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Original Article

Monthly Healthcare Expenditure Among Older Adults From an Urban Slum in India: An Equity Analysis

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Abstract

Introduction: The growing older adults' population is associated with increasing chronic disease prevalence and inequitably distributed healthcare expenditure. The primary aim was to estimate average monthly healthcare expenditure among older adults and explore equity or inequity in its distribution.

Methods: We conducted a secondary analysis of cross-sectional data from 400 adults aged ≥ 60 years in Raipur, India. Self-reported healthcare expenditure over the preceding six months was averaged to obtain monthly healthcare expenditure and compared across PROGRESS and PROGRESS-Plus factors, with adjustment for comorbidities and depression. Information on insurance, reimbursement, and source of payment was unavailable.

Results: Mean monthly healthcare expenditure was INR 763.15 (SD 967.36). Expenditure was significantly higher among participants with depression than among those without depression (adjusted mean difference: INR 868.4; 95% CI: 699.5–1037.3; $P < .001$). Depression scores showed a moderate positive correlation with expenditure (Spearman's $\rho = 0.674$; $P < .001$).

Conclusion: Among older adults residing in the urban slum studied, monthly healthcare expenditure differed across several equity-relevant characteristics, while depression was strongly associated with higher expenditure. These findings indicate potentially important expenditure inequalities; however, incomplete measurement of healthcare need precludes definitive attribution of the observed differences to inequity.

Keywords: Older adults, Healthcare expenditure, Health inequity, Urban slum

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Introduction

The world's population is ageing rapidly.[1] This can be attributed to dramatic increase in life expectancy due to major advances in medicine and technology, increased focus on public health, improved education, and better nutrition.[2] India is no different. Epidemiological and demographic transition coupled with improvements in health has resulted in a steady increase in proportion of Indian older adults from 5.3% in 1951 to 8.6% in 2011;[3] expected to increase to 12.7% by 2026.[4] It is not only the total number of older adults, but also the number of older adults in urban areas that is steeply increasing. In India, the share of older adults in total urban population has increased from 4.7% in 1961 to 8.1% in 2011.[4,5]

The ageing population in India is a public health challenge for two important reasons. Firstly, increasing longevity and decreasing mortality leads to an increase in multiple comorbid conditions, commonly known as 'Multimorbidity'.[6,7] In an analysis published from Longitudinal Ageing Study in India (LASI), the prevalence of single morbidity among older adults was 17.0% and multimorbidity was 72.0%.[6] Secondly, the costs associated with managing chronic conditions. The mean out-of-pocket expenditure of older adults on out-patient care in one month prior to LASI survey was 1,149 INR in India and 962 INR in Chhattisgarh.[8] Health expenditure in India is largely financed by households. The Total Health Expenditure (THE) as percentage of Gross Domestic Product (GDP) is 3.31%; however, only 1.35% is contributed by the government. The per capita out of pocket expenditure in India is 2,097 INR; almost 50% of total healthcare expenditure.[9] The per capita health expenditure has been increasing over time, which is associated with rising medical costs, medical technology, increase in non-communicable diseases, medical inflation, rising income, and a change in the country's population age structure.[10-13]

Intertwined with increasing morbidities, co-morbidities and healthcare expenditures among older adults is the inequality that exists based on background characteristics. The mean out of pocket expenditures among older adults were highest in urban, male, currently married, living with spouse or children and those from richest quintile.[6] Against this background, the primary aim of the study is to estimate the average monthly healthcare expenditure in older adults and to explore equity or inequity in monthly healthcare expenditure.

Methods

We present findings from secondary analysis of data from a community based analytical cross-sectional study

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conducted to estimate the prevalence of depression among older adults. The study was conducted in an urban slum of Raipur city, Chhattisgarh, India between 2019 and 2020. Detailed study methodology has been published earlier.[14,15] In short, we enrolled older adults (>60years) residing in the study area for at least six months preceding the date of survey (permanent residents) and having Hindi Mental Status Examination (HMSE) scale scores >19 (illiterate) or >24 (literate).[16] Older adults people not at home even after the third visit, debilitated, with hearing impairment and blindness, with history of psychosis, bipolar depression, schizophrenia, and use of psychotropic drugs were excluded. The primary study was approved by Institute Ethics Committee, All India Institute of Medical Sciences, Raipur, Chhattisgarh, India (AIIMSRPR/IEC/2018/178).

