Sources and Variations in Social Support and Risk for Elder Mistreatment in a US Chinese Population

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Abstract

OBJECTIVES: Research has examined the relationships between positive social support (PSS) and elder mistreatment (EM) but less is known regarding the negative aspect of social support (NSS), especially among minority groups in the United States. This study aimed to investigate the relationships between PSS/NSS from different sources and EM among US Chinese older adults.

DESIGN: Population-based cross-sectional study.

SETTING: Greater Chicago, IL, area.

PARTICIPANTS: A representative sample of Chinese older adults aged 60 years or older (N = 3157) from the Population Study of ChINese Elderly in Chicago in 2011 to 2013.

MEASUREMENTS: We applied a 10-item widely used instrument to assess EM. PSS and NSS from spouse/family members/friends were measured by a 12-item scale. Multivariate logistic regression analyses were conducted to examine the relationships.

RESULTS: After adjusting for confounders, higher levels of overall PSS from all three sources, including spouse, family members, and friends (odds ratio [OR] = 0.88 [95% confidence interval {CI} = 0.85–0.91]), were associated with lower risk of EM. But participants with a higher level of overall NSS from all three sources (OR = 1.51 [95% CI = 1.41–1.61]) were more likely to experience EM. The results on the relationships between PSS from spouse (OR = 0.70 [95% CI = 0.64–0.76]), PSS from family members (OR = 0.73 [95% CI = 0.68–0.79]), and EM were similar to overall PSS. But PSS from friends had a nonsignificant association with EM. Greater levels of NSS from spouse (OR = 1.84 [95% CI = 1.64–2.07]), family members (OR = 2.36 [95% CI = 2.03–2.75]), and friends (OR = 1.69 [95% CI = 1.32–2.17]) were associated with increased risks of EM.

CONCLUSION: Higher levels of SS were not always associated with lower risks of EM among US Chinese older adults. NSS might have counter effects. Future qualitative or longitudinal

research needs to explore detailed cultural explanations and casual relationships between SS and EM.

Keywords

positive social support; negative social support; elder mistreatment; minority aging

Elder mistreatment (EM) is a world-wide public health issue, which has been defined as "single, or repeated act, or lack of appropriate action, occurring within any relationship where there is an expectation of trust, which causes harm or distress to an older person."[1] The prevalence of EM varies among different populations. A national study on older adults in the United States showed that the prevalence of EM was more than 10%.[2] The rate was much higher in Asia.[3,4] The adverse effects of EM on mental and physical health were well-established, including increased risks of psychological distress, hospitalization, and mortality.[5–7] tion to other protective factors for EM, such as high levels of community cohesion and collective efficacy, research results have shown that social support (SS) plays an important role in EM.[2,8]

Studies in Europe, the United States, reported that greater levels of SS reduced the risks of different types of EM.[2,9,10] On the other hand, SS could have a negative dimension, causing disputes, criticism, and conflicts, which is generally referred to as social strain[11] or negative SS (NSS).[12] Solidarity-conflict model suggests that positive SS (PSS) and NSS coexist in close relationships, including nonfamilial ones.[11,13] It has been documented that NSS to is associated with depression, chronic illnesses, and EM.[14,15] However, most existing studies focus on PSS and EM. The evidence on the relationship between NSS and EM remains limited, particularly among US ethnic groups. Being nonwhite was associated with an increased risk of EM.[16] Moreover, it is difficult to apply the same results to diverse populations without considering the culture context.

