Investigating the Physical Multimorbidity and Mental Health Nexus: A study on Physical Multimorbidity, Covariates and Its link to Depression in Middle-Aged and Older Adults in India

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Abstract

Physical multimorbidity (MM) and depression pose major challenges to the Indian healthcare and social systems, necessitating research on their prevalence, covariates, and interrelation to improve care strategies. This cross-sectional study analyzes data from the Longitudinal Ageing Study in India (2017–2018), comprising 66,606 participants. Descriptive and bivariable analyses were conducted to examine the prevalence of physical MM, while regression analysis assessed associations between MM, depression, and other factors. The weighted prevalence of MM was 17.9%, with the highest prevalence observed in Kerala (40%) [95% CI 36.9, 43.2], indicating significant regional variation. Among depressive participants, MM prevalence was 24.6% [95% CI 21.5, 29.8], notably higher than in non-depressive individuals (17.5% [95% CI 16.3, 18.1]). Depression was strongly associated with a 31% increased likelihood of physical multimorbidity (AOR: 1.31, 95% CI 1.19, 1.41). Independent risk factors for MM included older age, higher education, widowhood/single status, urban residence, wealth index, poor self-rated health, and physical inactivity. The burden of MM is particularly high in developed states like Kerala. Depression is emerging as a key risk factor for MM. Recognizing depression as a potential screening tool among older adults is crucial, alongside strengthening community-led interventions to effectively manage MM associated with depression.

Introduction

Non-communicable diseases (NCDs) account for 74% of global mortality, with 77% occurring in low- and middle-income countries (LMICs)[1]. NCDs are most prevalent in older persons, and fast ageing group which is predicted to significantly increase, particularly in LMIC, where the United Nations predicts two-thirds of the population will be 60 years or older by 2050[2]. Physical MM, a term widely used to refer the presence of two or more chronic physical conditions occurring simultaneously,[3] represents a considerable immediate and future challenge for health and social care systems around the world and LMICs like India[4,5]. Compared to single chronic disease condition, MM has been associated with longer hospital stays, more frequent outpatient visits,

elevated health care costs[6,7], declined cognition[8], decreased quality of life[9], and increased risk of mortality[10,11].

Evidences denote that prevalence of depression is soaring among older people ranging from 28.4% to 35.1% [12,13]. In recent years, adults especially older adults suffering from severe mental illnesses, like major depression are more likely to experience disproportionate negative health consequences, which were formerly summed up as the three Ds: death, disability, and health-economic deficit[14]. The health condition will further significantly worsen in individuals with severe mental illness and coexistent physical and neuropsychiatric conditions [15].
Depression may raise the risk of chronic illnesses like heart disease, diabetes, stroke and physical MM [15,16]. The presence of chronic conditions including MM, and psychiatric conditions like depression, has been proposed as a keydriver of adverse health outcomes[17-20] threatening the attainment of sustainable development goal 3. A recent reliable systematic review revealed that there is a greater burden of physical MM among people with severe mental illness as compared to those without an illness[15]. The risk of increasing MM may be due to difficulties on implementing routine care such as balanced eating, taking risky habits and social addiction driven behaviors like smoking, and drinking[21]. In addition, poorer disease management may occur in people with depressive symptoms as they may be less likely to adhere to their medical regimens[22], leading to increased risk for development of physical MM.

Apart from depression, there are others factors linked with physical MM such as age[23], female sex [23,24], sedentary lifestyles[23,25], physical inactivity[25], educational level[24-26], living arrangements [26], household income[26], ethnicity[26], occupation[24-26] and area of residence(26). Despite the existing literature, the epidemiology and factors associated with physical MM are still poorly understood, especially in developing countries like India[15,16] where ageing phenomenon is going to be the biggest challenge. Furthermore, few studies who have explored the prevalence and its covariates did not include depression which is a possible contributor for physical MM. Hence, this study intends to measure the prevalence of physical morbidity and factors associated with and without depression.

