

RESEARCH ARTICLE

Extent and predictors of socio economic deprivation in urban geriatric subjects: evidence from Varanasi, India

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Abstract: Old age Socio Economic Deprivation (SED) is a significant issue because geriatric subjects (60 years and above) are more vulnerable to SED than the other age group. Socio-economic_deprivation refers to deprivation in terms of economic parameters, food, water sanitation, shelter and information. The predictors of SED in geriatric subjects have been the least researched area. The objective of the present study was to find out predictors of SED. This study was carried out by adopting a cross-sectional study design on 616 (279 male and 337 female) geriatric subjects (60 years and above) selected by a multistage sampling procedure from urban Varanasi, India. Pre-designed, pre-tested proforma was used for assessing socio-economic deprivation in subjects by using interview techniques. Data was analyzed by using SPSS version 22.0. In order to find out predictors of all significant variables in bivariate analysis, viz., associates of socioeconomic deprivation were subjected to a logistic regression model. According to Rangrajan Committee criteria 38.0% subjects were below the poverty line. Food, water and sanitation deprivation were to the extent of 44.8%, 29.2% and 14.8%, respectively. As many as 32.6 % and 40.9% of subjects were deprived of shelter and education, respectively. There existed a significant association of gender, marital status, caste, religion, type of family and literacy status of study subjects with SED. However, the logistic model nullified the significant association of these variables with SED. In comparison to family size < 3 risk of SED was 3.31 (CI: 1.13-9.68) and 10.17 (CI: 2.44-42.45) times more in subjects with family size 3-6 and >6, respectively. When upper, upper middle and lower middle socio-economic status categories were considered as reference it was found that risk

for SED was significantly ($p < 0.01$) more in lower and upper lower SES categories. Odds of SED for lower and upper lower SES were 84.13 (CI: 15.9-244.63) and 18.24 (CI: 8.69-38.24) times higher than their counterparts, respectively. People with socioeconomic deprivation need to have focused attention based on the predictors of SED. Limiting family size, ensuring income generation activities and economic security are key inputs for optimum dividends in tackling SED.

Keywords: Ageing, geriatric subjects, socio economic deprivation, urban area.

INTRODUCTION

In the present era, one of the most urgent global goals is to tackle socio-economic deprivation (SED). National governments and their partners have been working to reduce the global problem of SED measured in terms of poverty. Although poverty is often thought of as a lack of material resources, it correlates closely with all aspects of a person's life. People with SED are more likely to be malnourished. They are deprived of services like education, electricity, sanitation and health care. Their vulnerability to conflict and climate change is likely to be of higher magnitude (World Bank, 2018). Giving due consideration to these issues in alleviating worldwide poverty, Millennium Developmental Goals (MDGs) and Sustainable Development Goals (SDGs) came into effect in 2000 and 2015, respectively. Further, World Bank

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Group's twin goals for 2030 are in alignment with the central theme of the UN's Sustainable Developmental Goals viz., ending extreme poverty and promoting shared prosperity in every country in a sustainable manner. Despite tremendous efforts, poverty prevails in several corners of the world. Paradoxically, in the progressing world, people are getting either rich and richer or poor and poorer. These are the two extremes on which the world is progressing. According to Human Development Report (2021-22), across 107 developing countries, 1.3 billion (22%) live in multidimensional poverty; 82.3 percent are deprived in at least five indicators simultaneously (United Nations Development Report, 2022).

Socio-economic deprivation is a global phenomenon in which a group of people force to live a compromised life due to their low purchasing power. It realizes one's feeling of discrepancy between 'what one has and what one should have'. Although the experience of deprivation is uniquely varied for everyone, all poor people have feelings of 'powerlessness' and 'resourcelessness' (Qureshi, 2004). It is the root cause of social evils and creates number of socio-cultural and economic problems in the society. In absolute terms, deprivation reflects the inability of an individual to satisfy basic minimum needs of the life and it prevents people from participating in the development process (Khan & Hassan, 2014).

Since gaining independence, eradication of poverty and end of food deprivation have been the main aims of government of India. Several anti poverty programmes have been launched by the Government of India to uplift the living standard of people (Mishra, 2012). Measurement of poverty includes many socioeconomic facets, which have been changing from place to place and time to time. Therefore, despite availability of several approaches, successful execution of anti poverty programmes and schemes, SED still remains in many parts of country. As per revised estimates for India, the percentage of people living below \$ 1.25 a day decreased from 60% in 1981 to 42% in 2005. Even at a dollar day (2005 prices) poverty has declined from 42% over the same period. Contrary to this 1.4 billion people (1 in 4) in the developing world were living below US \$ 1.25 a day in 2005 down from 1.9 billion (one in two) in 1981. Based on estimates of national poverty line India's poverty rate was 28% in 2004/05 (World Bank, 2008). In the previous years as per Sustainable Developmental Goals report (2022) there had been reversal of years of progress in eradicating poverty (United Nations, 2022).