The primary outcome was self-reported healthcare expenditure incurred for the participant's healthcare during the six months preceding the survey, expressed as an average monthly expenditure in Indian rupees (INR). The amount was calculated as the sum of reported expenditure on medicines, medical investigations, consultation or doctor fees, hospital and nursing-home charges, and other medical expenses, averaged over the six-month reference period. The source of payment was not separately recorded; specifically, information on health-insurance coverage, reimbursement, third-party payment, or the proportion of expenditure ultimately borne directly by the participant or household was unavailable. Accordingly, the outcome represents reported monthly healthcare expenditure. The PROGRESS/PROGRESS-Plus framework was used as an equity-oriented framework for identifying socially relevant characteristics across which differences in healthcare expenditure could occur. PROGRESS comprises place of residence, race/ethnicity/culture/language, occupation, gender/sex, religion, education, socioeconomic status, and social capital, while PROGRESS-Plus incorporates additional context-specific characteristics associated with disadvantage. The framework identifies dimensions across which health inequalities or inequities may arise; however, the presence of a between-group difference alone does not establish that the difference is unfair or inequitable. In accordance with health-equity methodology, interpretation of inequity requires consideration of differences in healthcare need. In the present secondary analysis, the presence of comorbidities constituted the principal available indicator of healthcare need. Consequently, crude differences were interpreted as healthcare-expenditure inequalities across equity-relevant strata, whereas differences persisting after adjustment for comorbidities were considered suggestive of potential inequity rather than definitive evidence of inequity, because comprehensive measures of healthcare need were unavailable. Depression was examined as an additional clinically relevant correlate and covariate and was not assumed to represent a causal mediator of the association between PROGRESS/PROGRESS-Plus characteristics and healthcare expenditure.[17,18]

Depression in older adults was evaluated using validated Hindi version of Geriatric Depression Scale (GDS-15) – older adults with scores less than 5 was considered not to have depression, whereas scores 5 to 8, 9 to 11 and 12 to 15 suggests mild, moderate, and severe depression respectively. GDS-15 has a sensitivity of 92% and a specificity of 81% with a high degree of internal consistency, for identifying depression in the older adults.[19] Other scales used in the study include Lubben Social Network Scale – 6 (LSNS-6) (to estimate family and friendship ties) and Katz Activities of Daily Living (Katz ADL) index (to assess functionality).[20,21]

The data available for 400 participants were analyzed using Software for Statistics and Data Science (Stata) v16. As variability in monthly healthcare expenditure is often wide, normality of the data was checked. Provided that the dependent variable monthly healthcare expenditure is continuous, Mann-Whitney U test was applied to compare differences between two independent groups. For the analysis of PROGRESS and PROGRESS-Plus factors, mean differences in monthly healthcare expenditure were estimated without adjustment and using two adjusted models: one adjusted for comorbidities alone and another adjusted for both comorbidities and depression. Comorbidity adjustment was intended to account, to the extent permitted by the available data, for differences in healthcare need. Depression was included in the additionally adjusted model as a clinically relevant correlate of healthcare expenditure to determine whether expenditure differences across PROGRESS/PROGRESS-Plus strata were attenuated after accounting for depression. When comparing monthly healthcare expenditure between older adults with and without depression overall and within PROGRESS/PROGRESS-Plus subgroups, adjusted mean differences were estimated after adjustment for comorbidities alone. Depression was the explanatory variable and was therefore not included as a covariate in that analysis. Spearman rank correlation coefficients were estimated."