As the oldest and largest Asian American group in the United States, the population of the Chinese community was approximately 4.9 million in 2015.[18] Almost 80% of them were foreign born.[16] With almost every one in six (15%), the prevalence of EM among US Chinese older adults was higher than that reported in the US National Elder Mistreatment Study (11.4%).[2] This number may be underreported because Chinese older adults refrain from disclosing potential abuse to maintain family harmony and face.[20] Not only the aging process, but also immigration stress, such as language barriers, financial constraints, and other social changes, increase their needs for SS and risk for being vulnerable.[2,11]

Due to traditional cultural values, Chinese older adults tend to seek support from family, especially their spouses and adult children, rather than friends.[22] However, compared to friendship, spouse and child relationships are involuntary, creating both affections and conflicts.[23] It has been reported that family conflict serves as a risk factor for EM.[24,25] In addition, generation disparities in Eastern and Western values and practices could lead to social strain and insufficient family SS for Chinese older adults.[21] Given the changes in environment and culture collision, spousal and family support may not be accessible all the time. Friends would be the potential support source.[21] The European study has demonstrated that higher levels of SS from friends were associated with lower risks of EM.[9] However, the

relationship between NSS from friends and EM is unclear. It is, therefore, important to know which aspect of SS, and from which source, has influences on EM in this unique group. The various sources and variation in SS and EM have not been examined among US Chinese older adults. This study aimed to examine (1) the associations between overall PSS/NSS and EM and (2) the associations between PSS/NSS from spouse/family members/friends and EM among Chinese older adults in the United States.

METHODS

Population and Settings

The data were drawn from the Population Study of ChINese Elderly in Chicago (PINE), a community-engaged epidemiological study of Chinese older adults (60 years and older) in the Greater Chicago, area from 2011 to 2013. Of 3542 eligible participants approached, 3157 participants agreed to participate (response rate = 91.9%). Face-to-face home interviews were conducted by trained interviewers in multiple languages and dialects to meet participants' needs. Details of the study design and procedure have been published.[26–28] This study was approved by the Institutional Review Board of the Rush University Medical Center.

Independent Variables: Social Support

The 12-item SS scale, adapted from the Health and Retirement Study, is divided into two categories: PSS and NSS.

PSS was assessed by two questions from three sources (six items in total): how often you can open up to your spouse/family members/friends if you need to talk about your worries; how often you can rely on your spouse/family members/friends for help if you have a problem. Study participants rated the extent to which they experienced each item using a three-point scale (1 = hardly ever, 2 = sometimes, and 3 = often). The average score of six items was considered as overall PSS, ranging from 6 to 18 (Cronbach's $\alpha = 0.73$).[22] PSS score from spouse/family members/friends was calculated separately by two questions, ranging from 2 to 6. A higher score indicates a higher level of PSS.

NSS was measured by asking two items from three sources (six items in total): how often your spouse/family members/friends have(has) too many demands for you; how often your spouse/family members/friends criticize(s) you. Study participants rated the extent to which they experienced each item using a three-point scale (1 = hardly ever, 2 = sometimes, and 3 = often). The overall NSS score was averaged from total six items, ranging from 6 to 18 (Cronbach's $\alpha = 0.63$).[22] Different sources of NSS scores were calculated separately, ranging from 2 to 6. A higher score indicates a higher level of NSS.

Dependent Variable: Elder Mistreatment

In this study, we used the modified Vulnerability to Abuse Screening Scale and the Hwalek-Sengstok Elder Abuse Screening Test to assess EM. The scale consists of 10 items asking the participants if they have experienced any of the following since they turned 60 years old: (1) family conflicts, (2) felt uncomfortable with family members, (3) felt that nobody

wanted them around, (4) been told by someone that they gave too much trouble, (5) been afraid of family members, (6) felt that someone close tried to hurt or harm them, (7) been neglected or confined, (8) been called names or put down by someone close, (9) been forced by someone to do things, and (10) had belongings taken without permission. An affirmative "yes" to any of 10 items was considered as experiencing EM. The modified scale demonstrated satisfactory psychometric properties, with a Cronbach's α of 0.80 in our study sample.[29]

Covariates

The covariates used in this study were basic sociodemographic characteristics (age, sex), socioeconomic status (education, income), family structure indicators (marital status, living arrangement, and number of children alive), immigration-related factors (number of years living in the United States, number of years living in the community, language preference), and health-related characteristics (medical condition: sum of nine self-reported disease conditions including heart disease, stroke or brain hemorrhage, higher blood sugar or diabetes, high blood pressure, hypercholesterolemia, cancer, a broken or fractured hip, thyroid disease, and osteoarthritis, inflammation, or problems with joints; scores ranged from 0–9).

