Understanding Healthcare utilisation and expenditure of South Indian older adults’ – A Community based Cross-sectional study

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Abstract:

Context: In India, the elderly people suffer from at least one chronic disease which requires life-long medication. Financial instability and dependency warrants quality medical care which is affordable and feasible. This study aimed to evaluate the morbidity pattern, healthcare utilisation and healthcare expenditure using Andersen behaviour model. Methodology: A cross sectional community-based study was conducted in South Chennai among 277 elderly persons (above 60 years) with pretested semi-structured questionnaire. Obtained data was tabulated and expressed in frequencies and percentages. Chi-square test was used to find the association of catastrophic OOP and demographic variables. Results: Most of them (77.4%) had atleast one chronic single disease entity, in which most suffered with musculoskeletal pain (71.7%) followed by cataract, diabetes and hypertension. Among 177, 136 (76.8%) opted to seek health care from private health setup, only 41 (23.2%) participants went to public healthcare setup. Only 76 (43%) of the participants had any health insurance policy. About 43.4% of the elderly had catastrophic expenditures seeking treatment in private healthcare sector. Conclusions: Catastrophic out of pocket expenditure exceeds the national level mark among geriatric population which is troublesome. The proportion of the elderly in India is growing continuously, thus exalted financial security should be provided to live their remaining life with dignity.
Key-words: Elderly, Morbidity, Healthcare utilisation, Healthcare Expenditure, Catastrophic, Out of Pocket Expenditure

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Introduction:

'Population ageing' is one of the most discussed global phenomena in the present century. The elderly population (aged 60 years or above) in India accounted for 7.4% of the total population in 2001, 8.6% (104 million; 53 million females and 51 million males) in 2011 and has been projected to increase to 19% by the year 2050. Whereas, the state of Tamil Nadu has high proportion of 10.5% of which 10.2% of the Elderly population resides in urban regions, thereby putting an additional burden on the health care system of the state.

In India, the elderly people suffer from dual medical problems, i.e. both communicable as well as non-communicable diseases, encountering at least one chronic disease which requires life-long medication.

However, current literature suggests that unsupportive attitudes and limited awareness, lack of knowledge and non-acceptance of geriatrics as an established discipline result in inaccessible and poor-quality care for India’s old. Most of these studies are being conducted in slums, rural areas, old age homes, communities, or in the field practice area of medical colleges whereas this study focuses on a part of Metropolitan city where private health sectors are the major providers of healthcare which are expensive and people from various socioeconomic classes becomes an obstacle when it comes to utilizing the healthcare facilities. Hence, this study aims at assessing the morbidity pattern, healthcare utilization and out of pocket expenditure among elderly in South Chennai, Tamil Nadu.

Subjects and Methods:

This is a community based cross-sectional survey conducted in South Chennai of Tamilnadu state in India, consisting of six areas with 77 wards and with a total of 1474 polling booths according to the Tamilnadu Election Commission. Approval from Institutional Ethical committee was obtained before commencement of the study. Persons aged above 60 years (elderly) were the study population. The Sample size required for the current study was derived using the formula - 4PQ/ L =177, Where P = 38. With absolute error of 6%, 95% CI, estimated sample size N=261. To facilitate the subgroup analysis and to account for refusal to participate, it
was decided to include approximately 277 individuals in the final study. Persons aged above 60 years who were residing in the study area for more than one year and gave written consent were included in the study.

The study population were selected using ‘Multi Stage Random Sampling Method (2 stages)’. In Stage I, 18 polling booths (i.e., 3 from each area) out of 1474 were chosen by simple random sampling using computer generated random numbers. In Stage II- Population above 60 years were shortlisted from the complete list of people above 18 years. Out of them, 17 elderly participants from each polling booth were selected by Simple Random Sampling technique by Computer Generated Random Numbers. A total of 306 elderly participants were selected, out of which only 268 were included in the study. The remaining 38 of them were either missing, migrated, expired or some did not fit the inclusion criteria.

All the participants were informed regarding the purpose of study, benefits, procedure and confidentiality of the research study in local language. A written informed consent was taken from the subjects who were approached to participate in the study after establishing the willingness. Confidentiality of the respondents was maintained. The individuals who have morbid conditions needing further management was guided and counselled before referring to hospital. Face to Face interview was conducted using a pretested semi structured questionnaire consisted of four components including sociodemographic details, Morbidity pattern, Healthcare utilization and expenditure was used to elicit data from the study participants. Total expenditure on healthcare was calculated using the components like self-medication spending for past one month, out-patient care spending for past three months and in-patients care spending for past six months. As far as possible, subjective expenses of healthcare mentioned by the elderly were substantiated with the bills of hospital/ prescriptions etc., but then this was not achievable in every single participant.

