Understanding Depressive Symptoms Among Community-Dwelling Chinese Older Adults in the Greater Chicago Area

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Abstract

Objective: This study aimed to examine the prevalence of depressive symptoms among U.S. Chinese older adults.

Method: Data were from the Population Study of Chinese Elderly in Chicago (PINE) study, a population-based survey of U.S. Chinese older adults aged 60 years and above. The Patient Health Questionnaire (PHQ-9) was used to examine depressive symptoms.

Results: Of the 3,159 community-dwelling Chinese older adults, 1,717 (54.4%) reported having any depressive symptoms in the last 2 weeks. Older age ($r = .09$), being female ($r = .10$), lower income ($r = .09$), not being married ($r = .07$), having fewer years in the United States ($r = .05$), lower overall health status ($r = .32$), poorer quality of life ($r = .14$), and worsening health over the past year ($r = .24$) were significantly and positively correlated with any depressive symptoms.

Discussion: Depressive symptoms are common among U.S. Chinese older adults in the Greater Chicago area. Further longitudinal studies should be conducted to better understand risk factors and outcomes of depressive symptoms among U.S. Chinese older adults.

Keywords

depressive symptoms; Chinese; older adults; prevalence

Introduction

Depression is a significant public health issue across all socio-demographic groups. It is estimated that approximately 6.7% of U.S. adults have major depressive disorders per year,

in which 30.4% are classified as severe depression (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). The presence of depressive symptoms may lead to declined quality of life, worsened physical and cognitive function as well as increased use of health care services (Callahan, Hui, Nienaber, Musick, & Tierney, 1994; Gurland, 1992; Penninx, Leveille, Ferrucci, van Eijk, & Guralnik, 1999). More importantly, studies suggested that major depressive symptoms were closely related to mortality and suicide (Roose, Glassman, Walsh, Woodring, & Vital-Herne, 1983; Wulsin, Vaillant, & Wells, 1999).

Older adults are disproportionately affected by depressive symptoms. According to the World Health Organization, the overall prevalence rate of depression among older adults ranges from 10% to 20% (Rangaswamy, 2001). Yet it is challenging to screen for depressive symptoms in older adults, given that somatic depressive symptoms (e.g., fatigue, sleep disturbance) are often complicated by medical comorbidities (Magni, Frisoni, Rozzini, De Leo, & Trabucchi, 1996). Recent years have witnessed an increasing interest in studying depressive symptoms among older adults. However, few studies have focused on minority older adults, especially on Asian older adults.

The Chinese community represents as the largest and oldest Asian population in the United States. According to the U.S. Census Bureau, the number of U.S. Chinese older adults aged 60 years and above is approximately 538,417 (U.S. Census, 2010). Evidence suggested that depression was the most common psychological disorder concerning U.S. Chinese older adults (Casado & Leung, 2002; Mui, 1996). A population-based study reported that 18% to 29.4% of Chinese older adults in North America had at least a mild level depression, which was much higher than the prevalence reported among older adults in other racial/ethnic groups (Lai, 2004). Depressive symptoms are detrimental to health and well-being of U.S. Chinese older adults. It is likely to worsen physical health and influence family and social life (Dong, Chang, Wong, & Simon, 2012).

In spite of their adverse health outcomes, depressive symptoms in U.S. Chinese older adults tend to remain untreated. Compared with other racial/ethnic populations, Chinese older adults are less acculturated and more oriented toward traditional culture (Shinagawa, 2008). Chinese older adults' perceptions and health-seeking behaviors of depressive symptoms are greatly influenced by traditional Chinese cultural values (Dong et al., 2012). As one of the dominant values of Chinese culture, collectivism encourages individuals to sacrifice personal interests for the alleged benefit of the family, community, and society (Ho & Chiu, 1994). While depression is associated with some levels of social stigma in Chinese culture, older adults may avoid expressing depressive symptoms, so as to protect family honor and to "save face" (Parker, Gladstone, & Chee, 2001). In addition to the culture barriers, U.S. Chinese older adults may face disparities in mental health services due to language and transportation barriers created by immigration challenges (Mui & Kang, 2006).