The word geriatric was coined by Naseler in 1914 and is derived from Greek words *gera* and *iatros* which

means old age and treatment, respectively. The word "aged" is relative depending upon the society, its culture, the time and prevalent conditions. For standardization the United Nations have defined an aged person as one which is 60 years and above. (Lal *et al.*, 2022). The increased population growth rate and demographic transition including reduced fertility and technological advancements have increased the proportion of geriatric subjects. By 2051 approximately 20 per cent of the population, will be above 60 years of age (Irudaya & Mishra, 1995). Along with demographic shift, India is also experiencing epidemiological, economic transitions and social and institutional changes. Socio-economic changes such as increased urbanisation, and migration of young family members are leading to breakdown of traditional family system (Knodel *et al.*, 1992; Pandey, 2009). This has increased number of old persons living alone or in small households and have to endure economic vulnerability and rising poverty (Sherlock, 2000; Dreze, 1990).

Old age (≥ 60 years of age) itself is considered a complex category due to several inevitable physiological, psychosocial and economic changes; which make them vulnerable to SED, food and nutrition insecurity, poor nutritional status, morbidities, physical dependence, mental and psychological problems; these have a significant influence on their overall wellbeing and may lead them to a disadvantaged position (Keshari & Shankar, 2021). During old age, the number of working hours gets reduced with increasing age (Singh & Sharma, 1987). Apart from the changes in the work status, the social role of geriatric subjects may also change. In such situations, geriatric subjects face a higher incidence of poverty in comparison to other age groups (Barrientos *et al.*, 2003; Mujahid *et al.*, 2008). Old age SED is a significant issue in developing countries; policy and research mainly focus on the pension schemes in the organised sector that have little relevance for the poor elderly (Sherlock, 2000). Hence, poverty among the elderly tends to be more permanent than that among the non-elderly and the elderly are unlikely to come out of the poverty trap (Hurd, 1990). Urban geriatric subjects are likely to experience more adversities due to the high cost of living and priorities of the family. Understanding poverty is fundamental to understanding how societies/groups can progress. However, there is a paucity of information about extent and predictors of socio-economic deprivation in urban geriatric subjects. With this background, this study was undertaken to assessing the extent and predictors of socio-economic deprivation in the urban geriatric population.

LITERATURE REVIEW

Socio-economic deprivation in ageing population is a major global issue of the twenty-first century. Eradication of poverty is one of the key agendas of governments of different countries. Rapid ageing population pose a threat to old age people. In several situations, socioeconomic deprivation has been expressed by poverty which may be absolute or overall. Absolute poverty refers to a condition characterised by severe deprivation of basic needs including food, safe drinking water, sanitation, facilities, education and information. There exists operational definitions of different types of deprivation (Gordon, 2005). According to official estimates of poverty based on Tendulkar committee poverty line as many as 29.8% of the population were below the poverty line in India (Planning Commission, 2014). The country registered a significant decline of 9.89% percentage points in India's multidimensional poor from 24.85% in 2015-2016 to 14.96% in 2019-2021 (United Nations Development Programme, 2023).

Several studies conducted outside India have reported socio-economic adversities, this was to the extent of 36.4% (Adbayo *et al.*, 2013) and 41.0% (Akerle *et al.*, 2012) in studies from Nigeria. In general, the income of old age persons decreases while the consumption expenditure increases predominantly due to increase in health expenditure. Although in response to national policy for older persons for ensuring the financial and social protection of older persons, several initiatives have been taken, but their coverage and outreach are limited (Sunder Lal, 2022). There are evidences of higher socio-economic deprivation in terms of poverty estimates in older age groups (Barrientos *et al.*, 2003; World Bank, 2006; Mujahid *et al.*, 2008 and Gasparini *et al.*, 2007) and it is perpetual in nature (Hurd, 1990). It is also evident from Indian data that 40% of old people live below poverty line and 90% are not covered by any pension scheme (Pandey, 2009).

The recent past several studies have pointed out socio-economic adversities in older person (Longitudinal Ageing Study in India Report, 2020; Arokiasamy *et al.*, 2016, Brinda *et al.*, 2016). Longitudinal Ageing Study in India (LASI Report, 2020) shows that the monthly per capita consumption expenditure (MPCE) among older adults in India is Rs. 2,967, Rs. 2,543 in rural areas and Rs. 3,544 in urban areas. The MPCE of households with an elderly member (Rs. 3,001) is higher than that of households without an elderly member (Rs. 2,948). Forty-five percent of households have a BPL card, and among those, 65% have used it in the 30 days before the survey (LASI Report, 2020). According to United Nations Development Program report (2023), India

registered a significant progress in the decline of multi-dimensionally poor in four years (UNDP-2023).

The extent of poverty among geriatric subjects varies according to socio-cultural context. According to finding of research, socio-economic deprivation among younger old is less frequent than older old (75 years and above). Older women are at greater risk of poverty than older men. The findings on gender and old age poverty highlight that in general, women experienced a higher prevalence of poverty and have lower scores in successful ageing compared to their low-income male counterparts (Kawan & Walsh, 2018).

According to a study in southwest urban Nigeria incidence and depth of poverty are higher among female-headed households. The dependency ratio, household assets and educational status of heads, among others are the socio-economic factors influencing poverty (Akerle *et al.*, 2012). Mok *et al.* (2007) conducted a study among urban households in Malaysia and reported that household size, race and religion were important determinants of poverty. In a study in Kenya (Mberu *et al.*, 2016) formal employment, education, family size and number of births in households are significant predictors of moving into and out of poverty. According to Srivastava & Mahanti (2012) education, religion and caste are significant predictors of poverty in old age. Contrary to this age is not a significant predictor of poverty. Socio-economic condition of older women is more vulnerable in the context of demographic and socio-cultural change.