The operational definition for certain terms used in the study is ‘Totally Dependent’ is defined as elderly people who are completely (100%) requiring financial and basic livelihood assistance on their dependents for lifetime. ‘Partially Dependent’ is defined as elderly people who can partly (>30%) bear their own financial and basic livelihood expenses and also depend partly on their dependants to substantiate their livelihood expenses. ‘Totally Independent’ is defined as elderly people who can completely bear their own financial and basic livelihood expenses without depending. ‘Direct Costs’ is defined as direct expenses in healthcare setup like doctor fees, investigations and inpatient hospital stay. ‘Indirect Costs’ are defined as expenses involved during treatment of an ailment in the healthcare setup like travel (from and to) expenses, food expenses and loss of wages due to illness. ‘Total Medical Expenditure’ is the sum of both direct and indirect medical cost and the amount paid by the insurance company was deducted to estimate the net out of pocket
expenditure. ‘Catastrophic Expenditures’ is defined as healthcare expenditures (direct and indirect) is equal to or exceeding 40% of a household’s total income due to poor health in a month.\textsuperscript{10}

The obtained data was tabulated in Microsoft Excel 365 and analysed by Statistical Package for Social Sciences (SPSS) Software 21.0. Descriptive Statistics for all the variables were calculated in frequencies and percentages. Mean and Standard Deviation were calculated for quantitative variables. Chi square test for trend was applied to find the relationship of health care utilization, morbidity status and Healthcare expenditure with certain demographic variables.

**Results:**

A total of 177 respondents participated in the current study, out of them 66.1% of them belonged to a category of young old (60-70 years) while 33.9% of them belonged to a category of old old (above 70 years). About 56 (31.6%) of them were male participants while 121 (68.4%) of them were females. Most of them were unskilled workers 100 (56.5%) while 1.7% of them were retired. Maximum of 92 (52%) of them were widowed. Greatest number of the study participants were illiterates 162 (91.5%) whereas limited number of them (2.8%) had acquired higher or professional studies. According to the type of family, 14 (8%) of the participants were leaving alone, while bulky of them belonged to three generation family (50.8%). Based on the economic dependency, about 73 (41.2%) of them were totally independent, while 68 (38.4%) of them were totally dependent and 36 (20.3%) of them were partially independent. According to the updated BJ Prasad’s Socio-economic classification, most of the elderly belonged to middle III class 80 (45.2%).

The Morbidity pattern among the elderly in our study showed that about 137 (77.4%) of them had some chronic co-morbidities while 40 (22.6%) of them had no morbidity or illness. That is almost every second person among surveyed population encountered any form of chronic illness. There were 156 episodes of acute morbidities and 27 episodes of hospitalisation either for medical or surgical purposes (total number of persons hospitalised any time during the past 6 months). The most common diseases that elderly participants encountered was musculoskeletal problems as shown in Figure 1.

Among 177, 136 (76.8%) opted to seek health care from private health setup, only 41 (23.2%) participants went to public healthcare setup. Only 76 (43%) of the participants had health insurance policy and the various types of health insurance are shown in the Figure 2.
The Table 1 shows mean and standard deviation of various healthcare expenditures faced by the respondents. About 43.4% of the elderly had catastrophic expenditures seeking treatment in private healthcare sector.

The healthcare expenditure of respondents in private and public health expenditures are shown in Table 1. It shows mean and standard deviation of expenditure and also out of pocket (OOP) expenditure and catastrophic OOP. Almost half of study participants (43.4%) availing facilities from private are undergoing catastrophic OOP. The Table 2 shows the association of certain demographic variables with catastrophic OOP expenditure using chi square test with p value less than 0.05 is considered statistically significant.

Discussion:

In the present study, 66.1% of the participants belong to age group of 60-70 years and 33.9% of the Elderly belong to an age group of 70-80 years. This is similar to a study conducted in Assam where most of the elderly (68.5%) belonged to the age group of 60-69 years, 31.6% of the Elderly belonged to >70 years of age group. Manish Jain Et al in 2007 observed a similar trend where most of the Elderly (59.2) belonged to 60-69 years and 40.8% of the Elderly belonged to an age group of >70 years. Majority of the participants were females (68.4%) and 31.6% of the participants were males in our study. A study conducted in Assam also revealed a similar observation which showed majority (59.7%) of the elderly were females and 40.3% of elderly were males.

In a study conducted in Assam among the elderly, about 96.9% of the people were suffering from some illness while 3.1% of the Elderly had no illness. In another study conducted in Bangladesh, the percentage of Elderly who were suffering from single morbidity was 96.8% which is also similar to a study conducted in Raipur where the proportion of affected elderly was 95.31%. Whereas, this proportion had been declined in the current study to 77.4%, the reason may be attributed to race and cultural differences between these regions.

