Promoting Psychological Well-being for Healthy Ageing Post Spousal Loss: Insights from India

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Introduction

The rapid demographic shifts occurring globally, driven by increasing life expectancy and declining fertility rates, have led to a substantial rise in the number of older populations. A key aspect of aging and extended longevity is the loss of vital social relationships, particularly through the death of a spouse. Spousal loss in later life is widely recognized as a highly stressful event that disrupts an individual's overall psychosocial functioning, mental outlook, and health [1]. Conjugal bereavement is challenging for both sexes; while some may recover from the loss relatively unscathed, others find it extremely debilitating [2]. Research presents mixed evidence regarding the bereavement experiences of both sexes [1-3]. Spousal loss and widowhood are gendered and cultural experiences that bring physical, financial, and psychological burdens. Literature often describes widowhood in later years with terms like "second grief," "roleless role," and "troublesome adaptations" [4]. However, it is generally acknowledged that widowhood is associated with various physical, psychological, and social challenges. The United Nations General Assembly highlighted the serious challenges of widowhood when it declared the first International Widow's Day on June 23, 2011.

Widows often remain invisible—absent from statistics, unnoticed by researchers, neglected by national and local authorities, and largely overlooked by civil society organizations (CSOs). Despite this, the abuse of widows and their children stands as one of the most severe human rights violations and significant barriers to development today. Millions of widows worldwide endure severe poverty, social exclusion, violence, homelessness, poor health, and discrimination in both law and custom[5].

In India, widowhood among elderly women is often stigmatized due to rigid and unequal gender norms, as well as traditional kinship systems[6,7]. Some customs may require them to shave their heads, wear only white clothing, restrict themselves to one or fewer meals per day, and prohibit them from attending social gatherings or remarrying, leading to various forms of discrimination[8,9]. However, the experience of widowhood can differ significantly between men and women[6]. Widowed elderly women in India often struggle with significant

challenges, such as reduced access to financial resources and diminished social roles within their in-laws' or children's households, which can adversely affect their health. In contrast, widowed men generally maintain their access to financial and other resources even after losing a spouse[7]. These disparities can impact overall health outcomes differently for men and women[7,10]. Empirical research indicates that widowhood in elderly men is a risk factor for dependency in instrumental activities of daily living (IADL), mobility issues, and diabetes-related factors[7,10]. Additionally, literary evidence highlights various key factors that influence psychological well-being among the elderly following the loss of a spouse[1,11,12].

Psychological well-being is a umbrella construct encompassing various aspects of psychological health and personal experiences, including factors such as morbidity, anxiety, mood, self-esteem, emotional adjustment, and autonomy[1]. It can be understood as the sense of life satisfaction, quality of life, personal fulfilment, and the creation of subjective and objective values[13]. The concept of psychological well-being has been defined in various ways, with its components evolving through new empirical research and theoretical models[14]. It is typically categorized into three main aspects: (1) *Evaluative well-being*, which refers to an individual's assessment of the overall quality or goodness of their life and their overall life satisfaction. (2) *Hedonic well-being*, which pertains to everyday feelings or moods, such as sadness, anger, and stress. Notably, this approach focuses on positive indicators of well-being rather than negative states, providing unique insights into emotional experiences. (3) *Eudemonic well-being*, which centers on judgments about the meaning and purpose of one's life[13, 15]. Our study is conceptualized based on the *Evaluative* and *Hedonic* approaches, examining psychological well-being through the lens of life satisfaction and the presence of depressive symptoms[1, 15, 16].

Research indicates that various dimensions of psychological well-being—such as positive thoughts and feelings that lead to favourable life evaluations (e.g., a sense of purpose, optimism, and life satisfaction)—are uniquely linked to a reduced risk of disease incidence and premature mortality[17, 18]. Additionally, a substantial body of work suggests that positive functioning across different aspects of social relationships (e.g., structural, functional, and quality) is strongly associated with improved health outcomes[19, 20].

According to the World Health Organization (WHO), healthy ageing is defined as "the process of developing and maintaining the functional ability that enables wellbeing in old age"[21, 22]. Functional ability refers to the capacity to meet basic needs, learn, grow, make decisions,

remain mobile, build and sustain relationships, and contribute to society. This ability is influenced by intrinsic capacity, which is influenced by genetic factors, physical and mental health, and the specific environment in which individuals live and interact. These environments can evolve over time due to changes in political, economic, social norms, values, and resources. The interplay between intrinsic capacity and environmental factors collectively determines functional ability[23].

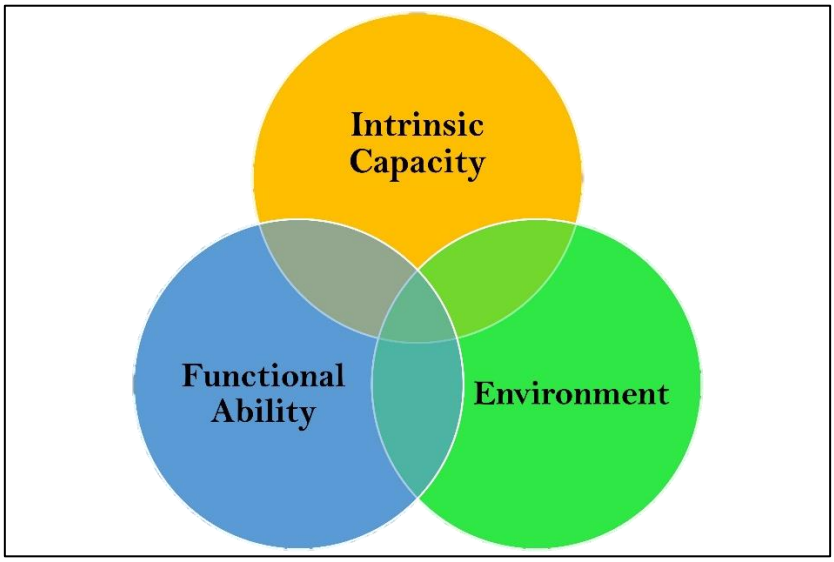

Fig 1. Healthy ageing model

As individuals age, they often experience a decline in functional abilities due to deteriorating health and a higher risk of non-communicable diseases. Previous research has identified widowhood as one of the most stressful life events a person can experience[12, 24, 25]. Most of the Empirical studies have consistently shown that married elderly individuals tend to have better physical and mental health and greater functionality compared to their non-married counterparts[26, 27]. Therefore, it is important to identify the factors that contribute to healthy ageing, particularly among the widowed elderly.

While psychological factors are important, they may not be sufficient on their own for promoting healthy ageing. Hence, we must also consider the role of social relationships and other lifestyle-related factors that may influence healthy ageing, especially within the geriatric population. Existing literature indicates that healthy ageing is influenced by multiple factors. Consequently, this study explores the relationship between psychological well-being and healthy ageing among older adults in India, aged 60 and above, who have lost their spouses.

