

Physical and Mental Well-Being of Elderly in India: A Study based on LASI Wave I- Data

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Abstract: *Rapid demographic changes—marked by increased life expectancy, declining fertility, and better health systems—have led to a global rise in the elderly population. In India, this shift is accompanied by a rising burden of chronic diseases such as hypertension, diabetes, respiratory and heart conditions, and musculoskeletal disorders. Using LASI Wave I data from a nationally representative sample of 31,902 elderly, this study examines the role of socio-economic and demographic factors in predicting chronic illnesses and their mental health impact. Logistic regression results show that education, income, gender and rural residence significantly affect likelihood of chronic disease. Geographic and caste-based disparities are also observed, with rural residents facing greater healthcare access issues. Furthermore, individuals with chronic illnesses—especially cardiovascular and joint diseases show higher odds of depression. The study underscores need for integrated public health strategies to address socio-demographic inequalities, improve healthcare accessibility and support mental well-being among ageing population.*

Keywords: Depression, Elderly health, LASI, Logistic regression, Mental health, Morbidity, Public Health Policy.

What We Already Know

- Ageing populations face a growing burden of chronic illnesses.
- Socio-economic and demographic factors affect health outcomes.
- Depression is linked to physical illness in older adults.

What This Article Adds

- Confirms chronic illness–depression link using LASI data.
- Highlights rural–urban and caste disparities.
- Recommends integrated, equity-focused health policies.

1. Introduction

The worldwide population is experiencing a notable demographic transformation, with the elderly demographic growing at an unparalleled pace. By the year 2020, around 1 billion individuals aged 60 or above were recorded globally, a number anticipated to soar to 2.1 billion by 2050, marking a 110% rise in merely three decades (UN, DESA, Population Division, 2024; WHO, 2024). This phenomenon is especially evident in developing nations, where swift urbanization and evolving social dynamics have led to an increasing elderly demographic. The number of elderly in India is projected to climb from roughly 138 million in 2021 to about 300 million by 2050, making up nearly 20% of the overall population (IIPS & UNFPA, 2023; UN, DESA, Population Division, 2024).

Elderly population, in general, face multiple socio-economic and health issues with growing age. Elderly in India contend with a range of health issues, including chronic ailments like diabetes, hypertension, respiratory disease, cancer, and arthritis, which considerably impact their quality of life (Kumar, 1997). Additionally, mental health challenges, such as depression, dementia, and anxiety, are increasingly common among the elderly, often worsened by social isolation, limited healthcare access, and weak support systems (Cleary et al., 2017; Maresova et al., 2019). The intersection of these physical and mental health challenges highlights the pressing necessity for thorough health

strategies that cater to the comprehensive needs of older adults.

Socio-economic factors play vital role in physical and mental state of individuals, particularly elderly. Higher income levels are generally associated with improved access to healthcare services, nutritious food options, and opportunities for physical activity, all contributing to better health outcomes (Benzeval, 2011). On the contrary, individuals in lower socio-economic strata frequently encounter obstacles such as insufficient healthcare access, substandard living conditions, and limited social support, aggravating chronic health conditions and heighten vulnerability to mental health issues like depression and anxiety (Hassan et al., 2020). Furthermore, education level plays a critical role, as it shapes health literacy and the capability to navigate the healthcare system adeptly (Faresjö & Rahmqvist, 2010). The stress linked to financial instability can further undermine mental health, leading to a cycle of health inequities that disproportionately impacts at-risk populations (Frankham et al., 2020). Elderly contribute significantly to society and the economy, serving as sources of wisdom, caregivers, mentors, and volunteers who enrich their communities. It becomes essential to recognise the efforts and provide them with such as improved healthcare access, pension plans, and social support systems to enhance their quality of life.

The relationship between physical health and mental health is significant, particularly within the elderly demographic. Chronic health conditions, such as diabetes, hypertension, and arthritis, can result in heightened levels of stress, anxiety, and depression (Beekman et al., 1995). The discomfort and restrictions linked to these conditions often lead to feelings of helplessness and social isolation, intensifying mental health concerns. Conversely, maintaining good physical health through consistent exercise, balanced nutrition, and effective management of chronic ailments can greatly boost mental well-being (Sharma et al., 2006). Participating in physical activities has been proven to alleviate symptoms of anxiety and depression, enhance mood, and cultivate a sense of achievement and self-worth.