In our study, the predominant type of morbidity that prevailed among the elderly in our study was musculoskeletal problems (90.4%). The similar kind of observation was found in a study conducted in Bangladesh by Gupta et.al, where musculoskeletal problems occupied around 84.11% of the morbidities followed by eye problems (81.25%). In a study conducted in Mmangkodi village in Botswana, despite being international, commonest morbidity was musculoskeletal problems (41%) [Lumbar pain and neck shoulder pain] followed by neurological diseases (10%). Another study conducted in rural area of Tamil Nadu also revealed joint stiffness (43.4%) or joint Pain as the most common symptoms experienced by the elderly followed by chewing problems (42.1%) and Cataract (32.1%). All these findings due to age related phenomenon and
degenerative diseases that sets on with age. Most of the studies conducted all over India shows musculoskeletal problems to be preponderant in women. This can be attributed to the household work done by most of women which is common in an Indian household.

In our study, most of elderly participants were utilizing services from private healthcare sector (76.8%) while a small proportion of participants were utilizing from public sector (23.2%). This pattern of observation is similar to a study conducted in Nepal where a proportion of about 56.4% of the elderly visited private healthcare services while 35.7% of them visited public hospitals. In a study conducted in Raipur by Goswami et.al, significant proportion of elderly (51.62%) accessed private healthcare services while 29.26% of them utilized public healthcare services. In another study conducted in Allahabad, most of the participants (81.5%) sought government hospital for treatment while the rest of the people (18.5%) approached private sector for treatment.

This difference is private and government hospitals can be due to preference of elderly people and their belief on government hospitals. In our study, most of the elderly participants who accessed private healthcare systems felt that medicines were very expensive (100%) and public healthcare system that they preferred was located faraway (78.7%), people who accessed public healthcare facilities felt that there was increased waiting time in the hospitals (36.6%) and also felt that attitude of the healthcare workers was very negative (31.7%). In a study conducted in coastal area of South India, it was observed that people who accessed public healthcare services felt that they had easy access (26.6%) and got free of treatment services (21.8%) and low cost (21.8%) while people who accessed private healthcare facilities felt that they had easy access (27.4%) to healthcare facilities and there was individual attention provided by the healthcare workers in private sector (25.7%).

Only 43% of the participants had medical insurance coverage in the present study. In a study conducted in Nepal, about 30.3% of the elderly participants had insurance while 69.7% did not have medical insurance. Lower level of insurance coverage may be attributed to the international differences in the administration. In a study which compares impact of health related expenditure in Bihar and Kerala, only 8.22% of elderly in Bihar had some insurance coverage while in Kerala showed that 56.07% of them availed health insurance which differs from our study. This can be because of more awareness given by the administering government on healthcare insurances to its people.

In our study, the mean outpatient cost in private sector is INR 384 (SD 4597.991) and, the mean outpatient cost in public sector is INR 128.29 (SD 104.5443). In a study conducted which compares healthcare expenditure among the Elderly in Bihar and Kerala, the average outpatient cost in Bihar in Public setup as
Rs.590 and Rs.545 in private setup whereas in Kerala Rs 425 was the average outpatient cost in private setup whereas the average outpatient cost was about Rs.234 in public setup. Shivendra.K.Singh .Et .al in an urban area of Lucknow observed that the mean outpatient costs for private healthcare setup among the elderly in 1097.87(SD 1009.08).

The mean inpatient cost in Private sector is INR 12079.64 (SD 42986.58) and the mean inpatient cost in government sector is INR 119.878 (SD 101.029). In a study conducted which compares healthcare expenditure among the elderly in Bihar and Kerala, the average inpatient cost in Bihar in private setup was Rs.8315 and Rs.7422 in public setup whereas in Kerala Rs 4959 was the average inpatient cost in private setup whereas the average inpatient cost was about Rs.2400 in public setup. Shivendra.K.Singh .Et .al in an urban area of Lucknow observed that the mean inpatient costs among the elderly in 5766.15 (SD 8673.27)[9]. This huge difference in the public healthcare sector in Tamilnadu can be attributed to the medical insurances, availability of free medications, nominal priced food in the hospital premises whereas private sectors charge amplified sum of money in every aspect.

In our study, about 43.4% of the elderly people had catastrophic out of pocket expenditure. In a study that compares the healthcare expenditure impact between households in Bihar and Kerala, the percentage of catastrophic health expenditure in Bihar was 22.1% while in Kerala the percentage of catastrophic out of pocket expenditure was 51%[9]. Brindha et.al observed in their study observed that the catastrophic out of pocket expenditure was about 7.5%[9]. The difference in values of catastrophic out of pocket expenditure is highly alarming and the need for uniformity in healthcare services is the need of the hour.

