Do Functional Limitations Predict Life Satisfaction Among Older Adults in India: A Study based on LASI Survey in India

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Abstract

Background: Functional limitation is a relevant health outcome to examine the quality of life among the elderly. In recognition of its importance, research evidence evaluating life satisfaction among older people has increased globally, but such research is minimalistic in the Indian context. Furthermore studies in the Indian context examining life satisfaction among the elderly population in the context of ADL and IADL are hard to find. Therefore, this study examines the association between functional limitations and life satisfaction among the older population in India.

Methods: Data for this study was utilized from the recent release of Longitudinal Ageing Study in India (LASI) wave 1. The total sample size for the present study is 31,464 older adults aged 60 years and above. Life satisfaction was the main dependent variable categorized as 0 “high,” 1 “medium,” and 2 “low.” Descriptive statistics, along with bivariate analysis, was used to present the preliminary analysis. Apart from that, the ordered logistic regression analysis was used to carve out the results.

Results: Overall, about one-third of older adults had low life satisfaction scores, and 46% of older adults had a high life satisfaction score. The low life satisfaction score was higher among older adults who reported poor self-rated health (36.7%) than those who reported good self-rated health (27.9%). For older adults who were independent for ADL, the odds of low life satisfaction score (LSS) versus the combined medium and high LSS were 1.20 times more than for older adults who were not independent for ADL [UOR: 1.20; CI: 1.14-1.26].

Conclusion: In this study, a possible association between functional limitations and life satisfaction among the elderly was explored. Both ADL and IADL were noted as factors determining life satisfaction among elderly and elderly reporting ADL and IADL had higher odds of LLS. The setting up of geriatric clinics under the Primary Health Care services would bring the necessary change as this would provide timely healthcare services to the elderly and generate a perception of overall satisfaction among the elderly as they may feel secure in the presence of better health infrastructure.

Background:

Over the years, India has witnessed an unprecedented growth in population resulting from higher fertility rates across India [1]. However, the decline in fertility rates in recent times has brought down the country's population growth rate [2]. With the declining growth rate in recent years, a new issue on population dynamics has arisen, i.e., the ageing population. A decline in fertility rates coupled with increased life expectancy has led to a rise in ageing population [3]. Improving education, health facilities, and life expectancy has led to an increase in the proportion of the elderly population in India, and the share of the elderly population has increased from 5.3 percent in 1971 to 5.7 percent in 1981 and further from 6 percent in 1991 to 8 percent in 2011 [4]. Moreover, by 2050, the share of the 60 + population is projected to climb 19 percent, or approximately 323 million people in India [5]. Increasing life expectancy adds more life to years and adds disabilities to the life years among the elderly [6]. The ageing process implies a higher probability of suffering from disease and disability [5], [7].

The ageing process not only affects the household headship [8] but also has been widely associated with chronic diseases [7], low psychological health [9], [10], low subjective well-being [9], [10], poor self-rated health [11], and life satisfaction [12]. Life satisfaction is an important universal objective and measurement of quality of life [13]. Life satisfaction among the elderly is a critical aspect of the psychological dimension that has proved association with positive health behaviours [14], better physical and mental health outcomes [15], and successful ageing [16]. Moreover, life satisfaction is a general measure of overall wellbeing that measures the degree of coherence between life dreamed of and the life achieved [17]. Various factors have been linked to life satisfaction among the elderly, including social support [18], living arrangement [18], marital status [19], and demographic factors [20]–[22]. Functional limitations as measured through Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) have also been linked to life satisfaction among the elderly [18].

Functional limitation/disability is a relevant health outcome to examine the quality of life among the elderly [23]. Disability can be examined in several ways; however, using ADL and IADL to measure disability is one of the most popular and widely used

tools [24]. ADL functions are more concerned with an individual's self-care, whereas IADL functions are more concerned with self-reliant functioning in daily life [25]. Studies have noted that ADL disability presents greater difficulties and is a severe form of disability than IADL disability [26], [27]. Several previous studies were conducted examining associated factors of functional limitations in ADL and IADL among the elderly [28]–[31]. Unfortunately, limited evidence was presented that examined the association between functional limitations and life satisfaction among the elderly [23]. A study in the Nigerian context examined the association between functional disability and quality of life; however, depression was also included as a covariate of quality of life and functional limitations [26]. Another study in Japan contextualized quality of life through ADL; however, the main focus was on the association between fear of falling and quality of life [32].

