

# Prevalence and Associated Factors of Depressive Symptoms among Older Adults in the Philippines

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## Abstract

**Background:** Depressive symptoms may increase with age, potentially influenced by sociodemographic characteristics, stressors and support, health status, and health behaviour. It is unclear if this is the case among older adults in the Philippines. Therefore, the aim of this study is to estimate the prevalence and associated factors of depressive symptoms among older adults in the Philippines.

**Methods:** In all, 5209 items of cross-sectional nationally representative data from older adults ( $\geq 60$  years) participating in the 2018 Longitudinal Study on Ageing and Health in the Philippines (LSAHP) were analysed. Depressive symptoms were assessed using the 11-item 3-response category Center for Epidemiological Studies Depression (CES-D) Scale.

**Results:** The overall prevalence of depressive symptoms was 32.1%, with 25.6% among older men and 36.5% among older women. In the final adjusted models, overall, widowed (Adjusted Odds Ratio (AOR): 1.52, 95% Confidence Interval (CI): 1.00 to 2.30), hunger (AOR: 2.22, 95% CI: 1.40 to 3.51), living alone (AOR: 1.61, 95% CI: 1.00 to 2.59), not satisfied with present life (AOR: 2.04, 95% CI: 1.09 to 3.81), body pain (AOR: 2.39, 95% CI: 1.73 to 3.31), and insomnia (AOR: 1.69, 95% CI: 1.24 to 2.31) were posi-

tively associated, while working (AOR: 0.55, 95% CI: 0.37 to 0.80) was negatively associated with depressive symptoms. In addition, among men, older age (80 years and above) (AOR: 1.95, 95% CI: 1.06 to 3.58), unmet healthcare needs (AOR: 2.19, 95% CI: 1.07 to 4.47), and hearing difficulty (AOR: 2.41, 95% CI: 1.06 to 5.52) were positively associated poor childhood health (AOR: 0.12, 95% CI: 0.04 to 0.36), while social network (AOR: 0.94, 95% CI: 0.90 to 0.99) was negatively associated. Among women, loss of bladder control (AOR: 1.69, 95% CI: 1.03 to 2.77) was positively associated with depressive symptoms.

**Conclusion:** One in three older adults participating in this study exhibited depressive symptoms. Sociodemographic factors, stressors, and health status factors were positively associated, and support factors were negatively associated with depressive symptoms.

## Keywords

depression; older adults; determinants; the Philippines

## Background

Worldwide, 35.1% of older adults are estimated to be affected by depression [1].

In the Association of Southeast Asian Nations (ASEAN), depressive symptoms were reported by 11.5% of older adults in Malaysia [2], and 31.3% of older adults in Vietnam [3]. Among rural healthcare clinic older patients (N = 410) in the Philippines, 11.5% reported depressive symptoms [4], and among community-dwelling individuals ( $\geq 50$  years, N = 384) in Metro Cebu in the Philip-

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piners, 22.1% had moderate to severe depressive symptoms [5]. Depression in later life is linked to a number of detrimental outcomes, such as decreased quality of life, higher comorbidity, decreased medication adherence, and an increase in suicidal thoughts and actions [6]. Limited research has been done in the Philippines on the prevalence of depressive symptoms and their association with older adults who live in communities [7–9], focusing on small local samples, while no nationally representative study exists on depressive symptoms among older adults in the Philippines. It is important to understand the risk groups for depressive symptoms among older adults in the Philippines in order to support healthcare practice and planning, which was the aim of this study.

Sociodemographic characteristics, stressors and support, health status, and health-risky behaviours are among the factors linked to depressive symptoms in older adults. The sociodemographic characteristics of female sex, unmarried or widowed status, low income or low socioeconomic status, and living in rural areas of developing nations are all linked to depressive symptoms [3,10]. Stressors associated with depressive symptoms include stressful life events, poor childhood health, food insecurity, and living alone [11,12]. Support factors associated with depressive symptoms low social network, lack of social support [13], and no grandparenting [14], which may increase the prevalence of depressive symptoms.

Health status variables associated with depressive symptoms include poorer self-rated health status, dissatisfaction with current life, functional disability [3,8] and comorbidity of pain [15]. Moreover, experiencing insomnia [16], loss of hearing [17–19], loss of vision [17–19], sensory loss [17–19], urinary incontinence [20,21], cognitive decline [22], and multimorbidity [23] are associated with depressive symptoms.