Methods

Study design and data source

The first wave of the Longitudinal Aging Study in India (LASI), an extensive and nationally representative survey of Indians 45 years of age and older conducted between 2017 and 2019, was utilized as the primary source of data for this cross-sectional study. The survey covered a wide range of the health, economic, and social determinants and consequences of population aging in the country[27]. In order to assure its representativeness, LASI used a stratified multistage cluster sampling technique. Primary sample units (PSUs) were chosen within each stratum following stratification based on rural and urban areas was implemented in this sampling technique. Households from these PSUs were sampled, and those who eligible were invited to participate in part in the survey. Face-to-face interviews were carried out with participants by trained interviewers utilizing a prepared questionnaire. Each stage of the data collection process was standardized to ensure rigor and consistency throughout the course of the study. More details about the survey are available elsewhere[28].

Outcome variable: Physical MM

Physical MM was determined by using eight different chronic illnesses covered by the LASI survey: high blood pressure, stroke, cancer or malignant tumor, diabetes, any chronic lung disease, any bone or joint condition, chronic heart disease, and high cholesterol.
A self-reported question titled "Has any health professional ever diagnosed you with the following chronic conditions or diseases?" was used to gather information on these chronic illnesses. In order to distinguish between people who have fewer than two chronic conditions (the "absence of physical MM") and people who have two or more chronic disorders (the "presence of physical MM"), MM was operationalized as a categorical variable.

Exposure Variables: Depression

The Composite International Diagnostic Interview-Short Form was used in this study for assessing major depressive disorders in older adults (CIDI-SF)[29]. The ten-item CIDI-SF questionnaire evaluates at dysphoria symptoms within the preceding two weeks and the past 12 months. It does this by asking three screening questions on dysphoria and/or anhedonia that lasted for at least two weeks in the 12 months prior, as well as seven symptom-based questions. These symptoms include anhedonia, apathy, changes in appetite, trouble concentrating, feelings of worthlessness, death thoughts, and insomnia. The overall depression scale score ranged from 0 to 10 and was calculated by adding the answers to the ten items. On the CIDI-SF, a score of three or above was indicative of major depression.

Control variables

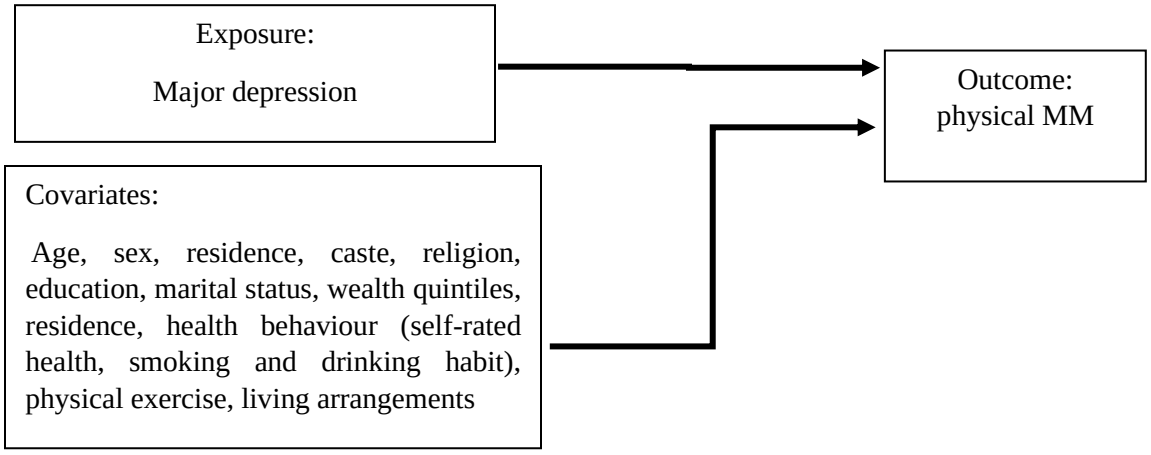
After an extensive literature review, various socio-demographic factors were included in the analysis as covariates. These were age (below 50, 50-59 years, 60-69 years, 70-79 years, and 80 years and above), sex (male and female), marital status (currently married and windowed/divorced/single), living arrangement (living alone, living with spouse, living with others), place of residence (urban and rural), education (no formal education, 1-5 years of education, 6-9 years of education, ≥ 10 years of education), caste (schedule caste (SC), schedule tribe (ST), other backward castes (OBC), and others , religion (Hindu, Muslim, Christian and others), wealth index (Poorest, Poorer Middle, Richer, Richest), smoking (never and ever), alcohol (never and ever), depression (no, yes), physical activity (no and yes), and self-rated health (good, fair and poor).