There are certain limitations in the current study; study enrolled only those elderly whose name was in the voters list others in that area were left out. Chance of ‘Recall bias’ is high as a result both subjective under reporting and over reporting of the expenditures incurred would have been occurred, but we tried to limit it by crosschecking/ verifying the bills and prescription slips if possible, during the data collection period.

Conclusion:

Ageing is an inevitable process. It is associated with progressive deterioration of health. In our study, the proportion of diseased among the elderly was 77.4%. Among which females were more affected than the male study participants. The most common morbidity that was seen among the elderly was musculoskeletal problems (90.4%) followed by ocular disease (48%) and hypertension (19.8%). Thus, the process of senescence sets a chain of events which is caused due to progressive deterioration and decrease in physical and mental wellbeing. This is further compounded by psychological problems like retirement, socioeconomic status,
dependency, loneliness which further aggravates the disease process. Around 42% of them were medically insured, rest were not aware of this. In our study about 43.4% of the Elderly had catastrophic out of pocket expenditure. The focus should be on bringing in newer policies which will protect the elderly from catastrophic health expenditures and encourage them to access preferred health care services whenever necessary. Public health sectors should be empowered with maximum services. Moreover, government should focus on empowering the public sector and its services. All these measures can bring in drastic change in lifestyle and can promote healthy, comfortable and sustainable ageing in India.

References:


Acknowledgement: nil

Tables & Figures:

Figure 1: Gender wise distribution of Chronic Morbidity among study participants.

Figure 2: Types of Health Insurances among Study Participants

TABLE 1: Healthcare expenditure and out of pocket expenditure in public and private healthcare sector of respondents

### Healthcare Expenditure

<table>
<thead>
<tr>
<th>Healthcare Expenditure</th>
<th>Private Healthcare Sector (INR)</th>
<th>Public Healthcare Sector (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicines Cost</td>
<td>N = 136</td>
<td>N = 41</td>
</tr>
<tr>
<td>Mean (±SD)</td>
<td>Rs. 1751.816 (±2406.007)</td>
<td>Rs. 125(±35.7)</td>
</tr>
</tbody>
</table>

### Direct Costs

| Mean (±SD) | Rs.1698.228 (±3312.877) | Rs.83,414 (±29,249) |

### Indirect Costs

| Mean (±SD) | Rs.391.404(±292.352) | Rs.419.878(±201.029) |

### Out-Patient Costs

| Mean (±SD) | Rs.3841.449(±4597.991) | Rs.128.292(±104.544) |

### In-patient Costs

| Mean (±SD) | Rs.12079.64(42986.58) | Rs.119.878(±101.029) |

### Total Costs (out of pocket expenditure) = Total Cost – Insurance amount paid

| Mean (±SD) | Rs.15529.68(±43603.28) | Rs.48.1707(±23.5121) |

### Catastrophic Out of Pocket Expenditure [N (%)]

| N (%) | 59(43.4%) | 0(0) |

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**Table 2: Association of demographic variables with catastrophic OOP expenditure of respondents**

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Category</th>
<th>N (%)</th>
<th>Odd’s Ratio</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Upper</td>
<td>Lower</td>
</tr>
<tr>
<td>Age</td>
<td>Young Old</td>
<td>43(73.4)</td>
<td>1.59</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Old Old</td>
<td>16(27.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>18(30.5)</td>
<td>0.92</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>41(69.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Employed</td>
<td>26(44.1)</td>
<td>1.72</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>33(55.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse Status</td>
<td>Living with</td>
<td>34(57.6)</td>
<td>1.78*</td>
<td>1.12</td>
</tr>
<tr>
<td></td>
<td>Living without</td>
<td>25(42.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per capita Income**</td>
<td>Below Average</td>
<td>36(60.1)</td>
<td>2.34*</td>
<td>1.91</td>
</tr>
<tr>
<td></td>
<td>Above Average</td>
<td>23(38.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Condition</td>
<td>Dependent</td>
<td>39(66.1)</td>
<td>1.59</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Independent</td>
<td>20(33.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of comorbidities</td>
<td>Acute</td>
<td>9(15.3)</td>
<td>2.37*</td>
<td>1.01</td>
</tr>
<tr>
<td></td>
<td>Chronic</td>
<td>50(84.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare facility</td>
<td>Public</td>
<td>0(0)</td>
<td>1.76*</td>
<td>1.52</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>59(100)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p value < 0.05 is statistically significant; **Average percapita income (Rs7145)