications: 10(3.78%), antibiotics: 5(1.89%), anticonvulsants: 4(1.51%)). The studied groups were not similar in this aspect, too.

Eventually, evaluating the frequency of non-psychiatric polypharmacy revealed greater rates in the subjects with  $\geq 65$  years of age. The obtained related data were as follows: 5 medications: 12 people (9.16%); 4 medications: 16(12.21%); 3 medications: 20(15.27%); 2 medications: 35(26.71%); 1 medication: 23(17.56%), and no other medications: 25(19.08%) in the elderly subjects. While the majority of non-elderly individuals 241(91.29%) reported no consumption of non-psychiatric medications.

Pharmacotherapy has always been associated with trial and error; thus, scientists and practitioners must continuously review the prescribed effectiveness and adverse effects of pharmaceuticals. Such reviews must be performed in respect of therapeutic effects, as well as the patients' condition (disorder's severity, etc.) and treatment prognosis [15]. In summary, the co-prescription of medical and psychiatric medications leads to medication interactions and the correlated adverse effects of such poly-pharmacotherapy.

The limitations of the present research naturally include the following matters: The current research was conducted in a single center; thus, the obtained data must be cautiously generalized to patients with diverse backgrounds. Because of the cross-sectional nature of the research, researchers could not provide the cause-effect relationship between symptoms and other variables in a longitudinal manner. Therefore, further research is recommended to compare the elderly and non-elderly in a more comprehensive manner.

## 5. Conclusion

In schizophrenic patients, the old age period is associated with more comorbid disorders, compared to their healthy counterparts. Such comorbid profile is similar

to other patients; e.g. the most prevalent comorbidities were musculoskeletal, cardiovascular, and metabolic disorders. Polypharmacy is a medical problem in the elderly, with numerous adverse effects. The adjunct consumption of psychiatric medications with the non-psychiatric ones highlights the vital phenomena of pharmaceuticals interactions and the associated adverse effects of polypharmacy.

## Ethical Considerations

### Compliance with ethical guidelines

All study procedures involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Also, informed consent was obtained from all study participants.

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### Authors' contributions

All authors contributed in preparing this article.

### Conflict of interest

The authors declare no competing interests.

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