

# Can Low Level of Life Satisfaction and Poor Living Arrangements Increase the Risk for Late Life Depression among Elderly?

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## Abstract

**Background:** The elderly are less vulnerable to depressive symptoms compared to younger populations. However, there is a likelihood of a greater risk for late-life depression among the elderly due to perceptions of low life satisfaction and poor living arrangements. Despite numerous studies examining various risk factors for late-life depression, the impact of a poor perception of life satisfaction and living alone on the health of the elderly remains unclear.

**Methods:** To investigate this, we examined late-life depressive symptoms among 30,389 Indian adults aged 60 and above. Using data from the recent round of the Longitudinal Aging Survey of India, we employed multivariable logistic regression to predict the likelihood of these factors, along with other associated risk factors.

**Discussion:** Our findings confirm a significant correlation between both life satisfaction and living arrangements and late-life depressive symptoms. These factors have an impact on the mental health of older adults in later life, leading to stress, anxiety, trauma, and various co-morbid complications.

**Conclusion:** This study thoroughly explores the theoretical implications and presents empirical results on the prevalence of late-life depression among the elderly, despite their lower risk profile. It highlights the importance of shaping policies in India to cater to the needs of the elderly, thereby reducing late-life depressive symptoms and minimizing the effects of risk factors. Additionally, focusing on coping strategies is essential to enhance social capital, making it crucial to implement social policies that provide support for the elderly and effectively address the mental health challenges associated with aging.

## Introduction

Depressive symptoms, including depression, pose a significant public health challenge across the lifespan. These symptoms impact individuals' socioeconomic status and overall well-being through stress, anxiety, trauma, and various mental health complications, irrespective of age [1]. Depression has a wide range of consequences, spanning socio-psychological to physical health issues [2]. It increases the likelihood of comorbidities, including the risk of death and disability, especially

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at advanced ages [3]. Depression can also lead to difficulties in decision-making and memory problems among older adults, as well as addictive behaviors such as alcohol and drug misuse, and abusive behaviors [4]. Additionally, depressive symptoms encompass complex mental health issues, contributing to mood swings, feelings of hopelessness, and even suicidal thoughts. Depression's impact on cognitive abilities and emotional stress is significant [5,6]. Furthermore, it escalates the risk of self-harm and other mental health complications [7].

Despite the numerous risk factors, depression is generally less prevalent among the elderly compared to other at-risk age groups [2]. However, late-life depression remains a considerable public health concern due to its increased likelihood in conjunction with risk factors commonly experienced by older adults [8]. These factors encompass life satisfaction, social isolation, and inadequate living arrangements. Depressive symptoms are more frequent among older adults grappling with challenges such as poor living conditions and low levels of life satisfaction [9,10]. Additionally, other common risk factors for depressive symptoms include lack of social support, cognitive decline, neurobiological changes, and traumatic events [11,12,6,13].

Therefore given the multifaceted risks linked to depressive symptoms, this study aims to explore late-life depressive symptoms and their correlation with living arrangements and life satisfaction among Indian adults aged 60 and above. The paper first delves into the concept of Late-Life Depression (LLD), followed by theoretical connections between late-life depression, Living Arrangements (LA), and Life Satisfaction (LS). Subsequently, the study examines risk factors for depressive symptoms, including life satisfaction and living arrangements, culminating in discussions and conclusions.

### Late life depression

Late-Life Depression (LLD), as measured through depressive symptoms among individuals aged 60 and above in this study, is the outcome of various etiological, medical, and psychosocial challenges faced in later years [14]. It arises due to a multitude of factors, spanning physical, socioeconomic, and psychological issues encountered by the elderly during their advanced age. Economic influences like unemployment, poverty, and resource scarcity, alongside social factors such as isolation, loneliness, and subpar living conditions, contribute to this condition. Psychological hurdles like anxiety, stress, and trauma, in addition to medical complications and other comorbidities, also enhance the likelihood of late-life depressive symptoms in older age [15].

Physical and living conditions can exacerbate the severity of depressive symptoms due to the stress and trauma resulting from bodily pain and functional limitations experienced by older adults [13]. Similarly, age-related risk factors, such as pain, fibromyalgia, fatigue, and late-life syndromes, contribute to a higher prevalence of depressive symptoms [16]. One key etiological factor for late-life depression is the presence of comorbidities, which significantly impact mental health. Research has shown that individuals at risk of coronary heart diseases exhibit higher levels of depressive symptoms, while those with cancer also face an increased risk [17,18]. Similarly, various chronic diseases elevate the likelihood of depression [19]. Health complications like high blood pressure and obesity further raise the risk of depression among older adults [3].