Notwithstanding the increasing need for investigating depressive symptoms, research on depressive symptoms among U.S. Chinese older adults is difficult due to data collection challenges, subgroup heterogeneity, and recruitment barriers (Dong et al., 2010). Current understanding on depressive symptoms among Chinese older adults is inconclusive, given that the majority of studies are based on relatively small sample sizes and conducted in

primary care settings, which may deteriorate the generalizability of study findings. A large-scale, population-based survey is needed to better understand the prevalence and correlates of depressive symptoms in U.S. older Chinese populations.

The objectives of this study are to (a) study the prevalence of depressive symptoms among community-dwelling Chinese older adults in the Greater Chicago area and (b) explore socio-demographic and health-related correlates of depressive symptoms among U.S. Chinese older adults.

Method

Population and Settings

The Population Study of Chinese Elderly in Chicago (PINE) is a community-engaged, population-based epidemiological study of U.S. Chinese older adults aged 60 and above in the Greater Chicago area. Briefly, the purpose of the PINE study was to collect community-level data of U.S. Chinese older adults to examine the key cultural determinants of health and well-being. The project was initiated by a synergistic community-academic collaboration among the Rush Institute for Healthy Aging, Northwestern University Medical Center, and many community-based social services agencies and organizations throughout the Greater Chicago area.

To ensure study relevance and enhance community participation, the PINE study implemented extensive culturally and linguistically appropriate community recruitment strategies strictly guided by a community-based participatory research (CBPR) approach. More than 20 social service agencies, community centers, health advocacy agencies, faith-based organizations, senior apartments, and social clubs served as study recruitment sites. Eligible participants were approached through routine social services and outreach efforts serving Chinese Americans families in the Chicago city and suburban areas. Of 3,542 eligible older adults who were approached, 3,159 agreed to participate in the study, yielding a response rate of 91.9%.

Based on the available census data drawn from U.S. Census 2010 and a random block census project conducted in the Chinese community in Chicago, the PINE study is representative of the Chinese aging population in the Greater Chicago area with respect to key demographic attributes including age, sex, income, education, number of children, and country of origin. The study was approved by the Institutional Review Boards of the Rush University Medical Center. More detailed descriptions of the study design and recruitment procedure have been reported elsewhere (Dong, Wong, & Simon, 2014)

Measurements

Socio-demographics.—Basic demographic information included age (in years), sex (female and male), education (years of education completed), personal income (US$0-US$4,999 per year; US$5,000-US$9,999 per year; US$10,000-US$14,999 per year; or more than US$15,000 per year), marital status (married, separated, divorced, or widowed), number of children, and living arrangement (living alone, living with one to two persons, or living with three or more persons). Years in the community (in years), years in the United

States (in years), and country of origin (Mainland China, Hong Kong or Macau, Taiwan, Vietnam, Thailand, Philippine, Malaysia, United States, or Canada) were also assessed in all participants.

Overall health status, quality of life, and health changes over the last year.— Overall health status was measured by "in general, how would you rate your health?" on a 4-point scale (1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*). Quality of life was assessed by asking "in general, how would you rate your quality of life?" on a 4-point scale ranging from 1 = *poor* to 4 = *very good*. Health changes over the last year were measured by "compared to 1 year ago, how would you rate your health now?" on a 3-point scale (1 = *worsened*, 2 = *same*, 3 = *improved*).

Depressive symptoms.—We used the Patient Health Questionnaire (PHQ-9) to assess depressive symptoms among Chinese older adults. The PHQ-9 consists of nine items, each of them assesses the nine *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association [APA], 1994) depression symptom criteria. Participants were asked if they had the following symptoms in the last 2 weeks: (a) changes in sleep; (b) changes in appetite; (c) fatigue; (d) feelings of sadness or irritability; (e) loss of interest in activities; (f) inability to experience pleasure, feelings of guilt, or worthlessness; (g) inability to concentrate or making decisions; (h) feeling restless or slowed down; and (i) suicide thoughts. Respondents indicated answers to each question on a 4-point scale ranging from 0 = *not at all* to 3 = *nearly every day*.