Materials and Methods:

Data Sources:

A cross-sectional study design was employed, utilizing data from the first wave of the Longitudinal Ageing Study in India (LASI), conducted in 2017-18. LASI is the first nationally representative survey focused on the health status and socioeconomic well-being of older adults aged 45 and above across all states and union territories of India[40]. LASI provides comprehensive information on demographics, household economic status, health conditions, healthcare access and utilization, family dynamics, and social security coverage.

LASI adopted a multistage stratified area probability cluster sampling design to determine a predefined sample size. The detailed sampling procedure is elaborated in the LASI report [40]. LASI covered a sample size of 73,396 individuals aged 45 and above. For the current study, which focuses on widowed older adults aged 60 and above, the sample was narrowed down to 10,060 widowed individuals (2,175 males and 7,885 females) across all states and union territories of India. The sample selection process is summarized in Fig. 2.

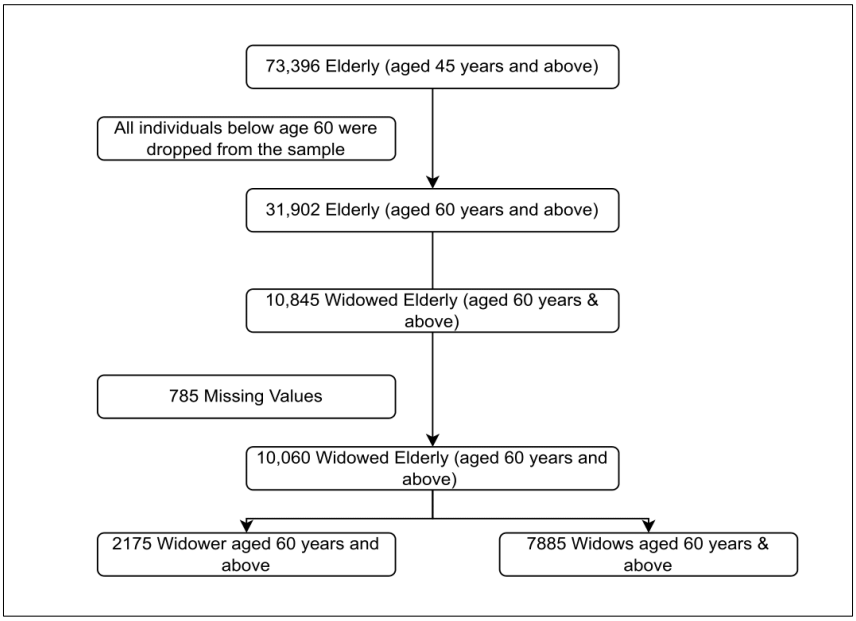

Fig 2. Sample selection criteria for the study

Outcome Variable

Aligned with the WHO's definition of healthy ageing, we conceptualize our understanding of healthy ageing through the lens of functional ability [21, 22]. Healthy Ageing Index (HAI) was developed using 27 variables across multiple domains: physiological health, functional health, cognitive functions, and social engagement. The absence of significant chronic disease served

as a proxy for *physiological health*. In order to determine healthy elderly, we considered nine important chronic diseases: hypertension, diabetes, cancer, chronic lung disease, chronic heart disease, stroke, arthritis, neurological problems, and cholesterol. The second factor, *Functional health*, was evaluated based on whether individuals required assistance with activities of daily living (ADL) or instrumental activities of daily living (IADL), such as dressing, walking, bathing, eating, getting out of bed, using the toilet, cooking, shopping, making telephonic calls, taking medications, doing work around the house or garden, managing money, and getting around or finding an address in an unfamiliar place, etc. Short-time memory recall and orientation to time (day, month, and year) were used to measure *Cognitive ability. Social engagement* measures the frequency of participating in the following social activities: visiting parks or beaches, playing cards or indoor games, participating in outdoor games or exercise, visiting friends or relatives, attending cultural performances or cinema, and participating in political or community meetings. Responses were categorized into seven options ranging from daily to never. Each of the 27 variables was coded as binary or quintile and then normalized to a 0-100 interval scale (see Table S1 supplementary material).

Principal component analysis (PCA) was used to generate the Healthy Ageing Index (HAI) composite score, integrating these 27 variables across four major domains: physiological health, functional health, cognitive functions, and social engagement. The HAI score ranges from 0-100, with a higher score indicating healthier aging status. The validity and reliability of the HAI were performed using Cronbach Alpha, and the full details are provided in the supplementary file. The Cronbach alpha was 0.84, indicating a good internal consistency.

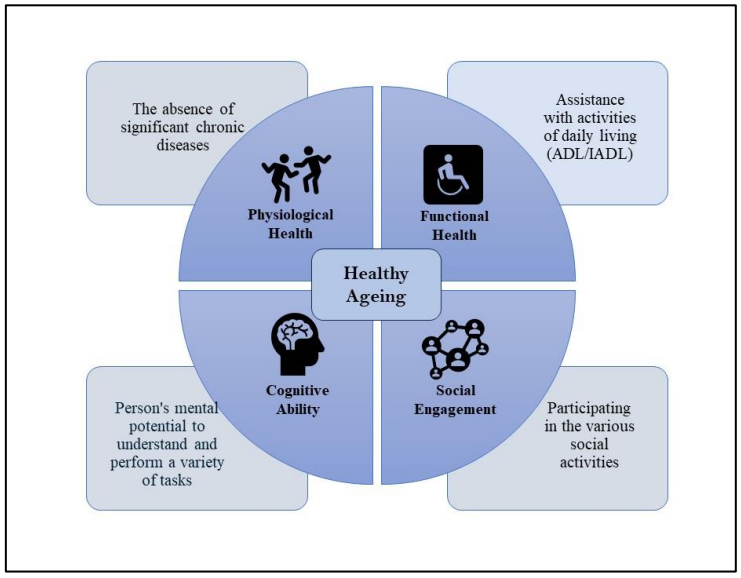

Fig 3. Conceptualization of Healthy Ageing

Predictor Variables

Psychological Wellbeing:

Based on the Evaluative and Hedonic approach, we conceptualized a measure of psychological well-being using two indicators: life satisfaction and the presence of depressive symptoms. Both these scales have been used extensively to measure the well-being of the geriatric population[15, 16, 41].

Life Satisfaction:

A participant's level of life satisfaction was assessed using the 1–7 response scale derived from the Satisfaction with Life Scale (SWLS) instrument based on five statements regarding life satisfaction[41]: 'In most ways, my life is close to ideal'; 'The condition of my life is excellent'; 'I am satisfied with my life'; 'So far, I have got all the important things I want in my life'; 'If I could live my life again, I would change almost nothing'. The level of agreement with each five statements using a 1–7 scale: '7- Strongly agree'; '6- Somewhat agree'; '5- Slightly agree'; '4- Neither agree nor disagree'; '3- Slightly disagree'; '2- Somewhat disagree'; '1-Stronngly disagree' were recorded. Using the responses, two category scales were constructed: 'low life satisfaction (score of 5–20) and 'high life satisfaction (score of 21–35). The outcome variables were coded 0 as "low" and 1 as "high"[41]. The coefficient alpha for life satisfaction in this study was 0.90, indicating a good internal consistency.