Statistical Analysis

We summarized the scores of PSS and NSS from varied sources by EM, using the unpaired *t*-test to contrast the differences between the groups with and without EM. The associations between SS variables and EM in Chinese older population were examined by multivariate logistic regressions, adjusting for the covariates. A series of logistic regression models were conducted using the step-wise procedure to identify potential confounding effects of the covariates: the first model (model 1) adjusted for age and sex. Education and income were added to model 2. Family structure indicators were added to model 3. Immigration factors were added into model 4. Medical condition was added to model 5. All data analyses were performed in SAS, version 9.2 (SAS Institute Inc, Cary, NC).

RESULTS

Scores of PSS and NSS by the Presence of EM

Sample demographic characteristics and social network results have been published.[22,30,31] Table 1 shows the scores of PSS and NSS from various sources by EM. Participants who experienced no EM had significantly higher overall PSS scores than those with EM (12.94 ± 3.14 vs 12.07 ± 3.43). Likewise, participants without EM had greater levels of PSS from spouse (4.33 ± 1.75 vs 3.95 ± 1.75) and family members (4.93 ± 1.22 vs 4.40 ± 1.44) than those with EM. However, there was no significant difference between two groups in PSS from friends (3.61 ± 1.48 vs 3.66 ± 1.54). In contrast, compared to participants with EM, the overall NSS score was significantly lower among those without EM (6.44 ± 1.14 vs 7.46 ± 2.02). Similar results were found between two groups in NSS from spouse (2.31 ± 0.71 vs 2.83 ± 1.14), family members (2.13 0.45 vs 2.51 ± 0.91), and friends (2.05 ± 0.30 vs 2.14 ± 0.47).

Associations Between Variations in SS and Risk for EM

There was a negative relationship between overall PSS and EM, and the results remained significant after considering different categories of covariates (Table 2). With every one-point increased overall PSS, people were 12% less likely to have self-reported EM (odds ratio [OR] = 0.88 [95% confidence interval {CI} = 0.85–0.91]). In contrast to PSS, overall NSS had positive relations with EM. The risk of EM raised 51% with every one-point increased overall NSS score (OR = 1.51 [95% CI = 1.41–1.61]) (Table 3, model 5).

Associations Between Variations in SS From Different Sources and Risk for EM

Having higher levels of PSS from spouse (OR = 0.70 [95% CI = 0.64–0.76]) and family members (OR = 0.73 [95% CI = 0.68–0.79]) was associated with the reduced risks of EM. However, the relationship between PSS from friends and EM was not statistically significant (Table 2, model 5). On the other hand, NSS from spouse/family members/friends was positively associated with EM. The risk for EM was 1.84 times if the level of NSS from spouse increased one point (OR = 1.84 [95% CI = 1.64–2.07]). Higher levels of NSS from family members were also linked to higher risk of self-reported EM (OR = 2.36 [95% CI = 2.03–2.75]). There is no significant relationship between PSS from friends and EM, while NSS from friends was significantly associated with EM (OR = 1.69 [95% CI = 1.32–2.17]) (Table 3, model 5). In addition, the significance of covariates varies across models. The results that higher education level and Cantonese/Taishanese language preference were associated with higher risk of EM remained consistent.

DISCUSSION

To our knowledge, this study was among the first to determine the relationships between sources and variations in SS and risk for EM among US Chinese older adults. Our findings indicated that (1) US Chinese older adults with higher levels of overall PSS, PSS from spouse, and PSS from family members were less likely to experience EM; (2) greater levels of overall NSS, NSS from spouse, and NSS from family members were associated with increased risks of EM; (3) PSS from friends and EM did not have a significant relationship, but NSS from friends and EM had the positive relation.