Earlier studies have revealed a notable connection between depressive symptoms and the incidence of comorbidities such as diabetes and cardiovascular diseases among the elderly [20]. This relationship is likely due to the additional stress imposed by these chronic conditions [21]. Depression is also prevalent among the elderly who experience poor physical health, an unhealthy lifestyle, social isolation, strained family relationships, functional limitations, and the presence of non-communicable diseases [22,23]. Similarly, a lack of social attention and emotional distress associated with aging increases the risk of heightened depression levels among the elderly.

### Late life depression and life satisfaction

Life satisfaction is integral to well-being, especially in upper ages. It entails a subjective assessment of cognitive well-being that encompasses an individual's living and health conditions [24]. Evaluating life satisfaction is crucial for discerning the health and socio-economic circumstances of individuals in their later years. Moreover, it plays a key role in assessing the effectiveness of healthcare policies tailored for the elderly [9]. Life satisfaction's examination is also essential for understanding the healthy aging of older adults and its implications for disease burdens and healthcare costs [25].

Research indicates that low life satisfaction heightens vulnerability to major depressive disorder, driven by genetic influences related to age [26]. It is considered a pivotal factor in reducing the risk of mental health complications due to its positive impact [27,28]. A study involving university students demonstrated that improved life satisfaction can be instrumental in preventing higher levels of depression [25]. Given that poor life satisfaction leads to increased stress and trauma, which in turn foster negative emotions, it is a critical element in managing depressive symptoms [29].

Life satisfaction holds significant importance for happiness and subjective well-being [24]. It exhibits a strong connection with concurrent depressive symptoms among older adults [30]. A comparative study involving Australian and Nepalese participants discovered an inverse relationship between life satisfaction and depressive symptoms [31]. Moreover, multiple studies highlight the role of well-being in mitigating depressive symptoms, given its influence on social support and sense of belonging in later years [32]. Poor life satisfaction can potentially exacerbate depressive disorders, significantly impacting well-being in later life stages [33]. This impact could be further compounded by inadequate social support and living arrangements. Additionally, life satisfaction is strongly associated with self-reported health, social support, and health behaviors [34].

### Late life depression and living arrangements

A safe and secure living environment is paramount to successful aging [35]. Older adults with favorable living arrangements are less likely to encounter challenges related to mental and physical health [36]. Factors such as living alone and social isolation jeopardize their well-being and amplify the risk of traumatic events leading to depressive symptoms [37]. Given the higher likelihood of depression among adults with poor living arrangements and quality of life, it's plausible that older adults face an increased risk of inadequate living arrangements due to elevated levels of depressive symptoms [38].

Prior research strongly suggests a connection between depressive symptoms and living arrangements, as living alone can foster fear and a sense of social longingness among older adults [39,10]. This further heightens their anxiety and concerns about healthcare and overall well-being. Older adults living alone are more susceptible to depressive symptoms [40]. However, a study conducted among Malaysian older adults revealed that living arrangements aren't the sole risk factor for older adults' mental health; their social networks also play a significant role [41]. Similarly, a study involving Thai older adults found that skipped generational households are more likely to exhibit higher levels of depressive symptoms [42].

Depressive symptoms can stem from poor functional health and living arrangements. Research demonstrates that older in-

dividuals living alone and experiencing social isolation are more prone to depressive symptoms [43,44]. Another study focusing on older adults in sub-saharan Africa revealed that elderly individuals in single-generation households are at a greater likelihood of having elevated depressive symptoms when at least one family member is present [45]. Meanwhile, a cross-sectional study among Chinese older adults found that those living alone or with both a child and spouse face an increased risk of depressive symptoms [46]. Moreover, living arrangements significantly impact the mental health of older adults due to their role in social well-being [47]. An immigrant-focused study indicated that social integration is crucial in mitigating the impact of depression on elderly health, contributing to well-being and happiness across older adults [38]. A comparative study involving Chinese and English older adults underscored the robustness of the association between depressive symptoms and living arrangements [48].