In recognition of its importance, research evidence evaluating life satisfaction among older people has increased globally [12], [33]–[36], but such research is minimalistic in the Indian context. Whatever limited research evaluating life satisfaction among the elderly in India is limited to various community settings [18], [21], [37], [38]. Furthermore, to the author's best knowledge, none of the studies in the Indian context has examined life satisfaction among the elderly population in the context of ADL and IADL. In Indian society, older people are traditionally attended by their family members and are more likely to be satisfied with their lives [18]. During ageing, older people deal with ADL and IADL limitations, and therefore, it becomes seemingly stressful for them to remain satisfied with their life. Given the positive association between life satisfaction and an individual's social support [14], and an inverse relationship between life satisfaction and solitude [33], this study becomes vital as it intends to examine life satisfaction through the lens of functional limitations among the elderly.

Given the above background, an attempt has been made to explore the association between functional limitations and life satisfaction among the older population in India. The study also explored the association between socioeconomic and demographic characteristics with life satisfaction among the older population. The study hypothesizes that the elderly with ADL and IADL related functional disabilities would have Low Life Satisfaction (LLS), representing it vice-versa. Those without ADL and IADL related functional disabilities would have higher life satisfaction (HLS).

Methods:

Data source:

Data for this study was utilized from the recent release of Longitudinal Ageing Study in India (LASI) wave 1 [39]. The LASI is a nationally representative survey of over 72000 older adults aged 45 and above across India's states and union territories [39]. The survey adopted a three-stage sampling design in rural areas and a four-stage sampling design in urban areas. In each state/UT, the first stage involved the selection of Primary Sampling Units (PSUs), that is, sub-districts (Tehsils/Talukas), and the second stage involved the selection of villages in rural areas and wards in urban areas in the selected PSUs [39]. In rural areas, households were selected from selected villages in the third stage [39]. However, sampling in urban areas involved an additional stage. Specifically, in the third stage, one Census Enumeration Block (CEB) was randomly selected in each urban area [39]. In the fourth stage, households were selected from this CEB [39]. The detailed methodology, with the complete information on the survey design and data collection, was published in the survey report [39]. The present study is conducted on eligible respondents aged 60 years and above. The total sample size for the present study is 31,464 older adults aged 60 years and above. The Indian Council of Medical Research (ICMR) extended the necessary guidance and ethical approval for conducting the LASI [39].

Variable description

Outcome variable

Life satisfaction among older adults was assessed using the questions a. In most ways, my life is close to ideal; b. The conditions of my life are excellent; c. I am satisfied with my life d. So far, I have got the important things I want in life; e. If I could live my life again, I would change almost nothing. The responses were categorized as strongly disagree, somewhat disagree, slightly disagree, neither agree nor disagree, slightly agree, somewhat agree, and strongly agree. Using the responses

to the five statements regarding life satisfaction, a scale was constructed. The categories of the scale are 'low satisfaction' (score of 5–20), 'medium satisfaction' (score of 21–25), and 'high satisfaction' (score of 26–35) [39]. The outcome variable was coded as 0 "high," 1 "medium," and 2 "low."

Control variable

Main control variables

Difficulty in ADL (Activities of Daily Living) was coded as no and yes. Activities of Daily Living (ADL) is a term used to refer to normal daily self-care activities (such as movement in bed, changing position from sitting to standing, feeding, bathing, dressing, grooming, personal hygiene, etc.) The ability or inability to perform ADLs is used to measure a person's functional status, especially in the case of people with disabilities and older adults [40], [41]. Difficulty in IADL (Instrumental Activities of Daily Living) was coded as no and yes. Instrumental activities of daily living are not necessarily related to the fundamental functioning of a person, but they let an individual live independently in a community. The set ask were necessary for independent functioning in the community. Respondents were asked if they were having any difficulties that were expected to last more than three months, such as preparing a hot meal, shopping for groceries, making a telephone call, taking medications, doing work around the house or garden, managing money (such as paying bills and keeping track of expenses), and getting around or finding an address in unfamiliar places [40], [41].