Presence of Depressive Symptoms:

A shortened 10-item Centre for Epidemiologic Studies Depression Scale (CES-D) was used to measure the depressive symptoms among elderly widows[42]. The 10 items included seven negative symptoms (trouble concentrating, feeling depressed, low energy, fear of something, feeling alone, bothered by things, and everything is an effort) and three positive symptoms (feeling happy, hopeful, and satisfied). The responses were coded as "rarely or never" (< 1 day), "sometimes" (1 or 2 days), "often" (3 or 4 days), and "most or all of the time" (5-7 days) in a week prior to the interview. For negative symptoms, "rarely or never" (< 1 day) and "sometimes" (1 or 2 days) were scored zero, and "often" (3 or 4 days) and "most or all of the time" (5-7 days) categories were scored one. Scoring was reversed for positive symptoms. The overall score ranges from zero to 10, and a score of four or more is used to measure the prevalence of depressive symptoms. The coefficient alpha for the CES-D in this study was 0.72, which was comparable to the values obtained in previous reliability studies[42, 43].

Religious participation:

Religious participation was assessed based on elderly widow's participation in the following religious activities: (a) pooja/prayer, (b) attending religious services (temple/mosque/church, etc.), (c) involvement in *Satsang/bhajan/kirtan*/or any religious gathering, and (d) attendance in religious functions/events such as *bhajan/Satsang/prayer*. The responses were "every day," "more than once a week," "once a week," "one to three times a month," "one or more times a year," and "not at all." Further, it was recoded 0 as 'no' (less than once a month) and 1 as 'yes' (at least once a month). Thus, religious participation in this study refers to participating in any of the above activities at least once a month.

Health Behaviour:

Current tobacco use (smoked/smokeless):

The question of whether the respondents were currently smoking (either smoked tobacco like *cigarette*, *bidi*, *hookah*, *cheroot*, or smokeless tobacco like chewing tobacco, *gutka*, *pan masala*, etc.) was used to assess current tobacco use (yes/no).

Current Alcohol Consumption:

The respondents' self-reported current consumption of alcohol status was evaluated using a yes/no question that asked if the respondents had consumed any alcohol at all during the previous three months, such as beer, wine, or any other type of drink.

Physical Activity:

Physical activity indicators were developed using the World Health Organization's (WHO's) recommendations for moderate and vigorous physical activity[44]. Where *Moderate physical activity* has been defined as the involvement of at least 150 minutes of moderate-intensity physical activity (such as cleaning the house, washing clothes, fetching water, drawing water from a well, gardening, walking at a moderate pace, bicycling at a regular pace, and floor or stretching exercises) throughout the week. *Vigorous physical activity* is defined by the involvement of at least 75 minutes of vigorous-intensity physical activity (like running or jogging, swimming, going to a health centre/gym, cycling, digging with a spade or shovel, heavy lifting, chopping, farm work, fast bicycling, and cycling with loads) throughout the week. Based on the response to moderate and vigorous physical activity, we classified respondents as *physically active* (those who are either engaged in moderate physical activity or

vigorous physical activity or an equivalent combination of moderate and vigorous intensity activity) and *physically inactive* (those who are not engaged in any type of moderate or vigorous physical activity throughout the week) [40].

Financial Support:

Financial support was assessed based on whether they received any financial help/support from family (parents, children, siblings, grandchildren, parents of spouse, or any other family members) or friends during the past 12 months. The response was recoded as "Yes" or "No".

Socio-demographic measures

The following socio-demographic variables, like age, sex, place of residence, educational attainment (Number of years of schooling), working status, living arrangements, economic and social status, etc., are taken as background variables. Age was categorized into three groups: '60-69', '70-79', and '80 and above' to distinguish between life stages: ' young-old,' 'old-old,' and 'oldest-old'[45]. Sex was included as a dichotomous variable, i.e., 'male' or 'female'. The place of residence was classified as 'rural' or 'urban'. Older adults' educational attainment based on the number of years of schooling was assessed using four categories: ' no schooling,' 'less than 5 years', '5-9 years', and '10 and more years of schooling. Similarly, the current working status is 'yes' and 'no'. Economic status was indicated by the household's Monthly Per Capita Consumption Expenditure (MPCE) quintile ('poorest,' 'poorer,' 'middle,' 'richer,' and 'richest'). Living arrangements among the older adults were classified into 'living alone or with spouse' and 'living with children & others.' Caste has been classified as 'Scheduled Castes (SC),' 'Scheduled Tribes (ST),' 'Other Backward Classes (OBC),' and 'Others.'

Statistical Analysis:

Descriptive statistics were used to present the weighted percentage distribution of the socio-demographic and health profiles of widowed elderly in India (Table 1). The estimated mean Healthy Ageing Score was calculated for widowed elderly with higher life satisfaction (Table 2) and with depressive symptoms (Table 3), adjusting for age and sex separately for widow males and females. Multiple linear regression analysis was performed to estimate the association between healthy ageing status and psychological well-being, with Healthy Ageing Index (HAI) as the dependent variable and life satisfaction, depressive symptoms, health behaviour, religious participation, financial support, and socio-demographic covariates as the independent variable. Three separate models (model 1 includes all elderly widows; model 2: elderly widow females; model 3: elderly widow males) aged 60 years and above. The estimates

were presented in the form of adjusted coefficients with a 95% confidence interval (CI). STATA 17.0 has been used to perform all the statistical analyses. Survey weights were applied to account for population-level estimates. Regression diagnostics, such as multicollinearity and normality tests, were run to ensure the fundamental regression assumptions were followed.

Results:

Socio-demographic and health profile of the elderly widows (60+):

Table 1 provides an overview of the socio-demographic and health characteristics of widowed elderly in India aged 60 years and above. The present analysis was based on 10,060 respondents who answered all relevant variables. The majority of participants were female (78%), with 44% aged between 60 and 69, living in rural areas (68%), and over half having no formal education (53%). In terms of living conditions, 14 percent of the widows lived alone, and around two of them are still in the workforce (19%). The MPCE quintiles were fairly evenly distributed, except for the wealthiest quintile, which made up 14 percent. Health-wise, over half had at least one chronic condition (56%), most were functionally dependent (62%) for daily activities (ADL/IADL), and about one-third exhibited depressive symptoms (34%). Regarding health behaviours, 51 percent were physically active, 27 percent smoked tobacco, and 5 percent consumed alcohol. Considering the other Social aspect, eight in every ten widowed elderly were socially active (80%) in their communities and 79 percent participated in religious activities. Further details are available in Table 1.

Table 1. Socio-demographic and health profile of widowed elderly in India.

