

Chronic Illnesses and Depression Among Chinese Immigrant Elders

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Abstract:

Objectives: The purpose of the study is to explore the unique effects of various chronic illnesses on depression in a sample of Chinese immigrant elders. **Methods:** The data were collected in the Greater Boston area at various social service agencies, social, and religious institutions. A self-administered sample of 177 Chinese-speaking immigrant elders was included in the study. The Center for Epidemiologic Studies Depression Scale (CES-D) was used to measure depressive symptoms in the study. Regression analysis was performed for three measures of depression: 7-selected CES-D scale, its subscale somatic symptoms, and depressive symptoms. **Results:** Chronic illnesses have various effects on the selected CES-D score, and its subscales under the total sample and the samples of male and female respondents. **Conclusions:** The findings suggest that medical, psychological, and social work treatments or interventions for depression should take the impact of chronic illnesses into consideration.

KEYWORDS. Chinese immigrant elders, depression, chronic illnesses, CES-D scale, back/neck pain, arthritis, physical health, gender, somatic symptoms, depressive affect

Article:

According to the National Institute of Mental Health (NIMH), in any given one-year period, 9.5% or 18.8 million American adults suffer from depression (National Institute of Mental Health, 2002). Research suggests that older Chinese immigrants are at a higher risk of depression than older Caucasians (Ying, 1988). A study conducted in a primary care clinic found that the prevalence of major depression was 19.6% among Chinese-Americans (Yeung et al., 2002). Several researchers pointed out that depression tends to be more prevalent among immigrant elders due to their lack of resources, loss, acculturation stress, language problems, experience of discrimination, and social isolation (Mui, 1998; Gelfand & Yee, 1991). The purpose of this study is to explore the unique effects of various chronic illnesses on depression in a sample of Chinese immigrant elders.

It has been evident that physical health is associated with depression among the aged (Bruce, 2001; Cronin-Stubbs et al., 2000; Penninx et al., 1998; Mui, 1993; Murrell, Himmelfarb, & Wright, 1983; Han, 2002). For example, data from both clinical and community-based studies have revealed that chronic illnesses such as heart disease, stroke, arthritis, back pain, diabetes, cancer, and kidney disease are more likely to be associated with depression (Ahto et al., 1997; Akechi et al., 2003; Anderson, Vestergaard, Riis, & Lauritzen, 1994; Blazer, Burchett, Service, & George, 1991; Gallagher, Moore, & Chernoff, 1995; Husaini & Moore, 1990; Murrell et al., 1983; Palinkas, Wingard, & Barrett-Connor, 1990; Patten, 1999; Peyrot & Rubin, 1997; Williamson & Schulz, 1992). However, few studies have examined the unique impact of a specific chronic illness on depression among the older population in the United States. (Bazargan & Hamm-Baugh, 1995; Black, Goodwin, & Markides, 1998; Penninx et al., 1996). Recent findings from the National Health and Nutrition Examination Survey Epidemiological Follow-Up Study indicate that individuals who suffered from arthritis and diabetes were more likely to suffer from the feelings of depression (Gaynes, Burns, Tweed, & Erickson, 2002).

Bazargan and Hamm-Baugh (1995) examined the unique impact of chronic illnesses on depression among elderly Blacks in New Orleans, Louisiana. According to their findings, respondents who had kidney problems, vision problems, and problems with circulation in the arms and/or legs suffered from a higher level of depression than

those without these chronic illnesses. Data from the first wave of the Hispanic Established Population for the Epidemiologic Study of the Elderly (EPESE) confirm that diabetes, stroke, arthritis, cancer, urinary and bowel incontinence, kidney disease, and stomach ulcers tend to increase the risk of depression (Black et al., 1998). Findings from research in mainland China and Hong Kong have revealed that elderly Chinese who had poor physical health appeared to suffer from a higher level of depression than those with good physical health status (Chou & Chi, 2002; Woo et al., 1994; Zhang et al., 1997). More specifically, Chou and Chi (2002) found that among several common chronic illnesses, arthritis is the only health problem that had a significantly unique effect on depressive symptoms. Other studies pointed out that the aggregated level of chronic illnesses that interfere with a person's physical mobility had significant effect on depression (Zhang et al., 1997).