India's aging population is persistently facing challenges related to tobacco and alcohol consumption, physical inactivity, and healthcare accessibility, while also highlighting new concerns such as mental health stigma and the impact of socioeconomic disparities (Eashwar et al., 2020; Pampel et al., 2010). Risky behaviours, including smoking and alcohol use, remain prevalent among older adults and are strongly associated with adverse metabolic health outcomes, increasing the risk of non-communicable diseases such as type 2 diabetes and hypertension (Utchimahali et al., 2024). Health remains a significant concern as stigma, perceived treatment inadequacy, and financial constraints prevent elderly in South India from seeking formal mental health support, leading them to rely on alternative coping mechanisms instead (Weaver et al., 2024).

The issue of physical and mental healthcare of elderly have become a prominent concern for policy making specifically for marginalised elder population. Meanwhile, community-based interventions such as Self-Help Groups (SHGs) are emerging as effective tools for improving health behaviours. SHGs focusing on social behaviour change strategies, including peer education and interpersonal communication, have led to improvements in dietary diversity, healthcare-seeking behaviour, and chronic disease management among vulnerable populations (Verma et al., 2024). However, sustaining these initiatives remains a challenge due to logistical issues, low participation rates, and the dissolution of older SHGs over time.

2. Data

The present study utilizes data from the first wave of the Longitudinal Aging Study in India (LASI), a nationally representative survey conducted by IIPS, Mumbai, which is internationally harmonized with the Health and Retirement Study (HRS). By leveraging LASI Wave I data, we focus exclusively on the elderly population aging 60 years and above to examine the socio-economic and demographic aspects of the elderly in relation to their physical health and to investigate the effect of physical health issues on their mental health, specifically depression. After applying the necessary filters, our final analytical sample consists of 31,902 individuals, ensuring a robust and representative dataset for our analysis.

Variables Under Study

The analysis incorporates two broad categories of variables: (1) socio-economic and demographic variables, and (2) diagnosed diseases. Also, we have used Centre for Epidemiologic Studies- Depression (CES-D) Scale to measure depression among elderly.

For the analysis, physical health variables considered under the study are namely- hypertension (HT002), diabetes (HT003), chronic lung diseases (HT005), chronic heart diseases (HT006), stroke (HT007), bone/joint disease (HT008) and high cholesterol (HT010). The individual in the survey were asked whether they have been diagnosed with these diseases ever or not. It is important to note that cancer or malignant tumour (HT004) has been excluded from the study due to its low prevalence in the population, recorded at only 0.7%. Also, Cancer includes various types of malignancies, each with distinct risk factors and outcomes,

and should be studied separately for a more comprehensive understanding. Neurological or psychiatric disorders (HT009) have been excluded from the table as we have used the Centre for Epidemiologic Studies-Depression (CES-D) Scale to measure depression among the elderly separately. CES-D consists of ten questions (FS701–FS710) that evaluate the respondent's emotional and psychological state over the past week. Each question assesses a specific symptom related to depression, such as difficulty concentrating, feelings of sadness, etc. To determine an individual's depression status, the responses are summed to create a total score. In the present study, individuals with a score greater than or equal to 5 are classified as depressed. This threshold helps differentiate those experiencing significant depressive symptoms from those with minimal or no symptoms.

Logistic Regression Model:

Logistic regression is a widely used statistical method for modelling the relationship between a binary dependent variable and one or more independent variables. The model is based on the logistic function, also known as the sigmoid function, which transforms linear combinations of predictors into probabilities. Mathematically, the is expressed as follows:

$$P(Y = 1|X) = \pi(X) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}}$$

where $P(Y = 1 | X)$ represents the probability of the event occurring, β_0 is the intercept, β_j 's ($j = 1, 2, \dots, k$) are the regression coefficients, and X_j 's ($j = 1, 2, \dots, k$) are the independent variables. The model assumes a linear relationship between independent variables and log odds of dependent variable, independence of observations, and no multicollinearity among predictors.

The parameters $\beta_0, \beta_1, \dots, \beta_k$ are estimated using the method of Maximum Likelihood Estimation (MLE). Given a dataset with n independent observations $(Y_i, X_{i1}, X_{i2}, \dots, X_{ik})$, the likelihood function is formulated as:

$$L(\beta_0, \beta_1, \dots, \beta_k) = \prod_{i=1}^n P(Y_i | X_i)$$

Since Y_i can be either 0 or 1, we can write the likelihood function as:

$$L(\beta) = \prod_{i=1}^n \left[\frac{e^{\beta_0 + \sum_{j=1}^k \beta_j X_{ij}}}{1 + e^{\beta_0 + \sum_{j=1}^k \beta_j X_{ij}}} \right]^{Y_i} \times \left[\frac{1}{1 + e^{\beta_0 + \sum_{j=1}^k \beta_j X_{ij}}} \right]^{1-Y_i}$$

The MLEs $\widehat{\beta}_0, \widehat{\beta}_1, \dots, \widehat{\beta}_n$, obtained by solving for the values for parameters that maximize the likelihood function, are used for prediction, hypothesis testing, and model interpretation in logistic regression analysis.