Data analysis

We employed descriptive statistics to give an overview of the study sample's demographics and physical MM prevalence. Individual sample weight was applied throughout the analysis to ensure the representativeness of the results. State-level weights were applied to estimate the prevalence of depression in various states and union territories (UTs) of India. Statistical significance was established at a two-sided p-value of 0.05. All analysis were conducted using Stata version 15.1. We utilized logistic regression models to analyze the causal connection between characteristics of participants, depression and MM status. Following undertaking both

unadjusted and adjusted analyses, factors that were significantly associated ($p < 0.05$) with physical MM in the unadjusted model were included in the adjusted model. We included odds ratios (OR) and 95% confidence intervals (CI) wherever applicable. The model fit was evaluated using Variance Inflation Factor along with other diagnostic assumptions such as multicollinearity and outliers.

Conceptual framework



Declaration

This study utilized a secondary dataset involving human participants. All methods adhered to relevant guidelines and regulations, with ethical approval granted by the Indian Council of Medical Research (ICMR) for the survey. Informed consent was obtained from all participants before the interviews."

Results

Table 1: Description of the study populations (N=66,606)

Variables	Frequency	Percentage	P. MM (95%CI)
Place of Residence			
Rural	43,240	64.9	13.7 [13.2,14.2]
Urban	23,366	35.1	27.1 [24.7,29.6]
Demographic variables			
Sex			
Male	31,039	46.6	16.5 [15.3,17.8]
Female	35,567	53.4	19.1 [17.7,20.3]
Marital Status			
Currently married	49,555	74.4	16.9 [15.9,17.9]
Widowed/divorced/single	17,051	25.6	20.9 [18.6,22.6]
Living arrangement			

Living alone	2,332	3.5	19.1 [16.5,21.9]
Living with spouse	48,638	73	17 [15.9, 17.9]
Living with others	15,636	23.5	20.5 [18.4,22.7]
Age (yrs)			
below 50	13,453	20.2	9.2 [7.7, 11.8]
50-59	21,251	31.9	15.3 [13.9,17.5]
60-69	19,211	28.8	22.2 [20.1,22.9]
70-79	9,250	13.9	26.4 [21.9, 27]
80+	3,441	5.2	22.3 [19.2,24.4]
Socio-economic variables			
Years of schooling			
No Formal education	31,350	47.1	14.3 [13.3,15.2]
1-5 years of education	16,359	24.6	19.8 [18.7, 21.1]
6-9 years of education	15,142	22.7	22.6 [19.8,25.6]
≥10 years of education	3,752	5.6	24.6 [19.1,31.1]
Caste			
SC	11,014	17.1	14.3 [13.2,15.5]
ST	11,746	18.3	7.7 [6.7,8.8]
OBC	25,212	39.2	19 [17.4,20.9]
Others	16,295	25.4	21.2 [20.3,22.3]
Religion			
Hindu	48,711	73.1	16.9 [16,17.8]
Muslim	7,806	11.7	23.4 [19.7,27.5]
Christian	6,638	10	20.1 [16.2,24.7]
Others	3,445	5.2	20.4 [18.2,22.7]
Wealth Index			
Poorest	13,181	19.8	11.2 [10.3,12]
Poorer	13,403	20.1	14.6 [13.6,15.7]
Middle	13,371	20.1	17 [15.7,18.4]
Richer	13,412	20.1	20.2 [18.2,22.4]
Richest	13,239	19.9	28.1 [24.7,31.6]
Health-related variables			
Smoking			
Never smoked	42,001	63.6	20.1 [18.8,21.5]
Ever smoked	24,023	36.4	14.2 [13.5,14.9]
Alcohol			
Never	54,190	82.1	18.6 [17.6,19.6]
Ever	11,854	17.9	14.3 [13.2,15.6]