The total score ranges from 0 to 27, with a score of 1 to 4 indicating minimal level of depressive symptoms, 5 to 9 indicating mild level of depressive symptoms, 10 to 14 indicating moderate level of depressive symptoms, and 15 and more indicating severe level of depressive symptoms (Kroenke, Spitzer, & Williams, 2001). The PHQ-9 has been validated among Chinese Americans and has good inter-rater reliability (Yeung et al., 2008). The standardized Cronbach's alpha of PHQ-9 in the PINE study was .82 (Chang, Beck, Simon, & Dong, 2014).

Data Analysis

We used descriptive statistics to summarize demographic information of the participants. Chi-square statistics were used to compare the socio-demographic characteristics between groups with and without any depressive symptoms. Pearson correlation coefficients were calculated to determine the relationships of socio-demographic and health-related variables with depressive symptoms. All statistical analyses were undertaken using SAS, Version 9.2 (SAS InstituteInc., Cary, NC).

Results

Sample Characteristics

Of the 3,159 participants, 58.9% were female. Characteristics of the study participants by any depressive symptoms are presented in Table 1. Overall, 1,717 (54.4%) participants had any depressive symptoms in the past 2 weeks. More specifically, 1,177 (37.3%) had minimal

depressive symptoms, 419 (13.3%) had mild depressive symptoms, 87 (2.8%) had moderate depressive symptoms, and 34 (1.1%) had severe depressive symptoms. The group with any depressive symptoms compared with the group without any depressive symptoms had a greater proportion of older adults who were aged 80 years and above (23.2% vs.18.7%, $p <$ .001), were female (63.5% vs. 53.4%, $p <$ .001), were widowed (26.8% vs. 21.7%, $p <$ .05), had 0 to 1 child (16.5% vs. 13.0%, $p <$ .05), had poor overall health status (28.6% vs. 7.2%, $p <$ .001), had fair or poor quality of life (56.1% vs. 41.0%, $p <$ .001), and had worsened health status over the past year (54.8% vs. 27.7%, $p <$ .001).

Presence of Depressive Symptoms

Sleeping disturbance was the most common symptom, with 34.4% of the participants reported having trouble failing or staying asleep, or sleeping too much some days in the last 2 weeks and 10.9% having sleeping problems nearly every day (Table 2). In addition, in the last 2 weeks, 30.4% of the participants felt tired or had little energy some days, 15.7% of the participants had little interest or pleasure in doing things, 15.6% moved or spoke so slowly that other people could have noticed, and 14.4% of the participants had trouble concentrating on things. In particular, 3.5% of the participants had suicidal thoughts in the last 2 weeks.

Prevalence of Depressive Symptoms by Socio-Economic Characteristics

The prevalence of any depressive symptoms increased as income decreased, with the prevalence of any depressive symptoms being highest in the lowest income group (56.0%; Table 3). Specifically, the highest prevalence of moderate and severe depressive symptoms was found in the lowest income group (4.5%). On one hand, in terms of the prevalence of depressive symptoms by educational levels, the 9 to 12 years education group had the highest proportion of older adults having any depressive symptom (55.2%; Table 4). On the other hand, older adults with the lowest educational level had the highest proportion of older adults having moderate to severe depressive symptoms (4.4%).

Correlation Between Socio-Demographic Factors and Depressive Symptoms

Socio-demographic and health-related correlates of depressive symptoms are presented in Table 5. Older age ($r =$ .09, $p <$ .001), being female ($r =$ .1, $p <$ .001), not being married ($r =$ .07, $p <$ .001), lower income ($r =$ .09, $p <$ .001), having been in the community for fewer years ($r =$ .05, $p <$ .01), lower overall health status ($r =$ .32, $p <$ .001), poorer quality of life ($r =$ .14, $p <$ .001), and worsening health status over the last year ($r =$ .24, $p <$ .001) were positively correlated with any depressive symptoms.

Discussion

In this population-based study, the findings indicate that depressive symptoms are prevalent among U.S. Chinese older adults. Moreover, older age, being female, not being married, lower income, having been in the community for fewer years, lower overall health status, poorer quality of life, and worsening health over the last year are significantly correlated with any depressive symptoms in the study population.