3. Result

Table 1: Frequency Distribution of Socio-Economic Variables under study

Variable	Category	Percent (%)
Place of Residence	Rural	66.1
	Urban	33.9
	Total	100.0
Income Category	Poor	41.2
	Middle	20.4

	Rich	38.4
	Total	100.0
Education	No Education	53.9
	Up to Primary	18.5
	Matric	19.3
	Higher	8.3
	Total	100.0
Living with Partner	Yes	63.9
	No	36.1
	Total	100.0
Religion	Hindu	73.0
	Muslim	11.7
	Other	15.3
	Total	100.0
Caste Category	SC/ST	32.9
	OBC	38.0
	Other	25.8
	Total	96.7
	Missing	3.3
Currently Working	Yes	29.4
	No	70.5
	Total	99.9
	Missing	0.1

The income category is categorised into three categories form 'initial five' as shown in the Table 1. Regarding education levels, the data was originally categorized into nine groups; however, as 83.5% of respondents have education up to matriculation, categories above 10th standard were combined into a single category as higher education. Religious categories were adjusted by combining all religions into the 'Other' religious group, except for Hindu and Muslim. 64 percent of the elderly are found to be living with their partner, whether married or in live-in relationship, whereas 36 percent were found to be living as widowed, divorced, separated, or never married.

Table 2: Logistic Regression Analysis of Chronic Disease Diagnosis with Socio-economic and Demographic Variables

Variable	$Exp(\beta)$ (Odds Ratio)	S.E. (Standard Error)	Sig. (p-value)	95% C.I. for $Exp(\beta)$
Place of Residence (Rural)				
Urban	0.574	0.028	<0.001*	0.544 – 0.606
Sex of Respondent (Female)				
Male	1.287	0.027	<0.001*	1.221 – 1.357
Education Level (No Formal Education)				
Primary	0.693	0.033	<0.001*	0.649 – 0.740
Metric	0.674	0.052	<0.001*	0.629 – 0.722
Higher	0.582	0.052	<0.001*	0.525 – 0.644
Religion (Hindu)				
Muslim	0.801	0.040	<0.001*	0.741 – 0.866
Other	0.950	0.036	0.151	0.885 – 1.019
Caste Category (SC)				
OBC	0.737	0.030	<0.001*	0.695 – 0.781
Other	0.729	0.034	<0.001*	0.683 – 0.779
Income Class (Poor)				
Middle	0.574	0.032	<0.001*	0.739 – 0.839
Rich		0.028	<0.001*	0.566 – 0.632
Working Status (Currently not Working)				
Currently Working	1.287	0.028	<0.001*	1.767 – 1.969
Constant	0.693	0.030	<0.001*	

* for $p < 0.05$, ** for $p < 0.01$, *** for $p < 0.001$; Reference categories for independent variables are indicated in parenthesis.

Table 3: Logistic Regression Analysis for Depression and Physical Health

Variable	$Exp(\beta)$ (Odds Ratio)	S.E. (Standard Error)	Sig. (p-value)	95% C.I. for $Exp(\beta)$
Hypertension or High Blood Pressure	1.0961	0.03132	<0.001*	1.0364 – 1.1592
Diabetes or High Blood Sugar	0.9446	0.03546	0.129	0.8776 – 1.0167
Chronic Lung Disease	1.3434	0.06229	<0.001*	1.2267 – 1.4712
Chronic Heart Disease	1.0974	0.06483	0.115	0.9775 – 1.2322
Stroke	1.3249	0.10070	<0.001*	1.1416 – 1.5378
Bone/Joint Disease	1.4138	0.04584	<0.001*	1.3263 – 1.5061
High Cholesterol	0.7547	0.05492	<0.001*	0.6543 – 0.8704
Constant	0.3355	0.00587	<0.001*	0.3242 – 0.3473

* for $p < 0.05$, ** for $p < 0.01$, *** for $p < 0.001$; 'No' is the reference category for independent variables.