Physical exercise			
Everyday	15,672	23.7	12 [10.5,13.8]
> Once in a week	4,559	6.9	10.9 [9.7,12.3]
Once in a week	2,396	3.63	15.6 [8.3,27.4]
1 to 3 times a month	3,274	4.96	11.6 [9.7,13.9]
Hardly ever or never	40,125	60.8	21.9 [20.8,23.2]
Depression			
No	60,199	92.2	17.5 [16.3,18.1]
Yes	5,111	7.8	24.6 [21.5,29.8]
Self-rated Health			
Good	27,484	41.8	9 [8.4, 9.7]
Fair	27,107	41.3	18.9 [17.3,20.7]
Poor	11,096	16.9	33.3 [31.3,35.3]

Note: Prevalence are weighted

Table 1 depicted the characteristics of the study participants. Approximately half (52.1%) of older individuals were between the ages of 45 and 59, while 5.17% participants were over the age of 80. Nearly one-third (35.08%) of older adults lived in urban settings. More than half of the older adults (53.4%) were women as compared to males (46.6%), and nearly three-fourths (74.4%) were married. Approximately half of the older individuals (47.07%) had no formal education, while roughly one-fifth (5.63%) had completed ten or more years of education. More than half (55%) of older persons reported having no diseases, while 5% was diagnosed with three or more diseases. Approximately three-fourth (73%) were living with spouse and followed Hindu religion. More than one third proportion of the respondents (39.2%), belonged from the "OBC" category, one-fifth (18.3%) were ST's and around 17.1 % were SC's. Income wise the proportion of the respondents was categorized as: poorest (19.8%), poorer (21.1%), middle (21.1%), richer (20.1%) and richest (19.9%). Around one-fourth of the respondents (16.9%) had poor self-rated health. Overall, 7.8% respondents had experienced depression. Around one-fourth of the participants (23.7%) were following physical exercise daily, while more than half (60.8%) had hardly ever or never carried out physical workout. Around 17.9% of the participants ever used alcohol and 36.4% ever smoked while others had refrained from alcohol (82.1) and smoking (63.6).

The data showed that around 27.1% of participants residing in urban areas had physical MM while only 13.7% respondents were found with MM in rural places. Likewise, prevalence of physical MM was higher in females (19.1%) compared to males (16.5%). There was a higher proportion of Physical MM among the participants who were widowed/divorced/single (20.9%) compared to currently being married (16.9%) groups. Similarly, inflated prevalence of physical MM was observed among 70-79 years (26.4%) old participants and who had completed ten or more than ten years of education (24.6%). There was a directly proportionate relationship between physical MM and income. Highest percentile of physical MM was observed in the richest group (28.1%) of people and lowest in the poorest group (11.2%). Lowest percentile of the physical MM was observed among those were living with spouse (17%) and highest percentile among those living with others (20.5%). Religion wise physical MM was higher

among Muslims (23.4%). Furthermore, physical MM was higher among depressed people (24.6%) compared to non-depressed individuals (17.5%). High prevalence of physical MM was observed among the participants who hardly or never practiced physical workout (21.9%). There was high percentage of physical MM among the people who rated their health status as poor (33.3%) compared to fair (18.9%) and good condition (9%).