Results

The mean (SD) monthly healthcare expenditure (in INR) in the study population was 763.15 (967.36). The results for health inequity in monthly healthcare expenditure analyses are presented in Table 1. Unadjusted estimates show that differences were observed in terms of employment, social capital (emotional attachment with family members, presence of conflict in the family and marginal family ties representing families; marginal friendship ties, visiting friend/group/ place on regular basis and attending social functions representing neighbourhoods/communities) and functionality. Importantly, all these factors remained significant when adjusted for presence of comorbidities. Inequity in monthly healthcare expenditure was highest in older adults not fully functional (MD 1286.0, 95% CI 938.3 to 1633.7), with limited social capital (not attending social functions, MD 1040.2, 95% CI 818.9 to 1261.6); presence of conflict in family, MD 842.7, 95% CI 572.2 to 1113.1; marginal friendship ties, MD 756.6, 95% CI 580.1 to 933.2; not visiting friend/group/place on regular basis, MD 647.9,

Table 1. Association of PROGRESS and PROGRESS-plus factors with monthly healthcare expenditure among elderly

Variables		Monthly healthcare expenditure (in INR) among elderly (n = 400)				
		Mean	SD	Unadjusted MD (95% CI)	Adjusted MD (95% CI)[a]	Adjusted MD (95% CI)[b]
Employment	Present	577.6	714.2	255.0 (42.7 to 467.4)*	174.8 (-15.2 to 364.7)	222.4 (10.2 to 434.6)*
	Absent	832.6	1039.1			
Sex	Male	715.4	932.8	-82.6 (-275.2 to 109.9)	54.9 (-116.3 to 226.1)	57.9 (-133.8 to 249.6)
	Female	798.1	992.5			
Religion	Hindu	761.1	970.3	-83.9 (-693.7 to 525.8)	117.9 (-421.8 to 657.8)	111.4 (-493.2 to 715.9)
	Non-Hindu	845.0	884.6			
Education	Literate	685.0	959.9	-120.2 (-319.5 to 79.0)	56.8 (-120.3 to 233.9)	125.5 (-71.9 to 322.9)
	Illiterate	805.2	970.5			
Emotionally attached with family members	Yes	648.8	854.3	601.9 (366.5 to 837.2)*	-224.7 (-456.5 to 7.2)	616.6 (383.7 to 849.5)*
	No	1250.7	1240.1			
Presence of conflict in the family	Yes	1502.9	1326.8	847.8 (574.9 to 1120.8)*	502.8 (243.0 to 762.6)*	842.7 (572.2 to 1113.1)*
	No	655.0	853.3			
Marginal family ties	Present	1293.2	1256.4	621.8 (360.4 to 883.2)*	-172.7 (-430.3 to 84.9)	623.5 (364.6 to 882.4)*
	Absent	671.4	878.5			
Marginal friendship ties	Present	1203.0	1138.6	778.6 (602.5 to 954.6)*	-197.7 (-464.8 to 69.4)	756.6 (580.1 to 933.2)*
	Absent	424.5	630.7			
Visiting friend/group/ place on regular basis	Yes	553.6	758.5	665.1 (470.9 to 859.3)*	285.1 (83.4 to 486.8)*	647.9 (454.6 to 841.2)*
	No	1218.7	1193.8			
Attending social functions	Yes	566.4	733.4	1063.5 (841.8 to 1285.1)*	684.3 (452.3 to 916.3)*	1040.2 (818.9 to 1261.6)*
	No	1629.9	1336.3			
Socio-economic status	Upper and middle	688.8	959.7	-83.1 (-393.5 to 227.4)	-147.2 (-430.4 to 135.9)	148.7 (-161.8 to 459.3)
	Lower	771.9	969.2			
Functionality	Not fully functional	1976.8	1275.8	1304.9 (954.7 to 1655.3)*	926.4 (598.1 to 1254.8)*	1286.0 (938.3 to 1633.7)*
	Fully functional	671.8	876.6			

Note: The factors are presented in order of PROGRESS and PROGRESS plus framework, provided the factors are available and appropriate. Social capital describes support available through informal social networks of neighbourhoods, communities, and families. Factors "Emotionally attached with family members", "Presence of conflict in the family" and "Marginal family ties" represent families; factors "Marginal friendship ties", "Visiting friend/group/ place on regular basis" and "Attending social functions" represent neighbourhoods/communities. [a] Adjusted for presence of comorbidities and depression, [b] Adjusted for comorbidities only, * Significant at $P<0.05$