Socio-demographic and Health Profile	Percentage/Mean (SD)	Frequency
Age Category		
60-69	44.47	4,610
70-79	37.38	3,614
80+	18.15	1,836
Sex		
Male	21.74	2,175
Female	78.26	7,885
Place of Residence		
Rural	68.18	6,568
Urban	31.82	3,492
Living Arrangements		
Living alone	14.36	1,341
Living with children & others	85.64	8,719
Educational Attainment		
No schooling	68.62	6,818
Less than 5 years	10.46	1,116
5-9 years	12.92	1,402
10 and more	8.01	724

Currently Working		
Yes	18.86	1,759
No	81.14	8,301
Wealth Quintile		
Poorest	23.45	2,224
Poorer	22.9	2,170
Middle	19.68	2,037
Richer	19.51	1,949
Richest	14.46	1,680
Caste		
SC	19.87	1,767
ST	8.13	1,659
OBC	45.44	3,796
Others	26.56	2,838
Health Profile		
Morbidity		
No morbidity	44.46	4,338
Single Morbidity	30.09	3,159
Multi-Morbidity	25.45	2,563
Functionality		
Functionally Dependent	61.84	5,862
Functionally Independent	38.16	4,198
Cognitive Ability	44.48 (18.67)	10,060
Social Participation		
Socially Inactive	19.53	1,960
Socially Active	80.47	8,100
Depressive Symptoms		
No	65.39	6,767
Yes	34.61	3,293
Life Satisfaction		
Low	35.46	3,386
High	64.54	6,674
Lifestyle Behaviours		
Current tobacco use (smoked/smokeless)		
No	73.07	7,410
Yes	26.93	2,650
Current alcohol consumption		
No	95.46	9,464
Yes	4.54	596
Physical Activity		
Physically active	50.58	5,265
Physically Inactive	49.42	4,795
Religious participation		
No	20.64	1,788
Yes	79.36	8,272
Financial Support		
Yes	16.47	1,651
No	83.53	8,409
Total	**100**	**10,060**

Mean score of HAI among Elderly widows with high life satisfaction and depressive symptoms

The mean Healthy Ageing Index (HAI) for our study population was 87.9, indicating that the population is relatively healthy. Notably, a significantly higher proportion of individuals over age 60 in our sample (61%) had an HAI score above this mean value.

Table 2 shows the age-sex-adjusted score of healthy ageing among widow elderly with higher life satisfaction by socio-demographic characteristics. The score was adjusted for age and sex-fixed effects. It was found that the overall healthy ageing score was relatively better among males (90.28; 95% CI: 89.83-90.74), rural residents (89.30; 95% CI: 89.04-89.57), currently working (91.73; 95% CI: 91.20-92.26), those belong to the ST category (90.49; 95% CI: 89.97-91.01), and age group (90.15; 95% CI: 89.84-90.47). Among the health behaviours and other social factors, the mean healthy ageing score was higher among the elderly who are physically active (84.82; 95% CI: 84.66-84.98) and among those receiving financial support (88.84; 95% CI: 88.61-89.07). In terms of the well-being factors, individuals with fewer depressive symptoms tend to have higher mean scores. Gender also plays a significant role, with notable differences in Healthy Ageing Index scores between widowed males and females. Females generally have lower Healthy Ageing scores across most sociodemographic parameters, including age, residence, living arrangements, education, and wealth. Similarly, in health behaviours and other social factors such as religious participation, widowed female consistently have lower healthy ageing scores than their male counterparts.

Table 2. Age-sex adjusted score of healthy ageing among the widowed elderly with a **high** level of life satisfaction by socio-demographic indicators in India, 2017-18.

Sociodemographic indicators	Overall	Female	Male
	Mean HAI Score (95% CI)	Mean HAI Score (95% CI)	Mean HAI Score (95% CI)
Age Category			
60-69	90.15(89.84-90.47)	89.73(89.37-90.08)	91.55(90.89-92.21)
70-79	88.02(87.66-88.38)	87.43(87.01-87.84)	90.07(89.38-90.76)
80+	85.76(85.27-86.25)	85.26(84.66-85.86)	87.49(86.67-88.31)
Place of Residence			
Rural	89.30(89.04-89.57)	88.99(88.68-89.310	90.42(89.92-90.92)
Urban	87.35(87.00-87.69)	86.47(86.47-87.26)	89.07(88.34-89.80)
Living Arrangements			
Living alone	89.56(88.92-90.19)	89.32(88.60-90.04)	90.20(88.85-91.55)
Living with children & others	88.44(88.22-88.67)	88.00(87.74-88.27)	89.97(89.53-90.400

Educational Attainment			
No schooling	89.38(89.11-89.65)	88.88(88.59-89.17)	90.95(90.30-91.60)
Less than 5 years	87.33(86.73-87.94)	86.82(86.08-87.55)	89.17(88.13-90.22)
5-9 years	87.35(86.80-87.90)	86.50(85.80-87.19)	89.83(89.00-90.66)
10 and more	86.44(85.70-87.17)	85.47(84.44-86.50)	88.85(87.91-89.79)
Currently Working			
Yes	91.73(91.20-92.26)	91.70(91.04-92.37)	92.36(91.55-93.18)
No	87.91(87.68-88.15)	87.57(87.30-87.83)	89.10(88.61-89.59)
Wealth Quintile			
Poorest	89.53(89.05-90.01)	88.99(88.44-89.55)	91.44(90.50-92.37)
Poorer	89.36(88.91-89.82)	89.05(88.52-89.58)	90.43(89.55-91.32)
Middle	88.74(88.28-89.21)	88.34(87.80-88.87)	90.16(89.23-91.09)
Richer	88.07(87.59-88.54)	87.60(87.04-88.15)	89.68(88.76-90.60)
Richest	86.95(86.45-87.44)	86.59(86.01-87.17)	88.21(87.28-89.14)
Caste			
SC	89.18(88.65-89.71)	88.87(88.25-89.50)	90.28(89.28-91.28)
ST	90.49(89.97-91.01)	90.31(89.71-90.91)	91.13(90.09-92.16)
OBC	88.36(88.01-88.71)	87.89(87.48-88.29)	90.01(89.33-90.69)
Others	87.45(87.06-87.83)	86.95(86.50-87.39)	89.19(88.43-89.94)
Depressive Symptoms			
No	89.39(89.15-89.64)	88.96(88.68-89.25)	90.86(90.39-91.33)
Yes	86.27(85.85-86.67)	85.94(85.46-86.41)	87.39(86.58-88.20)
Current tobacco use (smoked/smokeless)			
No	88.24(88.00-88.49)	87.91(87.63-88.19)	89.36(88.82-89.89)
Yes	89.55(89.11-89.98)	89.12(88.58-89.67)	90.91(90.27-91.56)
Current alcohol consumption			
No	88.47(88.25-88.68)	88.07(87.82-88.32)	89.83(89.39-90.28)
Yes	90.33(89.40-91.26)	91.10(89.64-92.56)	90.88(89.80-91.96)
Physical Activity			
Physically active	89.77(89.46-90.08)	89.37(89.02-89.72)	91.14(90.48-91.79)
Physically Inactive	87.48(87.18-87.77)	86.97(86.62-87.32)	89.21(88.67-89.74)
Religious participation			
No	88.15(87.61-88.69)	87.89(87.25-88.52)	89.15(88.1-90.14)
Yes	88.65(88.42-88.88)	88.21(87.94-88.48)	90.17(89.71-90.62)
Financial Support			
Yes	88.84(88.61-89.07)	88.44(88.17-88.71)	90.23(89.79-90.67)
No	87.11(86.57-87.64)	86.77(86.16-87.37)	88.26(87.08-89.43)

Table 3 depicts the distribution of the mean score of healthy ageing among elderly widows across the explanatory variables with any depressive symptoms. It was found that the mean score among widow females was lower than widow males across the socio-demographic (age, living arrangements, marital status, current work status, etc.) and religious participation. However, elderly widows receiving financial support from family and friends have lower HAI scores than their counterparts.