Understanding socio-cultural context of the population over time and space is of considerable importance. However, the identification of socio-economic vulnerability through appropriate models is desired for focused attention. There is a paucity of such initiatives in Indian context.

This calls for examining socio-cultural context with reference to predictors of socio-economic deprivation.

MATERIAL AND METHODS

Study design and setting

This community-based cross-sectional study was conducted in urban Varanasi, India. The total population of Varanasi district was 3682194 of which the urban population was 1599260 (43.4%). The average literacy rate of Varanasi district was 77.05%. The geriatric population comprises 7% of the total population of the district. (Registrar General and Census Commission of India, 2011). The study area Varanasi has a diverse

population with rich historical and cultural significance. The demographic composition and socio-economic dynamics of the study area are best fitted to examine the extent and spectrum of socio-economic deprivation-related challenges faced by geriatric subjects. Varanasi is one of the districts of eastern Uttar Pradesh state, India there exists a paucity of information about SEDs and their influencing factors. The findings of the present study will provide valuable insights that contribute to the broader discourse on aging and social disparities for future research.

Subjects and sample size

As per United Nations (2020) person with ≥ 60 years is defined as geriatric (old) subjects (UNHCR, 2020). This criterion was used for the selection of study subjects residing in urban areas. Taking a prevalence of 40% for SED (Pandey, 2009), 5% permissible error (absolute), design effect of 1.5 and 10% non-response rate of estimated sample size the final sample size worked out to be 616. Of 616 selected subjects' complete information was obtained from 604 subjects in the first visit. In 12 subjects (male 5 and female 7) information could not be obtained due to their non-availability at the time of first visit. In order to get complete information from 616 subjects additional visits (1-2) were made for these remaining 12 subjects.

Selection of study sample

The selection of subjects was done through a multistage sampling procedure with the following stages. [i] Out of 90 census enumeration wards in Varanasi city, 9 wards were selected by simple random sampling; [ii] In the selected census enumeration wards households were selected according to probability proportion to size adopting systematic random sampling method; [iii] In the selected households one family was selected randomly using lottery method and [iv] In the selected family one study subject was selected randomly using lottery method. Subjects who gave their consent for the study were included in the study, whereas subjects with a terminal illness or having serious mental abnormality and also if their duration of stay in the study area was less than six months he/she was excluded from the study.

Ethical approval

This study was approved by the Ethical Committee of Banaras Hindu University, India and consent was obtained from participants using bilingual (Hindi and English version) consent form.

Tools and technique

A predesigned and pretested proforma was the primary tool in this study. This comprised of three sections: [a] Demographic variables (viz., age, gender, marital status, religion, caste, education, occupation, family size and type and socio-economic status) [b] Questions related to different forms of deprivations (i.e., economic, food, water and sanitation, shelter and information deprivation) [c] Recording of weight and height of subjects. After obtaining consent each study subject was interviewed using this primary tool to obtain information about socio-demographic characteristics (viz., age, gender, material status, religion, caste, educational status, occupation; type of family and size of family). Besides this information about other types of deprivations viz., information, water, sanitation etc. were also obtained by the same technique. For obtaining information pertaining to socio-economic variables head of the family or any responsible member of the family was interviewed and subjects with SED were assessed based on several norms. Per capita income was used to categorise subjects on the basis of Rangrajan Committee Report 2014, modified BG Prasad Classification, 2014 (Mangal *et al.*, 2015) and using cut-off of less than one dollar and 1.25 dollars per capita per day (World Bank, 2018).

In order to compute socio-economic status as per the Kuppuswamy Classification, the education and occupation of the head of the family as well as total family income were assessed through the interview technique using above-mentioned tool (Kohli, 2015). Information was also elicited from the subjects about availability of ration card, safe drinking water, drainage and toilet facility, type of house and exposure to media. For recording weight and height of subjects Libra weighting scale and steel anthropometric rod with parallel bars were used, respectively, following standard techniques. Body Mass Index of subjects was computed by dividing their weight in kg by height in m^2 .

In order to find out associates of the SED subjects were categorised below and above poverty line by adopting the criteria given in the report of Rangrajan Committee (2014). A subject was considered below poverty line if per capita income was less than Rs 1410 per month. Association of SED in the terms of poverty estimates with various variables was obtained and test of significance was applied to find out associates of SED.

Statistical analysis

Data thus obtained were entered in personal computer and analysis was done by using Statistical Package SPSS

version 22.0 IBM Corp., Armonk, NY. Associates of the SED were obtained by bivariate analysis; χ^2 test was applied and $p < 0.05$ was taken as significant. In order to pinpoint predictors of socioeconomic deprivation binary logistic regression model was used. All significant variables were put in the logistic regression model which is an equation-based statistical analysis. In this case, the default method of conducting the regression was “enter” which is the same as forced entry where all the possible predictors are placed in the regression model in one block. In this study, the outcome variable has been dichotomous and there were several predictor variables. Since this study attempted to predict membership of only two categorical outcomes of socio-economic deprivation, binary logistic regression analysis was performed. The logistic regression equation used here is:

$$P(Y) = \frac{1}{1 + e^{-Z}}$$

In which $P(Y)$ is the probability of Y (outcome) occurring, e is the base of natural logarithms, $Z = b_1 + b_2 + b_3$ under the pretext that when a subject belongs to a risk category, then there will be no effect of constant and other risk categories whereas b_1, b_2, b_3 refers to coefficient (or weight) attached to the predictors. To find out regression coefficient (β) of a possible predictor the values of b_1, b_2, b_3 were put in the logistic regression equation. Odds ratio was obtained from exponential of β . (Field, 2009). In order to pinpoint predictors of SED Adjusted Odds Ratio with 95% Confidence Interval were computed. Interpretation of Adjusted Odds Ratio was done following standard guidelines (Goodwin & Ryu, 2023). Of all significant associates of SED only those remaining significant in the logistic regression analysis were identified as predictors of SED.