95% CI 454.6 to 841.2; marginal family ties, MD 623.5, 95% CI 364.6 to 882.4; not being emotionally attached with family members, MD 616.6, 95% CI 383.7 to 849.5) and being unemployed (MD 222.4, 95% CI 10.2 to 434.6) in that order. When adjusted for presence of comorbidities and depression, inequity in monthly healthcare expenditure turned insignificant for employment and few factors of social capital (emotional attachment with family members, marginal family, and friendship ties).

The mean (SD) monthly healthcare expenditure was 1192.14 (1155.83) among depressed and 307.63 (332.59) among non-depressed older adults – a statistically significant difference (Adjusted MD 868.4, 95% CI 699.5 to 1037.3; $P<0.001$). The amount of money spent by an older adult on his/her own healthcare per month was found to be positively correlated with depression ($rs(\rho)=0.674$, P value <0.001; moderate correlation). The monthly healthcare expenditure was much higher in older adults with depression irrespective of employment status, sex, religion, education, emotional attachment with family members, friendship ties, regular visits to friend/group/ place and SES. Among social capital factors, monthly healthcare expenditure was higher among older adults with depression provided there was no conflict in family (Adjusted MD 742.4, 95% CI 582.6 to 902.2), older adults attend social functions (Adjusted MD 619.1, 95% CI 473.0 to 765.2) and are fully functional (Adjusted MD 747.9, 95% CI 586.7 to 909.2). Detailed subgroup comparisons are presented in Table 2, and the correlation between depression score and monthly healthcare expenditure is shown in Figure 1.

Discussion

The present study identified substantial differences in monthly healthcare expenditure across several equity-relevant PROGRESS/PROGRESS-Plus characteristics among older adults residing in an urban slum. Differences were particularly evident according to functional status and several measures of social capital and persisted for a number of characteristics after adjustment for comorbidities, the principal available indicator of healthcare need. These findings indicate socially patterned inequalities in healthcare expenditure and raise the possibility of inequitable expenditure; however, they should not be regarded as definitive evidence of inequity because healthcare need was incompletely measured.

Table 2. Difference in monthly healthcare expenditure by depression status across PROGRESS and PROGRESS-plus subgroups among elderly