Table 3. Age-sex adjusted score of healthy ageing among the widowed elderly with **depressive symptoms** by socio-demographic indicators in India, 2017-18.

Sociodemographic indicators	Overall	Female	Male
	Mean HAI Score (95% CI)	Mean HAI Score (95% CI)	Mean HAI Score (95% CI)
Age Category			
60-69	88.28(87.75-88.80)	87.87(87.28-88.47)	89.83(88.65-91.01)
70-79	85.76(85.18-86.34)	85.32(84.68-85.97)	87.46(86.18-88.75)
80+	82.21(81.42-83.00)	81.67(80.74-82.61)	84.18(82.72-85.65)
Sex			
Male	87.88(87.11-88.66)	-	-
Female	85.73(85.34-86.12)	-	-
Place of Residence			
Rural	86.98(86.56-87.40)	86.65(86.17-87.13)	88.27(87.39-89.16)
Urban	84.46(83.85-85.07)	84.11(83.43-84.79)	85.82(84.43-87.20)
Living Arrangements			
Living alone	87.97(87.13-88.82)	87.78(86.84-88.72)	88.52(86.53-90.50)
Living with children & others	85.80(85.42-86.18)	85.39(84.95-85.82)	87.40(86.60-88.21)
Educational Attainment			
No schooling	87.00(86.58-87.41)	86.56(86.12-87.01)	88.50(87.45-89.55)
Less than 5 years	84.61(83.51-85.72)	83.91(82.57-85.24)	87.06(85.13-88.99)
5-9 years	84.27(83.29-85.25)	83.26(82.04-84.47)	87.21(85.63-88.80)
10 and more	82.76(81.29-84.24)	82.03(80.04-84.03)	85.07(82.99-87.16)
Currently Working			
Yes	90.19(89.30-91.07)	90.03(88.95-91.11)	91.11(89.63-92.60)
No	85.37(84.99-85.75)	85.14(84.72-85.57)	86.21(85.32-87.09)
Wealth Quintile			
Poorest	87.22(86.51-87.93)	86.96(86.16-87.76)	88.20(86.68-89.73)
Poorer	86.52(85.80-87.25)	86.09(85.28-86.91)	88.22(86.62-89.82)
Middle	85.83(85.03-86.63)	85.50(84.59-86.41)	87.14(85.51-88.77)
Richer	85.91(85.10-86.73)	85.46(84.54-86.37)	87.74(85.95-89.53)
Richest	84.69(83.80-85.59)	84.35(83.33-85.37)	86.02(84.13-87.91)
Caste			
SC	86.58(85.79-87.38)	86.35(85.44-87.25)	87.55(85.89-89.21)
ST	88.47(87.56-89.39)	88.02(86.98-89.05)	90.24(88.30-92.18)
OBC	86.16(85.60-86.71)	85.68(85.06-86.31)	88.02(86.83-89.20)
Others	84.68(84.02-85.35)	84.48(83.73-85.23)	85.44(84.00-86.88)
Life Satisfaction			
Low	86.17(85.66-86.68)	85.77(85.20-86.35)	87.75(86.63-88.88)
High	86.17(85.69-86.65)	85.85(85.30-86.39)	87.41(86.41-88.41)
Current tobacco use (smoked/smokeless)			
No	85.85(85.44-86.26)	85.66(85.21-86.10)	86.38(85.38-87.39)
Yes	87.03(86.35-87.72)	86.35(85.52-87.18)	89.02(87.90-90.13)
Current alcohol consumption			
No	86.00(85.64-86.36)	85.69(85.29-86.09)	87.22(86.41-88.03)
Yes	88.86(87.38-90.35)	89.32(87.15-91.50)	89.42(87.51-91.34)

Physical Activity			
Physically active	87.57(87.03-88.11)	87.15(86.55-87.74)	89.22(87.98-90.46)
Physically Inactive	85.10(84.63-85.57)	84.72(84.18-85.26)	86.60(85.66-87.54)
Religious participation			
No	85.61(84.84-86.39)	85.34(84.45-86.23)	86.76(85.23-88.29)
Yes	86.32(85.92-86.71)	85.93(85.49-86.37)	87.81(86.96-88.67)
Financial Support			
Yes	85.02(84.22-85.81)	84.83(83.95-85.72)	85.52(83.64-87.39)
No	86.44(86.06-86.83)	86.06(85.62-86.50)	87.95(87.14-88.76)

Multivariate linear regression estimates of healthy ageing status and psychological well-being among the elderly widows

Table 4 shows the results of multivariate linear regression analysis examining the association between life satisfaction and depressive symptoms among elderly widows (overall and separately for males and females) in India aged 60 years and above. The regression analysis highlights several key factors influencing healthy ageing among elderly widows. Among the overall widowed samples, depressive symptoms (β=-3.10; 95% CI: -3.46--2.73) and receiving financial support (β=-1.65; 95% CI: -2.11--1.19) have negative associations with healthy ageing. In contrast, religious participation (β=1.24; 95% CI: 0.78-1.70) and physical activity (β=2.00; 95% CI: 1.64-2.36) show a stronger positive association with healthy ageing status. In terms of sociodemographic indicators, age, sex, and place of residence show a negative association. Wealth and education present complex associations, as higher wealth and more education, are generally linked to lower healthy ageing scores, with some variation across groups. On the other hand, employment consistently shows a strong positive effect on healthy ageing, suggesting that staying engaged in work can promote better health outcomes in later life. We found that life satisfaction is positively associated with healthy ageing status. However, the association is not statistically significant.

The regression result shows gender-specific differences in healthy ageing experience among widowed males and females. For example, religious participation, physical activity, current working status, and living arrangements positively affect healthy ageing status for both males and females, but the strongest effect is seen among females. In contrast, financial support is negatively associated with healthier ageing status, more so for widowed males, while for age, the association shows smaller effects for widowed males across different age groups.