As the largest population-based study on depressive symptoms of U.S. Chinese older adults in the Greater Chicago area, this study shows that 17.1% of the participants have mild to severe depressive symptoms, which is much higher than the prevalence reported in U.S. older adults (4.9%; McGuire, Strine, Allen, Anderson, & Mokdad, 2009). The finding of this study contrasts a prior study suggesting that Chinese American older adults had lower levels of depressive symptoms as compared with older adults in the general population (Takeuchi et al., 1998). With community's full engagement, our academic-community partnership facilitated the design of culturally and linguistically appropriate research measures (Dong et al., 2012). Due to our CBPR approach, participants may be more comfortable conversing in their preferred dialects, more trusting our research assistants, and more willing to express emotions and acknowledge their feelings of depressive symptoms (Dong, Chang, Wong, & Simon, 2011).

Consistent with prior studies (A. M. Kleinman, 1977; A. Kleinman, 1982), this study demonstrates that Chinese older adults are more likely to experience somatic depressive symptoms such as having sleeping problems or feeling tired. This finding was supported by prior studies in clinical settings. For example, a cross-cultural comparison study conducted in clinical settings in Toronto, Canada, and Changsha, China demonstrated that Chinese patients tended to report somatic symptoms and perceive stigma of depression, while, in contrast, North American patients were more inclined to report psychological symptoms (Ryder et al., 2008). The tendency of complaining somatic depressive symptoms may add great complexity to the recognition and diagnosis of mental illness among U.S. Chinese older adults.

In this study, the prevalence and severity of depressive symptoms increase as age increases. Compared with younger older adults, oldest-old adults may report a higher incidence of chronic disease, functional disability, and life stress, which together place them at higher risk of depressive symptoms. In addition, due to physical barriers, oldest-old adult may be less likely to seek professional help. Depressive symptoms among oldest-old population warrant much more attention as the Chinese American community is graying rapidly. Our study also suggests that being female is significantly correlated with any depressive symptoms. The relationship of gender and depressive symptoms may be explained by a higher proportion of widows among older women. Being widowed may be associated with lower levels of social support and higher risk of loneliness and depression (Siegel & Kuykendall, 1990). In addition, given women's subordinate social status in Chinese culture, older women are more likely to experience elder abuse, which may result in a higher rate of depressive symptoms (Dong, Beck, & Simon, 2010; Dong & Simon, 2008; Dong & Simon, 2010).

The prevalence of depressive symptoms in Chinese older adults differs by socio-economic status. Our result is consistent with previous studies reporting income as an important correlate for depressive symptoms. The majority of our study participants immigrates to the United States in later life and has never been paid in the U.S. labor market. Without any social security and employment pensions, these older adults are more likely to live an undesirable life. Thus, financial inadequacy may constitute a source of stress and further exacerbate depressive symptoms among U.S. Chinese older adults. In addition, education

appears to have no significant correlation with depressive symptoms. Yet it should be noted that the prevalence of moderate to severe depressive symptoms is highest among the group with the lowest education level (0–8 years). This may be due in part to that older adults with lower educational levels are less likely to identify and seek help for depressive symptoms. Further studies should delve into the association between education and depressive symptoms.

In contrast to prior studies (Tong, Lai, Zeng, & Xu, 2011), this study demonstrates that there is no correlation between living arrangement and depressive symptoms. Guided by the cultural value of filial piety, Chinese older adults may prefer and expect to live with adult children in later life. Living alone may carry a social stigma for the reason of lacking child support. Researchers suggested that living alone may be associated with higher levels of social exclusion and increased risk of depressive symptoms among Chinese older adults (Tong et al., 2011). A study on 2,003 community-dwelling Chinese older adults in Hong Kong found that living alone was an independent risk factor for depressive symptoms (Chou, Ho, & Chi, 2006). However, living arrangement is not significantly correlated with any depressive symptoms in the present study. One reason for this may be that a large proportion of older adults living alone are residing in senior apartments. Friend and community support as well as various social activities in the senior housing may counteract the negative effects of decreased family and spouse support on older adults' well-being (Dong, Beck, & Simon, 2010). At the same time, living alone may reduce chances of family conflicts and elder abuse, and therefore decrease the risk of depressive symptoms (Dong, Chen, Chang, & Simon, 2013; Dong, Simon, Odwazny, & Gorbien, 2008). More complex analysis should be conducted in the future to explore the association between living arrangement and depressive symptoms.