Physical inactivity [24], tobacco use, alcohol use (as self-medication) [25], and a history of falls [26] are risk behaviours linked to depressive symptoms. This study seeks to determine the prevalence and correlation of depressive symptoms in older adults in the Philippines during 2018 as part of a national population survey.

## Materials and Methods

### Sample and Procedure

The current analyses were conducted using data from the 2018 Longitudinal Study on Ageing and Health in the Philippines (LSAHP) [27]. For the first stage of imple-

mentation, 5985 respondents (60 years and older) provided data to the LSAHP, a nationally representative survey. Provinces and villages served as the primary and secondary sampling units, respectively, using a multistage sampling method. Sample restrictions were applied for this study, i.e., excluding responses from proxies. The use of this criterion ensured that the responses represented the respondents' true health status and were provided by them. A total of 5209 respondents made up the analytic sample produced. The University of the Philippines Manila Research Ethics Board gave its approval to the LSAHP (MREB 2018-363-01), and participants provided written informed consent. All methods were carried out in accordance with relevant guidelines and regulations, including the Declaration of Helsinki.

### Outcome Measure

*Depressive symptoms* were assessed with the 11-item 3-response category Center for Epidemiological Studies Depression (CES-D) Scale [28], using a cut-off score of 7 or more [29] (Cronbach's alpha was 0.74 in this study).

*Sociodemographic factors* included age (60–69, 70–79, and 80 or older), sex, education, residence status, marital status, work status, and wealth status. The latter is a wealth index that combines aspects like materials used for the house, facilities present, such as a toilet, and ownership of large items like a vehicle. It is grouped into low (0 = lowest, second, or middle) and high (1 = fourth or highest).

### Stressor and Support Variables

*Hunger*. “In the last three months, did it happen even once in your household?” (Yes/No).

*Poor childhood health*. “Consider your health while you were growing up, from birth to age 16. Would you say that during that time you were?” (Coded 1 = “Of average health, Somewhat unhealthy, or Very unhealthy”, and 0 = “Very healthy” or “Healthier than average”).

*Child died*. Number of children who have died.

*Unmet healthcare needs*. “Within the past 12 months, have you felt ill and thought about going to see a doctor but didn't?” (Yes/No).

*Hospitalisation*. “In the past 12 months, have you ever stayed overnight in a hospital or any other medical facility because of an illness or accident?” (Yes/No).

*Living alone.* “What do you think is the best living arrangement for older persons like you? Should they live by themselves?”

*Taking care of grandchildren.* “Do you take care of any of your grandchildren, either fully or partially?” (Yes/No).

*Social engagement.* “Attend social activities (e.g., going together with friends, family or neighbours, going out to eat, walking for pleasure, attending parties, fiestas)” (at least once a month).

*Hang out with friends and neighbours* (coded 1 = > once/week, and 0 = ≤ once a week).

*Social network* was assessed with the Lubben Social Network Scale (LSNS-6), e.g., “How many relatives do you see or hear from at least once a month?” Higher scores represent higher social network (scores 0–30) [30]. Cronbach’s alpha was 0.79 for the LSNS-6 in this sample.

*Praying daily.* “Praying by yourself or privately in places other than a public place of worship (e.g., church, mosque, etc.)” (daily).

*Attend religious services* outside the home (at least once a week) [27].

#### Health Status

*Poor self-rated health.* “In general, how would you describe your state of health?” (Coded 1 = “Somewhat unhealthy or very unhealthy”, and 0 = “Very healthy, healthier than average or of average health”).

*Not satisfied with present life.* “Are you satisfied with your present life?” (Coded 1 = Not satisfied, 0 = Somewhat or very satisfied).

*Body pain.* “Are you often troubled with pain?” (Yes/No).

*Insomnia* was assessed with the Jenkins Sleep Scale (JSS-4) [31]: Insomnia was diagnosed in participants who scored 1 for any of the four symptoms [32]. The “JSS-4 was proven to have excellent reliability and demonstrated good construct validity” [33]. Cronbach’s alpha of the JSS-4 was 0.75 in this sample.

*Loss of bladder control.* “Do you experience loss of bladder control?” (Yes/No).

*Impaired cognition* (scores ≥8) was assessed with the Telephone Interview for Cognitive Status (TICS-HRS-35), including orientation questions, counting backwards, object naming, serial 7 s subtraction, and 10-word immediate and delayed recall (score range 0–35) [34].