Variables		Monthly healthcare expenditure (in INR) among elderly (n = 400)						
		Among elderly with depression (n = 206)		Among elderly without depression (n = 194)		MD (95% CI)	Adjusted MD (95% CI)[a]	*P* value
		Mean	SD	Mean	SD			
Overall		1192.1	1155.8	307.6	332.6	884.5 (715.1 to 1053.9)	868.4 (699.5 to 1037.3)	<0.001
Subgroup analysis								
Employment	Present	921.8	874.3	275.0	311.2	646.8 (403.5 to 890.1)	643.9 (399.1 to 888.7)	<0.001
	Absent	1281.1	1223.9	321.5	341.5	959.6 (746.0 to 1173.1)	941.7 (728.9 to 1154.5)	<0.001
Sex	Male	1157.9	1113.4	256.9	281.7	900.9 (652.3 to 1149.6)	869.9 (618.9 to 1120.9)	<0.001
	Female	1216.7	1189.3	345.5	362.7	871.2 (639.3 to 1102.9)	867.4 (636.6 to 1098.2)	<0.001
Religion	Hindu	1185.9	1162.5	309.2	335.0	876.8 (704.2 to 1049.5)	859.2 (686.9 to 1031.4)	<0.001
	Non-Hindu	1440.0	904.4	250.0	239.8	1190.0 (225.1 to 2154.9)	1266.0 (227.7 to 2304.3)	0.024
Education	Literate	1158.8	1212.2	274.4	303.7	884.4 (597.9 to 1170.8)	853.5 (568.9 to 1138.1)	<0.001
	Illiterate	1207.5	1133.0	328.6	349.2	878.9 (666.3 to 1091.6)	868.3 (655.7 to 1080.9)	<0.001
Emotionally attached with family members	Yes	1111.9	1097.5	309.5	336.2	802.4 (634.8 to 970.0)	787.7 (618.7 to 956.7)	<0.001
	No	1351.4	1256.9	257.1	224.4	1094.3 (140.6 to 2047.9)	1281.3 (359.4 to 2203.2)	0.007
Presence of conflict in the family	Yes	1613.0	1349.7	490.0	300.8	1123.0 (-103.5 to 2349.7)	1092.9 (-155.1 to 2340.9)	0.085
	No	1071.1	1068.1	302.8	332.8	768.3 (607.0 to 929.6)	742.4 (582.6 to 902.2)	<0.001
Marginal family ties	Present	1305.2	1263.9	600.0	_	705.2	1077.3 (-1463.3 to 3617.9)	0.399
	Absent	1147.8	1112.0	306.1	332.8	841.7 (675.4 to 1008.0)	826.6 (659.9 to 993.3)	<0.001
Marginal friendship ties	Present	1241.4	1150.3	406.3	305.2	835.2 (29.1 to 1641.3)	923.9 (115.5 to 1732.4)	0.025
	Absent	987.5	1171.0	303.4	333.8	684.1 (486.6 to 881.6)	679.3 (482.4 to 876.2)	<0.001
Visiting friend/group/ place on regular basis	Yes	988.6	1047.6	307.6	340.6	680.9 (511.3 to 850.6)	666.2 (497.1 to 835.3)	<0.001
	No	1380.5	1222.5	307.9	254.5	1072.6 (513.6 to 1631.6)	1081.7 (523.9 to 1639.3)	<0.001
Attending social functions	Yes	938.6	957.9	306.7	333.6	631.9 (484.6 to 779.2)	619.1 (473.0 to 765.2)	<0.001
	No	1664.0	1338.3	400.0	282.8	1264.0 (-635.7 to 3163.8)	1322.4 (-618.2 to 3262.9)	0.179
Socio-economic status	Upper and middle	1930.0	1310.7	300.9	259.2	1629.1 (1144.1 to 2113.9)	1627.1 (1149.4 to 2104.8)	<0.001
	Lower	1154.5	1138.3	308.9	345.9	845.5 (663.0 to 1028.0)	823.7 (640.6 to 1006.7)	<0.001
Functionality	Not fully functional	2031.5	1266.2	500.0	_	1531.5	1210.7 (-1441.5 to 3862.9)	0.356
	Fully functional	1065.5	1086.9	306.6	333.2	758.9 (597.5 to 920.3)	747.9 (586.7 to 909.2)	<0.001

Note: The factors in subgroup analysis are presented in order of PROGRESS and PROGRESS plus framework, provided the factors are available and appropriate. Social capital describes support available through informal social networks of neighbourhoods, communities, and families. Factors "Emotionally attached with family members", "Presence of conflict in the family" and "Marginal family ties" represent families; factors "Marginal friendship ties", "Visiting friend/group/ place on regular basis" and "Attending social functions" represent neighbourhoods/communities. [a] Adjusted for comorbidities only