Building upon prior studies, this study demonstrates that depressive symptoms are positively correlated with poor health status. In a longitudinal study of depression and health service use among older adults in primary care settings, the results suggested that older adults with depressive symptoms had poorer perceived health and greater health service use (Callahan, Hui, Nienaber, Tierney, & Musick, 1994). Our study together with prior evidence highlights the urgency of addressing depressive symptoms as a possible approach to reducing disease burdens in Chinese older adults. Yet it should be noted that much of the evidence on the association between health status and depression comes from clinical settings, future studies of community-dwelling populations are needed. In addition, the presence of depressive symptoms can be either a risk factor or an outcome for poorer health status. Given the complexity of the relationship and the cross-sectional design of the present study, we could not postulate on potential temporal relationships between health status and depressive symptoms. Further longitudinal studies are needed to determine the association.

The findings of this study should be interpreted with limitations. First, despite our study examined a representative sample of U.S. Chinese older adults in the Greater Chicago area, the findings may not be generalizable to other Chinese populations in the United States or in Asia. Second, this study only used income and education as proxy measures of socio-economic status. However, other socio-economic information such as occupations and the receipt of government pensions may also play important roles in contributing depressive

symptoms. Future studies should examine associations between socio-economic status and depressive symptoms by using a more comprehensive measurement.

A third limitation arises from the cross-sectional study design and we could not address the issues of temporal relationships in the present study. Future longitudinal studies are needed to understand risk and protective factors of depressive symptoms over time. Furthermore, quantitative data were limited in providing information under special cultural context. Future mixed method studies are needed to comprehensively understand the prevalence and epidemiology patterns of depressive symptoms in Chinese older adults. Finally, the present study did not collect information on older adults' health-seeking intentions and behaviors, which sets the groundwork for future studies to understand cultural aspects of depressive symptoms in a more comprehensive way.

The results of this study also provide new insights into policy-making and intervention developments. First, collaborated efforts are needed to identify depressive older adults and provide early prevention and intervention measures. Special attention should be given to the oldest-old, women, low-income older adults, and those with poor health status and quality of life. Furthermore, health education and promotion programs should be provided to raise older adults' awareness of depressive symptoms and enhance their motivation of seeking professional help. In addition, health care professionals should be aware of the importance and cultural aspects of screening for depressive symptoms among Chinese older adults. Government and community service organization should also improve the availability of culturally competent treatments for depressive symptoms in U.S. Chinese aging populations.

Conclusion

Depressive symptoms are common among U.S. Chinese older adults. Older age, being female, lower income, not being married, having been in the community for fewer years, lower overall health status, poorer quality of life, and worsening health over the last year are positively correlated with depressive symptoms. This study necessitates developing research, interventions, and policies on depressive symptoms in U.S. Chinese aging populations. Future studies should be conducted to understand risk factors and outcomes associated with depressive symptoms in U.S. Chinese old adults.

Funding

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Table 1.

Characteristics of Population Study of Chinese Elderly in Chicago (PINE Study} Participants.