Table 2: Prevalence of physical MM among middle and older adults of India (N=66,604)

Morbidity patterns	**Frequency**	**Percentage**
No physical morbidity	36,923	55.4
Single physical morbidity	17,767	26.7
Double physical morbidity	8,455	12.7
Triple or more than triple physical morbidity	3,459	5.2
Physical MM		
No	54,691	82.1
Yes	11,914	17.9

Table 2 showed that more than half of the older participants (55.4%) were free of physical morbidity, around 26.7% respondents had at least single morbidity, 12.7% individuals had double morbidity and finally 5.2% respondents had triple or more than triple morbidity at the same time. Overall, 1 in every six (17.9%) participants had physical MM and 82.1% had no form of physical MM.

Fig 1: Prevalence of physical MM among older adults across states in India.

Fig 1 highlighted that the prevalence of physical MM across various states and UTs of India. Highest prevalence was found in Kerala (40%), Lakshadweep (28.9%) and Karnataka (27.9%) while lowest prevalence estimates were found in Meghalaya (5.5%), Nagaland (6.5%) and Chhattisgarh (7.6%) (Supplementary file 1).

Table 3 showed the regression analysis performed for identification of covariates of physical MM and the association with depression after adjusting with sociodemographic characteristics and observed increase odds of physical MM. The result showed a strong and positive association between physical MM and depression. A higher odd of having physical MM (aOR= 1.31, CI= 1.19, 1.41) was found among those who were depressed compared to those who were not. Similarly, adjusted analysis revealed an elevated risk of having physical MM who resided in urban areas [aOR=1.74, CI=1.65,1.84], were females [aOR=1.21, CI=1.14, 1.28], were widowed/divorced/single [aOR=1.20, CI=0.97,1.50]. Similarly, compared to below 50 aged people, 50-59 years [aOR=1.76, CI= 1.64,1.90], 60-69 [aOR=2.76, CI=2.56,2.97], 70-79 [aOR=3.28, CI=3.01,3.58] and 80 years and above [aOR=2.37, CI=2.10,2.67] had a higher risk of acquiring depression. The risk of physical MM was increased proportionately with completed number of years of education. The odds of having physical MM among the older adults who had completed 1-5 years of education was 1.38 with CI of 1.31 to 1.47, 6-9 years [aOR=1.62, CI=1.52, 1.74] and ten or more than ten years of education [aOR=1.69, CI=1.53,1.88]. Furthermore, the result showed that higher odds of having physical MM [aOR= 2.27, CI= 2.09, 2.45] among those who fall under richest wealth quantile index compared to those who were

richer [aOR= 1.75, CI= 1.62, 1.89], middle [aOR=1.52, CI=1.40, 1.63]], and poorer [aOR=1.25, CI= 1.15,1.35]. Similarly, elevated odds of having Physical MM trend were noticed among those who rated their health as fair [aOR=1.93, CI= 1.83,2.04] and poor [aOR=4.51, CI= 4.23,4.82] in contrast to those who rated their health as a good. Compared to SC group, OBC [aOR=1.12, CI=1.04, 1.20] and other groups [aOR=1.20, CI=1.12,1.29] had higher risk of experiencing physical MM. However, ST group had a lower risk of MM [aOR=0.73, CI= 0.66,0.82]. The odds of having depression were high among those who hardly or never exercised [aOR=1.31, CI=1.23,1.39] than those who regularly worked out. Persons who were ever exposed to alcohol had lower risk of having physical MM [aOR=0.83, CI=0.78,0.88] a compared to those who were never.