Individual control variables

Age was categorized as young old (60–69 years), old-old (70–79 years), and oldest-old (80 + years) [42]. Sex was coded as male and female. Educational status was categorized as no education/primary not completed, primary, secondary, and higher [42]. Living arrangement was categorized as living alone, living with a spouse, living with children, and living with others. Marital status was categorized as currently married, widowed, and others [42]. Others included separated/divorced/never married. Working status was categorized as currently working, retired, and not working [9]. Active community involvement in life: Respondents were said to be socially engaged if they participate in the following activities. Eat out of house (Restaurant/Hotel); Go to park/beach for relaxing/entertainment; Play cards or indoor games; Play outdoor games/sports/exercise/jog/yoga; Visit relatives /friends; Attend cultural performances /shows/Cinema; Attend religious functions /events such as bhajan/satsang/prayer; Attend political/community/organization group meetings; Read books/newspapers/magazines; Watch television/listen radio and use a computer for e-mail/net surfing etc. If the respondent was involved in any of the above activities, the respondent was defined as socially engaged or involved in the community.

Self-rated health was coded as good which includes excellent, very good, and good, where as poor includes fair and poor [11]. Psychological distress was coded as low, medium and high. Psychological distress was measured using the following questions a. How often did you have trouble concentrating? b. How often did you feel depressed? c. How often did you feel tired or low in energy? d. How often were you afraid of something? e. How often did you feel you were overall satisfied? f. How often did you feel alone? g. How often were you bothered by things that don't usually bother you? h. How often did you feel that everything you did was an effort? i. How often did you feel hopeful about the future? j. How often did you feel happy? The response was coded as 1. Rarely or never 2. Sometimes 3. Often and 4. Most or all of the time. The response was coded as per the question in binary form 0 "Rarely or never/ Sometimes" and 1 "Often/ Most or all of the time" (Cronbach alpha: 0.70) [40].

Household control variables

The monthly per-capita consumer expenditure (MPCE) quintile was assessed using household consumption data. Sets of 11 and 29 questions on the expenditures on food and non-food items, respectively, were used to canvas the sample households. Food expenditure was collected based on a reference period of seven days, and non-food expenditure was collected based on reference periods of 30 days and 365 days. Food and non-food expenditures have been standardized to the 30-day reference period. The monthly per capita consumption expenditure (MPCE) is computed and used as the summary measure of consumption. The variable was then divided into five quintiles, i.e., from poorest to richest [39]. Religion was coded as Hindu, Muslim, Christian, and Others. Caste was recoded as Scheduled Tribe, Scheduled Caste, Other Backward Class, and others [43],

[44]. The Scheduled Caste includes “untouchables,”; a group of the population that is socially segregated and financially/economically by their low status as per Hindu caste hierarchy. The Scheduled Castes (SCs) and Scheduled Tribes (STs) are among India's most disadvantaged socio-economic groups. The OBC is the group of people who were identified as “educationally, economically and socially backward.” The OBC's are considered low in the traditional caste hierarchy but are not considered untouchables. The “other” caste category is identified as having higher social status [44]. The place of residence was categorized as rural and urban. The region was coded as North, Central, East, Northeast, West, and South [45].

Statistical analysis

Descriptive statistics, along with bivariate analysis, was used to present the preliminary analysis. Apart from that, the ordered logistic regression analysis was used to carve out the results. The dependent variables were ordered as 0 “high,” 1 “medium,” and 2 “low.” The ordered logit model is a regression model for an ordinal response variable. The model is based on the cumulative probabilities of the response variable. In particular, the logit of each cumulative probability is assumed to be a linear function of the covariates with regression coefficients constant across Response Categories [46]. All the methods were performed in accordance with the relevant guidelines and regulations laid down by the Declaration of Helsinki.