The findings of the potential positive effects of PSS from spouse and family members on EM in this study are consistent with previous research in other populations. A study from National Social Life, Health, and Aging Project suggested that greater levels of PSS from close relationships were related to lower reported rates of any EM, including verbal, financial, physical, and multiple types.[32] Our study also reported that older adults with higher levels of PSS from spouse and family members were less vulnerable to EM than their counterparts. The positive social interactions could have modifying effects on the interpersonal strain and on the occurrence and severity of EM.[15]

Our findings also found that greater levels of NSS from spouse and family members were linked to increased risk of EM. In our study sample, high levels of PSS and NSS from spouse and family members were obtained simultaneously.[22] Frequent contacts and interactions with spouse and other family members might generate strains and trigger EM,[33]

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and family disharmony was a risk factor for EM.[24] Such findings are consistent with previous studies suggesting that feeling uncomfortable with someone in the family (9.1%) and having family conflicts (6.7%) at home were the top two common forms of EM among US Chinese older adults.[31] Both of EM forms involved spouse and other family members. In Chinese values, making demands and criticism are generally the symbols of love and care. People believe it is the proper way for their loved ones to improve or live better without being aware of the consequences of NSS.

Interestingly, this study showed that PSS from friends was not significantly associated with EM. In contrast, existing evidence revealed that positive friends' support might improve older adults' well-being.[11] One possible explanation for such discrepancy is that social network members decrease with the aging process,[11] especially for those who immigrate in their late life.[22] Being of a similar age, most of older adults' friends face similar immigration stress. It may make PSS from friends less influential. In addition, Chinese older adults tended to seek support from their family rather than friends.[22] They were also more likely to have life satisfaction with more family-based support.[34] Based on previous findings, it was less likely for friendship to introduce conflicts and strains due to its voluntary character compared to the relationship with spouse and children.[35] Individuals could withdraw easily from an unsatisfying friendship.[35] This contradicts our result that NSS had positive association with EM. In Chinese traits, people value favors. This cultural value makes them difficult to decline friends' requests, intangibly increasing the demands for Chinese older adults. Another possible reason is that NSS from friends undermines older adults' self-efficacy or inner strength, which makes them more vulnerable to experience EM. Future qualitative studies are needed to explore the possible explanations in the Chinese cultural context.

No results would be interpreted without the context of limitations. First, NSS could have different forms, such as "interfering in another's affairs and discouraging the expression of feelings."[14] In this study, we only included criticism and demands. Second, we tested the relationships between SS variables and overall EM. Whether the study findings would differ in EM subtypes remains unclear. Third, EM was measured by a self-reported instrument, which might be subject to reporting bias. Lastly, the data were drawn from a cross-sectional study of US Chinese population. Therefore, causal relations and generalizability of the findings to other ethnic populations are uncertain.

Despite the limitations, PINE is the most extensive epidemiological research in western countries on the well-being of Chinese older adults.[36] This study is one of the first to expand the understanding of the relationships between sources and variations in SS and risks for EM in this population. Our findings have important clinical implications. It is known that EM victims use more healthcare services, including "emergency department visit, hospitalization, nursing home placement and hospice utilization."[37] Therefore, understanding the relationships stated in this article is critical for physicians, nurses, and other healthcare professionals to cultivate culturally appropriate screening and assessment strategies for EM. Healthcare professionals can also integrate adequate and proper family participation into healthcare assistance/services to enhance the spousal and family positive support. In the meanwhile, it is important to provide essential educational sessions, establish

safety plans, and direct social/legal services to raise the awareness of NSS and to strengthen EM protection among US Chinese older adults. New insights are provided for future studies to further explore (1) the relationships between sources and variations in SS and EM subtypes and (2) cultural explanations of friends' support on EM.