## Materials and methods

### Study sample

The analysis encompassed a total sample of 30,389 older adults aged 60 and above. The data were derived from the Longitudinal Aging Survey of India (LASI), a comprehensive survey focusing on older adults aged 45 years and above. Our focus was specifically on the older adults aged 60 and above, as late-life depression is typically more prevalent within this age group. Further details regarding the sampling methodology and survey procedures can be found in the final report of the LASI survey [49].

### Measures

**Late life depression:** The study's outcome variable was an asymptotic-based measure calculated using the CES-D scale (Center for Epidemiologic Studies-Depression), which assessed depressive symptoms among individuals aged 60 and above. The LASI CES-D scale consists of ten items, encompassing seven negative and three positive symptoms. A comprehensive breakdown of the scale's calculation can be found in the supplementary file. The resulting score was then transformed into a binary variable, with scores of 4 and above indicative of elderly individuals experiencing late-life depression.

### Independent variables

**Life satisfaction:** Life satisfaction is greatly influenced by an individual's capacity to make life choices, especially as they grow older. The elderly encounter a range of socioeconomic and emotional shifts during their later years. The primary independent variables in our study were life satisfaction and living arrangements. Life satisfaction serves as a crucial gauge of individuals' well-being, particularly for the elderly. As older individuals tend to rely more on psychosocial perceptions, assessing life satisfaction becomes pivotal for understanding their well-being and social connectedness. It hinges on the ability to make choices, especially in advanced age, and maintains a close relationship with depressive symptoms. To measure life satisfaction, we utilized the LASI survey questionnaire. Additional details regarding the construction of the life satisfaction variable can be found in the supplementary file in this study.

**Living arrangements:** They are essential for social well-being and serve as important determinants of life satisfaction. Additionally, they share a close association with depressive symptoms among older adults, particularly due to the challenges of

living alone or lacking family support. LASI collected data on living arrangements, which were subsequently classified into three groups: living alone, living with a spouse, and living with others. These categories were included in this study.

### Other covariates

The independent variables encompassed a range of sociodemographic and health-related factors, including self-rated health, morbidity, physical attributes, life stratification, impairments, and living arrangements. Additionally, we incorporated economic and work-related factors, such as income and work status, to better comprehend the influence of depressive symptoms. Further information about the independent variables can be accessed in supplementary file.

### Statistical analysis

The primary analyses studied the predictors of depression along with life satisfaction and living arrangements. Difference in demographic variables with prevalence of depressive symptoms was computed using the Chi square test to compare the significance between group results. Whereas multivariable logistic model below was used to assess the set of independent variables along with LS and LA to predict the depressive symptoms.

The logit model used for the study has been defined in equation below:

$$\text{Logit } p = \log \frac{p}{1-p} = \log \Omega = b_0 + b_1 LA_1 + b_2 x LS_2 + \dots + b_k x_k$$

Where, where  $p$  is the probability of older adults having any depressive symptoms, coefficient ' $b$ ' is the factor by which the odds changes with unit increase in variables. If " $b$ " is positive, odds ratio will increase, as this factor will be greater than 1 and the variable will have positive impact given the reported  $p$  values. Contrary to that if ' $b$ ' is negative, odd ratio will predict the negative impact of independent variable on depressive symptoms. LA and LS are living arrangements and life satisfaction respectively, where as  $x_k$  denotes the  $k$  number of independent variables in the study. Finally, Odds Ratio (OR) were reported along with Confidence Intervals (CI) in the final tables.

### Results

Table 1 presents the prevalence of any depressive symptoms among older adults aged 60 and above. Of the total number of respondents (32.6%) women are having any depressive symptoms as compared to (27.2%) men. Whereas nearly 31.4% respondents of rural areas are having depressive symptoms as compared 27.4% of urban areas. 46.0% living alone are having depression as compared to 26.2% living with family. 31.6% lived without others were found to be having any depressive symptoms among the older adults aged 60 and above. Similarly, 43.6% respondents reporting poor health are having depressive symptoms whereas those with any impairments are having nearly 44.6% of depressive symptoms. Sociodemographic variables revealed that that majority of the respondents belonging to poor socio-economic groups are likely to have a greater prevalence of depressive symptoms. We also found that low life satisfaction is associated with depressive symptoms (44.9%;  $p < 0.05$ ) whereas medium and high were 32.9% and 18.9% respectively at ( $p < 0.05$ ). Similarly, the other covariates such as ADL, IADL and other sociodemographic variables were all associated with depressive symptoms respectively ( $p < 0.05$ ).