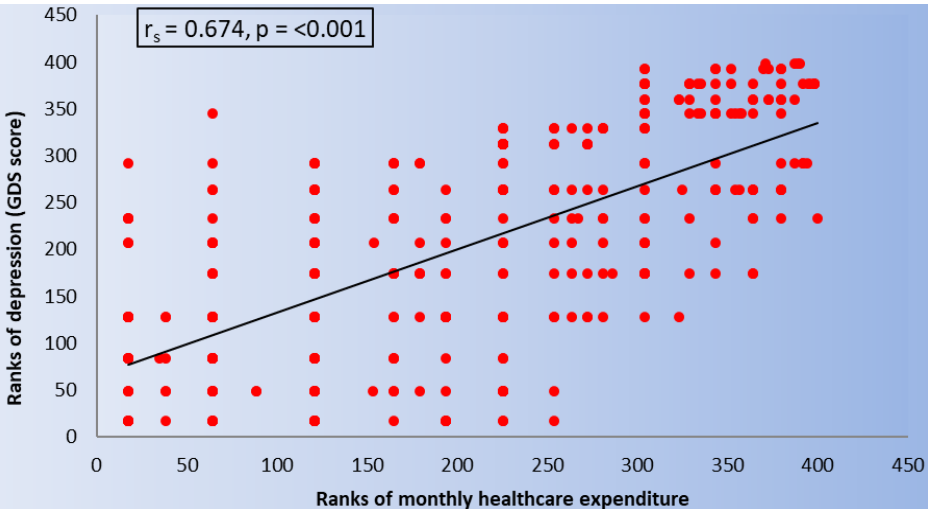


Figure 1. Spearman rank correlation between healthcare expenditure and depression

Depression was strongly associated with greater monthly healthcare expenditure, and additional adjustment for depression attenuated some of the associations between social characteristics and expenditure. Depression should therefore be regarded as an important correlate of healthcare expenditure in this analysis rather than as an established causal mediator or driver of inequity.

Evidence on total monthly healthcare expenditure among older adults in India, inequalities in these expenditures is lacking. The monthly healthcare expenditure among older adults in an urban slum of Raipur city was 764 INR. They are predominantly from lower socio-economic class (89.5%) with six or more family members (47.8%) and without employment (72.8%). More than half (58.0%) of the older adults in this study were financially dependent. At the national level the current rates of out-of-pocket expenditure as percent of total health expenditure is 48.8%,[8] which translates into 373 INR in the present study. In an analysis of consumption expenditure data, National Sample Survey (2009-10), it was reported that monthly per capita health spending in older adults households ranged between 442 INR (16.0% of household consumption expenditure) in richest and 26 INR (5.1%) in the poorest monthly per capita expenditure (MPCE) quintile; overall, an average of 144 INR.[22] The per capita health spending as percentage of monthly per capita health spending was highest for medicines (72.0%).[22] The higher monthly per capita healthcare expenditure among older adults in the present study may be attributed to difference in study duration (growing population, increasing prevalence of chronic diseases and multimorbidity, changing patterns of healthcare utilization, service price and intensity in recent years) and study population (urban slum populations are vulnerable socioeconomically and susceptible to diseases).

It was found that there exists significant inequity in the monthly healthcare expenditure among older adults based on all factors considered except for gender, religion, education, and SES. The non-significance with these factors may be explained by predominance of Hindu religion (97.5%), illiteracy (65.0%) and lower SES (89.5%) in the sample. The factors indicating significant inequity in the monthly healthcare expenditure remained significant when adjusted for presence of comorbidities or a positive past history. This highlighted the observation that inequity in monthly healthcare expenditure among older adults is primarily driven by status of depression among them. In a study that analysed the effect of age on health expenditure among different age groups in China, the per capita health expenditure in age group 65 years or over is 7.25 times as much as the population aged less than 25 years.[23] The China Health and Retirement Longitudinal Study found factors such as household size, per capita income, having members > 65 years, and having members with ≥ 2 chronic diseases to be major and positive contributors of inequality in catastrophic health expenditures.[24] The relative homogeneity of the study population, with 89.5% belonging to the lower socio-economic class, 97.5% identifying as Hindu, and 65.0% being illiterate, may have limited the statistical power to detect expenditure differences across these characteristics. Furthermore, as participants were drawn from a single urban slum in Raipur, the observed patterns of healthcare expenditure and inequity may reflect local socioeconomic, healthcare-access, and population characteristics and should not be assumed to represent other urban slum populations or the older adults' population of India as a whole.