	No depressive symptoms (*n* = 1,424)	Any depressive symptoms (*n* = 1,7l7)	χ^2	*df*	*p* value
Age, *n* (%)					
60–64	333 (23.4)	348 (20.3)			
65–69	326 (22.9)	315 (18.4)			
70–74	278 (19.5)	326 (19.0)			
75–79	221 (15.5)	330 (19.2)			
80 and above	266(l8.7)	398 (23.2)	25.0	4	<.00l
Sex					
Male	663 (46.6)	626 (36.5)			
Female	76l (53.4)	1,09l (63.5)	32.8	1	<.00l
Education (years), *n* (%)					
0–8	692 (48.7)	836 (48.9)			
9–12	42l(29.6)	5l8 (30.3)			
13 and above	308(21.7)	355 (20.8)	0.43	2	.81
Income (in US$), *n* (%)					
0–4,999	468 (33.l)	57l (33.5)			
5,000–9,999	688 (48.7)	927 (54.3)			
10,000–14,999	159 (ll.3)	l5l(8.9)			
15,000 and more	98 (6.9)	57 (3.3)	29.4	3	<.00l
Marital status, *n* (%)					
Married	1,057 (74.7)	1,l68 (68.5)			
Separated	20 (l.4)	37 (2.2)			
Divorced	3l (2.2)	43 (2.5)			
Widowed	307 (2l.7)	456 (26.8)	15.0	3	<.05
Number of children, *n* (%)					
0–1	185 (13.0)	283 (16.5)			
2–3	8l6 (57.4)	923 (53.8)			
4 and more	420 (29.6)	509 (29.7)	8.14	2	<.05
Living arrangement, *n* (%)					
Living alone	280 (19.7)	392 (22.8)			
1–2	729 (5l.2)	838 (48.8)			
3 or more	414 (29.l)	487 (28.4)	4.68	2	.l0
Years in the United States, *n* (%)					
0–9	324 (22.9)	383 (22.4)			
10–19	4l0 (28.9)	523 (30.6)			
20–29	375 (26.5)	447 (26.l)			
30 and more	308 (2l.7)	357 (20.9)	1.08	3	.78
Years in the community, *n* (%)					
0–9	689 (48.5)	934 (54.6)			

	No depressive symptoms (*n* = 1,424)	Any depressive symptoms (*n* = 1,717)	χ^2	*df*	*p* value
10–19	372 (26.2)	416 (24.3)			
20–29	241(16.9)	222 (13.0)			
30 and more	120 (8.4)	138 (8.1)	15.1	3	<.0I
Country of origin, *n* (%)					
Mainland China	1,330 (93.4)	1,585 (92.3)			
Hong Kong/Macau	36 (2.5)	68 (4.0)			
Taiwan	21 (1.5)	21 (1.2)			
Vietnam/Thailand/	20 (1.4)	37 (2.2)			
Philippine/Malaysia, *n* (%)					
United States/Canada	8 (0.6)	2 (0.1)			
Others	9 (0.6)	4 (0.2)	1.38	1	.24
Overall health status, *n* (%)					
Very good	91 (6.4)	48 (2.8)			
Good	675 (47.4)	417 (24.3)			
Fair	555 (39.0)	761 (44.3)			
Poor	103 (7.2)	491 (28.6)	335.5	3	<.001
Quality of life, *n* (%)					
Very good	112 (7.9)	103 (6.0)			
Good	728 (51.1)	651 (37.9)			
Fair	555 (39.0)	892 (52.0)			
Poor	29 (2.0)	70 (4.1)	73.6	3	<.001
Health changes over the last year, *n* (%)					
Improved	122 (8.6)	152 (8.9)			
Same	907 (63.7)	623 (36.3)			
Worsened	395 (27.7)	940 (54.8)	253.7	2	<.001

Table 2.

Presence of Depressive Symptoms.

PHQ-9 items	Not at all (%)	Several days (%)	More than half of the days (%)	Nearly every day (%)
Little interest or pleasure in doing things	2,639 (84.3)	213 (6.8)	152 (4.9)	127 (4.0)
Feeling down, depressed, or hopeless	2,676 (85.3)	233 (7.4)	132 (4.2)	97 (3.0)
Trouble falling or staying asleep, or sleeping too much	2,061 (65.6)	481(15.3)	258 (8.2)	344 (10.9)
Feeling tired or having little energy	2,186 (69.6)	450 (14.3)	254 (8.1)	251 (8.0)
Poor appetite or overeating	2,840 (90.4)	135 (4.3)	91 (2.9)	76 (2.4)
Feeling bad about yourself —or that you are a failure or have let yourself or your family down	2,828 (90.3)	142 (4.5)	96 (3.1)	65 (2.1)
Trouble concentrating on things, such as reading the newspaper or watching television	2,677 (85.6)	226 (7.2)	138 (4.4)	87 (2.8)
Moving or speaking so slowly that other people could have noticed	2,640 (84.4)	237 (7.6)	161 (5.2)	87 (2.8)
Thoughts that you would be better off dead, or of hurting yourself in some way	3,019 (96.5)	72 (2.3)	13 (0.4)	26 (0.8)

Note. PHQ = Patient Health Questionnaire.