Research Question

Given a relatively high risk of depression among older Chinese immigrants, the specific aim of this study is to investigate the unique relationships between chronic illnesses and depression in a sample of Chinese immigrant elders. More specifically, among some well-known common chronic illnesses of old age, which illness has a statistically significant effect on depression and how strong is that effect compared to others under consideration?

METHODS

Sample and Data Collection

The data were collected in the Greater Boston area at various social service agencies, social and religious institutions. A self-administered sample of 177 non-native-born Chinese elders sixty years and older was included in this study. The survey instrument was adapted from a similar study conducted among Russian immigrants in the Greater Boston area (Tran, Khatutsky, Aroian, Balsam, & Convey, 2000). This instrument was translated from English into Chinese by a bilingual and bicultural social gerontologist. To assure cultural equivalence, the translation was also reviewed and evaluated by experts and prospective respondents. The majority of the respondents (62%) were female and 53% reported being married or living with a partner. The mean age of the respondents was 71.8 years old, ranging from 60 to 90 years old. A large majority (62%) of respondents reported an annual household income \$10,000 or below. The average length of stay in the U.S. was 18.4 years, with a range of approximately less than a year to sixty-nine years. Therefore, a large proportion of the immigrants in the study came to the U.S. during middle age. The majority (82%) of respondents still reported English limitations.

Measures

Depressive Symptoms. Depressive symptomatology is measured by the short version of the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). This short version includes 10 items taken from the original CES-D scale, representing four clusters of depressive symptoms (i.e., somatic symptoms, depressed affect symptoms, lack of positive feeling symptoms, and interpersonal relation symptoms) found in the original 20 CES-D items (Kohout, Berkman, Denis, & Cornoni-Huntley, 1983). Preliminary psychometric evaluation of the 10 CES-D items in this study's data indicates items which measure "interpersonal relation symptoms" and "lack of positive affect symptoms" appear to have poor validity and reliability. Thus we only used seven items to measure depression in this study (i.e., four items measuring somatic symptoms and three items measuring depressed affect symptoms). Previous studies of distress suggest that it may be important to differentiate between the affective and somatic aspects of depression. In particular, there were studies that indicate that Chinese people tend to express symptoms of depression in somatic terms (Kleinman, 1977; Krause, Liang, & Gu, 1998; Marsella, 1987). In addition, Krause and Liang (1993) found that the CES-D items that measure somatic and depressed symptoms are more culturally appropriate for older Chinese respondents than other CES-D items. Table 1 presents a description of the seven selected CES-D items, four items of somatic symptoms, and three items of depressive affect symptoms. A high score stands for a greater feeling of depression. Overall, these seven items have an internal reliability coefficient of .74. Four somatic items have an internal reliability of .61 and three depressed items of .69. The correlation between somatic symptom scale and depressive symptom scale is .544 ($p < .001$). This correlation estimate is almost equivalent to the one (.543) found in Krause et al.'s (1998) study. The score for somatic symptoms is 1.77, which is much higher than the depressed affect symptoms (.67). Overall, females

have a higher score in the 7-item CES-D scale, as well as in the two subscales, but the scores are not significantly different between female and male respondents.

TABLE 1. Depression Scores

		Total population	Female	Male
	a Value ¹	Mean	Mean	Mean
Selected CES-D scale (7 items, Score: 0-24)	0.74	2.44 (3.01)	2.64 (3.27)	2.10 (2.54)
Somatic Symptoms as a subscale (4 items, Score: 0-12)	0.61	1.77 (2.06)	1.86 (2.08)	1.61 (2.02)
Depressive affect (3 items, score: 0-3)	0.69	0.67 (1.35)	0.77 (1.51)	0.49 (1.02)

1. Internal consistency reliability estimate

Independent Variables

Table 2 shows the independent variables used in the study and the coding algorithms for each variable.

