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Gender Differentials in Out of Pocket Health Expenditure Among Older Adults in India: Evidence from National Sample Survey 2014 and 2018

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Abstract

The proportion of older adults are increasing at a much higher rate than ever expected in both developing and developed countries, and India is no exception. High health care expenditure is attributed to deteriorating health condition among older adult following disability in later life stages and also due to the presence of chronic diseases, and multi-morbidity among them as life expectancy has substantially increased in last few decades. Data for the analysis was used from the National Sample Survey Organization conducted during the 71st (2014) and 75th round (2017-18). Descriptive statistics, bivariate analysis, and linear regression were used for the study. It was found that mean OOPE for older adults was high if the household head was an older adult in case of both men and women. Older adults from higher socio-economic status incurred high OOPE. Moreover, older adults who were financially independent incurred high OOPE compared to those who were partially or fully economically dependent. More interestingly, financially independent women incur higher OOPE than financially independent men. In most states, it was observed that mean OOPE was high for men compared to women, which depicts clear gender differentials. The findings of this study are significant and provide new information on discrepancies between older men and women in health-care spending. Older men were found to have slightly higher health care costs relative to women in this nationally representative survey, after adjusting for confounding factors.

Keywords OOPE · Older adults · Head of household · NSSO · India

Introduction

About 100 million people are pushed into poverty every year because they have to pay directly for their health care costs (WHO, 2014). Trends between 2001–2005 show a significant increase in total expenditures on health in the group of

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low-income countries (WHO, 2014). The threat that out-of-pocket expenditure (OOPE) poses to household living standards is increasingly recognized as a major consideration in financing health care (Molla et al., 2017). The concept of Universal Health Coverage (UHC) came out of global concern for a high amount of OOPE for health care in many low- and middle-income countries (WHO, 2010). Annually, about 7–8% of China and India's population, respectively, fall into poverty due to out-of-pocket health expenditure (OOPHE). Also, the percentage deficit in income for the population from the poverty line due to OOPHE is 2% and 1.3% in China and India, respectively (Kumar et al., 2015).

India's health system ranks as one of the most heavily dependent on OOPE in the world, and over the past decade in India, the expenditure on outpatient care increased more than 100 per cent while the expenditure on inpatient care increased by almost 300 per cent (Pandey et al., 2018a, b). OOPE remains common in India, where, according to a recent survey, only 15% of the population is covered by health insurance. In 2014, OOPE was estimated to account for 62% of total health expenditure (60.6 billion United States dollars, US$, out of US$ 97.1 billion) (Pandey et al., 2018c, d). Household heads with lower educational status, lower MPCE, and rural residency have higher chances of falling into poverty. Also, if the household head was an older adult or had another elder member in the household, it increased the chances of falling into poverty in China (Kumar et al., 2015). Health care spending is highly concentrated among older persons, especially among the oldest-old (Cutler & Meara, 1998). It has been found that total personal health expenditure rises sharply with age, with the oldest-old consuming three times as much as per person in the age group 65–74 years (Fuchs, 1998). Moreover, it was argued that households with older persons had high health care expenditure, which will, in the future, pose a high financial burden over the ageing demographic profile in India (Pandey et al., 2018d). The study by (Mohanty et al., 2014) found that the monthly per capita household spending of older adults households is 3.8 times higher than that of non-elderly households and also study confirmed that per capita health spending has a positive gradient with the economic status of a household, educational attainment of the head of the household and the presence of an older member in the household.

The older population had a greater increase in mean OOPE for hospitalization between 1995–96 and 2014 than the younger population (Pandey et al., 2018b). High health care expenditure is attributable to deteriorating health condition among older adults following disability in later life stages as well as the presence of chronic diseases and multi-morbidity (Gupta & Sankar, 2003; Schoenberg et al., 2007). A study confirms that poverty among older adults living alone or with other older members is higher than those living with non-older members (Srivastava & Mohanty, 2012). The permanent nature of poverty among older adults is of real concern as once they enter into the trap of poverty due to health care consumption, they are unlikely to come out of it (Hurd, 1990).

Evidence confirms that cancer prevalence is higher among older people than in any other age group, and it has the highest OOPE. More than 60 per cent of households

who seek care from private health care facilities incur more than 20 per cent of OOPE from total annual per capita household expenditure (Rajpal et al., 2018). One-tenth of older adults taking medications for chronic disorders spent more than 10 per cent of their income on medicine. Additionally, the odds of spending on medication among older adults was 3.8 times that of non-older adults (Park et al., 2015). It was found in the previous literature that older adults who experience chronic diseases like cancer, diabetes, high blood pressure or depression were likely to show higher OOPE. More-over, patients with cancer or diabetes were more likely than others to face a heavy burden of OOPE relative to income (Mofizul Islam et al., 2014). In the previous study, it has been found that total OOPE and medicinal OOPE were estimated to be 6.7% and 4.5% of total consumption expenditure respectively in the year 2011–2012, which marked a significant increase since 1993–94 (Selvaraj et al., 2018). Moreover, treatment expenditure of cancer, CVDs, and injuries for outpatient and inpatient care predominates the expenditure pattern (Selvaraj et al., 2018).