Table 3.

Prevalence of Depressive Symptoms by income Level.

	US$0-US$4,999 (*n* = 1,039)	US$5,000-US$9,999 (*n* = 1,615)	US$10,000-US$14,999 (*n* = 310)	US$15,000 and above (*N* = 155)
	n (%)	*n* (%)	*n* (%)	*n* (%)
Any symptoms	571 (56.0)	927 (57.4)	l5l (48.7)	57 (36.8)
Minimal (1–4)	389 (37.4)	625 (38.7)	ll2 (36.l)	43 (27.7)
Mild (5–9)	136 (13.1)	241 (14.9)	27 (8.7)	12 (7.7)
Moderate (10–14)	33 (3.2)	44 (2.7)	8 (2.6)	2 (1.3)
Severe (15–27)	13 (1.3)	17 (l.l)	4 (l.3)	0 (0)

Note. Percentage represents prevalence of depressive symptoms within each of the income groups.

Table 4.

Prevalence of Depressive Symptoms by Educational Levels.

	0–8 years (*n* = 1,528)	9–12 years (*n* = 939)	13 and more (*n* = 663)
	n (%)	*n* (%)	*n* (%)
Any symptoms	836 (54.7)	518 (55.2)	355 (53.5)
Minimal (1–4)	572 (37.4)	359 (38.2)	242 (36.5)
Mild (5–9)	198 (13.0)	125 (13.3)	94 (14.2)
Moderate (10–14)	45 (3.0)	26 (2.8)	15 (2.3)
Severe (15–27)	21 (1.4)	8 (0.9)	4 (0.6)

Note. Percentage represents prevalence of depressive symptoms within each of the education groups.

Table 5.

Correlations Between Any Depressive Symptom and Socio-Demographic Variables.

	Age	Sex	Edu	Income	MS	Living	Children	Yrs in U.S.	Yrs in com	Origin	OHS	QOL	HC	ADS
Age	1.0													
Sex	.01	1.0												
Edu	−.12 ***	−.21 ***	1.0											
Income	.05 **	.00	.01	1.0										
MS	−.33 ***	−.32 ***	.22	−.03	1.0									
Living	−.35 ***	−.07 ***	.02	.16 ***	.24 ***	1.0								
Children	.32 ***	.09 ***	−.38 ***	.00	−.13 ***	−.07 ***	1.0							
Yrs in U.S.	.35 ***	.03	−.10 ***	.35 ***	−.2 ***	−.31 ***	.15 ***	1.0						
Yrs in com	.23 ***	.02	−.11 ***	.24 ***	−.13 ***	−.18 ***	.10 ***	.66 ***	1.0					
Origin	.04 *	−.01	−.08 ***	−.20	.05 **	.05 **	.04 *	−.2 ***	−.15 ***	1.0				
OHS	−.08 ***	−.06 **	.06 ***	.12 ***	.05 **	−.00	−.00	−.01	.05 *	−.03	1.0			
QOL	.06 ***	.05 **	.09 ***	.08 ***	.03	−.01	.04 *	.00	−.02	−.04 *	.32 ***	1.0		
HC	−.11 ***	−.03	.02	.05 **	.07 ***	.01	−.02	−.04 *	.03	−.00	.35 ***	.15 ***	1.0	
ADS	.09 ***	.10 ***	−.03	−.09 ***	−.07 ***	−.02	.00	.00	−.05 **	−.02	−.32 ***	−.14 ***	−.24 ***	1.0

Note. Edu = education; MS = marital status; Living = living arrangement; Children = number of children; Yrs in U.S. = years in the United States; Yrs in com = years in the community; Origin = country of origin; OHS = overall health status; QOL = quality of life; HC = health changes over the last year; ADS = any depressive symptom.

*
  p < .05.

**
  p < .01.

***
  p < .001.