*Vision difficulty.* “Do you have difficulty seeing, even if wearing glasses?” (Coded 1 = Yes, a lot of difficulty or cannot do it at all; 0 = No, no difficulty or yes, some difficulty).

*Hearing difficulty.* “Do you have difficulty hearing, even if using a hearing aid?” (Coded 1 = Yes, a lot of difficulty or cannot do it at all; 0 = No, no difficulty or yes, some difficulty).

*Activities of daily living (ADL) limitations* (defined as any one of seven ADLs due to health reasons), e.g., “dressing” and “using the toilet” [31] (Cronbach’s alpha was 0.82 in this study).

*Multimorbidity* included two or more of the following conditions:

“Angina, myocardial infarction, etc., cancer, cerebrovascular disease (haemorrhage, infarction, stroke, etc.), high blood pressure, diabetes, respiratory illness (chronic, such as asthma, emphysema), digestive illness (stomach or intestinal), renal or urinary tract ailments/kidney, ailments of the liver or gallbladder, arthritis, neuralgia or rheumatism, chronic back pain, and osteoporosis” [27].

#### Health Risk Behaviour

*Physically inactive.* “How often do you engage in physical exercises such as walking, callisthenics, or ballroom dancing?” (Never).

*Current smoking.* “Do you currently smoke cigarettes or cigars?” (Yes/No).

*Current alcohol use.* “Do you currently drink alcohol?” (Yes/No).

*Falls.* “Have you fallen in the past 12 months?” (Yes/No) [27].

#### Data Analysis

Descriptive statistics were used to describe the prevalence of depressive symptoms in the sample. Using unconditional multivariable logistic regression, associations between social and health variables and depressive symptoms

**Table 1. Sample characteristics and the prevalence of depressive symptoms, the Philippines, 2018.**

Variable	Sample N (%)	Depressive symptoms		
		All N (%)	Male N (%)	Female N (%)
All	5209	1868 (32.1)	581 (25.6)	1287 (36.5)
Sociodemographic factors				
Age (years)				
60–69	2075 (66.3)	672 (31.1)	234 (22.4)	438 (37.5)
70–79	2122 (25.7)	773 (32.0)	248 (31.6)	525 (32.2)
80 or above	1012 (8.1)	423 (40.9)	99 (37.2)	324 (43.0)
Sex				
Female	3301 (59.8)			
Male	1908 (40.2)			
Wealth status (high)	1856 (34.6)	481 (20.3)	150 (13.2)	331 (24.9)
Education ( $\geq$ high school)	1813 (28.0)	498 (22.5)	162 (15.9)	336 (27.2)
Urban residence	2296 (43.2)	750 (26.7)	216 (19.1)	534 (31.1)
Widowed	2526 (39.7)	1056 (39.2)	184 (32.5)	872 (40.9)
Working	1853 (48.8)	577 (28.1)	241 (23.6)	336 (32.3)
Stressors and support variables				
Hunger	640 (13.6)	375 (57.5)	130 (56.6)	245 (57.9)
Poor childhood health	516 (8.9)	166 (25.3)	42 (12.0)	124 (31.7)
Child died	2048 (37.9)	839 (39.7)	212 (29.6)	627 (45.0)
Unmet healthcare needs	1408 (28.8)	698 (45.0)	210 (41.3)	488 (47.0)
Hospitalised in the past 12 months	874 (13.7)	371 (37.3)	113 (29.8)	254 (42.1)
Living alone	674 (13.2)	308 (47.6)	85 (37.4)	223 (52.9)
Taking care of grandchildren	1189 (22.9)	398 (34.4)	91 (24.4)	307 (38.8)
Social engagement	1596 (37.3)	495 (26.9)	132 (21.0)	363 (30.8)
Hanging out with friends	2229 (53.2)	756 (28.0)	231 (21.7)	525 (32.2)
Social network: M (SD)	13.2 (5.4)	12.6 (5.2)	12.5 (5.2)	12.7 (5.2)
Praying daily	2305 (36.3)	833 (32.9)	220 (25.6)	613 (36.6)
Religious service attendance	2459 (46.1)	787 (31.3)	166 (21.5)	621 (35.1)
Health status				
Poor self-rated health	1905 (30.2)	908 (44.3)	287 (35.7)	621 (50.5)
Not satisfied with present life	314 (6.4)	205 (60.6)	65 (47.9)	140 (66.1)
Body pain	1796 (33.4)	943 (49.5)	279 (40.4)	664 (55.4)
Insomnia	1818 (33.3)	834 (45.2)	257 (35.9)	577 (51.1)
Loss of bladder control	646 (10.6)	285 (45.0)	81 (26.7)	204 (53.8)
Impaired cognition	431 (6.8)	232 (48.6)	57 (32.3)	175 (56.2)
Vision difficulty	439 (6.9)	229 (49.5)	70 (51.4)	159 (48.5)
Hearing difficulty	287 (5.5)	118 (36.8)	41 (48.5)	77 (29.9)
ADL limitations	985 (18.7)	516 (41.1)	140 (37.5)	376 (43.2)
Multimorbidity	2031 (36.2)	835 (34.9)	239 (28.5)	596 (38.2)
Health risk behaviour				
Physically inactive	1113 (21.3)	479 (36.3)	143 (27.0)	336 (42.1)
Currently smoking	707 (17.3)	266 (32.1)	163 (28.6)	103 (40.7)
Current alcohol use	1393 (29.7)	464 (32.3)	242 (24.9)	222 (48.9)
Falls (past year)	939 (18.9)	448 (38.1)	129 (34.7)	319 (40.2)

ADL, activities of daily living; M, mean; SD, standard deviation; N, number; %, weighted percentage. To ensure that the results of the study are representative at the national level, sampling weights are applied to the analysis [27].

were determined. The multivariable model included variables deemed significant ( $p < 0.05$ ) in the univariable analysis. Results from the logistic regression models are presented as odds ratios (ORs) with 95% confidence intervals (CIs). Based on an earlier review of the literature, covariates were added. Weights were applied to both regression analyses and descriptive statistics to account for the intricate sampling design [27]. The Variance Inflation Factor (VIF) did not show any collinearity. At  $p < 0.05$ , all tests were deemed statistically significant. Version 15.0 of the STATA software (Stata Corporation, College Station, TX, USA) was used for all statistical procedures.

## Results

### *Sample Characteristics*

The analytic sample comprised 5209 participants (median age 66 years, interquartile range [IQR] = 9), with 40.2% men. The prevalence of depressive symptoms was 32.1%, 25.6% among older men and 36.5% among older women. Sample characteristics and the distribution of depressive symptoms are shown in Table 1 (Ref. [27]).

### *Association with Depressive Symptoms*

In the final adjusted model, widowed (Adjusted Odds Ratio (AOR): 1.52, 95% Confidence Interval (CI): 1.00 to 2.30), hunger (AOR: 2.22, 95% CI: 1.40 to 3.51), living alone (AOR: 1.61, 95% CI: 1.00 to 2.59), not satisfied with present life (AOR: 2.04, 95% CI: 1.09 to 3.81), body pain (AOR: 2.39, 95% CI: 1.73 to 3.31), and insomnia (AOR: 1.69, 95% CI: 1.24 to 2.31) were positively associated, while working (AOR: 0.55, 95% CI: 0.37 to 0.80) was negatively associated with depressive symptoms. Although women were more likely than men to experience depressive symptoms, the differences were not statistically significant (see Table 2).

### *Association with Depressive Symptoms among Male and Female Older Adults*

In the final adjusted model, among men, older age (80 years and above) (AOR: 1.95, 95% CI: 1.06 to 3.58), hunger (AOR: 3.38, 95% CI: 1.85 to 6.20), unmet healthcare needs (AOR: 2.19, 95% CI: 1.07 to 4.47), not satisfied with present life (AOR: 2.33, 95% CI: 1.18 to 4.61), insomnia (AOR: 1.65, 95% CI: 1.08 to 2.52), and hearing difficulty (AOR: 2.41, 95% CI: 1.06 to 5.52) were positively associated. In contrast, poor childhood health (AOR: 0.12,

95% CI: 0.04 to 0.36) and social network (AOR: 0.94, 95% CI: 0.90 to 0.99) were negatively associated with depressive symptoms. Among women, body pain (AOR: 2.10, 95% CI: 1.37 to 3.22), insomnia (AOR: 1.68, 95% CI: 1.19 to 2.40), and loss of bladder control (AOR: 1.69, 95% CI: 1.03 to 2.77) were positively associated with depressive symptoms (see Tables 3,4).

## Discussion

According to the study, 32.1% of older adults in the Philippines (those aged 60 and above) in a large national sample reported having depressive symptoms in 2018, which is comparable with the global prevalence of depression among older adults (35.1%) [1] and that of Vietnam (31.3%) [3], but higher than in Malaysia (11.5%) [2], I, and local studies in the Philippines (11.5%–22.1%) [4,5]. The prevalence of mental disorders in the Philippines increased from 7.0 million in 1990 to 12.5 million in 2019 [35]. The study found a high prevalence of depressive symptoms among older adults in the Philippines, calling for intensive intervention [35,36].

The study found that, overall, being widowed, experiencing hunger, living alone, not satisfied with present life, body pain, and insomnia were positively associated, while working was negatively associated with depressive symptoms. In addition, among men, older age (80 years and above), unmet healthcare needs, and hearing difficulty were positively associated, while poor childhood health and social network were negatively associated with depressive symptoms. Among women, loss of bladder control was found to be positively associated with depressive symptoms.

In older adults, the prevalence of depression decreased with age, according to a recent meta-regression analysis [1], but in this present study, although men's depressive symptoms increased with age, women's did not. It is possible that older men in the Philippines have less emotional control, psychological resilience, and the ability to adapt mentally to loss, potentially increasing the risk for depression [1]. In this study, women were more likely than men to experience depressive symptoms, but with no significant differences. This result contradicts certain reviews and earlier research that indicate women are more likely than men to experience depression [3,37]. In partial agreement with previous research [3,10], the univariable analyses in this study revealed associations between lower wealth and education and rural residence and depressive symptoms. A higher prevalence of food insecurity was found in those with a rural residence



**Table 2. Association with the prevalence of depressive symptoms among older adults, the Philippines, 2018.**

Variable	COR (95% CI)	<i>p</i> -value	AOR (95% CI)	<i>p</i> -value
<b>Sociodemographic factors</b>				
Age (years)				
60–69	1 (Reference)		1 (Reference)	
70–79	1.04 (0.73 to 1.49)	0.816	0.65 (0.42 to 1.02)	0.060
80 or above	1.54 (1.09 to 2.17)	0.015	0.80 (0.51 to 1.24)	0.316
Sex (male)	0.60 (0.46 to 0.77)	<0.001	0.76 (0.57 to 1.01)	0.063
Wealth status (high)	0.32 (0.22 to 0.46)	<0.001	0.69 (0.42 to 1.13)	0.140
Education ( $\geq$ high school)	0.51 (0.39 to 0.68)	<0.001	0.75 (0.55 to 1.02)	0.063
Urban residence	0.64 (0.44 to 0.92)	0.016	0.82 (0.55 to 1.22)	0.321
Widowed	1.71 (1.26 to 2.32)	<0.001	1.52 (1.00 to 2.30)	0.048
Working	0.70 (0.53 to 0.93)	0.014	0.55 (0.37 to 0.80)	0.002
<b>Stressors and support variables</b>				
Hunger	3.45 (2.37 to 5.02)	<0.001	2.22 (1.40 to 3.51)	<0.001
Poor childhood health	0.70 (0.41 to 1.17)	0.171	—	
Child died	1.74 (1.33 to 2.28)	<0.001	1.11 (0.83 to 1.48)	0.477
Unmet healthcare needs	2.21 (1.47 to 3.34)	<0.001	1.38 (0.96 to 1.99)	0.079
Hospitalised in the past 12 months	1.31 (1.04 to 1.64)	0.021	0.95 (0.72 to 1.26)	0.740
Living alone	2.14 (1.28 to 3.59)	0.004	1.61 (1.00 to 2.59)	0.050
Taking care of grandchildren	1.14 (0.77 to 1.70)	0.512	—	
Social engagement	0.68 (0.42 to 1.10)	0.115	—	
Hanging out with friends	0.67 (0.46 to 0.97)	0.035	0.86 (0.52 to 1.43)	0.596
Social network	0.97 (0.94 to 1.00)	0.034	0.98 (0.95 to 1.01)	0.258
Praying daily	1.06 (0.80 to 1.40)	0.669	—	
Religious service attendance	0.93 (0.69 to 1.26)	0.649	—	
<b>Health status</b>				
Poor self-rated health	2.18 (1.62 to 2.93)	<0.001	1.33 (0.95 to 1.86)	0.093
Not satisfied with present life	3.56 (1.98 to 6.40)	<0.001	2.04 (1.09 to 3.81)	0.026
Body pain	3.21 (2.48 to 4.15)	<0.001	2.39 (1.73 to 3.31)	<0.001
Insomnia	2.40 (1.79 to 3.22)	<0.001	1.69 (1.24 to 2.31)	<0.001
Loss of bladder control	1.86 (1.16 to 2.98)	0.011	1.45 (0.92 to 2.28)	0.109
Impaired cognition	2.11 (1.17 to 3.82)	0.014	1.20 (0.66 to 2.18)	0.556
Vision difficulty	2.20 (1.24 to 3.91)	0.008	1.34 (0.76 to 2.38)	0.308
Hearing difficulty	1.25 (0.56 to 2.80)	0.586	—	
ADL limitations	1.62 (1.05 to 2.52)	0.031	0.86 (0.54 to 1.37)	0.526
Multimorbidity	1.22 (1.00 to 1.49)	0.046	1.12 (0.89 to 1.42)	0.314
<b>Health risk behaviour</b>				
Physically inactive	1.27 (0.90 to 1.79)	0.171	—	
Currently smoking	1.00 (0.75 to 1.34)	0.995	—	
Current alcohol use	1.02 (0.77 to 1.34)	0.915	—	
Falls (past year)	1.39 (0.87 to 2.21)	0.168	—	

COR, Crude Odds Ratio; AOR, Adjusted Odds Ratio; CI, Confidence interval.

(15.3% compared to 11.0% urban residence), which may have contributed to a higher prevalence of depressive symptoms in rural than urban areas.

Consistent with previous research [11,12], the study findings revealed that stressful life events, such as food insecurity, unmet healthcare needs, and living alone, were associated with depressive symptoms among men and/or

women. Food insecurity and unmet healthcare needs can lead to chronic stress or feelings of uncertainty about the provision of food and health care for themselves and their families, potentially exacerbating depressive symptoms. Programmes for increasing food security and healthcare access are therefore required. This study found that poor childhood health was negatively associated with depres-

**Table 3. Association with the prevalence of depressive symptoms among older men.**

Variable	COR (95% CI)	<i>p</i> -value	AOR (95% CI)	<i>p</i> -value
<b>Sociodemographic factors</b>				
Age (years)				
60–69	1 (Reference)		1 (Reference)	
70–79	1.60 (1.05 to 2.44)	0.028	1.39 (0.84 to 2.28)	0.198
80 or above	2.05 (1.25 to 3.37)	0.005	1.95 (1.06 to 3.58)	0.031
Wealth status (high)	0.33 (0.21 to 0.51)	<0.001	0.64 (0.41 to 1.01)	0.054
Education ( $\geq$ high school)	0.45 (0.29 to 0.69)	<0.001	0.68 (0.44 to 1.07)	0.097
Urban residence	0.56 (0.33 to 0.94)	0.030	0.73 (0.44 to 1.22)	0.226
Widowed	1.54 (0.82 to 2.87)	0.176	—	
Working	0.78 (0.45 to 1.38)	0.397	—	
<b>Stressors and support variables</b>				
Hunger	4.81 (2.71 to 8.52)	<0.001	3.38 (1.85 to 6.20)	<0.001
Poor childhood health	0.38 (0.19 to 0.76)	0.007	0.12 (0.04 to 0.36)	<0.001
Child died	1.36 (0.84 to 2.22)	0.212	—	
Unmet healthcare needs	2.81 (1.55 to 5.12)	<0.001	2.19 (1.07 to 4.47)	0.032
Hospitalised in the past 12 months	1.28 (0.74 to 2.20)	0.376	—	
Living alone	1.89 (0.86 to 4.17)	0.114	—	
Taking care of grandchildren	0.93 (0.52 to 1.66)	0.807	—	
Social engagement	0.68 (0.34 to 1.34)	0.259	—	
Hanging out with friends	0.65 (0.40 to 1.05)	0.075	—	
Social network	0.95 (0.92 to 0.99)	0.015	0.94 (0.90 to 0.99)	0.021
Praying daily	1.01 (0.57 to 1.79)	0.984	—	
Religious service attendance	0.72 (0.46 to 1.13)	0.156	—	
<b>Health status</b>				
Poor self-rated health	2.12 (1.16 to 3.87)	0.014	1.32 (0.75 to 2.33)	0.335
Not satisfied with present life	2.84 (1.48 to 5.46)	0.002	2.33 (1.18 to 4.61)	0.016
Body pain	3.03 (1.63 to 5.64)	<0.001	1.80 (0.86 to 3.74)	0.116
Insomnia	2.15 (1.42 to 3.25)	<0.001	1.65 (1.08 to 2.52)	0.022
Loss of bladder control	1.07 (0.57 to 2.01)	0.836	—	
Impaired cognition	1.42 (0.58 to 3.48)	0.444	—	
Vision difficulty	3.35 (1.50 to 7.48)	0.003	1.43 (0.54 to 3.78)	0.466
Hearing difficulty	2.93 (1.39 to 6.21)	0.005	2.41 (1.06 to 5.52)	0.037
ADL limitations	1.99 (0.95 to 4.18)	0.067	—	
Multimorbidity	1.25 (0.76 to 2.04)	0.382	—	
<b>Health risk behaviour</b>				
Physically inactive	1.10 (0.64 to 1.89)	0.728	—	
Currently smoking	1.25 (0.85 to 1.85)	0.253	—	
Current alcohol use	0.94 (0.56 to 1.56)	0.800	—	
Falls (past year)	1.72 (0.88 to 3.39)	0.114	—	

COR, Crude Odds Ratio; AOR, Adjusted Odds Ratio; CI, Confidence interval; ADL, activities of daily living.

sive symptoms among men. It appears that boys with poor childhood health tend to become more resilient to depressive symptoms. This finding demands further research. A single-item measurement was used in this study to assess childhood health, and future studies should use multiple-item measures to more accurately estimate childhood health.

In line with a previous study [3], this survey found that a higher social network among men and those who were married (not widowed) decreased the odds of depressive symptoms. People experiencing stressful events may benefit physically and psychologically from support networks, which can also lessen psychological distress and depressive symptoms [38]. These findings can help with the develop-

**Table 4. Association with depressive symptoms among older women.**

Variable	COR (95% CI)	<i>p</i> -value	AOR (95% CI)	<i>p</i> -value
<b>Sociodemographic factors</b>				
Age (years)				
60–69	1 (Reference)		—	
70–79	0.79 (0.50 to 1.24)	0.307		
80 or above	1.26 (0.87 to 1.82)	0.227		
Wealth status (high)	0.44 (0.25 to 0.77)	0.005	0.77 (0.37 to 1.58)	0.469
Education ( $\geq$ high school)	0.60 (0.41 to 0.76)	<0.001	0.87 (0.60 to 1.26)	0.448
Urban residence	0.65 (0.45 to 0.94)	0.024	0.87 (0.54 to 1.41)	0.570
Widowed	1.50 (1.08 to 2.09)	0.017	1.30 (0.84 to 2.01)	0.245
Working	0.73 (0.50 to 1.06)	0.099	—	
<b>Stressors and support variables</b>				
Hunger	2.82 (1.68 to 4.72)	<0.001	1.63 (0.83 to 3.17)	0.154
Poor childhood health	0.79 (0.39 to 1.60)	0.509	—	
Child died	1.87 (1.40 to 2.48)	<0.001	1.12 (0.79 to 1.57)	0.522
Unmet healthcare needs	1.90 (1.24 to 2.91)	0.004	1.14 (0.80 to 1.63)	0.467
Hospitalised in the past 12 months	1.32 (0.90 to 1.93)	0.158	—	
Living alone	2.21 (1.16 to 4.20)	0.016	1.52 (0.85 to 2.72)	0.156
Taking care of grandchildren	1.14 (0.71 to 1.85)	0.584	—	
Social engagement	0.67 (0.40 to 1.12)	0.129	—	
Hanging out with friends	0.67 (0.44 to 1.03)	0.070	—	
Social network	0.98 (0.95 to 1.02)	0.328	—	
Praying daily	1.01 (0.73 to 1.39)	0.960	—	
Religious service attendance	0.87 (0.58 to 1.30)	0.493	—	
<b>Health status</b>				
Poor self-rated health	2.30 (1.68 to 3.15)	<0.001	1.31 (0.93 to 1.83)	0.122
Not satisfied with present life	3.76 (1.58 to 8.96)	0.003	2.35 (0.87 to 6.35)	0.090
Body pain	3.38 (2.18 to 5.24)	<0.001	2.10 (1.37 to 3.22)	<0.001
Insomnia	2.56 (1.79 to 3.66)	<0.001	1.68 (1.19 to 2.40)	0.004
Loss of bladder control	2.24 (1.29 to 3.90)	0.004	1.69 (1.03 to 2.77)	0.037
Impaired cognition	2.40 (1.18 to 4.85)	0.015	1.51 (0.75 to 3.04)	0.251
Vision difficulty	1.71 (0.79 to 3.71)	0.172	—	
Hearing difficulty	0.73 (0.22 to 2.41)	0.603	—	
ADL limitations	1.42 (0.67 to 3.02)	0.364	—	
Multimorbidity	1.13 (0.83 to 1.53)	0.433	—	
<b>Health risk behaviour</b>				
Physically inactive	1.36 (0.93 to 1.99)	0.117	—	
Currently smoking	1.21 (0.71 to 2.09)	0.479	—	
Current alcohol use	1.84 (1.26 to 2.69)	0.002	1.44 (0.96 to 2.15)	0.080
Falls (past year)	1.22 (0.76 to 1.95)	0.411	—	

COR, Crude Odds Ratio; AOR, Adjusted Odds Ratio; CI, Confidence interval; ADL, activities of daily living.

ment of interventions such as social network mobilisation targeting men. Married people are more likely to have social support, which helps to protect them from depressive symptoms. However, unlike some previous results [4,14], no significant association was found with depressive symptoms between low religious involvement and not grandparenting.

Regarding health status variables, in agreement with previous research [3,15–19,21], this study found an association between dissatisfaction with present life, physical pain, insomnia, hearing difficulty among men, loss of bladder control among women, and depressive symptoms. The association between insomnia and depression can be explained by its comorbidity [39]. However, contrary to some



research [3,8,17–20,22,23], this study did not find a significant association between poor self-rated health status, functional disability, visual difficulties, cognitive impairment, multimorbidity, urinary incontinence among men and depressive symptoms. In terms of health risk behaviours, unlike some previous studies [24–26], this study revealed no significant odds ratios for health risk behaviours (physical inactivity, smoking, alcohol use, and history of falls) and depressive symptoms. The non-associations between physical activity, alcohol use, and depressive symptoms may be explained by the use of only single-item measures, which were unable to identify the extent of physical activity and alcohol consumption levels.

The study findings point to the necessity for creating interventions to treat depression in older persons [4]. However, mental health services in the Philippines encounter ongoing difficulties, such as inadequate funding (mental health only receives 3% to 5% of the total health budget), a shortage of mental health professionals (1.68 per 100,000 in 2020), and inadequate community mental health services (there are only 0.05 community-based mental health centres for every 100,000 people) [40,41]. However, it might be necessary to provide service packages that include regular evaluations for mental health issues, recommendations for seeing a psychiatrist, and interventions related to psychosocial issues and healthy living. Additionally, bolstering the local senior population could be an additional community-based initiative for promoting mental health [4].

#### *Examining the Advantages and Disadvantages of the Study*

The study's strength lies in the use of a nationally representative sample of older adults in the Philippines, combined with standardised measures modified from the Health and Retirement Study. Self-reporting may introduce limitations to most data. Furthermore, a causal relationship could be established between any of the related factors since the study involved cross-sectional data. Depression was only assessed using a screening scale, with diagnostic assessment of major depression on at least a sub-sample being warranted. Future research should take into account the family history of depressive disorder, SNP or chip-based heritability, self-reported depression and treatment, and dietary habits, which were not evaluated in this survey.

## **Conclusion**

The study findings revealed that almost one in three older adults in the Philippines experienced depressive symptoms. Overall, being widowed, experiencing hunger,

living alone, not being satisfied with present life, body pain, and insomnia were positively associated, while working was negatively associated. In addition, among men, older age (80 years and above), unmet healthcare needs, and hearing difficulty were positively associated with depressive symptoms, whereas poor childhood health and social network were negatively associated. Additionally, among women, loss of bladder control was positively associated with depressive symptoms.

## **Availability of Data and Materials**

The datasets generated and/or analysed during the current study are available in the Economic Research Institute for ASEAN and East Asia, <https://www.drdf.org.ph/lsaahp-baseline-data-request-portal/>.

## **Author Contributions**

SP and KP designed and performed the research. KP analysed the data. SP drafted this manuscript. Both authors contributed to important editorial changes in the manuscript. Both authors read and approved the final manuscript. Both authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

## **Ethics Approval and Consent to Participate**

The University of the Philippines Manila Research Ethics Board gave its approval to the LSAHP (MREB 2018-363-01), and participants provided written informed consent.

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## **Conflict of Interest**

The authors declare no conflict of interest.

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