Results:

Table 1 presents socio-economic profile of older adults in India, 2017-18. About one-fourth of older adults were not fully independent for ADL, and nearly half of the older adults were not independent for IADL. More than half of the older adults belonged to the young-old cohort, 68 per cent of older adults had no education/primary not completed, and six per cent of older adults were living alone. Three-fifth of older adults were currently married, nearly one-third of older adults were working, and only nine per cent of older adults had community involvement. About 47 per cent of older adults reported poor self-rated health, and 29 per cent of older adults had high psychological distress. A higher proportion of older adults were Hindu, belonged to the OBC caste group, and lived in rural areas.

Table 1
Socio-economic profile of older adults in India, 2017-18

Background characteristics	Sample	Percentage
Difficulty in ADL		
No	23,802	75.7
Yes	7,662	24.4
Difficulty in IADL		
No	16,130	51.3
Yes	15,334	48.7
Age		
Young-old	18,410	58.5
Old-old	9,501	30.2
Oldest-old	3,553	11.3
Sex		
Male	14,931	47.5
Female	16,533	52.6
Education		
No education/primary not completed	21,381	68.0
Primary completed	3,520	11.2
Secondary completed	4,371	13.9
Higher and above	2,191	7.0
Living arrangement		
Living alone	1,787	5.7
Living with spouse	6,397	20.3
Living with children	21,475	68.3
Living with others	1,805	5.7
Marital status		
Currently married	19,391	61.6
widowed	11,389	36.2
Others	684	2.2
Working status		
Working	9,680	30.8
Retired	13,470	42.8
Not working	8,314	26.4
Community involvement		

Background characteristics	Sample	Percentage
No	28,545	90.7
Yes	2,919	9.3
Self-rated health		
Good	16,582	52.7
Poor	14,882	47.3
Psychological distress		
Low	12,135	38.6
Medium	10,216	32.5
High	9,114	29.0
MPCE quintile		
Poorest	6,829	21.7
Poorer	6,831	21.7
Middle	6,590	21.0
Richer	6,038	19.2
Richest	5,175	16.5
Religion		
Hindu	25,871	82.2
Muslim	3,548	11.3
Christian	900	2.9
Others	1,145	3.6
Caste		
Scheduled Caste	5,949	18.9
Scheduled Tribe	2,556	8.1
Other Backward Class	14,231	45.2
Others	8,729	27.7
Place of residence		
Rural	22,196	70.6
Urban	9,268	29.5
Region		
North	3,960	12.6
Central	6,593	21.0
East	7,439	23.6
Northeast	935	3.0
West	5,401	17.2

Background characteristics	Sample	Percentage
South	7,136	22.7
Total	31,464	100.0

Table 2 shows the percentage of older adults with high, medium, and low life satisfaction by background characteristics. Overall, about one-third of older adults had low life satisfaction scores, and 46% of older adults had a high life satisfaction score. Difficulty in ADL and IADL had a significant association with life satisfaction among older adults. For example, older adults who were not independent for ADL (37%) and IADL (35%) had a more low life satisfaction score than their counterparts. The low life satisfaction score was higher among older females than older males (33.8% vs. 30.4%). A negative association was observed between low life satisfaction scores and the educational level of older adults. Moreover, older adults who lived alone had more low life satisfaction score (47.8%). A low life satisfaction score was significantly higher among older adults who had community involvement (44.1%) than those who had no community involvement (31%). The low life satisfaction score was higher among older adults who reported poor self-rated health (36.7%) than those who reported good self-rated health (27.9%). Older adults who had high psychological stress reported more low life satisfaction score (47.2%). Similar to education, low life satisfaction scores among older adults had a significant negative association with the MPCE quintile. Low life satisfaction scores were more prevalent among older adults who belonged to scheduled caste/scheduled tribe. Moreover, older adults who lived in rural areas reported higher low life satisfaction scores compared to those who lived in urban areas (34.4% vs. 26.7%).