**Table 1:** Prevalence of any depressive symptoms among older adults in India.

	Percentage	Number		Percentage	Number
Background variables					
Sex			Residence		
Male <sup>®</sup>	27.5	14,558	Rural <sup>®</sup>	31.4	20,059
Female	32.6	15,831	Urban	27.4	10,330
Age groups			Education		
Age1	28.8	18,532	Illiterate <sup>®</sup>	34.1	16,254
Age2	31.3	8,761	0-4 Years	29.1	3,668
Age3	33.7	2,613	5-9 Years	25.9	5,836
Age 4	40.5	483	10+ Years	20.9	4,631
Social group			Religion		
ST <sup>®</sup>	34.9	4,968	Hindu	30.5	22,279
SC	27.5	4,994	Muslim	31.3	3,585
Gen	30	11,493	Christian	30	3,030
Others	28.1	8,934	Other	21.3	1,495
Marital status			Work Status		
Married <sup>®</sup>	27.3	19,370	Never worked	30.5	8,484
Widowed	34.8	10,236	Currently not working	32.4	12,792
Others	36.7	783	Currently working	27	9,113
Region			Income		
North India <sup>®</sup>	27.5	5,658	Poorest <sup>®</sup>	34.2	6,229
Central India	30.6	4,026	Poorer	28.9	6,251
East India	33.1	5,190	Rich	29.5	6,212
North East.	18	2,825	Richer	28	5,979
West India	33.4	3,991	Richest	30.1	5,718
South India	27.3	8,699			
Risk factors					
Self-related health			Any impairment		
Poor	43.6	7,007	No	28.7	27,790
Good	25.9	23,365	Yes	44.6	2,599
Living arrangements			Life satisfaction		
Living Alone	46	1,568	Low	44.2	9,270
Living With Family	26.2	13,217	Medium	32.9	7,222
Living with Others	31.6	15,604	High	18.9	13,823
Instrumental Activities of Daily Living			Activities of Daily Living (ADL)		
No	23.9	17,152	No	26.2	24,172
1 IADL	29.9	3,357	1 ADL	35	2,650
2+IADL	39.4	9,836	2+ ADL	50.2	3,562

**Note:** <sup>®</sup> denotes is reference category.

Table 2 shows the results of the logistic regression analysis between depressive symptoms and its associated risk factors including life satisfaction and living arrangements. The result from logistic regression shows that living alone has a higher risk of depressive symptoms than living with family (OR 1.08, 95% CI 1.65-1.66). Whereas living with others also has a higher risk (OR 1.08, 95% CI 1.08-1.09). Similarly looking at life satisfaction, odds ratio is significant and very high for low level of satisfaction with any depressive symptoms (OR 2.90, 95% CI 2.89-2.91),

whereas for medium it is also higher and significant with (OR 1.96, 95% CI 1.96-1.97). Similarly, some other risk factors such as activities of daily living, any impairment and poor self-related health were also found to be significant positively associated with likelihood of having any depression as shown in table 2. Whereas some socio-demographic variables such as sex, residence and marital status were also found to be significant and positively associated with risk of having any depression.

