Psychiatric and non-psychiatric polypharmacy among older adults with schizophrenia: a population-based study in Quebec, Canada, between 2000 and 2017

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CONTEXT

- Schizophrenia is a severe psychiatric disorder associated with multiple psychiatric and non-psychiatric comorbidities and an increased risk of metabolic syndrome (1, 2). Consequently, as adults with schizophrenia age, they become at high risk of polypharmacy.
- Psychiatric polypharmacy is well documented in this population, while little is known about trends and patterns of global polypharmacy (2, 3). The objective of this study is to draw a portrait of polypharmacy among Quebec older adults with schizophrenia.

OBJECTIVES

- Describe the proportion of older adults with schizophrenia in Quebec, Canada, exposed to polypharmacy (≥10, ≥15 or ≥20 medications/year) between 2000 and 2016.
- Calculate the total number of medications used yearly and describe the main medication classes used by the population studied.
- Describe the main comorbidities found in the targeted population.

METHODS

- **Data source:** We used the Quebec Integrated Chronic Disease Surveillance System (QICDSS) of the National Institute of Public Health of Quebec that contains data such as medications reimbursed by the public drug plan (covering 90% of the population 65 years old and over), and information such as the age, sex, region of residence (urban or rural), comorbidities and number of hospitalizations of each individual of the population studied.
- **Population:** Individuals of 66 years old and over with an ICD-9 or ICD-10 diagnosis of schizophrenia between the years of 2000 and 2016 who were admissible for the public drug plan and who were alive for the duration of the year studied.
- **Total number of medications & Analyses :** We calculated the yearly use of each psychiatric and non psychiatric medications available in our database by the population studied. We then calculated the total number medications used by every individual in each year under study and the age- and sex-standardized proportion of individuals with polypharmacy, as defined by the usage of 10+, 15+, and 20+ medications. We further identified the clinical and socio-demographic factors associated with polypharmacy using Poisson regression models with robust variance estimation.

RESULTS AND DISCUSSION

Table 1: Characteristics of the population studied in 2000, 2004, 2008, 2012 and 2016

Characteristics	2000 n = 2566		2004 n = 2947		2008 n = 3467		2012 n = 4100		2016 n = 4634	
	N	%	N	%	N	%	N	%	N	%
Age										
66-75	1832	71.40	2037	69.12	2326	67.09	2849	69.49	3283	70.85
76-85	627	24.43	773	26.23	960	27.69	1020	24.88	1079	23.28
86+	107	4.17	137	4.65	181	5.22	231	5.63	272	5.87
Sex										
Female	1780	69.37	1971	66.88	2284	65.88	2652	64.68	2846	61.42
Male	786	30.63	976	33.12	1183	34.12	1448	35.32	1788	38.58
Comorbidity (Mean ± SD)	3.08 ± 2.09		3.28 ± 2.31		3.42 ± 2.43		3.60 ± 2.62		3.62 ± 2.76	
Diabetes	405	15.78	612	20.77	883	25.47	1175	28.66	1492	32.20
Hypertension	946	36.87	1388	47.10	1799	51.89	2316	56.49	2638	56.93
Heart Faliure	191	7.44	234	7.94	270	7.79	345	8.41	389	8.39
Stroke	171	6.66	238	8.08	323	9.32	350	8.54	404	8.72
Mood disorder	1034	40.30	1150	39.02	1352	39.00	1372	33.46	1390	30.00
Alzheimer	247	9.63	333	11.30	495	14.28	629	15.34	606	13.08
Osteoporosis	305	11.89	508	17.24	777	22.41	1098	26.78	1235	26.65
Asthma	144	5.61	223	7.57	332	9.58	424	10.34	499	10.77
COPD	533	20.77	725	24.60	901	25.99	1107	27.00	1348	29.09
Hospitalizations (Mean ± SD)	1.57 ± 1.04		1.58 ± 0.93		1.56 ± 0.89		1.65 ± 1.67		1.66 ± 1.59	
GP visits (Mean ± SD)	11.27 ± 14.17		10.87 ± 14.03		10.02 ±13.40		9.78 ± 13.78		9.40 ± 13.60	

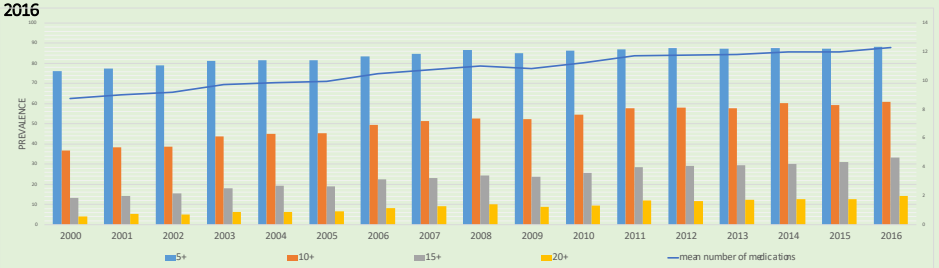
Table 2: Number of different medications claimed in a year by older people with schizophrenia from 2000 to 2016

Number of Medications	2000 n = 2566		2004 n = 2947		2008 n = 3467		2012 n = 4100		2016 n = 4634	
	N	%	N	%	N	%	N	%	N	%
Mean ± SD	8.76 ± 5.29		9.87 ± 5.81		11.03 ± 6.20		11.76 ± 6.50		12.30 ± 6.78	
0	47	1.83	38	1.29	40	1.15	52	1.27	40	0.86
1-4	568	22.14	506	17.17	423	12.20	457	11.15	499	10.77
5-9	1007	39.24	1074	36.44	1174	33.86	1216	29.66	1270	27.41
10-14	600	23.38	760	25.79	983	28.35	1185	28.90	1277	27.56
15-19	237	9.24	381	12.93	501	14.45	714	17.41	893	19.27
20+	107	4.17	188	6.38	346	9.98	476	11.61	655	14.13

Table 3: Number of different antipsychotics claimed in a year by older people with schizophrenia from 2000 to 2016

Antipsychotics	2000 n = 2566		2004 n = 2947		2008 n = 3467		2012 n = 4100		2016 n = 4634	
	N	%	N	%	N	%	N	%	N	%
Mean ± SD	1.51 ± 0.75		1.52 ± 0.74		1.54 ± 0.75		1.62 ± 0.77		1.67 ± 0.84	
0	419	16.33	387	13.13	398	11.48	664	16.20	642	13.85
1	1321	51.48	1552	52.66	1791	51.66	1836	44.78	2060	44.45
2	607	23.66	748	25.38	964	27.81	1168	28.49	1360	29.35
3+	219	8.53	260	8.82	314	9.06	432	10.54	572	12.34

Figure 1 : Age- and sex- standardized proportions of older adults with schizophrenia exposed to polypharmacy, between 2000 and 2016



- The prevalence of total medications used increased consistently from 2000 to 2016, across all age groups. The mean number of medications claimed in 2000 was 8.76 and increased to 12.30 through 2016.
- The age- and sex-standardized proportions of people exposed to different degrees of polypharmacy also increased from 2000 to 2016: 10+ drugs: 36.8% to 61.0%; 15+: 13.4% to 33.4%; 20+: 4.2% to 14.1%.
- Non-antipsychotic medications essentially drove the rise in polypharmacy since antipsychotics deemed stable (mean number of antipsychotics claimed: 1.51 in 2000 vs 1.67 in 2016). The only clinically significant factor associated with polypharmacy in the multivariate regression was the number of comorbidities (e.g., polypharmacy-10+: RR[2 vs 0-1]=1.57; 95% IC:1.51-1.65, RR[3-4 vs 0-1]=2.27 (2.18-2.36); RR[5+ vs 0-1]=3.14 (3.02-3.27)).
- The number of comorbidities has increased over time; it is a contributing factor to the rise of polypharmacy. Furthermore, the rising number of psychiatric and non psychiatric medications available for the comorbidities could also be a contributing factor.
- The population studied may be exposed to an increased risk of drug-induced adverse events and drug-drug interactions, considering the functional deficits, the older age, the high number of comorbidities and the use of psychiatric medications with important side effects (4-6).
- The risks and benefits of polypharmacy in older patients with schizophrenia are not well defined. There is a need to better understand which combination of medications provide the greatest benefits and lowest risks in this population.

CONCLUSION

We found a noticeable increase in polypharmacy exposure in older adults with schizophrenia, raising concerns about the growing risks for adverse effects and drug interactions, notably with antipsychotic treatments.

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