Table 2
Percentage of older adults with High, Medium and Low life satisfaction by
their background characteristics in India, 2017-18

Background characteristics	Life satisfaction			p-value
	High	Medium	Low	
Difficulty in ADL				0.001
No	47.1	22.2	30.8	
Yes	40.1	22.9	37.0	
Difficulty in IADL				0.001
No	49.0	21.8	29.2	
Yes	41.6	22.9	35.4	
Age				0.352
Young-old	45.5	22.8	31.7	
Old-old	46.0	21.2	32.8	
Oldest-old	44.0	23.0	33.1	
Sex				0.001
Male	47.2	22.5	30.4	
Female	44.0	22.3	33.8	
Education				0.001
No education/primary not completed	39.9	23.4	36.8	
Primary completed	49.8	22.0	28.2	
Secondary completed	60.2	19.6	20.3	
Higher and above	63.7	19.0	17.3	
Living arrangement				0.001
Living alone	32.9	19.4	47.8	
Living with spouse	45.3	23.1	31.6	
Living with children	47.3	22.5	30.3	
Living with others	36.7	21.2	42.2	
Marital status				0.001
Currently married	47.4	22.9	29.7	
widowed	43.0	21.4	35.7	
Others	32.7	23.2	44.1	
Working status				0.001
Working	44.4	23.7	31.9	
Retired	46.2	21.3	32.4	
Not working	45.6	22.4	32.0	

Background characteristics	Life satisfaction			p-value
	High	Medium	Low	
Community involvement				0.001
No	46.2	22.7	31.0	
Yes	37.6	18.3	44.1	
Self-rated health				0.001
Good	50.8	21.3	27.9	
Poor	39.8	23.5	36.7	
Psychological distress				0.001
Low	62.2	19.0	18.8	
Medium	42.8	24.1	33.1	
High	28.5	24.4	47.2	
MPCE quintile				0.001
Poorest	37.6	24.0	38.4	
Poorer	43.0	22.9	34.1	
Middle	46.9	22.9	30.3	
Richer	49.7	21.9	28.4	
Richest	52.5	19.3	28.2	
Religion				0.001
Hindu	45.6	22.2	32.2	
Muslim	43.5	23.9	32.7	
Christian	44.5	19.5	36.0	
Others	49.7	23.9	26.4	
Caste				0.001
Scheduled Caste	37.5	23.1	39.4	
Scheduled Tribe	39.8	23.1	37.1	
Other Backward Class	46.5	21.9	31.6	
Others	50.9	22.5	26.7	
Place of residence				0.001
Rural	42.2	23.5	34.4	
Urban	53.7	19.6	26.7	
Region				0.001
North	41.9	24.3	33.8	
Central	41.8	25.5	32.7	
East	37.6	25.9	36.5	

Background characteristics	Life satisfaction			p-value
	High	Medium	Low	
Northeast	45.2	28.7	26.1	
West	68.6	15.3	16.1	
South	41.6	19.1	39.4	
Total	45.5	22.4	32.2	
p-value based on chi-square test				

Estimates from ordered logistic regression analysis for life satisfaction among older adults are presented in Table 3. Model 1 shows unadjusted odds ratio for life satisfaction whereas Model 2 provides the adjusted (odds ratio) estimates for life satisfaction. For older adults who were independent for ADL, the odds of low life satisfaction score (LSS) versus the combined medium and high LSS were 1.20 times more than for older adults who were not independent for ADL [UOR: 1.20; CI: 1.14–1.26]. Likewise, the odds of combined categories of low and medium LSS versus high LSS was 1.20 times higher for those who were independent for ADL than those who were not independent. However, this result was not significant in adjusted model 2. The odds of difficulty in IADL decreased from unadjusted to adjusted model. For older adults who had difficulty in IADL, the odds of low LSS versus the combined medium and high LSS were 1.13 times higher than for older adults who had not difficulty in IADL [AOR: 1.13; CI: 1.08–1.19]. Likewise, the odds of combined categories of low and medium LSS versus high LSS was 1.13 times higher for those who had difficulty in IADL than those who did not have. For female, the odds of low LSS versus the combined medium and high LSS were 0.94 times lower than for males. Similarly, the odds of the combined categories of low and medium LSS versus high LSS was 0.94 times lower for females compared to males. For older adults with higher education, the odds of low LSS versus the combined medium and high LSS were 1.31 times higher than for those who had no education. Likewise, the odds of the combined categories of low and medium LSS versus high LSS was 1.31 times higher for older adults with higher education compared to those who had no education. Moreover, for older adults who lived in rural areas, the odds of low LSS versus the combined medium and high LSS were 1.11 times higher than for those who lived in urban areas. Likewise, the odds of the combined categories of low and medium LSS versus high LSS was 1.11 times higher for older adults living in rural areas compared to those who lived in urban areas.