Physical health was measured by three dimensions: self-rated health, individual chronic illnesses, and number of chronic illnesses. Self-rated health is coded from 5 = excellent to 1 = poor. Self-reported health status can have a strong association with depressive symptoms. According to the literature, respondents who rated their health as good were less likely to be depressed (Mui, 1996, Mui, 1998, Woo et al., 1994; Zhang et al., 1997). Chronic illnesses were measured by asking respondents, “what are the health problems that limit your activities?” By definition, a chronic illness is one that is long lasting, and not easily cured (Chronic Illness Alliance Inc., 2002). A code of 1 was used if the respondents answered “yes” to one of the following 10 conditions: arthritis, back/neck problems, eye/vision problems, hypertension, walking problems, hearing, fracture/bone problems, lung/breathing problems, heart problems, and diabetes.

Demographics include: age, gender, marital status, annual household in-come, length of stay in the U.S., and English limitations on at least one activity. Age reported was the actual age of respondents. Several studies indicated that young-old elders were at a greater risk of depression than those who are the oldest-old (Blazer et al., 1991; Zhang et al., 1997). Gender was coded to 1 = female and 0 = male. While many studies conducted in the U.S. suggested that being female was predictive of greater depressive symptoms (Bazargan & Hamm-Baugh, 1995; Black et al., 1998; NIMH, 2002; Ying, 1988), Zhang’s study (1997) found that Chinese elderly men had a greater chance of depression than Chinese elderly women. It is expected that being married was associated with decreased depressive symptoms (Chou & Chi, 2002; Blazer et al., 1991; Murrell et al., 1983). Marital status was coded to 1 = married, living with partner and 0 = other. Household income was coded to 1 = annual income under \$10,000 a year and 0 = other. Financial situation also plays a role in a person’s physical and mental health status. According to previous studies, people with lower income and reported increase of economic difficulties tend to become more depressed (Bazargan & Hamm-Baugh, 1995; Blazer et al., 1991; Krause & Liang, 1993; Zhang et al., 1997).

TABLE 2. Coding Algorithms and Descriptive Analysis (N = 177)

Variables	Coding Algorithms	Mean/Percentage	SD
Physical Health			
Self-rated health	5 = excellent	3.4%	1
	4 = very good	22.0%	
	3 = good	30.5%	
	2 = fair	37.9%	
	1 = poor	6.2%	
Total number of chronic illnesses	Actual number	2.12	1.9
Chronic illnesses			
	1 = yes; 0 = no		
Arthritis		42.6%	0.5
Back/neck		31.8%	0.5
Eye/vision		28.8%	0.5
Hypertension		25.4%	0.4
Walking		20.8%	0.4
Hearing		17.0%	0.4
Fractures		13.6%	0.3
Lung/breathing		13.6%	0.3
Heart		11.3%	0.3
Diabetes		7.3%	0.3
Demographics			
Age (years)	Actual age	71.8	7.2
Female	1 = female; 0 = male	62.3%	0.5
Marital status	1 = married/living with partner; 0 = other	52.5%	0.5
Household income	1 = income under \$10,000; 0 = other	62.2%	0.5
Length of stay in U.S.(years)	Actual years of stay	18.4	14
English limitations on at least one activity	1 = at least one limitation; 0 = otherwise	81.9%	0.4
Social Support			
See friends	5 = every day	29.90%	1.4
	4 = two to four days/wk	21.50%	
	3 = at least once a week	24.30%	

Variables	Coding Algorithms	Mean/Percentage	SD
	2 = at least once every two wks	9.00%	
	1 = less than once a month	14.70%	
	0 = never (don't have friends)	0.60%	
Health Behavior			
Frequency of doctor visits	1 = never	10.20%	1.5
	2 = once	16.40%	
	3 = twice	19.80%	
	4 = three or four times	28.20%	
	5 = five to nine times	14.10%	
	6 = ten or more times	11.30%	
Frequency of traditional Chinese doctor visits	1 = never	74.00%	1.1
	2 = once	10.20%	
	3 = twice	6.20%	
	4 = three or four times	5.70%	