**Table 2:** Predictors of any depressive symptoms among older adults in India.

	Odds ratio	Confidence intervals			Odds ratio	Confidence intervals	
Background variables							
Sex				Residence			
Male <sup>®</sup>		Lower Limit	Upper Limit	Rural <sup>®</sup>		Lower limit	Upper limit
Female	1.01***	1.007	1.009	Urban	1.01***	1.014	1.016
Age groups				Education			
Age1				Illiterate <sup>®</sup>			
Age2	0.93***	0.928	0.930	0-4 Years	0.84***	0.843	0.846
Age3	0.85***	0.848	0.851	5-9 Years	0.85***	0.850	0.852
Age 4	1.04***	1.034	1.041	10+ Years	0.78***	0.780	0.782
Social group				Religion			
ST <sup>®</sup>				Hindu			
SC	0.77***	0.771	0.774	Muslim	1.01***	1.009	1.012
Gen	0.86***	0.860	0.862	Christian	0.85***	0.852	0.857
Others	0.90***	0.899	0.901	Other	0.61***	0.609	0.612
Marital status				Work status			
Married <sup>®</sup>				Never worked			
Widowed	1.07***	1.069	1.072	Currently not working	1.08***	1.081	1.083
Others	1.08***	1.080	1.086	Currently working	1.03***	1.030	1.032
Income							
Poorest <sup>®</sup>							
Poorer	0.84***	0.842	0.844				
Rich	0.92***	0.920	0.923				
Richer	0.87***	0.873	0.876				
Richest	1.01***	1.000	1.003				
Risk factors							
Self-related health				Any impairment			
Good <sup>®</sup>				No <sup>®</sup>			
Poor	1.51***	1.510	1.513	Yes	1.42***	1.417	1.421
Living arrangements				Life satisfaction			
Living with family <sup>®</sup>				High <sup>®</sup>			
Living with Others	1.01***	1.081	1.084	Medium	1.97***	1.969	1.973
Living Alone	1.65***	1.655	1.662	Low	2.90***	2.901	2.907
Instrumental Activities of Daily Living (IADL)				Activities of Daily Living (ADL)			
No <sup>®</sup>				No <sup>®</sup>			
1IADL	1.19***	1.184	1.188	1 ADL	1.27***	1.266	1.270
2+IADL	1.32***	1.323	1.326	2+ADL	1.93***	1.929	1.934

**Note:** <sup>®</sup> denotes is reference category of independent variables respectively

Not having any depression is the reference category; 95% confidence interval in parentheses; significance level: \*\*\*significant at 1%, \*\*significant at 5%, \*significant at 10%; <sup>®</sup> is reference category of independent variables.

### Discussion

The elderly are particularly susceptible to morbidities and mortality, and this vulnerability is heightened by the increased likelihood of depression in later life stages. They face an elevated risk of encountering physical, mental, and other mor-

bidity-related challenges, while simultaneously contending with reduced quality of life and life satisfaction. Mental health stands out as a particularly pronounced challenge they face as they age. Social isolation is a key contributing factor to mental health struggles in older age, stemming from inadequate living arrangements and low levels of life satisfaction. Therefore, the objective of this study was to investigate the relationship between depressive symptoms, life satisfaction, and living arrangements among older Indian adults aged 60 and above.

Our findings vividly highlighted the increased risk associated

with depressive symptoms stemming from living alone and experiencing low life satisfaction. The results revealed that individuals living alone or with others have a higher likelihood of experiencing depressive symptoms compared to those living with their families. These results are in line with prior research findings [50,47]. Living without any family support is likely to make people feel lonely, especially at older age and hence increase the risk of depressive symptoms [51]. Similar other studies have also suggested that living arrangements likely enhance the depressive symptoms given the lack of social support and family help in difficult times [43,52]. Social bonds can also serve as crucial factors in alleviating stress, particularly considering the rising engagement in social activities and increased involvement in work and sources of happiness [32]. Hence, it's plausible that living arrangements play a pivotal role in reducing depressive symptoms, as they promote greater participation and foster a sense of belonging among individuals in their later years.

The current study also confirmed the influence of life satisfaction on depressive symptoms, with the findings indicating a higher likelihood of experiencing depressive symptoms among older adults with low levels of life satisfaction. These results are consistent with previous research, which has shown a strong correlation between life satisfaction and elevated levels of happiness [33,25]. Earlier studies have found that life satisfaction is significantly associated with depressive symptoms along with other risk factors [53]. Although some studies have found moderate impact of life satisfaction [54], whereas another study found that the estimates are over estimated when it comes to impact of life satisfaction on depressive symptoms [55]. There is clear evidence from research that depressive symptoms increase with age and low level of life satisfaction [56,57]. The relation is also found to be other way since depressive symptoms reduce life satisfaction and quality of life among the older adults [58,59].

We also examined the other risk factors such poor health and having any impairment. The results clearly indicated the greater risk of poor health or any impairment with depressive symptoms as found with other studies [23,60]. Furthermore, our results also highlight the socio-economic and demographic risk factors associated with depressive symptoms among older individuals. These findings align with earlier studies and exhibit a degree of significance. Consequently, the impact of poor life satisfaction and living arrangements significantly affects late-life depression. This consideration holds particular importance for India, given the increasing implications of an aging population in the country. Subsequent studies could potentially delve into the burden and risk factors, broadening their focus to include multiple facets of this issue.