Table 3
Ordered logistic regression estimates for life satisfaction among older adults in India, 2017-18

Background characteristics	Model-1	Model-2
	UOR (CI)	AOR (CI)
Difficulty in ADL		
No	Ref.	Ref.
Yes	1.20*(1.14,1.26)	0.98(0.92,1.04)
Difficulty in IADL		
No	Ref.	Ref.
Yes	1.41*(1.35,1.47)	1.13*(1.08,1.19)
Age		
Young-old		Ref.
Old-old		0.93*(0.89,0.98)
Oldest-old		0.81*(0.75,0.88)
Sex		
Male		Ref.
Female		0.94*(0.89,0.99)
Education		
No education/primary not completed		Ref.
Primary completed		1.94*(1.76,2.15)
Secondary completed		1.60*(1.44,1.79)
Higher and above		1.31*(1.18,1.45)
Living arrangement		
Living alone		1.27*(1.10,1.46)
Living with spouse		0.90(0.80,1.02)
Living with children		0.86*(0.77,0.96)
Living with others		Ref.
Marital status		
Currently married		Ref.
widowed		0.96(0.91,1.02)
Others		1.07(0.93,1.24)
Working status		
Working		Ref.
Retired		0.93*(0.88,0.98)
Not working		0.89*(0.83,0.96)

Background characteristics	Model-1	Model-2
	UOR (CI)	AOR (CI)
Community involvement		
No		Ref.
Yes		1.05(0.97,1.14)
Self-rated health		
Good		Ref.
Poor		1.32*(1.26,1.38)
Psychological distress		
Low		Ref.
Medium		1.92*(1.82,2.03)
High		2.99*(2.82,3.16)
MPCE quintile		
Poorest		1.31*(1.21,1.41)
Poorer		1.13*(1.05,1.22)
Middle		1.10*(1.02,1.18)
Richer		1.06(0.98,1.14)
Richest		Ref.
Religion		
Hindu		Ref.
Muslim		1.16*(1.08,1.24)
Christian		0.93(0.85,1.02)
Others		0.95(0.85,1.06)
Caste		
Scheduled Caste		1.20*(1.12,1.29)
Scheduled Tribe		1.18*(1.09,1.28)
Other Backward Class		0.99(0.93,1.05)
Others		Ref.
Place of residence		
Rural		1.11*(1.05,1.17)
Urban		Ref.
Region		
North		Ref.
Central		1.01(0.94,1.1)
East		1.35*(1.26,1.46)

Background characteristics	Model-1	Model-2
	UOR (CI)	AOR (CI)
Northeast		1.05(0.96,1.16)
West		0.50*(0.46,0.54)
South		1.19*(1.11,1.28)
/cut1	-0.02(-0.05,0.01)	1.02(0.86,1.18)
/cut2	0.97*(0.94,0.99)	2.13*(1.96,2.29)
Ref: Reference; *if $p < 0.05$; UOR: Unadjusted odds ratio; AOR: Adjusted odds ratio; CI: Confidence interval; Life satisfaction: 0 "High", 1 "medium" and 2 "low".		

Discussion:

By examining the association between functional disability and life satisfaction among the elderly, this study addressed the long-standing gap in the literature. Previously, minimal literature has examined the association between functional disability and life satisfaction [47]–[49], and such studies from the Indian context are somewhat more limited [18]. Banjare et al. (2015) examined determinants associated with life satisfaction among the elderly in rural Odisha, and they did not exclusively examine the association between functional limitation and life satisfaction; rather, they included the functional limitation as a general predictor of life satisfaction [18]. Therefore, the current study fills the research gap to a great extent while examining the association between functional disability and life satisfaction among the elderly. The findings noted support for our hypothesis that those with ADL and IADL related functional disabilities would have Low Life Satisfaction (LLS). The unadjusted and adjusted model findings noted higher odds of LLS among elderly with ADL and IADL related functional limitations. These findings agree with previously available literature [18], [50]. Occurrence of functional limitations bound elderly to the home [51], cut their personal ties [52], and limit their physical activity [53], which could be associated with lower life satisfaction among them. Functional limitations reduce the ability to move and reduce participation in social activities and social contacts, leading to a decline in life satisfaction among the elderly.