There is a scarcity of literature that focuses on the immigration-related factors such as length of stay in the U.S. and English limitations of activity on depression among elderly immigrants. Ying (1988) found that although Chinese-Americans who reside longer in the U.S. were more likely to report lower levels of depression, the relationship between length of stay in the U.S. and depression may not be a linear correlation. The length of stay was determined by asking the respondents the date of their arrival in the U.S., and the actual number of years in the U.S. was calculated in the study. In the multivariate analysis model, a new variable is created by squaring the variable in order to convert nonlinear variables to a linear relationship (Wittink, 1988). In a study comparing Chinese-American elders to American elders, it was reported that Chinese elders living in a new environment cite language barriers as one of the major sources of stress (Lee & Ellenbecker, 1998). English limitations on activities include: shopping, transportation, communicating with neighbors or grandchildren, traveling, going to a bank or to health care settings, watching television, or leisure activities. English limitations on activities was coded as 1 = at least one English limitation on the above activities, and 0 = otherwise.

Social support was measured by frequency of seeing friends. According to previous studies, strong social support plays a major role in reducing the likelihood of becoming depressed (Bazargan & Hamm-Baugh, 1995; Lee & Ellenbecker, 1998; Mui, 1996; Woo et al., 1994; Zhang et al., 1997). According to Woo et al. (1994), infrequent contact with friends and neighbors was significantly associated with an increase of depressive symptoms. Frequency of seeing friends was coded as 0 = never (do not have friends), 1 = less than once a month, 2 = at least once every two weeks, 3 = at least once a week, 4 = two to four days a week, and 5 = every day.

Health behavior was measured by frequency of physician visits and frequency of traditional Chinese doctor visits. The frequency of physician visits in a 12-month period was coded from 1 = never, 2 = once, 3 = twice, 4 = three or four times, 5 = five to nine times, and 6 = ten or more times. The frequency of traditional Chinese doctor's visits was coded from 1 = never, to 5 = five or more times. Physician visits may not only be related to respondents' physical health, but also to their mental health. It is expected that people who visit physicians and traditional Chinese doctors often are more likely to report a higher level of depressive symptoms (Bryant-Comstock, Stender, & Devercelli, 2002; Chou, 2001; de Boer, Wijker, & de Haes, 1997; Williams et al., 1995; Mantle, 2002).

Data Analysis

Several statistical procedures were involved in this study. T-test was used to test the gender differences in the mean seven-item CES-D score, somatic CES-D score, and depressive affect score. Factor analysis and internal reliability procedures were employed to test the internal consistency of the CES-D scale. Ordinary Least Squares regression (OLS) was performed to examine the relationships between chronic illnesses and depression in various regression models. All regression analyses include an assessment of possible multicollinearity among the independent variables.

RESULTS

Bivariate Analysis

The descriptive analysis of the independent variables is presented in Table 2.

Physical Health. Although more than half (56%) of respondents' self-rated health was very good or good, 44% rated their health as fair or poor. Arthritis was the most commonly reported chronic illness (43%) which limited respondents' activities. The other most commonly reported chronic illnesses were back/neck problems (32%), eye/vision problems (29%), hypertension (25%), and walking problems (21%). Only 7% of the respondents in the study re-reported that diabetes limited their activities. On average, the respondents re-reported having at least two chronic illnesses that limit their activities.

Social Support and Health Behavior. Almost one-third (30%) of respondents reported seeing friends every day, while nearly half (46%) reported seeing friends two to four days a week or at least once a week. More than half (64%) of respondents reported visiting the doctor at least once to four times a month. One fourth (25%) reported visiting the doctor 5 to 10 times a month, while 10% reported never visiting a doctor in a 12-month period.