Table 4. Multiple linear regression of the potential factors associated with Healthy ageing among the widowed elderly in India, 2017-18

Factors	Model 1 Overall β (95% CI)	P-value	Model 2 Female β (95% CI)	P-value	Model 3 Male β (95% CI)	P-value
Life Satisfaction						
Low®						
High	0.33(-0.04-0.70)	0.08	0.41(-0.01-0.84)	0.05	0.01(-0.73-0.74)	0.992
Depressive Symptoms						
No®						
Yes	-3.10(-3.46--2.73)	0.00	-3.02(-3.45--2.60)	0.00	-3.35(-4.09--2.62)	0.00
Religious participation						
No®						
Yes	1.24(0.78-1.70)	0.00	1.39(0.85-1.93)	0.00	0.85(0.00-1.70)	0.049
Financial Support						
No®						
Yes	-1.65(-2.11--1.19)	0.00	-1.54(-2.06--1.02)	0.00	-2.12(-3.11--1.13)	0.00
Physical Activity						
Physically inactive®						
Physically active	2.00(1.64-2.36)	0.00	2.10(1.69-2.51)	0.00	1.54(0.81-2.27)	0.00
Current tobacco use (smoked/smokeless)						
No®						
Yes	0.56(0.16-0.96)	0.01	0.39(-0.09-0.87)	0.11	1.01(0.31-1.71)	0.01
Current alcohol consumption						
No®						
Yes	0.14(-0.62-0.90)	0.72	0.45(-0.73-1.62)	0.45	-0.01(-0.94-0.93)	0.99
Age Category						
60-69®						
70-79	-1.27(-1.66--0.89)	0.00	-1.44(-1.88--1.00)	0.00	-0.64(-1.44-0.15)	0.11
80+	-2.99(-3.48--2.49)	0.00	-3.07(-3.65--2.48)	0.00	-2.64(-3.56--1.72)	0.00
Sex						
Male®						
Female	-2.06(-2.53--1.60)	0.00	-	-	-	-
Place of Residence						
Rural®						
Urban	-1.65(-2.04--1.27)	0.00	-1.74(-2.18--1.30)	0.00	-1.13(-1.92--0.34)	0.01
Educational Attainment						
No schooling®						
Less than 5 years	-1.47(-2.03--0.91)	0.00	-1.64(-2.31--0.97)	0.00	-0.91(-1.90-0.08)	0.07
5-9 years	-0.99(-1.52--0.46)	0.00	-1.18(-1.84--0.52)	0.00	-0.53(-1.40-0.35)	0.24
10 and more	-1.18(-1.92--0.45)	0.00	-1.52(-2.51--0.53)	0.01	-0.75(-1.83-0.32)	0.17
Currently Working						
No®						
Yes	2.64(2.16-3.12)	0.00	2.72(2.14-3.31)	0.00	2.45(1.62-3.27)	0.00
Living Arrangements						
Living with children & others®						
living alone	1.43(0.91-1.95)	0.00	1.56(0.97-2.15)	0.00	0.77(-0.33-1.87)	0.17

Wealth Quintile						
Poorest®						
Poorer	0.02(-0.49-0.53)	0.94	0.09(-0.50-0.68)	0.77	-0.30(-1.33-0.72)	0.56
Middle	-0.69(-1.22--0.17)	0.01	-0.72(-1.33--0.12)	0.02	-0.66(-1.70-0.39)	0.22
Richer	-1.19(-1.73--0.66)	0.00	-1.24(-1.85--0.62)	0.00	-1.03(-2.09-0.04)	0.06
Richest	-1.99(-2.57--1.42)	0.00	-1.95(-2.61--1.29)	0.00	-2.10(-3.24--0.96)	0.00
Caste						
Others®						
SC	0.38(-0.15-0.92)	0.16	0.39(-0.23-1.01)	0.21	0.31(-0.73-1.35)	0.56
ST	2.19(1.64-2.74)	0.00	2.36(1.72-2.99)	0.00	1.53(0.43-2.63)	0.01
OBC	0.05(-0.38-0.47)	0.84	-0.02(-0.52-0.47)	0.92	0.24(-0.62-1.10)	0.59

®*Reference Category*

Discussion:

The present study was conducted on a sample of 10,060 elderly widows across all the States and Union Territories of India, based on the LASI (wave-1) data aged 60 years and above. The aim of the study was to investigate the association between psychological well-being and healthy ageing among elderly who lost their spouses. We also examined the gendered differences in healthy ageing status. We created an index of healthy ageing based on the World Health Organisation (WHO) functional ability framework [21] comprising 27 variables from four major domains (i.e., physiological health, functional health, cognitive ability, and social engagement). The healthy ageing index ranges from 0-100, with a higher score indicating better healthy ageing status. The mean Healthy Ageing Index of our study population was 87.9 (male: 89.91 & female 87.43), representing that the study population is healthier.

Our findings contributed four major findings to the knowledge base on the healthy ageing status of elderly widows. First, depressive symptoms have a strong negative impact on healthy ageing across all groups, underscoring the detrimental effect of mental health issues. It is evident that spousal loss, especially in the later years, leads to various psychological distress, physical illness, depression, etc.,[1, 2, 12, 46] which might have pernicious effects on the healthy ageing status.

Second, our study is consistent with the previous studies indicating that healthy ageing in old age is determined by various lifestyle behaviours [39, 47-51]. The relationship between physical activity and improved health status has been extensively researched. Older adults who engage in higher levels of physical activity tend to exhibit better metabolic function, greater cellular endurance, improved muscle tissue performance, enhanced energy metabolism, and a

reduced risk of age-related neurodegenerative disorders[52]. Those who participate in moderate to vigorous physical activity also demonstrate higher functional abilities. Additionally, older adults with greater social participation, such as interacting with others and engaging in social activities, are more likely to be healthier[39, 48, 49, 51, 52]. However, the relationship between healthy ageing status with alcohol consumption cannot be generalized, as there is mixed evidence of alcohol consumption of health status, especially among older adults[6, 35, 47, 51, 53, 54].

Third, among elderly widows, religious participation had a positive association with healthier ageing status. Literary evidence also suggests that after spousal loss, the elderly who have a positive outlook on life will be less vulnerable to the debilitating effects of grief and coping with loneliness[1, 12]. Therefore, promoting these positive outlooks might lead to better healthy ageing status. Similar studies from India suggest that religious participation in old age reduces the chances of cognitive impairments and enhances mental well-being among the elderly with depressive symptoms[43].

Fourth, receiving financial support from family members is negatively associated with healthy ageing status, with widowed males showing higher effects. There has been mixed evidence on the effects of receiving financial support from children and families on the well-being and depressive symptoms among the elderly. Some studies from the Chinese context suggested that receiving financial support from children is beneficial and, in turn, alleviates depression[55]. While some studies from China, Singapore, and Hong Kong suggest contradictory findings, receiving support from children creates a feeling of being a burden and results in excessive guild and shame among older persons[55-57]. Future studies are needed to see the meaning of financial support in monetary terms and cultural contexts.

While considering healthy ageing it is equally important to focus on the sociodemographic aspects in addition to the psychological domains, lifestyle behaviours, religious participation, and other family and social aspects. Ageing itself significantly reduces healthy ageing scores, especially for those aged 80 years and above, indicating that advanced age presents challenges to maintaining health. Living arrangements play a role, with living alone positively associated with healthy ageing for widowed females, though this effect is not significant for widowed males. Wealth and education present complex associations, as higher wealth and more education, are generally linked to lower healthy ageing scores, with some variation across groups. On the other hand, employment consistently shows a strong positive effect on healthy

ageing, suggesting that staying engaged in work can promote better health outcomes in later life. Overall, the analysis reveals that psychological, lifestyle behaviours, religious participation, and sociodemographic factors play crucial roles in determining healthy ageing, with noticeable gender differences in some associations.