One of the previous literature found that in Brazil, receiving inpatient health care for older people was not differentiated by wealth, whereas in India, the wealth deferential in receiving inpatient health care exist, which signifies high OOPE for health care utilization. Therefore, the success of Brazil's health reforms in reduc-ing inequalities in older inpatient care indicates a potential pathway that could be followed (Channon et al., 2012). When talking in terms of Asia, it was argued that there is still heavy dependence on out-of-pocket health care expenditure in Asia. It largely affects the household living standards of people. Moreover, catastrophic expenditure is generally higher in low-income countries that rely more on OOP financing and lower in high/middle-income countries that make greater use of pre-payment mechanisms (Pandey et al., 2018c). Indonesia and Malaysia both coun-tries had been able to control their catastrophic health care payments. Indonesia had implemented a health card scheme and shielded low-income families from high OOPE. On the other hand, Malaysia had implemented in her public health care sector and successfully avoided catastrophic payments for health care payments (WHO, 2012).

The literature above stressed the significance of the age of the household's head and how OOPE for the elderly was higher could increase if the head of the house-hold is an older person. The present study discusses the differences in OOPE on non-communicable diseases (NCDs) and communicable diseases (CDs) among the elderly, depending on whether the head of the household was an older adult or not. We hypothesized that the average OOPE on NCDs and CDs among the elderly is higher if the head of the household is an older person. Therefore, the present study solely focuses on the OOPE for NCDs and CDs among older people bifurcating the results according to the household headship of the older adults. Moreover, gender differentials for OOPE among older adults will be determined in the study. Indian census (2001) defines 'Head of the Household" as one recognized by the house-hold as being so who vests the primary responsibility for managing the household's affairs and decision-making on behalf of the household (RGI, 2001).

Data and Methods

Data for the analysis was used from the National Sample Survey Organization (NSSO) conducted during the 71st (2014) and 75th round (2019). NSSO collected information related to health and its associated expenditure from 333,104 individuals in 65,932 households in the 71st round and 555,115 individuals in 113,823 households in 75th round. While 27,245 older adults were surveyed in 2014, 42,762 older adults were surveyed in 2017-18. The data for analysis included households consisting of at least one older adult enabling us to analyze the effect of household headship of older adults on health-related OOPE among them and other older adults living in the household. The final sample for households included for the analysis consisted of 14,291 households in 2014 and 22,527 households in 2017-18.

Outcome Variable

NSSO provides information on total medical expenditure for inpatient care as well as the reimbursement received. This information was used to compute OOPE. OOPE (defined as total expenditure net of reimbursement) for inpatient care among older adults for any disease is used as a dependent variable. In NSSO, medical expenditure related to inpatient care includes bed costs, doctor/surgeon fees, laboratory tests, prescription expenses, and other miscellaneous expenses (such as physiotherapy fees, personal medical equipment, attendant fees, blood, and oxygen). Total cost (expenditure/expenses) is the summation of patient's travel charges, escort expense, food transport on others, their lodging charges and medical cost.

Predictor Variables

The predictor variable used for the analysis are as follows: Head of household (Older adult, Non-older adult), age (60–69, 70–79 and 80 + years), Place of residence (Rural and Urban), Caste (SCs/STs, Non-SCs/STs), Religion (Hindu, Muslim, and Others), Education level (Illiterate and Literate), Monthly Per-Capita Expenditure (MPCE) (Poor, Middle, Rich), Marital status (Unmarried, Currently married and others), Diseases (NCD, CD, and others) (Kastor & Mohanty, 2018), Living arrangement (Alone, With spouse and others) and Financial Independence (Independent, Partial Dependent and Fully independent). The NSSO considers an aged person as an economic dependent if he/she needed financial help from others for leading his/her daily life. Further interaction terms were used to understand the gender differential (*Supplementary Material*). Interaction terms of gender with MPCE, living arrangement, financial dependence, head of sex of the household, and marital status were computed (*Supplementary Material*).

Statistical Analysis

Descriptive statistics, bivariate analysis, and linear regression (Long & Freese, 2006) were used for the study. OOPE was given with mean, standard error, and 95% confidence interval. Bivariate analyses were performed to explain the gender differences in OOPE for older adults in India with respect to identified socio-economic and demographic covariates. Further multivariate linear regression was used to estimate the impact of selected covariates on incurring OOPE for inpatient care among older adults in India. The general form of the regression model is as follows:

$$ln\,(OOPE)_i = \alpha + \beta_1\big(Head\ of\ household_i\big) + \beta_2\big(Age_i\big) + \beta_3\big(Education_i\big)$$
$$+ \beta_4\big(Religion_i\big) + \beta_5\big(Caste_i\big) + \beta_6\big(MPCE_i\big) + \beta_7\big(Marital\ Status_i\big)$$
$$+ \beta_8\big(Disease_i\big) + \beta_9\big(Living\ arrangement_i\big)$$
$$+ \beta_{10}\big(Financial\ dependence_i\big) + \beta_{11}\big(Place\ of\ residence_i\big) + e_i$$

Similar analysis was carried out for various interaction term and for both 71st round and 75th round.

Results

The selected variables related to older adults is reported in Table 1. We observed that around 22% of households had older adult's headship during 2014, reducing to 20% in the period 2017–18. However, the gender distribution of household headship of older adults did not change between 2014 and 2017–18. The proportion of illiterate older adult's head of households decreased from 39% in 2014 to 36.6% in 2017–18. While looking at the OOPE, among the households with older adult as a head, the average spending on NCDs is almost thrice than communicable diseases in both periods. We observed that there is a huge gender gap between the average expenditure on NCDs for 2014 as well as 2017–18. However, this gender gap was reduced in the period 2017–18. The average OOPE for NCDs increased from INR *36,133* in 2014 to INR *41,815* in 2017–18.

Table 2 shows gender differences among the older adults on average OOPE according to various socio-economic and demographic characters. We observed that average OOPE on inpatient care on older adults was higher among households with older adult's headship than households with non-older adult's headship in 2014 and 2017–18. Irrespective of the place of residence, education, age group, place of residence, caste, religion, and education, the average OOPE on inpatient care on older men is higher than older women in both rounds. The gender discrepancy is notably very high among the partially financially dependent older adults in 2014, which reduced to a great extent in 2017–18. According to living arrangements, older women living alone spent higher than older men living alone for the year 2014 and in the period 2017–18.

Table 1 Socio-economic and demographic characteristics of older adults in India, NSS0 71st and 75th round

Variables	71st round (2014)						75th round (2017–18)					
	Total		Men		Women		Total		Men		Women	
	N	%	N	%	N	%	N	%	N	%	N	%
Percent of older adults who are household head	14,291	21.7	11,768	82.3	2,523	17.7	22,527	19.8	18,647	82.8	3,878	17.2
Mean age of head of household	14,291	67.1	11,768	67.1	2,523	67	22,523	67.5	18,644	67.4	3,877	67.9
Percent of older people living in urban areas	12,226	44.9	6,035	49.4	6,191	50.6	19,163	44.8	9,794	51.1	9,369	48.9
% population belongs to Poor Category (MPCE)	11,253	41.3	5,554	40.6	5,695	42.0	15,022	35.1	7,568	34.5	7,443	35.7
Percentage of SC and ST households	3,395	23.8	2,716	80	679	20	5,350	23.8	4,352	81.3	996	18.6
Percentage of Hindu households	11,250	78.7	9,304	82.7	1,946	17.3	17,317	76.9	14,385	83.1	2,930	16.9
Percentage of household heads who are non-literate	5,579	39	4,008	71.8	1,571	28.2	8,255	36.6	6,001	72.7	2,252	27.3
Mean OOPE for older person (NCD)	3,266	36,133	2,139	41,521	1,127	26,754	5,059	41,815	3,286	45,887	1,773	33,819
Mean OOPE for older person (CD)	2,531	13,179	1,451	14,044	1,080	12,224	3,737	16,589	2,201	18,596	1,535	14,007
Mean OOPE for older person (Others)	655	32,388	422	34,709	233	28,339	1,029	44,165	646	42,970	383	46,230
Number of older people who are head of the Household	14,291	100	11,768	82.3	2,523	17.7	22,527	100	18,647	82.8	3,878	17.2
Number of older people living with older adult Head of HH	20,473	100	11,994	58.6	8,479	41.4	32,660	100	18,994	58.2	13,664	41.8
Total Number of older person	27,245	100	13,692	50.3	13,553	49.7	42,762	100	21,902	51.2	20,858	48.8

N Sample, *%* Percentage Distribution, *SC/ST* Scheduled caste/Scheduled Tribe, *CD* Communicable diseases, *NCD* Non-communicable disease, *OOPE* Out of Pocket Expenditure, *MPCE* Monthly per capita expenditure

Table 2 Mean out of pocket expenditure (OOPE) in Rupees by socio-demographic characteristics in India, NSSO 71ST and 75th round

Variables	71st round (2014)				75th round (2017–18)			
	N (Men)	OOPE (Men)	N (Women)	OOPE (Women)	N (Men)	OOPE (Men)	N (Women)	OOPE (Women)
Head of the Household								
Older adult	4,012	30,639	2,440	19,896	6,133	35,746	3,691	25,943
Non-older adult	542	22,989	1,384	16,596	895	29,769	1,913	21,213
Age (in years)								
60–69	2,491	27,422	2,193	19,219	3,964	34,407	3,366	22,747
70–79	1,516	33,256	1,152	18,823	2,266	35,048	1,616	25,728
80+	542	29,356	471	16,171	794	37,434	620	27,656
Place of residence								
Rural	2,401	23,906	1,836	13,775	3,673	27,026	2,892	17,009
Urban	2,153	39,357	1,988	26,600	3,355	47,207	2,712	36,128
Caste								
SC/ST	922	14,069	846	9,254	1,397	20,937	1,176	12,396
Non SC/ST	3,632	32,548	2,978	20,887	5,631	38,105	4,428	27,244
Religion								
Hindu	3,661	28,829	2,997	16,684	5,481	35,481	4,268	24,260
Muslim	522	25,598	421	14,076	819	31,806	685	17,592
Others	371	46,015	406	23,093	728	34,787	651	31,642
Education								
Illiterate	1,508	15,645	2,423	13,317	2,190	19,258	3,311	18,350
Literate	3,046	36,841	1,401	29,325	4,838	41,822	2,293	32,745
MPCE								
Poor	1,146	12,816	1,098	11,290	1,871	22,410	1,578	15,761
Middle	747	20,280	618	12,554	1,127	28,100	935	19,032

Table 2 (continued)

Variables	71st round (2014)				75th round (2017–18)			
	N (Men)	OOPE (Men)	N (Women)	OOPE (Women)	N (Men)	OOPE (Men)	N (Women)	OOPE (Women)
Rich	2,661	36,772	2,108	23,053	4,030	42,020	3,091	30,097
Marital Status								
Unmarried	26	18,250	47	20,403	60	49,996	26	15,240
Currently married	3,815	31,362	1,576	23,038	5,895	35,998	2,423	27,623
Others	713	21,646	2,201	15,485	1,073	27,659	3,155	21,931
Diseases								
NCD	2,420	40,190	1,791	24,443	3,742	44,887	2,696	31,892
CD	1,649	13,718	1,645	11,535	2,555	18,276	2,308	13,153
Others	485	34,266	388	27,697	731	43,023	600	36,309
Living arrangement								
Alone	70	16,616	148	18,218	101	15,139	346	16,439
With spouse	76	14,644	238	10,810	1,455	33,659	546	26,367
Others	4,408	30,158	3,438	19,675	5,471	35,166	4,712	24,592
Financial dependence								
Independent	1,736	30,140	415	18,388	2,936	42,019	526	20,647
Partially	971	34,981	664	13,123	1,745	28,731	1,269	24,737
Fully	1,841	26,969	2,737	20,323	2,343	32,211	3,806	24,488

SC/ST Scheduled caste/Scheduled Tribe, *CD* Communicable diseases, *NCD* Non-communicable diseases, *OOPE* Out of Pocket Expenditure, *MPCE* Monthly per capita expenditure

Table 3 Mean out of pocket expenditure (OOPE) in Rupees for older men and women in different states among in India, NSSO 71st and 75th round

Sates/UT's	71st Round				75th Round		
	OOPE (Men)	OOPE (Women)	OOPE (Ratio men/ women)		OOPE (Men)	OOPE (Women)	OOPE (Ratio men/women)
Jammu & Kashmir	12,136	14,356	0.85		16,230	7,365	2.20
Himachal Pradesh	31,301	14,573	2.15		36,496	15,429	2.37
Punjab	43,181	28,329	1.52		50,572	30,662	1.65
Chandigarh	15,406	42,076	0.37		1,05,839	13,476	7.85
Uttarakhand	7,439	22,034	0.34		53,872	42,269	1.27
Haryana	37,997	48,304	0.79		40,174	27,551	1.46
Delhi	62,153	36,332	1.71		48,337	79,828	0.61
Rajasthan	19,155	14,729	1.30		27,192	27,557	0.99
Uttar Pradesh	40,520	29,843	1.36		32,646	24,767	1.32
Bihar	22,891	27,991	0.82		45,643	10,984	4.16
Sikkim	30,001	10,343	2.90		10,396	13,376	0.78
Arunachal Pradesh	12,377	7,740	1.60		7,094	7,925	0.90
Nagaland	9,981	11,364	0.88		20,602	15,088	1.37
Manipur	13,831	26,150	0.53		28,753	13,595	2.11
Mizoram	19,127	28,382	0.67		15,268	15,856	0.96
Tripura	11,600	5,412	2.14		9,880	4,555	2.17
Meghalaya	25,393	15,858	1.60		19,070	23,507	0.81
Assam	31,858	10,944	2.91		46,518	27,596	1.69
West Bengal	22,419	20,824	1.08		33,870	25,217	1.34
Jharkhand	10,468	13,879	0.75		19,849	31,225	0.64
Orissa	23,013	12,875	1.79		23,694	9,894	2.39
Chhattisgarh	22,422	25,118	0.89		25,450	6,204	4.10

Table 3 (continued)

Sates/UT's	71st Round			75th round		
	OOPE (Men)	OOPE (Women)	OOPE (Ratio men/ women)	OOPE (Men)	OOPE (Women)	OOPE (Ratio men/women)
Madhya Pradesh	23,860	17,157	1.39	31,052	16,234	1.91
Gujarat	30,350	23,044	1.32	23,043	20,875	1.10
Daman & Diu	N.A	N.A	N.A	1,03,191	47,347	2.18
Dadra & Nagar Haveli	2,892	8,026	0.36	1,896	2,295	0.83
Maharashtra	27,842	27,046	1.03	55,416	23,132	2.40
Andhra Pradesh	17,563	13,480	1.30	25,444	11,521	2.21
Karnataka	21,653	18,800	1.15	43,122	20,001	2.16
Goa	28,490	35,815	0.80	17,537	19,283	0.91
Lakshadweep	17,914	7,061	2.54	26,400	18,090	1.46
Kerala	42,252	17,302	2.44	33,679	16,502	2.04
Tamil Nadu	42,088	14,092	2.99	40,374	26,740	1.51
Pondicherry	7,923	4,009	1.98	49,214	10,276	4.79
Andaman & Nicobar Islands	6,480	1,929	3.36	39,826	55,606	0.72
Telangana	18,853	14,486	1.30	42,401	39,979	1.06

N.A No data available, *OOPE* Out of Pocket Expenditure

Table 3 indicated that the highest OOPE was in Delhi for men (Rs. 62,153), whereas, for women, it was highest in Haryana (Rs 48,304) in 2014. In 2018, the highest OOPE among men was in Chandigarh (Rs. 105,839), whereas, for women, it was highest in Delhi (Rs 79,828). The inequality for men and women can be interpreted by the men and women ratio. We found that the highest inequality in terms of expenditure observed in Andaman and Nicobar Island, where the average OOPHE was 3.36 times higher among men in comparison to women, followed by Tamil Nadu (2.99) and Sikkim (2.90) in 2014. In 2018, this inequality was highest in Pondicherry (4.79), followed by Bihar (4.16) and Chhattisgarh.

Table 4 depicts linear regression estimates for experiencing the OOPE for inpatient care among the older adults by selected background variables in 2014 and 2017–18 in India. Model 1 consists of the unadjusted estimates of the parameters. We found that impatient care expenditure on older people is higher among households with older adults headship for the year 2014 (0.11; 95% CI: 0.02, 0.20) and period 2017–18 (0.05; 95% CI: 0.01, 0.11). In model 2, after controlling all other variables, we found that increased age, urban residence, being literate, having high MPCE, living with family members, and being men found to be positively associated with inpatient care expenditure for both the periods 2014 and 2017–18. Along with that, the OOPE on older inpatient care was found to be lower among the households with older adults headship after controlling other factors included in the model. A similar pattern was observed for the year 2017–18. Among older adults suffering from communicable disease, the probability of incurring OOPE for inpatient care was 88 per cent lower than older adults with NCDs. This effect may be because all the possible predictors affected the OOPE adjusted in the model.

Regression results of interaction terms of gender with selected covariates are given in *supplementary material*. Model 3 focuses on the interaction effect of gender and household headship. The results showed that older women and older men heads of households spent insignificantly lower on older inpatient care than non-older men head of households for the year 2014 (*supplementary table 1*). However, the coefficient was significant for the year 2017–18 (*supplementary table 2*). The interaction term of MPCE and gender reported in model 4. We found that the OOPE on inpatient care among rich older men and women is significantly higher than poor older men for the year 2014 and 2017–18. The interaction effect of gender and marital status presented in model 5 is insignificantly negatively associated with the OOPE on inpatient care among the older adults for both periods. The interaction term of gender and living arrangements is included in model 6. We found that older women living with spouses spent a significantly lower amount on inpatient care than older men living alone (-1.09; CI 95%: -1.57, -0.61) for the year 2014. However, no significant association between the interaction term of living arrangement and gender with the OOPE on inpatient care has been observed for the period 2017–18.

Finally, model 7 included the interaction effect of gender and economic dependence on older adults. Independent older women spent significantly higher (0.39; CI 95%: 0.23, 0.55) while partially dependent older women spent significantly lower (-0.68; CI 95%: -0.82, -0.53) than independent older men on inpatient care in 2014. While for the period 2017–18, in contrast, independent older women have lower (-0.25; CI 95%: -0.40, -0.09) expenditure than older men on inpatient care.

Table 4 Multivariate Regression analysis for OOPE among older adults in India (unadjusted and adjusted), NSSO 71st and 75th round

Variables	71st round (2014)		75th round (2017–18)	
	Model-1# (Unadjusted) OR (95% CI)	Model-2$ OR (95% CI)	Model-1# (Unadjusted) OR (95% CI)	Model-2$ OR (95% CI)
Head of the Household				
Non-older adult	Ref	Ref	Ref	Ref
Older adult	0.11*(0.02,0.2)	-0.05(-0.15,0.05)	0.05(0.01,0.11)	-0.11*(-0.18,-0.04)
Age (in years)				
60–69	Ref	Ref	Ref	Ref
70–79	0.16*(0.08,0.24)	0.01(-0.08,0.08)	0.12*(0.06,0.18)	0.11*(0.05,0.17)
80+	0.02(-0.1,0.14)	-0.12*(-0.23,-0.01)	0.25*(0.16,0.34)	0.1*(0.02,0.19)
Gender				
Men	Ref	Ref	Ref	Ref
Women	-0.41*(-0.49,-0.34)	-0.02(-0.1,0.06)	-0.26*(-0.32,-0.2)	-0.07(-0.15,0)
Place of residence				
Rural	Ref	Ref	Ref	Ref
Urban	0.51*(0.43,0.58)	0.31*(0.23,0.38)	0.47*(0.41,0.53)	0.38*(0.32,0.44)
Caste				
SC/ST	Ref	Ref	Ref	Ref
Non- SC/ST	0.81*(0.71,0.91)	0.54*(0.44,0.63)	0.58*(0.51,0.65)	0.29*(0.22,0.36)
Religion				
Hindu	Ref	Ref	Ref	Ref
Muslim	-0.17*(-0.29,-0.04)	-0.29*(-0.41,-0.18)	-0.14*(-0.22,-0.05)	-0.19*(-0.27,-0.11)
Others[a]	0.40*(0.27,0.53)	0.14*(0.02,0.27)	0.28*(0.18,0.38)	0.13*(0.04,0.23)
Education				
Illiterate	Ref	Ref	Ref	Ref

Table 4 (continued)

Variables	71st round (2014)		75th round (2017–18)	
	Model-1[#] (Unadjusted)	Model-2[$]	Model-1[#] (Unadjusted)	Model-2[$]
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Literate	0.80*(0.73,0.88)	0.34*(0.26,0.41)	0.6*(0.54,0.66)	0.28*(0.22,0.34)
MPCE				
Poor	Ref	Ref	Ref	Ref
Middle	0.27*(0.14,0.4)	0.18*(0.06,0.3)	0.15*(0.06,0.24)	0.13*(0.05,0.21)
Rich	0.80*(0.71,0.89)	0.63*(0.54,0.71)	0.62*(0.55,0.69)	0.57*(0.5,0.63)
Marital Status				
Unmarried	Ref	Ref	Ref	Ref
Currently married	-0.17(-0.63,0.3)	-0.17(-0.67,0.33)	-0.17(-0.51,0.16)	-0.05(-0.37,0.28)
Others[b]	-0.65*(-1.12,-0.18)	-0.37(-0.87,0.12)	-0.48*(-0.82,-0.14)	-0.27(-0.6,0.05)
Diseases				
NCD	Ref	Ref	Ref	Ref
CD	-0.88*(-0.96,-0.8)	-0.69*(-0.76,-0.62)	-0.89*(-0.95,-0.83)	-0.78*(-0.84,-0.72)
Others[c]	0.06(-0.06,0.19)	0.09(-0.03,0.2)	0.19*(0.09,0.28)	0.26(0.17,0.35)
Living arrangement				
Alone	Ref	Ref	Ref	Ref
With spouse	-1.27*(-1.54,-1)	-1.08*(-1.33,-0.82)	0.71*(0.55,0.87)	0.22*(0.05,0.38)
Others[d]	0.21(-0.02,0.43)	0.04(-0.19,0.26)	0.69*(0.54,0.84)	0.34*(0.19,0.49)
Financial dependence				
Independent	Ref	Ref	Ref	Ref
Partially	-0.62*(-0.73,-0.51)	-0.41*(-0.51,-0.3)	-0.19*(-0.27,-0.11)	-0.1*(-0.18,-0.02)
Fully	-0.18*(-0.27,-0.09)	-0.07(-0.15,0.02)	-0.05(-0.12,0.02)	0.07(0,0.15)

Table 4 (continued)

Variables	71st round (2014)		75th round (2017–18)	
	Model-1# (Unadjusted) OR (95% CI)	Model-2$ OR (95% CI)	Model-1# (Unadjusted) OR (95% CI)	Model-2$ OR (95% CI)
Number of observations		8,357		12,616
R-Square		0.19		0.15
F statistics		100.28		120.62

SC/ST Scheduled Caste/Scheduled Tribe, *CD* Communicable diseases, *NCD* Non- communicable diseases, *Ref* Reference category, *OOPE* Out of Pocket Expenditure, *MPCE* Monthly per capita expenditure

*if $p < 0.05$

[a]Christianity, Sikhism, Jainism, Buddhism, Zoroastrianism, and others

[b]widowed, divorced, separated

[c]Injuries

[d]living with spouse and other members, and living without spouse but other members

#model-1 represents the unadjusted odds ratios

$model-2 represents the adjusted odds ratios

Discussion

In the last two decades, life expectancy at birth in India has increased and is expected to reach 70 by 2023 (Office of the Registrar General and Census Commissioner, India, 2006). The increased lifespan is, however, associated with increased economic insecurity, decreased family support, and decreased health. As India is a low-income country, the percentage of OOPE is as high as 89 per cent (World Bank, 2017a, b). This study provides gender differentials in OOPE among older adults using two rounds of a nationally representative sample. Our findings suggest that the OOPE related to older adults is substantially higher among households with older adult as a head than with non-older adult as a head. It suggests that if the household head is an older adult, then the health care rights of older adults remain preserved. As a previous study has found, the distribution of OOPE over time has shifted dramatically over the period 2014–18 and remains higher for older adult men (Mohanty et al., 2014). One important reason for the high OOPE is that older adult patients may have multiple morbid conditions. Thus, patients have to see multiple physicians for managing their numerous medical conditions, leading to over-medication and polypharmacy and thus have to spend more (Mohanty et al., 2014; Park et al., 2015). The cost of inpatient treatment continues to grow with age as it has been found that among older men and women, expenditure is higher for age 60 years and above, over the period 2014–2018. Expenditures on long-term care increase sharply with age, consistent with previous findings (Stewart, 2004). This result confirms that expenditure for inpatient decedents is inversely proportional to the life expectancy (Melberg & Sørensen, 2013).

Health-related OOPE is always higher for the urban area than the rural area for both older men and women. The following reasons could explain these variations in inpatient care utilization. It should be noted that the provision of private and public health-care facilities is very biased towards the urban areas in India. In reality, urban people who make up just 28 per cent of India's population have access to 66 per cent of the country's total hospital beds, while the proportion of beds available in rural areas for the remaining 72 per cent is 34 per cent (Aitken et al., 2013; Ghosh, 2014). The concentration of services in urban areas may have resulted in a more equitable distribution of inpatient treatment in urban areas vis-à-vis rural areas. The quality of care, however, varied significantly between public and private hospitals in urban areas; and it seemed that those who were willing to receive medical care ended up receiving the comparatively poorer quality of treatment compared to their better-off counterparts, as reflected in their long hospital stay. On the other hand, due to inadequate hospital affordability in rural areas, the option of access to inpatient care was minimal for rural residents, and because the facilities available were not inexpensive and open to the poor, the rich spent more nights in the hospital than the poor ones (Ghosh, 2014).

Also, we have found that, for all age groups, older women living alone spent higher OOPE on inpatient care compared to men, probably because the prevalence of high burden for medical care in women is substantially higher than in men; this

finding is consistent with a study conducted in 2003 (Selden & Banthin, 2003). The OOPE for inpatient care varied considerably from state to state. Among men, Delhi (the year 2014) and Chandigarh (the year 2018) have the highest OOPE, while among women, Haryana (the year 2014) and Delhi (the year 2018) have the highest OOPE, respectively. States such as Delhi, Haryana, and Chandigarh, with a relatively higher level of public spending, showed a higher level of OOPE in inpatient care.

OOPE on inpatient care was higher among older men who belonged to the rich category and among the better-educated people, creating a link between the willingness to pay and the quality of health care services. Those with an economic status below the poverty line can benefit from the Medical Aid program, but individuals with assets or working children are exempt from these benefits (Park et al., 2015). Previous studies have been reported that the OOPE is far higher among the richer ones in India and other developed countries (Baird, 2016; Kastor & Mohanty, 2018; Mohanty et al., 2016). The OOPE for men was higher for NCDs than CDs and disease from other causes, which further increased over time. NCDs are more common than CDs and other diseases and are generally more time-consuming to be treated, making them more costly than treatment of other diseases (Huffman et al., 2011; Binnendijk et al., 2012; Karan et al., 2014; Ladusingh et al., 2018; Pandey et al., 2018a). On the other hand, independent men are spending more on inpatient care compared to independent women. In the light of rapidly changing demographics, increased NCDs, and increased cost of medication, health spending is more likely to increase over the coming years and may drive families and individuals into poverty trapping.

Conclusion

In conclusion, this study found that older people's health status was poor. The low social-economic status of the respondents adversely affected their health status as well as their health-seeking behaviour. Although OOPE among older adults has been well documented, we have little information about the nature of its growth and how high-cost spenders by gender-wise that drive it up until now. Our analysis shows a striking trend in health-care expenditure growth. This study's findings are significant and provide new information on discrepancies between older men and women in health-care spending. Older men were found to have slightly higher health care costs relative to women in this nationally representative survey, after adjusting for confounding factors (Williams et al., 2017).

Seniors typically have limited retirement income, but in developing countries where social security programs, including pension security, are not adequately developed, the low-income status among the older adults is much larger. The low-income status of the older adults, combined with the payment program for co-insurance, results in a significant burden on drug costs. In addition, individuals who belongs to high-income groups are keen to pay more OOPE as they prefer to receive better treatment. For instance, they may prefer to see specialist doctors in private settings, with relatively high consultation fees, rather than

'waiting for their turn' in the public system. Thus, individuals from low-income groups are more likely to incur the financial burden linked to OOPE. Therefore, our findings indicate that given a health-care system that offers universal coverage and a well-established and robust social security program, some individuals with chronic illness face significant cost pressures that fall most heavily on those who can at least bear them (Islam et al., 2014).

Maintaining freedom is the main goal of successful ageing (Depp & Jeste, 2006). In addition, the attention paid to maintain functional ability is a major aspect of the health care of older adults; avoiding disability by effective management of chronic diseases and impairments is of vital importance for the treatment of older adults so that they can continue to live in the community independently for as long as possible (Hung et al., 2011).

The Indian government has implemented many health insurance programs like National Health Mission (NHM), Rashtriya Bima Swasthya Yojana (RBSY), Aam Aadmi Bima Yojana, Universal Health Insurance Scheme (for poor families), Central Government Health Scheme (CGHS), Rajiv Aarogyasri Scheme in Andhra Pradesh, Mukhyamantri Amrutam scheme in Gujarat, Chief Minister's Comprehensive Health Insurance Scheme in Tamil Nadu, National Program for Cancer, Diabetes, Cardiovascular Disease, and Stroke Prevention and Control (NPCDCS) in 2010 (Kastor & Mohanty, 2018). Despite the implementation of these programs, a majority of the Indian population continues to incur a relatively high OOPE fee for drugs in need of inpatient care as less than 20 per cent of the population is covered by any health insurance scheme, and many of these schemes do not cover chronic illnesses (Central Bureau of Health Intelligence, 2015; Mahal, 2002). It is important to highlight that hospitalization frequency is significantly lower than outpatient visits in general, especially for chronic NCDs requiring frequent appointments and long-term or lifelong medication support (Thakur et al., 2011). Clinicians must also ensure that clinical recommendations are followed to decrease the incidence of comorbid conditions and postpone the occurrence of adverse complications, all of which may impact costs. Literature also suggests that male patients with multiple chronic conditions, who have poor physical and mental health are likely to face a severe OOPE burden (Islam et al., 2014; Williams et al., 2017). Pharmaceutical products in many countries have changed health insurance policies, especially in Asian countries where the ageing population is rapidly growing, and the majority of the older adults are not eligible for pension benefits. Based on the finding, we propose increasing public spending on geriatric care, especially for non-communicable diseases among older adults. Though there are many social insurance programs (social benefits schemes) such as old-age pensions, tax concessions, and family laws for the care of older adults, little effort has been made to provide the older adults with geriatric care and health needs. (Kastor & Mohanty, 2018). Finally, there is limited literature examining gender differences in health-care spending among older adults. Further research is required to clarify the drivers of these disparities and identify possible factors associated with higher costs (Williams et al., 2017).

Limitations

There are some limitations to the analysis. First, this research was limited to inpatient care (hospitalization) only, and NSS, which collects data on OOPE of inpatient, is self-reported. Second, recall bias may be higher in the 365 days reference period and may have resulted in underestimating households' OOPE. Third, for inpatient cases, the issue of comorbid conditions did not play a major role because NSSO data capture disease expenditure separately for specific disease conditions. Fourth, the data did not provide detailed information on the number of borrowings/debts, the expense of borrowings (interest rates), availability and cost of drugs, access to modern treatment techniques, and how they are repaid; therefore, the reliable estimates could not be quantified. Finally, while there are substantial state-level and men-women variations in the estimates provided in this paper, we have focused on the Indian average as a whole and believe that state-level and rural–urban analyses may be possible future work.

Recommendations

The expenditure by households for treating any chronic condition needs to be considered from a policy perspective. While health education, prevention, and early care will mitigate some of these costs, there is a need to implement health financing systems that enhance financial risk security and help achieve universal health coverage for those who have acquired the disease and need care. Policymakers need to ensure that future changes tackle both the health as well as the financial burden adequately. The cost-sharing effect should not, however, be overlooked. Given the economic burden of chronic diseases that require lifetime care, policy interventions are required to reduce the cost burden of chronic conditions for older people, such as reducing co-insurance on chronic medicines. There is a need to enlarge the number of various schemes. Also, the extension of the NPCDCS to all the districts which were initially implemented in 100 districts representing 21 states will also help to prevent many households from falling into the trap of medical poverty (Kastor & Mohanty, 2018). Though, National Health Policy (2017) highlighted the need to provide free medicines in public health facilities through increased investment and strengthening mechanisms in the drug procurement and supply chain (National Health Policy, 2017). It aims to boost central government spending on health by 2025 from the current level of 1.15% to 2.5% of GDP (Kastor & Mohanty, 2018). Both national and state governments are required to provide free medicines in public health facilities and expand the mechanism of the price limit for key medicinal products in the private sector. Lastly, as other studies have reported, the higher spending on health-care by the state governments increases the ability of the public health facilities to cope with the increasing demand for health-care and thereby improves the utilization of inpatient care by the poor (Chuma et al., 2012; Prinja et al., 2013).

Declarations

Conflict of Interest The authors declare no conflict of interest.

Informed Consent Not applicable.

Ethical Treatment of Experimental Subjects (Animal and Human) Not applicable.

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