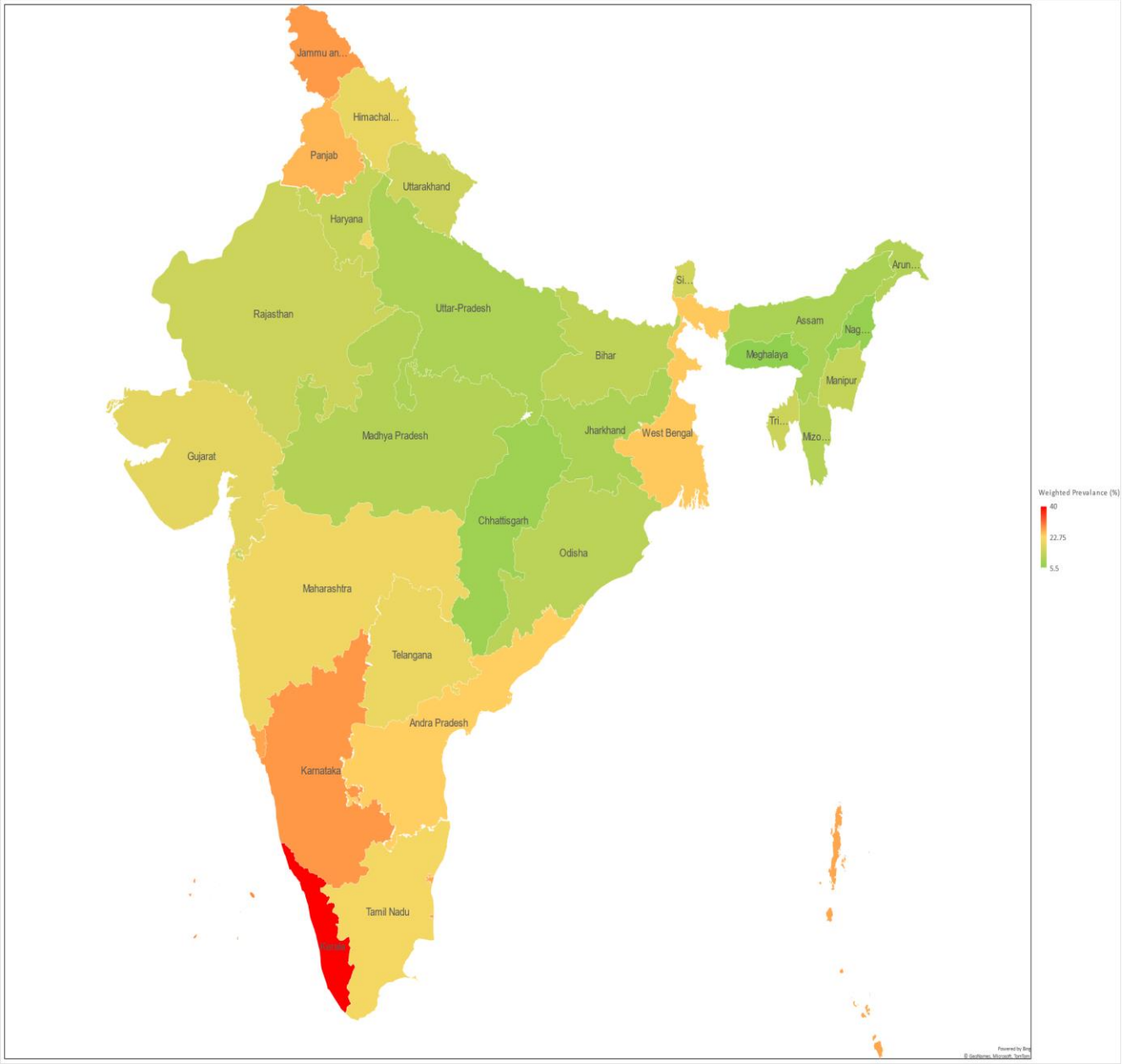


Table 4: Regression analysis of depression and socioeconomic covariates with physical MM

Variables	Model 1(OR 95% CI)	Model 2	Model 3
Depression			
No	1	1	1
Yes	1.54*** (1.43, 1.66)	1.71***[1.57,1.85]	1.31***[1.19,1.41]
Place of Residence			
Rural		1	1
Urban		1.6***[1.59,1.76]	1.74***[1.65,1.84]