Promoting psychological well-being can positively impact healthy ageing in India, as it does in many other contexts. Good mental health is closely linked to physical health. Reducing stress, anxiety, and depression can lower the risk of chronic diseases such as heart disease, diabetes, and hypertension, which are prevalent among the elderly in India. Psychological well-being also encourages social engagement and participation, which are crucial for healthy ageing. Social isolation and loneliness are significant risk factors for physical and mental health decline in older adults, especially among elderly widows. Additionally, promoting mental well-being helps maintain cognitive function and can delay the onset of dementia and other cognitive impairments. Mental exercises, social activities, and a positive outlook are beneficial for brain health.

Furthermore, psychological well-being fosters resilience and adaptability, enabling older adults to better cope with ageing changes and challenges post spousal loss, such as managing health issues and changing living situations, social and cultural stigma, and loneliness. Ultimately, psychological well-being enhances the overall quality of life for older adults by promoting a sense of purpose, fulfilment, and satisfaction.

In the Indian context, promoting psychological well-being among the elderly requires addressing specific cultural, social, and economic factors and looking at the diverse socio-cultural setup of the country. Strengthening family support systems and intergenerational relationships is vital, as family plays a central role in the lives of many elderly Indians. Developing community-based programs encouraging social interaction, physical activity, and mental stimulation can also improve well-being. Additionally, improving access to mental health services and integrating mental health care into primary health care systems are critical steps. It is also important to ensure that interventions are culturally sensitive and appropriate, considering the diverse traditions and beliefs across different regions of India. Finally, advocating for policies that support the mental health and well-being of the elderly, such as social security measures, pension schemes, and age-friendly infrastructure, is crucial. By addressing these areas, India can enhance the psychological well-being of its ageing population, leading to healthier and more fulfilling lives for its elderly citizens.

The current findings should be considered alongside the following limitations. The psychological measurement was based on two indicators: life satisfaction and the presence of depressive symptoms to evaluate an individual's well-being. But psychological well-being is a much wider concept and conceptualizing it with the limited variable available in the dataset increases the robustness of our findings. An important limitation of the study is the cross-sectional nature of the data. Therefore, we cannot infer causality from our associational estimates, and moreover, we were unable to adjust the pre-widowhood health status, which is an important consideration for healthy ageing. Therefore, future research is needed to understand the life course perspective of health outcomes in old age.

Conclusion

The study presents a new perspective on the association between psychological well-being and healthy ageing among older adults who have lost their spouses. Overall, our results suggested that depressive symptoms, physical activity, age, religious participation, and work status play critical roles in determining healthy ageing, with noticeable gender differences in some associations.

In India, promoting psychological well-being among the widowed elderly is very important in addressing their specific cultural, social, and economic factors. In view of the diverse stigmas, vulnerabilities, and limited formal support systems associated with widowhood, strengthening family ties and intergenerational relations is vital. In addition, community-based programs should be encouraged to promote social engagement, physical activity, and mental stimulation to enhance overall well-being. Furthermore, expanding access to mental health services and incorporating mental health care into primary health care systems, promoting community counselling for elderly widows are some essential measures to achieve a healthy ageing society.

References

1. Fry, P.S., *The unique contribution of key existential factors to the prediction of psychological well-being of older adults following spousal loss.* Gerontologist, 2001. **41**(1): p. 69-81.

2. Stroebe, M.S. and W. Stroebe, *Who suffers more? Sex differences in health risks of the widowed.* Psychol Bull, 1983. **93**(2): p. 279-301.
3. Wortman, C.B. and R.C. Silver, *Successful mastery of bereavement and widowhood: A life-course perspective*, in *Successful Aging: Perspectives from the Behavioral Sciences*, P.B. Baltes and M.M. Baltes, Editors. 1990, Cambridge University Press: Cambridge. p. 225-264.
4. McGloshen, T.H. and S.L. O'Bryant, *The Psychological Well-Being of Older, Recent Widows.* 1988. **12**(1): p. 99-116.
5. United Nations (UN). *Statement for International Widows Day 2014*. Available from: https://news.un.org/en/story/2013/06/443022.
6. Perkins, J.M., et al., *Widowhood and Alcohol, Tobacco, and Other Drug Use Among Older Adults in India.* The Journals of Gerontology: Series B, 2016. **73**(4): p. 666-674.
7. Perkins, J.M., et al., *Marital status, widowhood duration, gender and health outcomes: a cross-sectional study among older adults in India.* BMC Public Health, 2016. **16**(1): p. 1032.
8. Drèze, J. and P.V. Srinivasan, *Widowhood and poverty in rural India: Some inferences from household survey data.* Journal of Development Economics, 1997. **54**(2): p. 217-234.
9. Alka, R., *Determinants of Well-Being among Widows: An Exploratory Study in Varanasi.* Economic and Political Weekly, 2001. **36**(43): p. 4088-4094.
10. van den Brink, C.L., et al., *Effect of widowhood on disability onset in elderly men from three European countries.* J Am Geriatr Soc, 2004. **52**(3): p. 353-8.
11. Matud, M.P., et al., *Gender and psychological well-being in older adults.* Int Psychogeriatr, 2020. **32**(11): p. 1293-1302.
12. Siegel, J.M. and D.H. Kuykendall, *Loss, widowhood, and psychological distress among the elderly.* J Consult Clin Psychol, 1990. **58**(5): p. 519-24.
13. Kovalenko, O.H. and L.M. Spivak, *Psychological well-being of elderly people: the social factors.* Social Welfare: Interdisciplinary Approach, 2018. **8**(1): p. 163-176.
14. Kashdan, T., R. Biswas-Diener, and L. King, *Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia.* The Journal of Positive Psychology, 2008. **3**: p. 219-233.
15. Steptoe, A., A. Deaton, and A.A. Stone, *Subjective wellbeing, health, and ageing.* Lancet, 2015. **385**(9968): p. 640-648.
16. Markides, K.S. and N. Krause, *Intergenerational solidarity and psychological well-being among older Mexican Americans: a three-generations study.* J Gerontol, 1985. **40**(3): p. 390-2.
17. Kubzansky, L.D., et al., *Positive Psychological Well-Being and Cardiovascular Disease: JACC Health Promotion Series.* J Am Coll Cardiol, 2018. **72**(12): p. 1382-1396.
18. Kim, E.S., et al., *Resilient Aging: Psychological Well-Being and Social Well-Being as Targets for the Promotion of Healthy Aging.* 2021. **7**: p. 23337214211002951.
19. Chandola, T. and M. Marmot, *Social Epidemiology*. 2005. p. 893-916.
20. Hawkley, L.C. and J.T. Cacioppo, *Loneliness matters: a theoretical and empirical review of consequences and mechanisms.* Ann Behav Med, 2010. **40**(2): p. 218-27.
21. WHO, *World report on ageing and health*. 2015, Geneva: World Health Organization.
22. Rudnicka, E., et al., *The World Health Organization (WHO) approach to healthy ageing.* Maturitas, 2020. **139**: p. 6-11.