Depressive symptoms are likely exacerbated by low life satisfaction and inadequate living arrangements for the elderly. Consequently, Late-Life Depression (LLD) is expected to be notably prevalent among those with a greater likelihood of being alone and having low levels of life satisfaction. Thus, it becomes imperative to formulate policies geared towards improving both health and social outcomes. These policies should encompass heightened investments in social integration, alongside the promotion of psychosocial well-being. Interventions must target social integration and the augmentation of social capital to mitigate the impact of depression on the elderly and their overall health and well-being.

Furthermore, targeted policies should address living arrangements and community interventions, particularly focusing on

the vulnerable individuals, including those who are financially disadvantaged or live alone. The policies implemented in India should consider the needs of the elderly to effectively curtail the incidence of late-life depressive symptoms and minimize the influence of risk factors. Lastly, recognizing the importance of coping strategies in boosting social capital, it is pivotal to enhance social policies that prioritize the support of the elderly. These strategies will play a pivotal role in addressing the mental health challenges associated with aging.

### Declarations

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### References

1. WHO, & CGF. Social determinants of mental health. World Health Organization. 2014.
2. Fiske A, Wetherell JL, Gatz M. Depression in Older Adults. *Annual Review of Clinical Psychology*. 2009; 5: 363-389.
3. Padayachey U, Ramlall S, Chipps J. Depression in older adults: Prevalence and risk factors in a primary health care sample. *South African Family Practice*. 2017; 59: 61-66.
4. Forsyth JP, Parker JD, Finlay CG. Anxiety sensitivity, controllability, and experiential avoidance and their relation to drug of choice and addiction severity in a residential sample of substance-abusing veterans. *Addictive Behaviors*. 2003; 28: 851-870.
5. Bendixen AB, Engedal K, Selbæk G, Hartberg CB. Anxiety symptoms in older adults with depression are associated with suicidality. *Dementia and Geriatric Cognitive Disorders*. 2018; 45: 180-189.
6. Blazer DG, Bachar JR, Manton KG. Suicide in late life: Review and commentary. *Journal of the American Geriatrics Society*. 1986; 34: 519-525.
7. Vanderhorst RK, McLaren S. Social relationships as predictors of depression and suicidal ideation in older adults. *Aging & Mental Health*. 2005; 9: 517-525.
8. Zou C, Chen S, Shen J, Zheng X, Wang L, et al. Prevalence and associated factors of depressive symptoms among elderly inpatients of a Chinese tertiary hospital. *Clinical Interventions in Aging*. 2018; 13: 1755.
9. Gigantesco A, Fagnani C, Toccaceli V, Stazi MA, Lucidi F, et al. The Relationship Between Satisfaction With Life and Depression Symptoms by Gender. *Frontiers in Psychiatry*. 2019.
10. Xiu-Ying H, Qian C, Xiao-Dong P, Xue-Mei Z, Chang-Quan H. Living arrangements and risk for late life depression: A meta-analysis of published literature. *The International Journal of Psychiatry in Medicine*. 2012; 43: 19-34.
11. Alvarez P, Rengifo J, Emrani T, Gallagher-Thompson D. Latino older adults and mental health: A review and commentary. *Clinical Gerontologist*. 2014; 37: 33-48.
12. Blazer DG. Depression in late life: Review and commentary. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*. 2003; 58: M249-M265.
13. Lawhorne L. Depression in the older adult. *Primary Care: Clinics in Office Practice*. 2005; 32: 777-792.

14. Alexopoulos GS. Mechanisms and treatment of late-life depression. *Translational Psychiatry*. 2019; 9: 1-16.
15. Harnois G, Gabriel P. Mental health and work: Impact, issues and good practices. 2000.
16. Zis P, Daskalaki A, Bountouni I, Sykioti P, Varrassi G, et al. Depression and chronic pain in the elderly: Links and management challenges. *Clinical Interventions in Aging*. 2017; 12: 709.
17. Carney RM, Freedland KE, Veith RC. Depression, the autonomic nervous system, and coronary heart disease. *Psychosomatic Medicine*. 2005; 67: S29-S33.
18. Niedzwiedz CL, Knifton L, Robb KA, Katikireddi SV, Smith DJ. Depression and anxiety among people living with and beyond cancer: A growing clinical and research priority. *BMC Cancer*. 2019; 19: 1-8.
19. Simon GE. Treating depression in patients with chronic disease. *Western Journal of Medicine*. 2001; 175: 292.
20. De Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ. Association of depression and diabetes complications: A meta-analysis. *Psychosomatic Medicine*. 2001; 63: 619-630.
21. Bair MJ, Robinson RL, Katon W, Kroenke K. Depression and pain comorbidity: A literature review. *Archives of Internal Medicine*. 2003; 163: 2433-2445.
22. Liu X, Cao H, Zhu H, Zhang H, Niu K, et al. Association of chronic diseases with depression, anxiety and stress in Chinese general population: The CHCN-BTH cohort study. *Journal of Affective Disorders*. 2021; 282: 1278-1287.
23. Mukeshimana M, Mchunu G. The co-morbidity of depression and other chronic non-communicable diseases: A review of literature on the epidemiology, diagnosis and health effects. *Rwanda Journal*. 2016; 3: 44-50.
24. Diener E. Subjective well-being. *The Science of Well-Being*. 2009; 11-58.
25. Seo EH, Kim SG, Kim SH, Kim JH, Park JH, et al. Life satisfaction and happiness associated with depressive symptoms among university students: A cross-sectional study in Korea. *Annals of General Psychiatry*. 2018; 17: 52.
26. Nes RB, Czajkowski NO, Røysamb E, Ørstavik RE, Tambs K, et al. Major Depression and Life satisfaction: A population-based twin study. *Journal of Affective Disorders*. 2013; 144: 51-58.
27. Bartels M, Cacioppo JT, van Beijsterveldt TC, Boomsma DI. Exploring the association between well-being and psychopathology in adolescents. *Behavior Genetics*. 2013; 43: 177-190.
28. Nes RB, Røysamb E, Tambs K, Harris JR, Reichborn-Kjennerud T. Subjective well-being: Genetic and environmental contributions to stability and change. *Psychological Medicine*. 2006; 36: 1033-1042.
29. Van Beveren ML, Harding K, Beyers W, Braet C. Don't worry, be happy: The role of positive emotionality and adaptive emotion regulation strategies for youth depressive symptoms. *British Journal of Clinical Psychology*. 2018; 57: 18-41.
30. Guney S, Kalafat T, Boysan M. Dimensions of mental health: Life satisfaction, anxiety and depression: A preventive mental health study in Ankara University students population. *Procedia-Social and Behavioral Sciences*. 2010; 2: 1210-1213.
31. Simpson PL, Schumaker JF, Dorahy MJ, Shrestha SN. Depression and Life Satisfaction in Nepal and Australia. *The Journal of Social Psychology*. 1996; 136: 783-790.
32. Knutson B, Wolkowitz OM, Cole SW, Chan T, Moore EA, et al. Selective alteration of personality and social behavior by serotonergic intervention. *American Journal of Psychiatry*. 1998; 155: 373-379.
33. Potthoff P, Eichmann F, Kanitscheider C. Five-year impact of Depression on life-satisfaction and The Protective Influence of Social Support. *Value in Health*. 2015; 18: A122.
34. Koivumaa-Honkanen H, Honkanen R, Viinamäki H, Heikkilä K, Kaprio J, et al. Self-reported life satisfaction and 20-year mortality in healthy Finnish adults. *American Journal of Epidemiology*. 2000; 152: 983-991.
35. Tinker A. The social implications of an ageing population. *Mechanisms of Ageing and Development*. 2002; 123: 729-735.
36. Day AT, Day LH. Living arrangements and 'successful'ageing among ever-married American white women 77-87 years of age. *Ageing & Society*. 1993; 13: 365-387.
37. Gale CR, Westbury L, Cooper C. Social isolation and loneliness as risk factors for the progression of frailty: The English Longitudinal Study of Ageing. *Age and Ageing*. 2018; 47: 392-397.
38. Tran TV, Khatutsky G, Aroian K, Balsam A, Conway K. Living arrangements, depression, and health status among elderly Russian-speaking immigrants. *Journal of Gerontological Social Work*. 2000; 33: 63-77.
39. Dean A, Kolody B, Wood P, Matt GE. The influence of living alone on depression in elderly persons. *Journal of Aging and Health*. 1992; 4: 3-18.
40. Chung H. Living arrangements, proximity to child/parent and depressive symptoms among older adults. 2019; 31.
41. Hamid TA, Din HM, Bagat MF, Ibrahim R. Do Living Arrangements and Social Network Influence the Mental Health Status of Older Adults in Malaysia? *Frontiers in Public Health*. 2021.
42. Punpuing S, Ingersoll-Dayton B, Tangchonlatip K, Hutaphad W. Psychological Functioning and Living Arrangements among Older Thai People. *Journal of Population Ageing*. 2020.
43. Chan A, Malhotra C, Malhotra R, Østbye T. Living arrangements, social networks and depressive symptoms among older men and women in Singapore. *International Journal of Geriatric Psychiatry*. 2011; 26: 630-639.
44. Sicotte M, Alvarado BE, León EM, Zunzunegui MV. Social networks and depressive symptoms among elderly women and men in Havana, Cuba. *Ageing and Mental Health*. 2008; 12: 193-201.
45. McKinnon B, Harper S, Moore S. The relationship of living arrangements and depressive symptoms among older adults in sub-Saharan Africa. *BMC Public Health*. 2013; 13: 682.
46. Zhang Y, Liu Z, Zhang L, Zhu P, Wang X, et al. Association of living arrangements with depressive symptoms among older adults in China: A cross-sectional study. *BMC Public Health*. 2019; 19: 1017.
47. Oh DH, Park JH, Lee HY, Kim SA, Choi BY, et al. Association between living arrangements and depressive symptoms among older women and men in South Korea. *Social Psychiatry and Psychiatric Epidemiology*. 2015; 50: 133-141.
48. Hu Y, Ruiz M, Bobak M, Martikainen P. Do multigenerational living arrangements influence depressive symptoms in mid-late life? Cross-national findings from China and England. *Journal of Affective Disorders*. 2020; 277: 584-591.
49. IIPS, NPHCE, MoHFW, HSPH, USC. Longitudinal Ageing Study in India (LASI) Wave. 2020; 1: 2017-18.

50. Cong L, Dou P, Chen D, Cai L. Depression and Associated Factors in the Elderly Cadres in Fuzhou, China: A Community-based Study. *International Journal of Gerontology*. 2015; 9: 29-33.
51. Hughes ME, Waite LJ. Health in household context: Living arrangements and health in late middle age. *Journal of Health and Social Behavior*. 2002; 43: 1.
52. Kooshlar H, Yahaya N, Hamid TA, Abu Samah A, Sedaghat Jou V. Living arrangement and life satisfaction in older Malaysians: The mediating role of social support function. 2012.
53. Fergusson DM, McLeod GFH, Horwood LJ, Swain NR, Chapple S, et al. Life satisfaction and mental health problems (18 to 35 years). *Psychological Medicine*. 2015; 45: 2427-2436.
54. Aşiret GD, Özdemir L, Maraşlıoğlu N. Hopelessness, depression and life satisfaction among patients with multiple sclerosis. 2014.
55. Buason A, Norton EC, McNamee P, Thordardottir EB, Asgeirsdóttir TL. The Causal Effect of Depression and Anxiety on Life Satisfaction: An Instrumental Variable Approach. National Bureau of Economic Research. 2021.
56. Kaup AR, Byers AL, Falvey C, Simonsick EM, Satterfield S, et al. Trajectories of depressive symptoms in older adults and risk of dementia. *JAMA Psychiatry*. 2016; 73: 525-531.
57. Lee MA. A longitudinal data analysis on depressive symptoms of Korean older adults: Examining the differential effects of spousal loss and marital satisfaction across men and women. *Korea Journal of Population Studies*. 2014; 37: 109-130.
58. Hsu HC. Physical function trajectories, depressive symptoms, and life satisfaction among the elderly in Taiwan. *Aging & Mental Health*. 2009; 13: 202-212.
59. Sivertsen H, Bjørkløf GH, Engedal K, Selbæk G, Helvik AS. Depression and Quality of Life in Older Persons: A Review. *Dementia and Geriatric Cognitive Disorders*. 2015; 40: 311-339.
60. Ward C, Touchet E, Marfeo E, Ward N. Mobility and Cognitive Decline in Older Adults with Cognitive Impairment. In A. Gutches & A. K. Thomas (Eds.), *the Cambridge Handbook of Cognitive Aging: A Life Course Perspective*. Cambridge University Press. 2020; 701-716.