Sex			
Male		1	1
Female		1.40***[1.33,1.47]	1.21***[1.14,1.28]
Marital Status			
Currently married		1	1
Widowed/divorced/single		0.96[0.91,1.01]	1.20***[0.97,1.50]
Living arrangement			
Living alone		1	1
Living with spouse		1.72***[1.36,2.16]	1.75***[1.38,2.22]
Living with others		1.38***[1.22,156]	1.40***[1.24,1.60]
Age (yrs)			
below 50		1	1
50-59		1.87***[1.74,2.01]	1.76***[1.64,1.90]
60-69		3.26***[3.02,3.50]	2.76***[2..56,2.97]
70-79		4.34***[3.99,4.72]	3.28***[3.01,3.58]
80+		3.62***[3.23,4.07]	2.37***[2.10,2.67]
Socio-economic variables			
Years of schooling			
No Formal education		1	1
1-5 years of education		1.36***[1.28,1.44]	1.38***[1.31,1.47]
6-9 years of education		1.52***[1.42,1.61]	1.62***[1.52,1.74]
≥10 years of education		1.43***[1.29,1.58]	1.69***[[1.53,1.88]
Caste			
SC		1	1
ST		0.71***[0.64,0.79]	0.73***[0.66,0.82]
OBC		1.09**[1.02,1.17]	1.12***[1.04,1.20]
Others		1.17***[1.08,1.25]	1.20***[1.12,1.29]
Religion			
Hindu		1	1
Muslim		1.43***[1.33,1.55]	1.42***[1.30,1.53]
Christian		1.31***[1.18,1.46]	1.31***[1.17,1.45]
Others		1.05***[0.93,1.19]	1.08[0.95,1.22]
Wealth Index			
Poorest		1	1
Poorer		1.23***[1.14,1.33]	1.25***[1.15,1.35]
Middle		1.47***[1.36,1.58]	1.52***[1.40,1.63]
Richer		1.73***[1.61,1.87]	1.75***[1.62,1.89]
Richest		2.24***[2.08,2.42]	2.27***[2.09,2.45]

Health-related variables			
Smoking			
Never smoked			1
Ever smoked			1.04[0.97,1.11]
Alcohol			
Never			1
Ever			0.83***[0.78,0.88]
Self-rated health			
Good			1
Fair			1.93***[1.83,2.04]
Poor			4.51***[4.23,4.82]
Physical exercise			
Everyday			1
> once in a week			1.045[0.93,1.17]
once in a week			1.02[0.88,1.17]
1 to 3 times a month			1.07[0.95,1.21]
hardly ever or never			1.31***[1.23,1.39]
Pseudo R2	0.0020	0.1077	0.1471
Observations	65,311	63,020	62,922

1 denotes reference category, ***p<0.05, **p< 0.01, ***p<0.001**

Discussion

The present study was conducted to identify the prevalence of physical MM, it's covariates and relationship with and without depression among the older Indian older individuals. Current study highlighted that depression is a substantial risk factor for the development of physical MM in later stage of life. Similarly, others factors like widowed/divorced/single, urban residence, increasing age, higher education, wealth index, self-rated health and physical exercise are also linked with physical MM.

Present study found the prevalence of physical MM to be 17.9% among ageing population, similar to a study conducted in low and middle -income countries[30]. Likewise, other studies have highlighted same proportion [31-33]. However, a nationally representative study in India reported lower than our estimates (7.2%) of physical MM[34] and in Nepal 13.96%[35]. Likewise, higher prevalence compared to present study was reported in Ghana 38.8%[36], Ethiopia 59.1%[37], Vietnam 40%[38]. A systematic review that computed a pooled estimate of multimorbidity from 129 studies from high and low/middle-income income countries had found the prevalence of multimorbidity is in Asia is 35%[39]. Variations notice in the prevalence of multimorbidity between and within the countries could be attributed to differences in dietary patterns, lifestyle, alcohol intake, tobacco use, and level of physical activity, among other factors, multimorbidity is not unusual. Some of these variances may be due to differences in the methods used in specific studies. For example, the prevalence of physical multimorbidity depends on the number of diseases included in the study, the community under study, and participant selection. Moreover,

the diverging score adopted in each may difference which affects the magnitude of the physical multimorbidity.