The odds of LLS were lower among the oldest-old than the young-old elderly, which deviates from the findings of several previous studies [49], [54], [55]. This study specifically noted higher chances of low life satisfaction among young-old than oldest old. Generally, it is assumed that as age increases, the odds of low life satisfaction among the elderly would decrease due to the onset of several chronic conditions and change in living arrangement; however, the findings in this study are somewhat different. A study in the Chinese context corroborated the findings of this study and noted that older individuals had a higher level of life satisfaction than their younger counterparts [56]. The finding of lower odds of LLS among the oldest-old is compatible with a phenomenon known as the paradox of ageing [57], [58]. The paradox of ageing relates to the notion that older people tend to react less to adverse situations, ignore irrelevant negative stimuli better, and remember relatively more positive information than negative information [57], leading to higher life satisfaction. Also, older people are more likely to derive emotional satisfaction from prioritizing positive information processing [58], which could have also linked to higher life satisfaction among the oldest elderly. To add more, a study noted that older people tend to use less interpersonal comparisons than younger people, positively affecting their life satisfaction [59].

The odds of LLS were lower among female elderly than their male counterparts, implying that the satisfaction level was higher among female elderly than in male elderly. Previous studies reported mixed findings where certain studies noted higher life satisfaction among male elderly [60], whereas few other studies noted higher life satisfaction among female elderly [12], [61], [62]. Older women are more likely to seek healthcare in India [63], partially explaining their higher life satisfaction. Furthermore, women enjoy an advantage in adapting to old age complications over men [64], which could also explain the higher life satisfaction among older women than older men.

However, the odds of LLS were declining with the increase in the educational status of the elderly; this study noted higher odds of LLS for each class of educated elderly than non-educated elderly. In general, education is positively linked to life satisfaction in previous literature [9], [55], [65]. However, quite a few studies noted similar results as in this study [60], [66]. A possible mechanism that links education to job satisfaction and further to life satisfaction may partially explain the higher life satisfaction among educated elderly [67], [68]. It explains that those with higher education would find a job that fits better to their skills and abilities, leading to higher life satisfaction. However, this study noted an otherwise result where odds of LLS were higher among educated elderly. There could be a few plausible mechanisms for the same in this study. First, individuals with lower levels of education may be easily satisfied with their current simple living conditions in contrast to educated elderly still having some unsatisfied needs in their life [56]. Educated elderly might be working before getting retired, and after retirement, they might be feeling a sudden change in their environment and lifestyle, which may partially explain the status of life satisfaction among them. Moreover, pension status after retirement plays an important role in depression among the elderly, which may also partially explain the life satisfaction among the elderly [69]; however, this study did not examine pension status and its association with life satisfaction among the elderly.

Corroborating with several previous studies [70]–[72], this study also noted a higher odds of LLS among elderly living alone and lower odds of LLS among the elderly living with children. Living with children provides a sense of security and social support to the elderly and a sense of belongingness, which could be attributed to higher life satisfaction. Living with children provides social support that improves self-esteem, gives a purpose to live, and can rightly be attributed to higher life satisfaction. Family support has been positively linked to life satisfaction among the elderly [54]. Several research has presented evidence that financial support from children contributes to life satisfaction among the elderly [71], [73]. As expected, those who reported poor self-rated health and had high psychological distress had higher odds of LLS. This finding is in agreement with previously available literature in the Indian context [18], [74]–[78]. Elderly having poor psychological health are more prone to depression, which could further be linked to LLS [18]. Good health allows the elderly to maintain social contacts, resulting in a higher level of life satisfaction.