4. Discussion

The dependent variable in Table 2 shows the logistic regression output between diagnosis of at least one chronic disease (mentioned in supplementary table 2) and the socio-economic factors (listed in Table 1). Findings reveal that 51%

of respondents reported having been diagnosed with at least one of a disease, highlighting the high prevalence of chronic conditions in the studied population. The odds ratio $Exp(\beta)$ quantifies changes in the likelihood of disease diagnosis for a one-unit increase in a predictor variable. Also, statistical significance is assessed using the p-value. Table 2 indicates

that place of residence significantly affects disease diagnosis ($p < 0.001$), with individuals living in urban areas having 42.6% lower odds of being diagnosed with a chronic disease compared to those in rural areas. This suggests a higher risk for rural populations, likely due to limited healthcare access and environmental factors (Chan & Chuah, 2024). Gender also plays a crucial role, as being male increases the odds of disease diagnosis by 28.7% compared to being female, potentially due to lifestyle choices and occupational hazards (Alabbas et al., 2024). Education level is inversely related to disease diagnosis ($p < 0.001$), with individuals having higher education experiencing 41.8% lower odds of being diagnosed compared to those with no formal education, highlighting the protective effects of education through healthier behaviours (Irakhah et al., 2024). With Muslims having 19.9% lower odds of being diagnosed with physical issues compared to Hindus ($p < 0.001$) religion emerged to be a significant factor. This might be due to the smaller representation of Muslims (11.7%) in the study population, leading to potential bias in the results. Other factors such as section wise backwardness, lack of education etc can also be the factors to be explored further in this result. Caste category also predicts disease diagnosis ($p < 0.001$), as individuals from OBC and other castes have 26.3% and 27.1% lower odds, respectively, compared to SC/ST groups, reflecting socio-economic disparities. Income class shows a strong inverse relationship with disease diagnosis, with individuals in the middle- and rich-income groups having 21.2% and 40.2% lower odds, respectively, compared to the poor ($p < 0.001$), emphasizing the role of better healthcare access and living conditions. Working status is a critical factor, with currently working individuals having 86.5% higher odds of being diagnosed with a chronic disease ($p < 0.001$), likely due to occupational stress and health risks at older age (Hilland & Anthun, 2024). living with partner was not statistically significant. These findings highlight the need to improve rural healthcare, promote education, and address socio-economic inequalities to reduce chronic disease risks.

Impact of Diagnosed Diseases on Mental Health of Elderly:

Table 3 shows the outcomes of logistic regression between physical health conditions and depression. The results show that hypertension (OR = 1.096, $p < 0.001$), chronic lung disease (OR = 1.343, $p < 0.001$), stroke (OR = 1.324, $p < 0.001$), and bone/joint disease (OR = 1.413, $p < 0.001$) are significantly associated with higher odds of depression. Potential explanations include the chronic pain and physical limitations associated with these conditions, which can reduce quality of life and increase psychological distress (Kivimäki et al., 2014). Chronic lung disease and stroke, in particular, may lead to reduced mobility and social isolation, both of which are known risk factors for depression (Alexopoulos, 2005; Turner & Kelly, 2000).

Interestingly, high cholesterol (OR = 0.754, $p < 0.001$) is significantly associated with lower odds of depression. One possible explanation for this is that individuals with high cholesterol may be receiving medical treatment, dietary interventions, or lifestyle modifications that positively impact mental health (Zhang, 2003). Alternatively, some studies suggest that cholesterol plays a role in serotonin function, and lower cholesterol levels have been linked to mood disorders

(Engelberg, 1992). Diabetes (OR = 0.944, $p = 0.129$) and chronic heart disease (OR = 1.097, $p = 0.115$) do not show statistically significant associations with depression. This could be due to effective disease management or variations in individual coping mechanisms that mitigate depressive symptoms (Gonzalez et al., 2008).

With 30,655 observations and a highly significant chi-square test value ($p < 0.001$), the model indicated a strong overall fit. All these findings underscore the importance of integrating mental health care into chronic disease management, particularly for conditions that impair daily functioning and mobility.

5. Conclusion

The present study reveals that socio-economic factors—such as income, education, working status, and geographic location—significantly influence health outcomes. Individuals from lower-income groups and those with limited education face a higher likelihood of adverse health conditions, emphasizing the importance of economic stability and educational attainment in promoting well-being. Rural populations are particularly vulnerable to physical health issues due to limited healthcare than urban residents. Gender plays a critical role, with women being more likely to seek medical care compared to men, who underutilize healthcare services. The study further highlights a strong link between chronic physical conditions—such as cardiovascular diseases, diabetes, and respiratory issues—and mental health challenges like anxiety and depression, underscoring the need for integrated healthcare approaches that address both physical and mental health. To improve public health outcomes, targeted policies should enhance healthcare access for low-income and rural populations through mobile clinics, telemedicine, and subsidized care. Strengthening education programs can improve long-term health, while integrating mental health services into primary healthcare settings can facilitate early diagnosis and intervention. Gender-specific health campaigns and workplace programs addressing mental health are also vital. Future research should prioritize longitudinal studies to examine causal relationships between socio-economic factors, physical health, and mental well-being, while also exploring the influence of lifestyle, social support, and cultural contexts on health disparities. Comparative studies across regions can inform policymakers on effective strategies, and qualitative research on healthcare experiences can provide a deeper understanding of barriers to access.

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