The study indicated that states with lower rates of physical MM were Meghalaya, Nagaland and Chhattisgarh whereas Kerala, Lakshadweep and Karnataka (27.9%) had the highest rates. Variations noticed in this study may be due to cultural, social, and healthcare reasons in different parts of India.

Similar to this study, there is compelling evidence supporting a close relationship between physical MM and depression[16,30,40,41]. Consistent finding with a study was found where patients with the major depressive disorders exhibited significantly higher incidence of chronic conditions like cardiometabolic, musculoskeletal and digestive diseases[42]. A study based on English Longitudinal Study of Ageing (ELSA), also found that depressive symptoms at baseline face a 5% higher risk of developing various chronic conditions 10 years later[43], a result that was also hinted at by an earlier, smaller study[44,45]. Similarly, a large study representative of the Danish population highlighted an elevated risk of developing several groups of medical conditions in individuals diagnosed with mood disorders[46]. Moreover, Early life mental well-being proved to influence the later development of multimorbidity, as women in their 20s with lower psychological trajectories faced greater rates of physical illnesses in their 30s [47]. Another study using the same cohort found that the prevalence of multimorbidity significantly increased after starting of a depressive episode in middle-aged women[48]. There have been several pathways detected to development of multimorbidity among depressive patient in various literature stating patient with depression often face increased levels of disability and cognitive decline, and generally experience a lower quality of life along with more frequent use of healthcare services [16,41,49]. Additionally, depression led to unhealthy behaviors like smoking, drinking or substance use, which subsequently raise the likelihood of developing multiple health conditions [49].

The odds of having physical multimorbidity was found to be elevated among female in this study is consistent with previous studies[22,24,26]. One systematic review showed that physical multimorbidity increase substantially in the highest age groups[39] and other small-scale studies also support this systematic review findings [34,38].

Although the prevalence estimates varied among various literature, most studies indicated multimorbidity as a common phenomenon in individuals 60 years and above [23,31,50]. A recent systematic review has also highlighted consistent outcomes[51].

Likewise, the present study found that place of residence was linked to physical multimorbidity, with individuals residing in urban exhibiting significantly higher odds of physical MM revealing inline result from other studies from different parts of the world [30,31,34].

In this study, the higher education was significantly associated with increased odds of physical MM compared to uneducated that align with the outcomes many studies [52,53]. However, this finding is contradicting the findings from a systematic review from Nigeria mentioned low education is predictor for physical MM[51]. Similarly, the study of Liew [54], found a higher level of education was a beneficial for the health of over 40-year-old Indonesian women to fight against multimorbidity.

Physical inactivity has been found to be associated with increased odds of physical MM corroborating some prior evidence [55,56]. Low or lack of physical activity is a key contributor to weight gain and obesity. Obesity, in turn, is linked to a variety of chronic conditions [57].

The study has following strengths, a large nationally representative dataset with random selection of the respondents by trained field investigators, and the measurement of physical MM is based on major chronic condition prevent among older adults. The major limitations were the cross-sectional which precluded causality assessment and lack of temporal association. Further study is needed to unravel the intricate connection between physical MM and depression, as well as the common causes that underpin the two illnesses.

Conclusion

Nearly one in every five Indian older adults had physical MM denoting high burden of it. Furthermore, the burden of physical MM is varying according to states and extremely large burden noticed in the developed states like Kerala. Depression is closely interlinked with increase the probability of physical MM. Likewise, other factors like education, physical activity, female sex, increasing age, and urban residence are associated with physical MM Community led interventions within primary care facilities indicate the need for strengthening the management of physical MM associated with depression.

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Author Contributions

GK, YS, and AKJ conceptualized and designed the study. GK and YS conducted data analysis, while GK and AKJ drafted the manuscript. All authors reviewed and approved the final version.

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Competing Interests

The authors declare no conflicts of interest.

Data availability

This study uses secondary data which is publicly available on request to IIPS, Mumbai through https://www.iipsindia.ac.in/content/LASI-data.