CONCLUSIONS

This study's findings suggest that higher levels of SS were not always associated with lower risk of EM among US Chinese older adults. Higher levels of NSS were associated with increased risk of EM. Future qualitative or longitudinal research needs to explore detailed cultural explanations and casual relationships between SS variables and EM.

ACKONWLEDGEMENTS

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Table 1.

The Scores of Positive Social Support and Negative Social Support From Different Sources by the Presence of Elder Mistreatment[a]

Variable	Elder Mistreatment		
	Yes (N = 474)	No (N = 2657)	*P* Value
Overall positive social support	12.07 ± 3.43	12.94 ± 3.14	<.001
Positive social support from spouse	3.95 ± 1.75	4.33 ± 1.75	<.001
Positive social support from family members	4.40 ± 1.44	4.93 ± 1.22	<.001
Positive social support from friends	3.66 ± 1.54	3.61 ± 1.48	.7
Overall negative social support	7.46 ± 2.02	6.44 ± 1.14	<.001
Negative social support from spouse	2.83 ± 1.14	2.31 ± 0.71	<.001
Negative social support from family members	2.51 ± 0.91	2.13 ± 0.45	<.001
Negative social support from friends	2.14 ± 0.47	2.05 ± 0.30	<.001

[a]Values are expressed as mean ± SD. The ratings of negative aspect in overall social support were reversed.

Table 2.

The Association Between Positive Social Support From Different Sources and Risk for Elder Mistreatment[a]

Variable	Model A	Model B	Model C	Model D	Model E
Age	0.99 (0.97–1.00) *	0.99 (0.98–1.00)	0.99 (0.98–1.00)	0.99 (0.97–1.00)	0.98 (0.98–1.00) **
Female sex	1.10 (0.90–1.34)	1.37 (1.11–1.69) **	1.45 (1.16–1.81) ***	1.28 (1.02–1.61) *	1.26 (1.00–1.58) **
Education		1.12 (1.09–1.14) ***	1.45 (1.16–1.81) ***	1.05 (1.02–1.08) ***	1.05 (1.02–1.08) ***
Income		0.99 (0.92–1.08)	1.00 (0.92–1.08)	1.01 (0.92–1.10)	1.01 (0.93–1.10)
Married			1.29 (0.98–1.69)	1.29 (0.98–1.70)	1.23 (0.98–1.71)
Living arrangement			0.98 (0.92–1.04)	0.98 (0.92–1.04)	0.98 (0.92–1.04)
No. of children alive			0.95 (0.88–1.03)	0.97 (0.90–1.05)	0.97 (0.90–1.05)
Years in the United States				1.01 (1.00–1.02)	1.01 (1.00–1.02)
Years in the community				0.99 (0.97–1.00) *	0.99 (0.98–1.00) *
Language preference				0.39 (0.30–0.52) ***	0.39 (0.29–0.51) ***
Medical conditions					1.05 (0.98–1.13)
Positive social support	**0.88 (0.85–0.91)** ***	**0.89 (0.86–0.92)** ***	**0.88 (0.84–0.91)** ***	**0.88 (0.84–0.91)** ***	**0.88 (0.85–0.91)** ***
Age	0.98 (0.97–1.00) *	0.99 (0.97–1.00) *	0.99 (0.98–1.01)	0.99 (0.97–1.00)	0.98 (0.97–1.00)
Female sex	0.95 (0.77–1.18)	1.15 (0.92–1.43)	1.26 (1.01–1.57) *	1.11 (0.88–1.40)	1.09 (0.86–1.37)
Education		1.11 (1.09–1.14) ***	1.10 (1.08–1.13) ***	1.05 (1.02–1.08) **	1.04 (1.02–1.07) **
Income		0.99 (0.91–1.07)	1.00 (0.92–1.08)	1.01 (0.92–1.10)	1.01 (0.92–1.10)
Married			2.40 (1.69–3.41) ***	2.46 (1.72–3.52) ***	2.47 (1.73–3.54) ***
Living arrangement			0.99 (0.93–1.05)	0.98 (0.92–1.05)	0.99 (0.93–1.05)
No. of children alive			0.94 (0.87–1.02)	0.96 (0.88–1.04)	0.96 (0.88–1.04)
Years in the United States				1.01 (1.00–1.02)	1.01 (1.00–1.02)
Years in the community				0.99 (0.97–1.00) *	0.99 (0.97–1.00) *
Language preference				0.40 (0.30–0.53) ***	0.41 (0.31–0.54) ***
Medical conditions					1.07 (0.99–1.15)
Positive social support from spouse	**0.86 (0.81–0.92)** ***	**0.83 (0.78–0.88)** ***	**0.71 (0.64–0.77)** ***	**0.70 (0.64–0.76)** ***	**0.70 (0.64–0.77)** ***
Age	0.99 (0.98–1.00)	0.99 (0.98–1.01)	0.99 (0.98–1.01)	0.99 (0.97–1.00)	0.99 (0.97–1.00)
Female sex	1.30 (1.06–1.59) *	1.59 (1.28–1.96) ***	1.53 (1.22–1.92) ***	1.36 (1.08–1.71) **	1.33 (1.05–1.68) *