Regression Analysis

Total Respondents

Standardized multiple regression coefficients Beta (B) and standard errors (SE) were reported in Tables 3, 4, and 5. The results of the OLS regression models for the total respondents are presented in Table 3. With the exception of arthritis and back/neck problems, preliminary analysis showed that all conditions were not significantly related to depressive symptoms while controlling for other variables listed in Table 3. Therefore, these eight conditions were not included in the final analysis models.

In terms of specific chronic illnesses, back/neck problems were found to be a significant predictor of depression as measured by the sum of seven-item CES-D score. Self-reported health status was the strongest predictor of depressive score ($B = 0.26$). Respondents who reported their physical health as excellent or very good were more

likely to report a lower level of depression. Being married, having a higher frequency of physician visits, and having a higher frequency of traditional Chinese doctor visits were also predictive of higher CES-D score. Age, income, length of stay in the U.S., English limitation on activities, frequency of seeing friends, and being female were not significant factors in the model.

Similar results were found in the somatic symptoms' model. Back/neck problems were a significant predictor of somatic symptoms. Self-reported health status, frequency of visiting physicians and traditional Chinese doctors were also predictive of somatic symptom scores. Among the significant factors, self-reported health status was the strongest predictor of somatic symptoms ($B = .33$). The effect was even stronger than the one in the CES-D model. Different from the CES-D score model, being married was no longer a significant factor in the model.

TABLE 3.
Ordinary Least Squares Regression Predicting Seven-Item CES-D and Two Subscale Depression Scores for Total Population (N = 177)

	Model 1		Model 2		Model 3	
	7-item CES-D score		Somatic Symptoms		Depressive Affect Score	
Sociodemographic Variables	B	SE	B	SE	B	SE
Age	0.06	0.03	0.03	0.02	0.08	0.01
Female	-0.05	0.43	-0.06	0.28	-0.02	0.22
Married	-0.14*	0.4	-0.09	0.26	-0.18*	0.2
Income \$10,000 and above	0.05	0.42	< 0.01	0.27	0.09	0.21
Length to stay in the U.S.	0.05	< 0.01	0.01	< 0.01	0.1	< 0.01
English limitation on one or more activities	-0.09	0.51	-0.04	0.33	-0.13	0.25
Social Support Frequency of seeing friends	-0.07	0.14	-0.02	0.09	-0.14	0.07
Physical Health Self-reported status	-0.26***	0.23	-0.33***	0.15	-0.08	0.11
Chronic Illnesses Arthritis	0.13	0.43	0.08	0.28	0.16*	0.21
Back or neck problem	0.2	0.46	0.19**	0.3	0.15	0.23
Health Behavior Frequency of physician visits	0.14*	0.14	0.2**	0.09	0.02	0.07
Frequency of traditional Chinese doctor visits	0.19**	0.18	0.23***	0.12	0.06	0.09
R-Square	0.37		0.44		0.22	
Adjusted R-square	0.33		0.40		0.17	

*Note: *Significant at 0.05 level, **Significant at 0.01 level, ***Significant at 0.001 level.*

The results in the depressive affect model were very different from those found in the models that used the sum of seven-item CES-D score, and somatic symptom score. Instead of back/neck problems, arthritis was predictive of depressive affect score. Being married was another factor that was significantly associated with depressive affect symptoms. Other variables, such as self-reported health status, age, being female, income, length of stay in the U.S., English limitation, frequency of seeing friends, and physician and traditional Chinese doctor visits were not found to be significant in the model.

Female Respondents

The results of the OLS regression models predicting seven-item CES-D score, somatic symptom score, and depressive affect score among female respondents are presented in Table 4. Back/neck problems were a predictive of CES-D score for female respondents. Self-reported health status was the strongest predictor in the model ($B = .26$). In addition, being married, seeing friends, and seeing traditional Chinese doctors were

significantly associated with CES-D score. Age, income, length of stay in the U.S., English limitations, and frequency of seeing physician were found not to be related to CES-D score. In the somatic symptom model, similar to the model predicting CES-D score, back/neck problems were a significant factor for female respondents. Self-reported health status and seeing traditional Chinese doctors were also found to be related to somatic symptoms. However, being married and seeing friends were not often significantly associated with somatic symptom score. In fact, being married and seeing friends were negatively related to depressive affect score, but back/neck problems, self-reported health, and seeing traditional Chinese doctors were not predictive factors in the depressive affect model. No chronic illnesses were found to be significantly related to depressive affect score in the model.