23. Michel, J.P. and R. Sadana, *"Healthy Aging" Concepts and Measures.* J Am Med Dir Assoc, 2017. **18**(6): p. 460-464.
24. Pandey, M.K. and A.K. Jha, *Widowhood and health of elderly in India: examining the role of economic factors using structural equation modeling.* International Review of Applied Economics, 2012. **26**(1): p. 111-124.
25. Agrawal, G. and K. Keshri, *Morbidity patterns and health care seeking behavior among older widows in India.* PLoS One, 2014. **9**(4): p. e94295.
26. Goldman, N., S. Korenman, and R. Weinstein, *Marital status and health among the elderly.* Soc Sci Med, 1995. **40**(12): p. 1717-30.
27. Koball, H.L., et al., *What Do We Know About the Link Between Marriage and Health?* 2010. **31**(8): p. 1019-1040.
28. Södergren, M., *Lifestyle predictors of healthy ageing in men.* Maturitas, 2013. **75**(2): p. 113-7.
29. United_Nations, *Poplitical Declaration of the High Level Meeting of the General Assembly of the Prevention and Control of the non communicable diseases United Nations*. 2011.
30. Pruchno, R., S. Hahn, and M. Wilson-Genderson, *Cigarette smokers, never-smokers, and transitions: implications for successful aging.* Int J Aging Hum Dev, 2012. **74**(3): p. 193-209.
31. Støvring, N., et al., *The cumulative effect of smoking at age 50, 60, and 70 on functional ability at age 75.* Scand J Public Health, 2004. **32**(4): p. 296-302.
32. Le Marchand, L., et al., *Relationship of alcohol consumption to diet: a population-based study in Hawaii.* Am J Clin Nutr, 1989. **49**(3): p. 567-72.
33. Burke, G.L., et al., *Factors associated with healthy aging: the cardiovascular health study.* J Am Geriatr Soc, 2001. **49**(3): p. 254-62.
34. Yates, L.B., et al., *Exceptional longevity in men: modifiable factors associated with survival and function to age 90 years.* Arch Intern Med, 2008. **168**(3): p. 284-90.
35. Daskalopoulou, C., et al., *Associations of smoking and alcohol consumption with healthy ageing: a systematic review and meta-analysis of longitudinal studies.* BMJ Open, 2018. **8**(4): p. e019540.
36. Organization, W.H. *10 facts on ageing and health*. 2017; Available from: https://www.who.int/news-room/fact-sheets/detail/10-facts-on-ageing-and-health.
37. Hu, R.-H., et al., *Increasing age- and gender-specific burden and complexity of multimorbidity in Taiwan, 2003–2013: a cross-sectional study based on nationwide claims data.* BMJ Open, 2019. **9**(6): p. e028333.
38. Tosato, M., et al., *The aging process and potential interventions to extend life expectancy.* Clin Interv Aging, 2007. **2**(3): p. 401-12.
39. Foscolou, A., et al., *Lifestyle determinants of healthy ageing in a Mediterranean population: The multinational MEDIS study.* Exp Gerontol, 2018. **110**: p. 35-41.
40. *The Longitudinal Ageing Study in India 2017-18 - national report*. 2020, International Institute for Population Sciences, National Programme for Health Care of Elderly, Ministry of Health and Family Welfare, Harvard T. H. Chan School of Public Health, and the University of Southern California.
41. Diener, E., et al., *The Satisfaction With Life Scale.* J Pers Assess, 1985. **49**(1): p. 71-5.
42. Andresen, E.M., et al., *Screening for Depression in Well Older Adults: Evaluation of a Short Form of the CES-D.* American Journal of Preventive Medicine, 1994. **10**(2): p. 77-84.
43. Muhammad, T., *The role of religiosity and religious participation in the relationship between depressive symptoms and cognitive impairment among older Indian adults.* Sci Rep, 2022. **12**(1): p. 11915.

44. World Health, O., *WHO guidelines on physical activity and sedentary behaviour*. 2020, Geneva: World Health Organization.
45. Phulkerd, S., et al., *Influence of healthy lifestyle behaviors on life satisfaction in the aging population of Thailand: a national population-based survey.* BMC Public Health, 2021. **21**(1): p. 43.
46. Bae, S.M., *Factors associated with depressive symptoms among elderly Koreans: the role of health status, work ability, financial problems, living alone, and family relationships.* Psychogeriatrics, 2020. **20**(3): p. 304-309.
47. Daskalopoulou, C., et al., *Healthy ageing trajectories and lifestyle behaviour: the Mexican Health and Aging Study.* Scientific Reports, 2019. **9**(1): p. 11041.
48. Cramm, J.M. and J. Lee, *Smoking, physical activity and healthy aging in India.* BMC Public Health, 2014. **14**: p. 526.
49. Pac, A., et al., *Influence of Sociodemographic, Behavioral and Other Health-Related Factors on Healthy Ageing Based on Three Operative Definitions.* J Nutr Health Aging, 2019. **23**(9): p. 862-869.
50. Sabia, S., et al., *Influence of individual and combined healthy behaviours on successful aging.* Cmaj, 2012. **184**(18): p. 1985-92.
51. Mandi, R., D.W. Bansod, and A.K. Goyal, *Exploring the association of lifestyle behaviors and healthy ageing among the older adults in India: evidence from LASI survey.* BMC Geriatrics, 2023. **23**(1): p. 675.
52. Radak, Z., et al., *Exercise plays a preventive role against Alzheimer's disease.* J Alzheimers Dis, 2010. **20**(3): p. 777-83.
53. Stockwell, T., et al., *Do "Moderate" Drinkers Have Reduced Mortality Risk? A Systematic Review and Meta-Analysis of Alcohol Consumption and All-Cause Mortality.* J Stud Alcohol Drugs, 2016. **77**(2): p. 185-98.
54. Holmes, M.V., et al., *Association between alcohol and cardiovascular disease: Mendelian randomisation analysis based on individual participant data.* BMJ : British Medical Journal, 2014. **349**: p. g4164.
55. Xia, W., et al., *Effect of Receiving Financial Support from Adult Children on Depression among Older Persons and the Mediating Role of Social Participation.* Int J Environ Res Public Health, 2022. **19**(19).
56. Ng, A.C.Y., D.R. Phillips, and W.K.-m. Lee, *Persistence and challenges to filial piety and informal support of older persons in a modern Chinese society: A case study in Tuen Mun, Hong Kong.* Journal of Aging Studies, 2002. **16**(2): p. 135-153.
57. Shiraz, F., Z.L.J. Hildon, and H.J.M. Vrijhoef, *Exploring the Perceptions of the Ageing Experience in Singaporean Older Adults: a Qualitative Study.* J Cross Cult Gerontol, 2020. **35**(4): p. 389-408.