Variable	Model A	Model B	Model C	Model D	Model E
Education		1.10 (1.08–1.13) ***	1.10 (1.07–1.13) ***	1.05 (1.02–1.08) **	1.05 (1.02–1.08) **
Income		0.99 (0.91–1.07)	0.98 (0.90–1.07)	1.00 (0.91–1.09)	1.00 (0.92–1.09)
Married			0.90 (0.70–1.17)	0.89 (0.69–1.16)	0.90 (0.69–1.17)
Living arrangement			0.99 (0.94–1.06)	0.99 (0.93–1.05)	0.99 (0.93–1.06)
No. of children alive			0.96 (0.89–1.04)	0.98 (0.91–1.06)	0.98 (0.91–1.06)
Years in the United States				1.01 (1.00–1.02)	1.01 (1.00–1.02)
Years in the community				0.98 (0.98–1.00)	0.99 (0.98–1.00)
Language preference				0.42 (0.32–0.56) ***	0.43 (0.32–0.57) ***
Medical conditions					1.06 (0.99–1.14)
Positive social support from family members	**0.72 (0.67–0.78)** ***	**0.72 (0.66–0.77)** ***	**0.72 (0.67–0.78)** ***	**0.73 (0.67–0.79)** ***	**0.73 (0.68–0.79)** ***
Age	0.99 (0.98–1.01)	1.00 (0.98–1.01)	0.99 (0.98–1.01)	0.99 (0.97–1.00)	0.98 (0.97–1.00) *
Female sex	1.15 (0.94–1.41)	1.44 (1.16–1.77) ***	1.37 (1.09–1.71) **	1.23 (0.98–1.54)	1.20 (0.95–1.51)
Education		1.10 (1.08–1.13) ***	1.10 (1.07–1.12) ***	1.04 (1.01–1.07) **	1.04 (1.01–1.07) **
Income		1.00 (0.92–1.08)	0.99 (0.91–1.08)	1.00 (0.91–1.09)	1.00 (0.92–1.09)
Married			0.87 (0.68–1.13)	0.87 (0.67–1.13)	0.88 (0.68–1.14)
Living arrangement			0.97 (0.91–1.03)	0.97 (0.91–1.03)	0.97 (0.91–1.03)
No. of children alive			0.95 (0.88–1.03)	0.97 (0.90–1.05)	0.97 (0.90–1.05)
Years in the United States				1.01 (1.00–1.02)	1.01 (1.00–1.02)
Years in the community				0.99 (0.97–1.00) *	0.99 (0.97–1.00) *
Language preference				0.39 (0.30–0.52) ***	0.40 (0.30–0.53) ***
Medical conditions					1.06 (0.99–1.14)
Positive social support from friends	**1.01 (0.95–1.08)**	**0.96 (0.90–1.03)**	**0.95 (0.89–1.02)**	**0.94 (0.89–1.01)**	**0.94 (0.88–1.01)**

[a]Data are given as odds ratio (95% confidence interval).