Male Respondents

Table 4 also presents the findings of OLS regression models predicting seven-item CES-D score, somatic symptom score, and depressive affect score among male respondents. Results differed from the findings in the total respondents and female respondents; instead of back/neck problems, arthritis as a chronic condition was significantly related to CES-D score for male respondents. Having a higher frequency of physician visits was also a significant factor in the model. No other variables were found to be significant in this model.

TABLE 4.

Ordinary Least Squares Regression Predicting Seven-Item CES-D and Two Subscale Depression Scores for Male and Female Respondents (N = 67 and 110 individually)

Sociodemographic Variables		Model 1		Model 2		Model 3	
		7-item CES-D Score		Somatic Symptoms		Depressive Affect Score	
		B	SE	B	SE	B	SE
Age	Female	0.07	0.04	0.05	0.02	0.08	0.02
	Male	<0.01	0.04	-0.03	0.03	0.06	0.02
Married	Female	-0.21*	0.59	-0.16	0.37	-0.22*	0.3
	Male	-0.02	0.59	0.01	0.43	-0.07	0.28
Income \$10,000 and above	Female	<0.01	0.58	-0.04	0.36	0.04	0.29
	Male	0.06	0.58	<0.01	0.43	0.14	0.28
Length of stay in the U.S.	Female	0.01	<0.01	0.01	<0.01	<0.01	<0.01
	Male	0.16	<0.01	0.02	<0.01	0.37*	<0.01
English limitation on one or more activities	Female	-0.07	0.67	-0.03	0.42	-0.11	0.34
	Male	-0.05	0.78	-0.02	0.57	-0.07	0.38
Social Support Frequency of seeing friends	Female	-0.18	0.2	-0.09	0.13	-0.25**	0.1
	Male	0.19	0.18	0.17	0.13	0.13	0.09
Physical Health Self-reported status	Female	-0.26**	0.33	-0.36***	0.21	-0.06	0.17
	Male	-0.17	0.31	-0.2	0.23	-0.03	0.15
Chronic Illnesses Arthritis	Female	0.11	0.57	0.06	0.35	0.16	0.29
	Male	0.28	0.69	0.22	0.5	0.25	0.33
Back or neck problem	Female	0.2*	0.6	0.18*	0.38	0.18	0.3
	Male	0.19	0.75	0.24*	0.54	-0.01	0.36
Health Behavior Frequency of physician visits	Female	0.09	0.2	0.14	0.03	-0.01	0.1
	Male	0.37**	0.2	0.39**	0.15	0.15	0.1
Frequency of traditional Chinese doctor visits	Female	0.21*	0.25	0.27**	0.16	0.08	0.13
	Male	0.06	0.25	0.1	0.18	-0.04	0.12
R-Square	Female	0.41		0.44		0.31	
Adjusted R-Square	Male	0.35		0.38		0.23	

Note: *Significant at 0.05 level, **Significant at 0.01 level, ***Significant at 0.001 level.

In the somatic symptom model, back/neck problems became a significant factor consistent with the variable back/neck problems found in the models among total population and female respondents. Frequency of physician visits was found to be the only other variable significant in the somatic symptom model among male respondents. In the depressive affect model, length of stay in the U.S. was found to be the only significant variable related to male's depressive affect. Other variables, such as being married and seeing friends, were predictive of depressive affect symptoms among female respondents, but were not significant factors among male respondents.

Discussion

The present study examines the relationship between chronic illnesses and depression in a sample of 177 Chinese immigrant elders residing in the Greater Boston area. The present study also examined the effect of chronic illnesses on two dimensions of depression and took gender differences into consideration.

Our study found that although women reported higher depression scores than men, the differences were not statistically significant. In addition, gender was not a predictor for depressive symptoms in the multivariate models. This finding is different from most studies conducted in the U.S. (Bazargan & Hamm-Baugh, 1995; Black et al., 1998; NIMH, 2002). Ying's study (1988) conducted among Chinese-Americans in San Francisco reported that Chinese-American men report significantly fewer symptoms of depression than do women. Elderly Chinese men obtain higher status than women in their families and are the main income generators in their homeland. The immigration process may diminish the family authority and may even reverse their status in the family. Therefore, they may exhibit higher depression symptoms than their non-immigrant elders in the U.S.

Our findings suggest that arthritis and back/neck problems had a significant association with depressive symptoms among Chinese immigrant elders. The findings reflect Zhang et al. (1997)'s study which indicated that back pain was significantly related to depression among Chinese elders in mainland China. Further, the present findings are consistent with Cho and Chi (2002)'s study that identified arthritis as the significant predictor of depression among Chinese elders in Hong Kong. Presumably, arthritis has the potential for restricting functional ability and causing pain.

In the present study, chronic illnesses have various effects on the selected CES-D score, and its subscales as somatic symptoms and depressive affect. Back/neck problems were predictive of the selected CES-D score and somatic symptom scores in most models. Arthritis was only found to be a significant factor in the model of depressive affect among the total population and in the model of the seven-item CES-D score among male respondents. Back/neck problems and arthritis are associated with substantial pain and discomfort, and these conditions can be characterized as chronic stressors, causing reduced activity and lower self-esteem. In addition, pain and its association with depression support the belief that somatic pain is a specific component of depressive symptoms among the Chinese elderly (Zhang et al., 1997). In all three somatic symptom models, only physical health-related factors and health behavior-related factors were significant factors. Except for arthritis, a significant factor in depressive affect total population model, all other health-related factors did not have significant correlation with depressive affect. Therefore, we should be aware that while examining the relations between chronic illnesses and depression among elders, it is important to look at both somatic and depressive symptoms of depression.

Ying's study (1988) found no distinction between depressive affect and somatization among Chinese-Americans in her study. In our study, we found that the score for somatic symptoms was much higher than for depressive affect. The study findings are consistent with Kleinman (1977)'s results that somatization is more common among Chinese culture than western culture. In addition, our study further illustrates a clear distinction between depressive affect and somatic symptoms in terms of predictive models. The differences between our study and Ying's study may largely be due to the differences of our study population.

The study found gender differences in terms of chronic illnesses' effect on depression, which is consistent with Kessler and McLeod (1984), who present some evidence of sex differences in psychological distress associated with ill health. Back/neck problems had a significant relationship with somatic symptoms among both male and female respondents. However, in the seven-item CES-D score models, back/neck problems were found significant for only female respondents. Since the study sample is small, no further explanation can be explored in the study. Nonetheless, since both arthritis and back/neck problems are associated with pain, the finding of a sex effect indicates that depression is not a typical feminine reaction to pain and should not be considered a particularly salient issue in only women's health (Geerlings et al., 2002). Pain and depression must be evaluated and managed seriously among both groups of Chinese elderly men and women.

Several data limitations need to be acknowledged in this study. Since the study involves a non-random, community-based sample recruited through Chinese service organizations and Chinese churches, any attempts to generalize this study's findings should be interpreted with caveat. Moreover, this sample intentionally excluded frail elders, those with major cognitive limitations, as well as institutionalized individuals, because of their inability to handle a large complex questionnaire. As a result, our data are not representative of the whole Chinese-speaking community of elderly immigrants, and the results should be interpreted accordingly. All health and mental health data are self-reported, and no verification with medical records was available. In conclusion, our findings suggest that medical, psychological, and social work treatments or interventions for depression should take the impact of chronic illnesses into consideration.

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