RESULTS

Familial characteristics of study subjects

Out of all subjects, 509 (82.6%) were Hindu and remaining 107 (17.4%) were Muslim. None of the

subjects belonging to Muslim religion were from SC/ST caste, whereas 74.8% and 25.2% from this religion were from Other Backward Caste and Other caste categories, respectively. As much as 15.9%, 51.6% and 32.5% were from SC/ST, OBC and other caste category, respectively (Table 1 A).

As many as 217 (35.2%) subjects were from nuclear family. In case of 80 (13.0%), 225 (36.5%) and 311 (50.5%) subjects family size was < 3 , 3-6 and > 6 , respectively. As per Kuppuswamy scale socioeconomic status of 42 (6.8%), 156 (25.3%) and 160 (26.0%) subjects was upper, upper middle and lower middle, respectively. Subjects from upper lower and lower SES families were 217 (35.2%) and 91 (6.7%), respectively.

Individual characteristics of study subjects

In 41.4% cases, the subjects themselves were head of the family. The proportion of male and female subject was 45.3% and 54.7%, respectively. As much as 63.6% 28.4% and 7.9% subjects were from the age group 60-69, 70-79 and ≥ 80 years, respectively. In all 64.6% subjects were with a spouse whereas 32.6% of male and 37.7% of female subjects were without a spouse. As much as 40.9% of subjects were illiterate; corresponding values for male and female subjects were 16.8% and 60.8%, respectively. In contrast to this 38.0% of males and 11.6% of female were educated secondary level and above. The majority (84.6%) of female subjects were homemakers whereas 39.4% of male subjects were not engaged in gainful employment; 14.7% of male subjects were retired from service. A considerable proportion (79.2%) of female and 39.9% of male subjects had no contribution to the income of their families; overall this value was 61.5% (Table 1 (B)).

Majority (89.0%) subjects had own house. Electricity was predominant (96.9%) source of lighting. Two third of subjects had no liabilities. Nearly 3 out of 4 subjects were financially dependent on their family. As much as 83.0% 43.3% and 64.6% subjects were aware about old age pension, disability benefits and widowed pension, respectively, whereas 56.5% subjects were aware about health insurance scheme. Only 11.7% subjects received

Table 1 (A): Distribution of subjects according to religion and caste

Caste	Religion					
	Hindu		Muslim		Total	
	No.	%	No.	%	No.	%
SC/ST	98	19.2	0	0.0	98	15.9
OBC	238	46.8	80	74.8	318	51.6
Others	175	34.0	27	25.5	200	32.5
Total	509	100.0	107	100.0	616	100.0

Table 1 (B): Distribution of subjects according to Individual characteristics:

Particulars	Number	Percentage
Head of the family (n=616)		
Self	255	41.4
Spouse	205	33.2
Son/daughter	256	25.3
Gender (n=616)		
Male	279	45.3
Female	337	54.7
Age in years (n=616)		
60-69	392	63.6
70-79	173	28.1
≥80	51	8.3
Literacy status (n=616)		
Illiterate	252	40.9
Just literate	59	9.6
Primary	99	16.1
Middle	61	9.9
High School	52	8.4
Intermediate	29	4.7
Graduate	43	7.0
Postgraduate	21	3.4
Occupation status (n=616)		
Self-employed	102	16.5
Service	26	4.2
Retired	45	7.3
Skilled worker	45	7.3
Unskilled worker	3	0.5
Homemaker	285	46.3
Unemployed	110	17.9
Subjects contribution of income to their own family		
Overall (n= 616)	377	61.2
Male (n=279)	110	39.4
Female (n=337)	267	79.2

Table 1 (C): Living arrangement of study subjects (616)

Particulars	Number	Percentage
Dwelling		
Own	548	89.0
Rented	68	11.0
Source of lighting		
Electricity	597	96.0
Kerosene	19	3.1
Liabilities		
Child marriage	75	12.2
Child employment	41	6.7
Education +Marriage	47	7.6
Education +Marriage+ Employment	16	2.6
Marriage + Employment	21	3.4
None	416	67.5
Financial status of subjects in their family		
Dependent	379	61.5
Semi dependent	84	13.6
Independent	153	24.8
Awareness about		
Old age pension	511	83.0
Disability benefits	267	43.3
Accidental death benefits	319	51.8
Widow/	398	64.6
Health insurance scheme	348	56.5
Recipient of any financial support from government scheme	72	11.7
Awareness regarding getting financial support from government/ private	171	27.8

financial benefits from government/private sector and 27.8% stated that they were aware about someone getting financial benefits from government/private sector (Table 1 (C)).