Sex: 1 = female, 0 = male; marital status: 1 = married, 0 = other (separated, divorced, widowed, never married); living arrangement = number of people who live in the household; language preference: 1 = Cantonese, Taishanese, 0 = Mandarin, English; and medical conditions = sum of nine self-reported disease conditions, including heart disease, stroke or brain hemorrhage, high blood sugar or diabetes, high blood pressure, hypercholesterolemia, cancer, a broken or fractured hip, thyroid diseases, and osteoarthritis, inflammation, or problems with joints (scores range from 0–9).

*
$P < .05$,

**
$P < .01$,

***
$P < .001$.

Table 3.

The Association Between Negative Social Support From Different Sources and Elder Mistreatment[a]

Variable	Model A	Model B	Model C	Model D	Model E
Age	1.00 (0.99–1.01)	1.00 (0.99–1.01)	0.99 (0.98–1.01)	0.99 (0.97–1.00)	0.98 (0.97–1.00)
Female sex	1.38 (1.12–1.70) **	1.60 (1.29–2.00) ***	1.42 (1.13–1.79) **	1.27 (1.01–1.61) *	1.24 (0.98–1.57)
Education		1.08 (1.06–1.106) ***	1.08 (1.06–1.11) ***	1.03 (1.01–1.06) *	1.03 (1.00–1.06) *
Income		1.00 (0.92–1.09)	0.99 (0.91–1.07)	0.99 (0.91–1.08)	1.00 (0.91–1.09)
Married			0.66 (0.50–0.86) **	0.66 (0.50–0.87) **	0.66 (0.51–0.87) **
Living arrangement			0.96 (0.90–1.02)	0.96 (0.90–1.02)	0.96 (0.90–1.02)
No. of children alive			0.96 (0.88–1.04)	0.97 (0.90–1.06)	0.97 (0.89–1.05)
Years in the United States				1.01 (1.00–1.02)	1.01 (1.00–1.02)
Years in the community				0.98 (0.97–1.00) **	0.98 (0.97–1.00) **
Language preference				0.46 (0.34–0.61) ***	0.44 (0.33–0.59) ***
Medical conditions					1.07 (0.99–1.15)
Negative social support	**1.54 (1.44–1.64)** ***	**1.49 (1.40–1.59)** ***	**1.53 (1.43–1.63)** ***	**1.50 (1.41–1.61)** ***	**1.51 (1.41–1.61)** ***
Age	1.00 (0.99–1.01)	1.00 (0.99–1.01)	0.99 (0.98–1.01)	0.99 (0.97–1.00)	0.98 (0.97–1.00)
Female sex	1.44 (1.16–1.78) ***	1.67 (1.34–2.08) ***	1.45 (1.15–1.83) **	1.30 (1.02–1.64) *	1.27 (1.00–1.61)
Education		1.08 (1.06–1.10) ***	1.08 (1.05–1.10) ***	1.03 (1.00–1.06) *	1.03 (1.00–1.06) *
Income		1.00 (0.92–1.09)	0.99 (0.91–1.07)	0.99 (0.90–1.08)	0.99 (0.90–1.09)
Married			0.57 (0.43–0.75) ***	0.58 (0.44–0.77) ***	0.58 (0.44–0.77) ***
Living arrangement			0.97 (0.91–1.03)	0.97 (0.91–1.03)	0.97 (0.91–1.04)
No. of children alive			0.94 (0.87–1.02)	0.96 (0.88–1.04)	0.96 (0.88–1.04)
Years in the United States				1.01 (1.00–1.02) *	1.01 (1.00–1.02) *
Years in the community				0.98 (0.97–1.00) *	0.98 (0.97–1.00) *
Language preference				0.45 (0.34–0.60) ***	0.45 (0.34–0.60) ***
Medical conditions					1.07 (1.00–1.15)
Negative social support from spouse	**1.89 (1.70–2.10)** ***	**1.76 (1.58–1.96)** ***	**1.90 (1.69–2.13)** ***	**1.84 (1.64–2.06)** ***	**1.84 (1.64–2.07)** ***
Age	0.99 (0.98–1.01)	1.00 (0.98–1.01)	0.99 (0.98–1.01)	0.99 (0.97–1.00)	0.98 (0.97–1.00) *