Based on factors of health inequalities, it was found that monthly healthcare expenditure was consistently higher among depressed older adults than those non-depressed, except for conflicts in family, attending social functions and functionality (but these are significant factors in overall analysis, Table 1). Two important findings are, firstly, presence of conflicts in family, older adults not attending social functions like marriages and limited functionality are in itself factors that result in monthly healthcare expenditure inequity. Secondly, irrespective of factors of health inequality, depression in older adults is a driver of inequity in monthly healthcare expenditure among older adults. A positive moderate correlation between scores of depression and monthly healthcare expenditure also strengthens this finding. Similarly, analysis of Medicare Current Beneficiary Survey (MCBS) data between 2007 and 2012 found that total healthcare expenditures were higher among depressed compared to their counterparts without depression.[25] Even among primary care patients, anxiety and depressive disorders are associated with markedly higher health care costs even after adjustment for medical comorbidity.[26] In a community-based study that assessed the effect of older adults having depression on healthcare expenditures in the following year, it was found that older adults with depression in year 1 had a significantly higher healthcare expenditure in year 2 compared with non-depressed older adults after controlling for other covariates, including healthcare needs.[27]

The average monthly healthcare expenditure data among older adults in India is scarce. To the best of our knowledge this is the first study to report on equity or inequity in monthly healthcare expenditure among older adults. Data on past history or presence of chronic diseases, status of depression enabled us in exploring factors driving monthly healthcare expenditure inequity. The present study has several limitations. First, being a secondary analysis of cross-sectional data, the findings demonstrate associations and do not establish a temporal or causal relationship between depression and healthcare expenditure. Second, monthly healthcare expenditure was based on participants' self-reported expenditure over the preceding six months and was therefore susceptible to recall error, particularly in a population with a high proportion of participants with limited literacy. In addition, healthcare expenditure can be episodic, and a single high-cost event such as hospitalization or nursing-home care could disproportionately influence the calculated monthly average for an individual participant and contribute to the observed skewness and large standard deviations. Although the non-normal distribution was addressed analytically using non-parametric

comparisons, the influence of such high-cost episodes on the expenditure estimates cannot be completely excluded. Third, information on total household expenditure, the proportion of expenditure paid out-of-pocket, and the proportion of participants experiencing catastrophic health expenditure was not available; therefore, the broader financial burden of healthcare on older adults' households could not be assessed. Disaggregated information on individual expenditure components, such as consultation charges, medicines, investigations, hospitalization, and other medical expenses, was also unavailable, limiting assessment of which components contributed most to the observed expenditure inequities. Further, comorbidity was captured primarily as the presence or absence of chronic disease, without detailed information on the type, number, duration, or severity of individual conditions. Data on health insurance coverage and differences in healthcare-seeking behaviour between depressed and non-depressed older adults were also unavailable. These unmeasured factors may have influenced healthcare utilization and expenditure and could have contributed to residual confounding in the observed association between depression and monthly healthcare expenditure. Finally, given the exploratory nature of the subgroup analyses and the multiple comparisons performed across PROGRESS and PROGRESS-Plus factors, no formal adjustment for multiple testing was applied. Consequently, some statistically significant associations, particularly those with borderline confidence intervals, should be interpreted cautiously because of the possibility of type I error.

Conclusion

Among older adults residing in the urban slum studied in Raipur, monthly healthcare expenditure was substantial and differed across several equity-relevant social and functional characteristics. Several differences persisted after adjustment for the available measure of healthcare need, indicating potentially important equity concerns, although incomplete measurement of need precludes their definitive classification as inequities. Depression was strongly associated with higher healthcare expenditure and should be considered an important correlate rather than an established causal mediator. These findings support greater attention to mental health, social vulnerability, and healthcare financing among older adults in resource-constrained urban settings.

Authors' Contribution

Conceptualization: Mohan Kumar
Data Curation: Mohan Kumar, Mohan Babu Saminathan
Formal Analysis: Mohan Kumar
Investigation: Mohan Kumar
Methodology: Mohan Kumar, Mohan Babu Saminathan
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Validation: Manisha Ruikar
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Writing–Original Draft: Mohan Kumar, Mohan Babu Saminathan
Writing–Review & Editing: Mohan Kumar, Mohan Babu Saminathan, Manisha Ruikar

Competing Interests

The authors declare no competing interests.

Ethical Approval

The primary study was approved by the Institute Ethics Committee, All India Institute of Medical Sciences, Raipur, Chhattisgarh, India (AIIMSRPR/IEC/2018/178).

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