Extent of socio-economic deprivation

Considering Socio-Economic Deprivation (SED) as the root cause of many problems in geriatric subjects in general and urban subjects in particular, the extent of SED was assessed using a variety of parameters and the results are given in Table 1. Per capita income (PCI) has been extensively used in assessing SED. B.G. Prasad classification characterizes people in different social classes (I to V) and subjects belonging to social classes IV and V are in economically disadvantaged positions. Out of 616 subjects, 280 (45.5%) subjects were from classes IV and V and they were deprived on the economic scale. In urban areas, Kuppuswamy scale for determining socioeconomic status is of widely applicable. This scale is based on the education of the head of the family, the occupation of the head of the household (last occupation if retired) and family income per month. Based on this, scale subjects are classified as upper, upper middle, lower middle, upper lower and lower SES strata and subjects belonging to upper lower and lower SES are considered to be in the state of SED. Two hundred fifty eight (41.9%) subjects belonged to this category.

According to the report of Rangrajan Committee, subjects residing in urban areas should be considered below the poverty line if their income is less than Rs. 47 per person per day meaning thereby their per capita monthly income is less than Rs. 1410/-. By adopting this criterion, 38.0% subjects were below poverty line. According to World Bank, subjects are categorized below and above poverty line on their basis of per capita income per day. The cut of point has been fixed at 1 dollar and 1.25 dollar per capita per day. Out of 616 subjects 314 (51.0%) had income less than 1 dollar per capita per day whereas in 357 (58.0%) cases per capita per day income was less than 1.25 dollar. In order to ensure food security public distribution system has been in vogue and under this scheme beneficiaries were provided yellow, white, red/pink cards; subjects with yellow card were considered as above poverty line and rest were below poverty line. Out of 616 subjects in this study, 598 (97.1%) were provided card and of these 85 (14.2%) were below poverty line. Problems of poverty serve as indicator for assessing the progress of any nation on socioeconomic front. Therefore, it can be treated as synonym to SED. However, the later includes many other conditions such as deprivation of food, water, sanitation, shelter, education and access to

information. Subjects were considered in food deprivation when their body mass index was less than 18.5 kg/m^2 . By this criterion, 44.8% subjects had food deprivation. Water deprivation (no safe water supply) was to the extent of 29.2%. Ninety one (14.8%) subjects were without drainage and toilet facilities and thus subjects were deprived from sanitation facilities. Presence of Kutcha/semi pucca house indicates shelter deprivation. Kutcha house is made of easily available raw materials like mud, straw, stones and wood whereas a Pucca house is built with iron, bricks, cement, steel etc to form a concrete structure and semi pucca house is a combination of materials used in both. As much as 32.6% subjects had shelter deprivation. Education deprivation, measured on the basis of extent of illiteracy, prevailed in and 40.9%. Extent of information deprivation (non exposure to media) was 51.3% (Table 2).

Associates of socio-economic deprivation

Except for age, all other socio-demographic and socio-economic variables pertaining to study subjects were significantly associated with Socio Economic Deprivation (SED). In this study a subject having per capita income Rs < 1410 per month has been considered as below poverty line (BPL). By this criterion, 37.2% of subjects in the 60-69 years age group were BPL; the corresponding value for subjects belonging to the age group 70-79 years and > 80 years were 37.6% and 45.1%, respectively ($P > 0.05$). In comparison to male subjects (32.6%) significantly ($P < 0.05$) more females (42.4%) were BPL. As many as 35.2% of married, 31.9% of widower and 51.2% of widowed subjects were BPL. There existed a significant ($p < 0.01$) gradient in the proportion of BPL subjects belonging to different caste categories. In this study 48.0% SC/ST, 43.4% Other Backward Caste (OBC) and 24.5% other caste category subjects were BPL. There existed a significant ($P < 0.01$) declining trend in the extent of BPL with higher literacy status; this was maximum in the case of illiterates (48.8%) and nil in subjects having post graduate degrees. Subjects below the poverty line were maximum (46.0%) where the size of the family was > 6 and this was least (27.5%) in those with family size < 3. There existed no significant ($p > 0.05$) association between subjects engaged and not engaged in gainful employment with SED. About 36.2% of subjects engaged in gainful employment and 39.0% of subjects not engaged in gainful employment were BPL; the extent of BPL was least (13.3%) in retired subjects. Eighty seven (47.8%) subjects from joint family were BPL; the corresponding value for subjects from three generations and nuclear family was 37.8% and 30.0%, respectively (Table 3).

Table2: Extent of socio-economic deprivation (N= 616)

Particulars	Indicators	Findings	
		Number	Percentage
Economic deprivation	Social Class (V and IV)	280	45.5
	SES (Upper lower +Lower)	258	41.9
	PCI (< 47 per person per day)	234	38.0
	PCI (< 1 dollar per person per day)	314	51.0
	PCI (< 1.25 dollar per person per day)	357	58.0
	Subjects with ration card (n=598), BPL card holders.	85	14.2
Food deprivation	BMI less than 18.5 (n=612)	274	44.8
Water deprivation	Don't have safe drinking water supply	180	29.2
Deprivation of sanitation facilities	Drainage and toilet facility	91	14.8
Shelter deprivation	Kuccha house/ semi pucca	201	32.6
Education deprivation	Illiterate	252	40.9
Information deprivation	Non exposure to media	316	51.3

Associates of socio-economic deprivation

The association of socio-economic class with Socio Economic Deprivation is given in table 4A. As much as 4.5% of upper middle, 19.4% of lower middle 72.8% of upper lower and 92.7% lower class subjects (on the basis of Kuppuswamy classification) had per capita income < Rs 1410 per month meaning thereby they belonged to below poverty line families as per Ragrajan committee report. None of the subjects from the upper class were below the poverty line (Table 4 A).

Per capita income was considered an important variable to classify subjects in social class based on BG Prasad classification; 69.7% of subjects belonging to class IV and all subjects from class V were categorised as below the poverty line by the criteria adopted by Rangrajan committee. On the basis of Ragrajan committee 74.5% and 65.5% of subjects having per capita income per day < 1 dollar and < 1.25 dollar, respectively were categorised as BPL (Table 4 B).

Type of card is often taken as a proxy indicator of socio-economic status. In this study even 32.7% of subjects with yellow card were labelled as BPL; the corresponding value for subjects with White, Red/Pink and without cards were 70.4%; 71.4% and 33.3%, respectively. All the socio-economic variables were significantly ($p < 0.01$) associated with SED measured utilizing the conceptual framework of poverty as per Ragrajan committee criteria (Table 4 C).

Predictors of socio-economic deprivation

Adjusted Odds ratios (AORs) of gender, marital status, caste, religion, type of family, family size, literacy status and socio-economic status (Kuppuswamy classification)

were computed by the SPSS package by exponentiation of corresponding regression coefficients and are given in table 5. Significant association of gender, marital status, caste, religion, type of family, and literacy status of study subjects with SED in bivariate analysis got eliminated in the logistic model.

Adjusted odds ratio for SED was more than one for widower (AOR= 1.25; CI 0.501-3.10), SC/ST (AOR= 1.797; CI: 0.73-4.41) OBC (AOR= 1.646; CI: 0.84-3.22), joint family (AOR=1.80; CI: 0.55-5.89). Only family size and socio-economic status were significantly ($p < 0.05$) associated with SED in the logistic regression model. In comparison to family size < 3 risk of SED was 3.31 (CI: 1.13-9.68) and 10.17 (CI: 2.44-42.45) times more in subjects with family size 3-6 and >6, respectively. This implies that there was 231% and 917% increase in the odds of SED in subjects with family size 3-6 and > 6, respectively. When upper, upper middle and lower middle socio-economic status categories were considered as reference it was found that risk for SED was significantly (< 0.01) more in lower and upper lower SES categories. Odds of SED for lower and upper lower SES were 84.13 (CI: 15.9-244.63) and 18.24 (CI: 8.69-38.24), respectively. In order to see group effect of significant predictors (family size and SES), category-wise regression coefficient (β), for family size > 6 and 3-6 were 2.32 and 1.20 when compared to reference family size < 3. In case of SES β was 4.43 for lower and 2.90 for upper lower in comparison to reference category (Table 5). Since the β was positive in both conditions, there is a direct relationship between predictors and SED. Family size more than three and lower plus upper lower SES (Kuppuswamy classification) subjects had higher AOR for SED measured on the basis of subjects having per capita income Rs < 1410 per month. In order to check the

Table 3: Association of socio-economic deprivation with demographic variables

Particulars (616)	Below poverty line PCI(<47/day)		Above poverty line PCI(>47/day)		Total		Test of significance
	No.	(%)	No.	(%)	No.	(%)	
Age (Years)							
60-69	146	37.2	246	62.8	392	100	χ^2 :1.199 df:2 p:>0.05
70-79	65	37.6	108	62.4	173	100	
> 80	23	45.1	28	54.9	51	100	
Gender							
Male	91	32.6	188	67.4	279	100	χ^2 : 6.24df:1 p:<0.05
Female	143	42.4	194	57.6	337	100	
Marital status							
Married	140	35.2	258	64.8	398	100	χ^2 : 12.17 df:2 p:<0.01
Widower	29	31.9	62	68.1	91	100	
Widowed	65	51.2	62	48.8	127	100	
Religion							
Hindu	179	35.2	330	64.8	509	100	χ^2 :9.89; df:1 p:<0.01
Muslim	55	51.4	52	48.6	107	100	
Caste							
SC/ST	47	48.0	51	52.0	98	100	χ^2 :23.53 df:2 p:<0.01
OBC	138	43.4	180	56.6	318	100	
Others	49	24.5	151	75.5	200	100	
Educational status							
Illiterate	123	48.8	129	51.2	252	100	χ^2 :52.01 df:7 p:<0.01
Just literate	26	44.1	33	55.9	59	100	
Primary	40	40.4	59	59.6	99	100	
Middle	22	36.1	39	63.9	61	100	
High school	14	26.9	38	73.1	52	100	
Intermediate	7	24.1	22	75.9	29	100	
Graduate	2	4.7	41	95.3	43	100	
Post graduate	0.0	0.0	21	100	21	100	
Occupational status							
Engaged in gainful employment	80	36.2	141	63.8	221	100	χ^2 :20.57 df: 1 p:> 0.05
Not engaged in gainful employment	154	39.0	241	61.0	395	100	
Type of Family							
Nuclear	65	30.0	152	70.0	217	100	χ^2 :13.39 df:2 p:<0.01
Joint	87	47.8	95	52.2	182	100	
Three generation	82	37.8	135	62.2	217	100	

continued -

- continued from page 121

Size of family							
< 3	22	27.5	58	72.5	80	100	χ^2 : 17.29 df:2 p:<0.01
3-6	69	30.7	156	69.3	225	100	
> 6	143	46.0	168	54.0	311	100	

(PCI: Per Capita Income)

Table 4 A: Association of socio-economic class of subjects with their socio-economic deprivation

Particulars (616)	Below poverty line PCI(<Rs1410/month)		Above poverty line PCI(>Rs1410/month)		Total		Test of significance
	No.	(%)	No.	(%)	No.	(%)	
Socio Economic Class							
Upper class	0	0.0	42	100	42	100	χ^2 : 287.4 df:4 p:<0.01
Upper middle	7	4.5	149	95.5	156	100	
Lower middle	31	19.4	129	80.6	160	100	
Upper lower	158	72.8	59	27.2	217	100	
Lower class	38	92.7	3	7.3	41	100	

Table 4 B: Associates of socio-economic deprivation with social class and per capita income per day in dollar

Particulars (616)	Below poverty line PCI(<Rs1410/month) No. (%)		Above poverty line PCI(>Rs1410/month) No. (%)		Total No. (%)		Test of significance
Social Class							
I	0	0.0	93	100	93	100	χ^2 : 479.8 df:4 p:<0.01
II	0	0.0	120	100	120	100	
III	0	0.0	123	100	123	100	
IV	106	69.7	46	30.3	152	100	
V	128	100.0	0	0.0	128	100	
1Dollar per day							
< 1 dollar	234	74.5	80	25.5	314	100	χ^2 :362.9;df:1;p:<0.01
>1dollar	0	0.0	302	100	302	100	
1.25 Dollar per day							
< 1.25 dollar	234	65.5	123	34.5	357	100	χ^2 :273.8df:1;p:<0.01
>1.25dollar	0	0	259	100	259	100	

Table 4 C: Type of card and socio-economic deprivation of the subjects

Particulars (616)	Below poverty line PCI(<Rs1410/month) No. (%)		Above poverty line PCI(>Rs1410/month) No. (%)		Total No. (%)		Test of significance
Type of Card							
Yellow	168	32.7	345	67.3	513	100	χ^2 : 44.50 df:3 p:<0.01
White	50	70.4	21	29.6	71	100	
Red/pink	10	71.4	4	28.6	14	100	
No card	6	33.3	12	66.7	18	100	

Table 5: Results of the logistic regression analysis for socio-economic deprivation

Particulars		Estimate of β	SE of β	P value	AOR	95% CI	
						Lower	Upper
Gender	Female	-0.09	0.64	0.894	0.92	0.26	3.22
	Male (Reference)	---	---	---	---	---	---
Marital status	Widower	0.22	0.47	0.64	1.25	0.50	3.10
	Widowed	-0.13	0.42	0.76	0.88	0.39	1.99
	Married (Reference)	---	---	---	---	---	---
Caste	SC/ ST	0.59	0.46	1.796	1.796	0.73	4.41
	OBC	0.49	0.34	1.646	1.646	0.84	3.22
	Others (Reference)	---	---	---	---	---	---
Religion	Muslim	-0.003	0.44	0.995	0.99	0.42	2.36
	Hindu (Reference)	---	---	---	---	---	---
Type of Family	Joint	0.59	0.60	0.329	1.80	0.55	5.89
	Nuclear	-0.16	0.47	0.791	0.88	0.35	2.22
	Nuclear (Reference)	---	---	---	---	---	---
Family size	>6	2.32	0.73	0.001	10.17	2.44	42.45
	3-6	1.20	0.55	0.029	3.31	1.13	9.68
	<3 (Reference)	--	---	---	---	---	---
Literacy status	Illiterate + just literate	-0.76	0.49	0.119	0.47	0.18	1.22
	Primary+ Middle	-0.50	0.46	0.278	0.60	0.24	1.50
	High school & above (Reference)	--	---	---	---	---	---
Kuppuswamy SES	Lower	4.43	0.85	0.000	84.13	15.92	244.65
	Upper lower	2.90	0.38	0.000	18.23	8.69	38.24
	Upper+ Upper Middle+	--	---	---	---	---	---
	Lower Middle (Reference)	---	---	---	---	---	---

appropriateness of the fitted logistic model, the predicted outcomes were generated and those were compared with actual outcomes the result revealed that the overall correct prediction percentage was 88.4% which is quite satisfactory.

DISCUSSION

There has been considerable variation in the extent of SED by different parameters. Deprivation based on economic parameters was the least (1 out of 7) when ration card was taken as a parameter. Due to the potential risk of misclassification in using cards as a proxy indicator of socio-economic status and SED it should be used cautiously for estimating SED. The extent of SED, as observed in this study on the basis of socio-economic status as per modified Kuppuswamy classification has been very close to the figure (4 out of 10 households) in a study conducted South-West urban Nigeria (Akerle *et al.*, 2012). Contrary to this lower figure of extent of poverty has been observed in Nigerian study (Adbiyo *et al.*, 2013) whereas study from Kenya revealed worsening of household poverty over time (Mberu *et al.*, 2016). It is interesting to note from a study done in poor urban households of Nairobi that nearly one out of three households remain in chronic poverty, one out of five fell into poverty and one out of six successfully escaped poverty and merely three out of ten fully remained out of poverty trap (Mberu *et al.*, 2016).

Millennium Development Goals (MDG) has been the most successful global anti-poverty push in history. They help to lift more than 1 billion people out of extreme poverty (Kumar, 2016). It is estimated that, one third of world poor live on less than \$1 a day and 8 out of 10 live on less than \$2 a day (UNDP, 2007). Poverty has been estimated by different criteria, and it has remained a significant problem over decades (Mishra, 2012; Planning Commission, 2012). However, according to a press note, there has been gradual decline in the poverty ratio in rural-urban India since 2003-2004 (Vina & Silpa, 2013).

In present study age was not a significant associate of SED contrary to this a study by Srivastava & Mohanty (2012) reported elderly in the age group 80 years and above are less likely to be poor compared to elderly in the age group 60-69yrs (Srivastava & Mohanty, 2012). Imperial evidence supports a U-shaped relationship of age and poverty; elderly population faces a higher incidence of poverty compared to the other group. (Barrantes *et al.*, 2003; Gasparini *et al.*, 2007; Mujahid *et al.*, 2008 and World Bank, 2006). Similar findings have been reported from a study conducted in the South-West urban Nigeria (Akerle *et al.*, 2012). The significant ($p < 0.05$)

association of gender and SED obtained in this study, and this was nullified in logistic regress analysis. Nearly one third of male and 3 out of 7 females were victim of SED. Older women are at risk of socio-economic deprivation (Tout, 1993). There existed no significant ($p > 0.05$) association of religion and caste of subjects with SED. However, the religion wise difference in the occurrence of SED has been reported from a study from Malaysia by Mok *et al.* (2007) and a study from India by Srivastava & Mohanty (2012). Caste has been also identified as significant predictor of SED in other studies as well (Pandey, 2009; Srivastava & Mohanty 2012). Contrary to the finding of the present study influence of type of family on SED has been reported by Srivastava and Mohanty (2012). In conformity with the finding of the present study association of household size and SED has been also substantiated in studies conducted in Malaysia (Mok *et al.*, 2007) and in Nairobi in informal settlement in Kenya (Mberu *et al.*, 2016). With the increasing level of education there was decline in the extent of SED. The significant association between education and SED in the bivariate analysis has not been substantiated in logistic regression analysis in this study. Educational attainment in general (Mberu *et al.*, 2016; Srivastava & Mohanty, 2012) and educational status of household head (Akerle *et al.*, 2012) have significant association with SED. Formal employment makes a difference of occurrence of SED reported by Mberu *et al.* (2016). However, no significant ($p > 0.05$) association between occupation and SED was observed in present study.

In the fitness of the thing's dependency ratio, household assets and socioeconomic status have been identified associates of SED in the study conducted in South-West urban Nigeria (Akerle *et al.*, 2012). Some of the other factors have also been considered with reference to socio-economic deprivation. Race (Mok *et al.*, 2016) and social group (Srivastava & Mohanty 2012) have been also found linked with SED (Srivastava & Mohanty, 2012). Nearly one out of six rural elderly and one out of ten urban elderly males are indebted as per 16th National Sample Survey (1997). These findings of the present study are also supported by Srivastava & Mohanty, (2012) indirectly. According to them elderly living alone and having low education level were at higher risk of SED. Logistic regression analysis identified that family size and socio-economic status as per modified Kuppuswamy's classification were predictors of SED. Higher risk of SED was identified in subjects with more than 3 family size and belonging to lower and upper lower SES. As socio-economic vulnerability of geriatric subjects is a function of lower level of education and lesser engagement in gainful employment of the head of family, per capita income of the family as well as subject's income, subjects with more family size, focused actions

for economic upliftment of geriatric subjects is need of the hour. Findings of the present study clearly highlight that besides economic deprivation many other types (viz., food, water and sanitation, shelter, education and information) deprivations prevailed in the study subjects. However, in order to find out associates and predictors of SED, socio-demographic and economic issues were taken in account. Although findings of the study emphasises focused attention for subjects in economically disadvantage position and with higher family size it will be worthwhile to address the various other aspects which are major determinants of health. In fact, optimum health is an input as well as output measure of socio-economic development. The findings of the present study highlight that subjects with family size > 3 and belonging to upper lower and lower had higher vulnerability for socio-economic deprivation. These findings have significant policy and programmatic implications. In India majority of the older persons are from the unrecognized sector and they don't have regular source of income. About 1 out of 8 belonged to organized sector and have distinct benefit from service pension and health benefits. In response to national policy for older persons, several initiatives have been taken to ensure financial security and social protection. Expanded old age pension scheme, taxation benefits in terms of increased standard tax deduction and higher interest rate for long-term saving for senior citizens have been initiated. However, their impact in combating socioeconomic deprivation in geriatric subjects from lower and upper-lower SES categories is likely to be limited (Lal *et al.*, 2022).

CONCLUSIONS

Socio Economic Deprivation is widespread in urban geriatric subjects when measured from different angles. Further subjects with SED need to have focused attention based on the predictors of SED (viz., family size and socio-economic status). Limiting family size, ensuring income generation activities and economic security are key inputs for optimum dividends in tackling SED.

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