Variable	Model A	Model B	Model C	Model D	Model E
Female sex	1.17 (0.95–1.43)	1.40 (1.13–1.73) **	1.31 (1.05–1.65) *	1.17 (0.93–1.47)	1.14 (0.90–1.44)
Education		1.10 (1.07–1.12) ***	1.09 (1.07–1.12) ***	1.04 (1.01–1.07) *	1.04 (1.01–1.07) *
Income		1.00 (0.92–1.08)	0.99 (0.91–1.08)	1.00 (0.91–1.09)	1.00 (0.92–1.09)
Married			0.86 (0.66–1.12)	0.86 (0.66–1.12)	0.86 (0.66–1.13)
Living arrangement			0.96 (0.90–1.02)	0.95 (0.89–1.02)	0.96 (0.90–1.02)
No. of children alive			0.95 (0.88–1.03)	0.97 (0.89–1.06)	0.97 (0.89–1.06)
Years in the United States				1.01 (1.00–1.02) *	1.01 (1.00–1.02) *
Years in the community				0.98 (0.97–1.00) **	0.98 (0.97–1.00) **
Language preference				0.41 (0.31–0.55) ***	0.41 (0.31–0.55) ***
Medical conditions					1.07 (1.00–1.15)
Negative social support from family members	**2.33 (2.02–2.69)** ***	**2.28 (1.96–2.64)** ***	**2.30 (1.98–2.67)** ***	**2.35 (2.02–2.74)** ***	**2.36 (2.03–2.75)** ***
Age	0.99 (0.98–1.01)	1.00 (0.99–1.01)	1.00 (0.98–1.01)	1.00 (0.97–1.00)	0.99 (0.97–1.00)
Female sex	1.16 (0.95–1.42)	1.41 (1.14–1.74) ***	1.34 (1.08–1.68) **	1.20 (0.96–1.51)	1.18 (0.94–1.48)
Education		1.10 (1.08–1.12) ***	1.09 (1.07–1.12) ***	1.04 (1.01–1.07) **	1.04 (1.01–1.07) **
Income		0.99 (0.91–1.07)	0.98 (0.90–1.06)	0.99 (0.91–1.08)	0.99 (0.91–1.08)
Married			0.88 (0.68–1.13)	0.88 (0.68–1.13)	0.88 (0.68–1.14)
Living arrangement			0.97 (0.92–1.03)	0.97 (0.91–1.03)	0.97 (0.92–1.04)
No. of children alive			0.95 (0.88–1.03)	0.98 (0.90–1.06)	0.98 (0.90–1.06)
Years in the United States				1.01 (1.00–1.02)	1.01 (1.00–1.02)
Years in the community				0.99 (0.97–1.00) *	0.99 (0.97–1.00) *
Language preference				0.42 (0.31–0.55) ***	0.42 (0.32–0.55) ***
Medical conditions					1.07 (0.99–1.14)
Negative social support from friends	**1.83 (1.45–2.32)** ***	**1.81 (1.43–2.31)** ***	**1.77 (1.39–2.25)** ***	**1.69 (1.32–2.16)** ***	**1.69 (1.32–2.17)** ***

[1]Data are given as odds ratio (95% confidence interval).

Sex: 1 = female, 0 = male; marital status: 1 = married, 0 = other (separated, divorced, widowed, never married); living arrangement = number of people who live in the household; language preference: 1 = Cantonese, Taishanese, 0 = