Original Article

Morbidity pattern, social safety net, and drug adherence level among geriatric patients attending in a health-care facility: A cross-sectional study

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Abstract:

INTRODUCTION: Financial support system available to geriatric populations affects their adherence level to the prescribed treatment leading to a rise in chronic disease burden.

OBJECTIVE: The aim of this study was to ascertain the disease pattern, health expenditure, and adherence to the prescriptions among geriatric patients reporting to a hospital in North India.

METHODOLOGY: This descriptive, cross-sectional study was conducted from July 2017 to June 2018. Patients who were 60 or above years in age, already diagnosed and were on treatment for more than 3 months were included in the study. A total of 310 patients were selected using convenient sampling method. Data were collected by a pretested and validated questionnaire.

RESULTS: The mean age of the patients was 66.16 years ± 5.37 years (54.8% males). Monthly average family income was Rs. 15202.97 ± 1134.63. Overall, 25% of the treatment cost was met through various social schemes (52% = pension scheme, 32% of patients had no such schemes and only 2% through health insurance schemes). Rest was out-of-pocket expenditure. Common diseases were hypertension (60.64%), diabetes mellitus (35.8%), cancer (28.38%), and coronary artery disease (22.58%). More than half (52.9%) of the patients had two or more illnesses; about 35.8% of them were taking treatment for 1–5 years. Moderate adherence was observed among the majority of the patients. Statistically significant ($P < 0.05$) difference in treatment adherence to the prescriptions was observed.

CONCLUSION: Geriatric patients had many chronic morbidities. They had high out-of-pocket expenditure and suboptimal financial support affecting their level of adherence to the prescriptions.

Keywords:
Adherence, chronic morbidities, geriatric, out-of-pocket expenditure, social schemes

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Introduction

In India, life expectancy at birth has recently gone up, and the population will be around 21% (301 million) by 2050. The elderly suffers from many chronic diseases such as diabetes, hypertension, coronary artery disease, musculoskeletal, psychiatric, and cancers. A high disease burden in the elderly puts immense pressure on limited health resources and services.[1-3] Long-term therapies and polypharmacy associated with multiple comorbidities lead to a higher risk of nonadherence to medications in elderly patients.[4,5] This results in frequent hospital and doctors' visits, longer stays and higher readmission rates in hospitals, decreased

treatment benefits for the patients and increased expenditure treatment.[6,7]

Two-thirds of the elderly live in rural India and half of these come from poor socioeconomic strata.[4] Three-fourth of the elderly are either fully or partially dependent on others. A significant number remains either uninsured or underinsured. This is more true for females.[2,4]

Need of the study

India is committed to Universal Health Coverage. However, the efforts are in their early stages only. Health insurance has only recently been given attention by the health-care administrators. Whatever financial support schemes are available geriatric patients are utilized suboptimally.

For having any worthwhile impact of the financial support system to be developed for geriatric patients, it is important to create a database on the research questions such as – (a) What is the disease pattern in geriatric patients; (b) What is their case load on hospitals, and (c) What is the existing health security schemes for them.

Against this background, this study was conducted with the objectives: (i) to ascertain the disease pattern among the geriatric patients visiting a tertiary care hospital of India, (ii) to evaluate the existing financial support system through any health security schemes for their treatment, and (iii) to determine the treatment adherence level in them.

Methodology

The descriptive, cross-sectional questionnaire-based study was conducted from July 2017 to June 2018. The study population included the patients who were 60 years or above in age, already diagnosed and were on treatment for more than 3 months (chronic conditions) before they were admitted in inpatient department (IPD) or had attended the outpatient department (OPD) of the study hospital. Only those patients who were willing to participate and met the inclusion criteria were recruited in the study. There was a total of 31 study areas selected using the lottery method. These were divided into 18 OPD and 13 IPD areas of different departments of the study hospital. Ten patients per study area were selected using the lottery method. One study area was visited per day to collect the data. Each area was visited three times but not on consecutive days. Sociodemographic details disease profile of the patients, number of illnesses, duration of treatment, and any other relevant information in respect of the ongoing treatment was also recorded on the proforma. Previous medical records available with the patients were seen to obtain relevant information pertaining to the case.

The level of adherence to the treatment was assessed using eight-item Morisky Medication Adherence Scale-8 (MMAS-8).[8] The total score on the MMAS-8 can range from 0 to 8. A total score of "0" reflects high adherence, a score of "1–2" reflects medium adherence, whereas a 14 score of ">2" reflected low adherence levels.

The sociodemographic data were analyzed using descriptive statistics, namely mean and standard deviation. Significance of the association between dependent and independent variables were evaluated using the Chi-square test. The SPSS version 22(IBM, Chicago, USA) and Epi-info version 7 were used for the analysis of data.

Ethical clearance was taken from the Institute Ethics Committee, and written informed consent was taken from each participant.

Results

Demographic details of the patients are described in Table 1.

The total number of patients in the study population (*n*) was 310. Among these, 130 (41.9%) were from IPD and 180 (58.1%) were from OPD. The mean age of the patients was 66.16 years ± 5.37 years; 54.8% were males and 51.9% of patients belonged to rural areas. Most (80%) patients were married and 78.7% were from the joint families. Some (26.5%) of the patients were illiterate. Occupation-wise, one-fourth were government employees' beneficiaries and 38.4% were homemakers.

Their mean monthly income was Rs. 15202.97 ± 1134.63 which included salaries, pensions, income of family members, and assistance from health schemes. Most (90%) of the patients were from the above poverty line category. Most (81.9%) of the patients gave no history of addiction (taking alcohol and smoking). Overall, 25% treatment cost was incurred by some social schemes. Rest was out-of-pocket expenditure [Figure 1].

In 68% of patients, treatment cost was covered by pension or other scheme; about 32% of patients were found uncovered by any social safety schemes [Figure 2].

Majority (64%) of the patients spent Rs. 1000–1500/month on their treatment. Figure 3 shows the prevalence of chronic diseases reported by them, for example, hypertension (60.64%), diabetes mellitus (35.8%), cancer (28.38%), and coronary artery disease (22.58%). More than half (52.9%) of the patients had two illnesses and most (35.8) of them was taking treatment for 1 year–5 years [Figure 4]. Details of treatment adherence are described in Table 2. Majority of them (64%) often forgot to take the prescribed medicines; most (95.5%) did take their medicines yesterday; many (28%) found it difficult

Table 1: Demographic profile of the study population (*n*=310)

Variables	*n* (%)
Patient care area	
IPD	130 (41.9)
OPD	180 (58.1)
Age group (years)	
60-69	233 (75.2)
70-79	69 (22.3)
≥80	8 (2.6)
Gender	
Female	140 (45.2)
Male	170 (54.8)
Residence	
Rural	161 (51.9)
Urban	149 (48.1)
Marital status	
Married	248 (80.0)
Widow	41 (13.2)
Widower	21 (6.8)
Unmarried	0 (0)
Divorced	0 (0)
Family type	
Joint	244 (78.7)
Nuclear	66 (21.3)
Educational status	
Illiterate group	82 (26.5)
Secondary	57 (18.4)
Graduates	45 (14.5)
Postgraduation	17 (5.5)
Occupational status	
Housewives	119 (38.4)
Government employees	81 (26.1)
Private jobs	51 (16.5)
Farmers	42 (13.5)
Driver	1 (0.3)
Income status (monthly), INR	
900-10,000	150 (48.4)
10,001-20,000	72 (23.2)
20,001-30,000	40 (13.4)
30,001-4000	40 (13.4)
≥40,000	5 (1.6)

IPD=In patient department, OPD=Outpatient department

Figure 1: Mode of payment for treatment
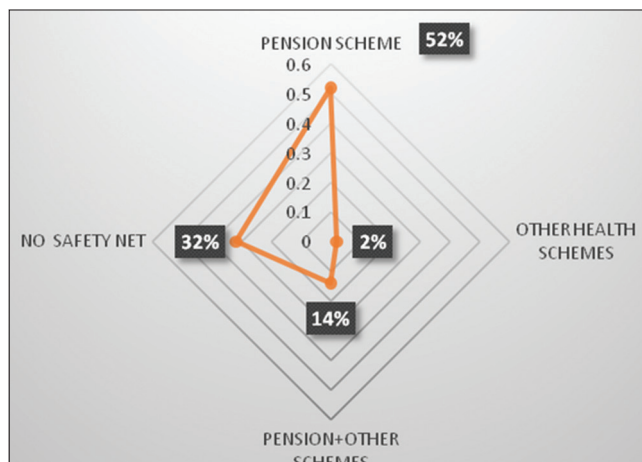
Figure 2: Type of health schemes availed by the patients
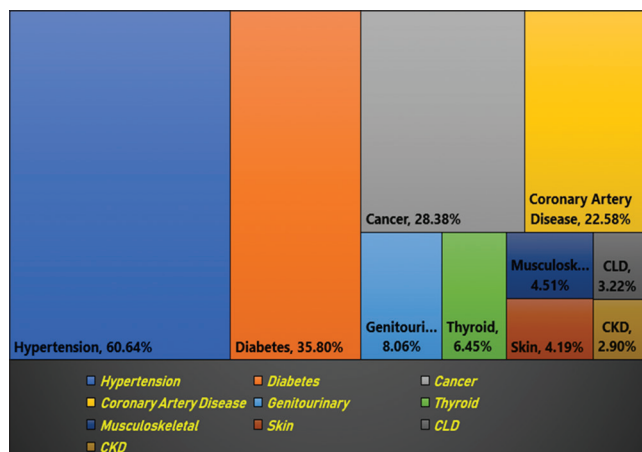
Figure 3: Disease patterns among geriatrics

to stick to their treatment plan; and few (12.3%) stopped taking their medicines without telling their doctor because they felt worse.

Better adherence (*P=0.007****) to their medications was seen in patients from OPD (66.4%) as compared to 59.2% in IPD patients [Table 3]. There was a declining level of adherence to treatment with increasing age of the patients. Most of the patients showed medium level of adherence (44.2%). The maximum number of patients in the study (52.9%) population had two illnesses. With an increase in the number of comorbidities, the level of adherence to treatment significant decreased ($P < 0.05$). Significantly, lower
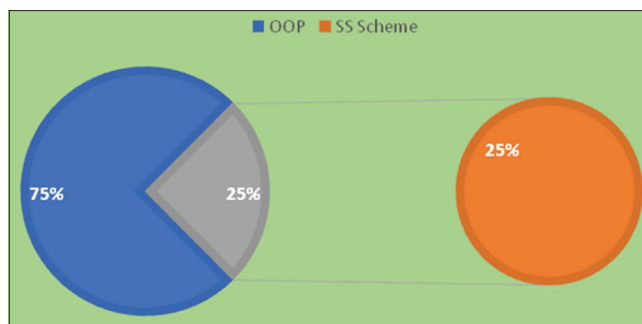
adherence levels were observed when the duration of chronicity was higher ($P = 0.00$).

Overall, 56% of the patients knew about health or any social security schemes, but no significant association was observed between knowledge and adherence level [Table 4].

Discussion

In old age, chronic diseases burden increases due to senescence. Similar trend was observed in this study

Table 2: Morisky 8-item treatment adherence questions

| Morisky questions	Yes	No
Forgot to take medicine	198 (63.9)	112 (36.1)
Missed medicines in past 2 weeks for reasons other than forgetting	37 (11.9)	273 (88.1)
Stopped taking their medicines without telling their doctor because they felt worse	38 (12.3)	272 (87.7)
Number of patients who forget to bring their medicines when they leave their home	39 (12.6)	271 (87.4)
Number of patients who took their medicines yesterday	296 (95.5)	14 (04.5)
Patients who stopped taking their medicines when they felt that their health is under control	20 (6.5)	290 (93.5)
Patients who found it difficult to stick to their treatment plan	87 (28.1)	223 (71.9)
Difficulty in remembering to take all medications		***n* (%)**
0 (never/rarely)		125 (40.3)
1 (once in a while)		162 (52.3)
2 (sometimes)		23 (7.4)
3 (usually)		00 (0.0)
4 (all the time)		0 (0.0)
Total		310 (100.0)
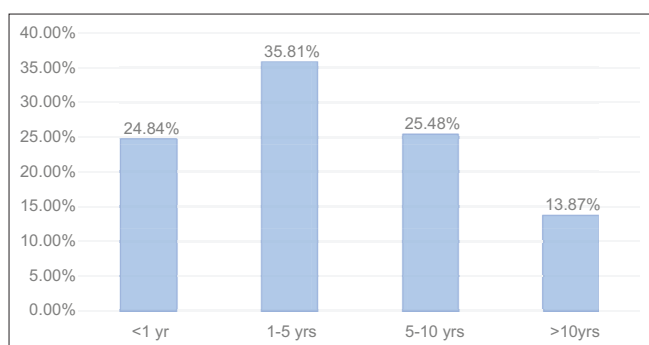
Figure 4: Chronicity of the diseases

on geriatric patients based in a tertiary care facility of India where the most common presenting illnesses were hypertension, diabetes mellitus, cancer, coronary artery disease followed by others involving many systems of the body. Similar disease pattern was seen in a study on geriatric patients conducted by Sarode *et al*.[9]

Quality of life in geriatric patients is immensely affected by the level of adherence to the prescribed treatment, which is affected by multiple factors. In our study, high adherence to medication was observed only in 19% of patients. Overall, it was deficient, i.e., medium in 44.2% and low levels in 36.8% of patients. A study by Shruthi *et al*. conducted on 251 geriatric participants in OPD with chronic illnesses showed that 45.41% had good, 35.45% moderate, and 19.12% had poor adherence levels.[10]

A similar study conducted by Lee *et al*. showed 65.1% of patients had good adherence to treatment (high and moderate), whereas 32.6% were of poor adherence to treatment.[11] A study by Korb-Savoldelli *et al*. showed that of 199 patients included in the study, the adherence level was high 43.7%, 37.7% medium, and 17.6% low.[12] A study conducted by Waari *et al*. showed the adherence levels to be low for 28.3%, medium for 26.2%, and high for 45.5% of the patients.[13] Another study conducted

by Holt *et al*. showed that 51.7% of the patients had high adherence levels, 34.2% had medium, and 14.1% of patients had low adherence levels to medication.[14] Therefore, our study reflected much lower treatment adherence levels among the geriatric patients compared to other studies.

In our study with the increase in the number of illnesses, the adherence levels significantly decreased. This may be due to patients with multiple illnesses require more number of drugs than those with single illness with complex dosing regimen and increased medication costs. Furthermore, patients with single illness are likely to be more adherent to treatment because of the simpler dosing regimen.

A study conducted by Shruthi *et al*. also showed that the patients with multiple illnesses with longer duration of treatment receiving multiple medication showed lower levels of adherence. Forgetfulness was the most common cause for missing the medications apart from other causes such as polypharmacy, the complexity of regime, lack of time, side effects, and others.[10] In our study also, most of the patients had answered to question no. 1 of MMAS-8 with "yes" response (63.9%) showing a high degree of forgetfulness.

In a study conducted by Balkrishnan, revealed that no association was observed between the number of illnesses and the level of drug adherence.[15]

Although better (25%) adherence level was observed in OPD patients in comparison to IPD (10.8%) patients in our study. This may be because the indoor patients might have been less adherent to the treatment they were taking earlier which led to the admission ($P < 0.05$).

It was significant to note that in the majority (68%) the patients, treatment cost was covered by pension or other

Table 3: Association with adherence with other variables

Variables	Adherence to medication, *n* (%)				*P*<0.05
	Low	Medium	High	Total	
Patient care area					0.007**
IPD	53 (40.8)	63 (48.5)	14 (10.8)	130 (100)	
OPD	61 (33.9)	74 (41.4)	45 (25)	180 (100)	
Total	114 (36.8)	137 (44.2)	59 (19)	310 (100)	
Age group					
60-69	81 (34.8)	103 (44.2)	49 (21.0)	233 (100.0)	0.523
70-79	29 (42.0)	31 (44.9)	9 (13.0)	69 (100)	
≥80	4 (50.0)	3 (37.5)	1 (12.5)	8 (100)	
Total	114 (36.8)	137 (44.2)	59 (19.0)	310 (100)	
Educational status					
Illiterate	36	32	14	82	0.194
Primary	18	21	7	46	
Middle	18	14	8	40	
Secondary	22	23	12	57	
Higher secondary	3	17	3	23	
Graduates	11	23	11	45	
Postgraduates	6	7	4	17	
Total	114	137	59	310	
Area of residence					
Rural	62 (38.5)	62 (38.5)	37 (23.0)	161 (100.0)	0.065**
Urban	52 (34.9)	75 (50.3)	22 (14.8)	149 (100.0)	
Total	114 (36.8)	137 (44.2)	59 (19.0)	310 (100.0)	
Gender					
Female	49 (35.0)	67 (47.9)	24 (17.1)	140 (100)	0.479
Male	65 (38.2)	70 (41.2)	35 (20.6)	170 (100)	
Total	114 (36.8)	137 (44.2)	59 (19.0)	310 (100)	
Income/month (Rs)					
900-10,000	59	66	25	150	0.766
10,001-20,000	23	36	13	72	
20,001-30,000	20	24	14	58	
30,001-40,000	11	8	6	25	
≥40,000	1	3	1	5	
Total	114	137	59	310	
Knowledge of health schemes					
No	52	57	27	136	0.774
Yes	62	80	32	174	
Total	114	137	59	310	
Number of co-morbidities					
1	16	18	24	58	0.00**
2	66	72	26	164	
3	31	39	7	77	
4	1	8	2	11	
Total	114	137	59	310	
Duration of chronicity					
3 months-1 year	18	14	45	77	0.00**
1-5 years	43	58	10	111	
5-10 years	35	41	3	79	
≥10 years	18	24	1	43	
Total	114	137	59	310	

***Statistically significant. IPD=In patient department, OPD=Outpatient department

health schemes. Despite that, the patients had to make out-of-pocket expenditure. This hints at inadequacy of the existing schemes.

Only one-third (32%) of the patients were uncovered by any schemes. However, this data may not be exclusively representative of the general population.

Table 4: Treatment adherence and health schemes

Adherence level	Knowledge of the patients about health schemes Mode of payment for treatment expenses					
	Yes		Total	No		Total
	Out-of-pocket	Health schemes		Out-of-pocket	Health schemes	
Low	40	22	62	46	6	52
Medium	48	32	80	54	3	57
High	18	14	32	26	1	27
Total	106	68	174	126	10	136
P	0.720			0.328		

Conclusion

1. Majority (81%) of our patients had moderate/poor treatment adherence
2. The most common morbidity was hypertension, followed by diabetes mellitus, cancer, coronary artery disease, and others
3. One-third (32%) of our patients had no financial assistance for their treatment. Existing schemes were inadequate to prevent out-of-pocket expenditure
4. Significant difference was observed between the level of adherence and the patient care areas, number of morbidities, and duration of treatment.

Recommendations

1. Further study is required to know the problem of poor adherence and lack of financial assistance among the geriatric patients despite the existing social safety schemes for the poor
2. Geriatric patients and their family members should be counseled about the importance of health promotion activities, disease prevention strategies, and treatment adherence for healthy aging.

Strengths

a. This study assessed on the same platform, the three interlinked health problems of the elderly, i.e., disease pattern, their adherence level to prescribed medications and the financial support system available for the treatment
b. This study highlights the determinants of nonadherence of treatment among geriatric patients.

Weakness

a. This is a facility-based study and community-level data would have added to the quality of the study
b. We did convenient sampling method with a small sample size, it will be better if we did it by simple random sampling with a larger sample size
c. Checking adherence with Morsiky 8-item tool has inherent limitations, as it is very subjective. It would have been better if we checked their adherence by "pill count" method
d. In this study we did only cost analysis; full economic evaluation would have given us a better insight of and health-care expenditure among the geriatrics, including out of pocket and catastrophic expenditure.

Conflicts for interest
There are no conflicts for interest.

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