The elderly in rural areas had higher odds of LLS, implying a higher life satisfaction among the urban elderly. Previous studies also noted a higher life satisfaction among the urban elderly [78]. The elderly in urban areas have greater access to medical services, which could be linked to higher life satisfaction [72]. Moreover, urban elderly have a greater awareness of their age-related outcomes, which can further be linked to higher life satisfaction [79]. The modern facilities, better infrastructure, and higher pension allowance in urban areas probably contributed to the higher life satisfaction among the urban elderly [12].

Limitations and strengths of the study:

The study findings should be interpreted in the light of several limitations. One major challenge to perceive the well-being of older adults is to obtain reliable information on self-rated life satisfaction, as some oldest-old and old-old people may be suffering from loss of cognitive ability leading to ambiguity in the study results [80]. To a certain extent, possible biases in self-evaluation of life satisfaction may be driven by socio-economic factors. The cross-sectional nature of data limits our understanding of causality, and reverse causation is possible for study findings. Despite the above limitations, the study has certain noteworthy strengths too. The study is based on recently released data, therefore, providing the current estimates. Furthermore, the study findings can be generalized in a broader context as the data collected are nationally representative. The study measured life satisfaction with various items, therefore providing robust estimates than those studies where life satisfaction was measured with a single item [78]. Measuring life satisfaction with a single item may be influenced by the mood of the respondents during the interview and other situational factors, and therefore measuring life satisfaction with a set of items will always be a suggested way to examine life satisfaction [81]. At last, minimal research investigated the association between functional disability and life satisfaction among the elderly. This study could set things in motion for other researchers who may explore this association in their future studies.

Conclusion:

In this study, a possible association between functional limitations and life satisfaction among the elderly was explored, along with exploring other determinants of life satisfaction among the elderly in India using information from a nationally representative survey. Both ADL and IADL were noted as factors determining life satisfaction among elderly and elderly reporting ADL and IADL had higher odds of LLS. Other prominent factors determining life satisfaction among the elderly include higher age, female gender, living with children, good self-rated health, low psychological distress, and urban residence. This study focuses on functional limitations and life satisfaction among the elderly and certainly has some policy suggestions. Addressing psychological distress among the elderly could be a game-changer in providing a sense of satisfaction among the elderly, and to achieve this, there is a need to strengthen the quality of care delivered to older people. The setting up of geriatric clinics under the Primary Health Care services would bring the necessary change as this would provide timely healthcare services to the elderly and generate a perception of overall satisfaction among the elderly as they may feel secure in the presence of better health infrastructure. Since living with children enhances life satisfaction among the elderly, more stress should be laid upon the counseling among the younger generation, which can encourage them to support and look after the needs of their elderly as it would improve further lead to life satisfaction among the elderly [18]. At last, focus needs to be aimed at the elderly who are not independent for ADL and IADL functions and are suffering from severe functional limitations.

Abbreviations

ADL: Activity of Daily Living

IADL: Instrumental Activity of Daily Living

LASI: Longitudinal Ageing Study in India

CI: Confidence Interval

UOR: Unadjusted Odds Ratio

OR: Odds Ratio

LLS: Low Life Satisfaction

HLS: High Life Satisfaction

Declarations

Ethics approval and consent to participate:

The data is freely available on request and survey agencies that conducted the field survey for the data collection have collected a prior consent from the respondent. The ethical clearance was provided by Indian Council of Medical Research (ICMR), India. Moreover, participants were provided with the information brochures explaining the purpose of the survey, ways of protecting their privacy, and safety of the health assessments as part of the ethics protocols.

Consent for publication:

Not applicable

Availability of data and materials:

The datasets generated and/or analysed during the current study are available with the International Institute for Population Sciences, Mumbai, India repository and could be accessed from the following link: https://iipsindia.ac.in/sites/default/files/LASI_DataRequestForm_0.pdf. Those who wish to download the data have to follow the above link. This link leads to a data request form designed by International Institute for Population Sciences. After completing the form, it should be mailed to: datacenter@iips.net for further processing. After successfully sending the mail, individual will receive the data in a reasonable time.

Competing Interest:

The authors declare that they have no competing interests.

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Author's Contribution:

The concept was drafted by SC and RP. SS and PK contributed to the analysis design. SC advised on the paper and assisted in paper conceptualization. SC and RP contributed in the comprehensive writing of the article. All authors read and approved the final manuscript.

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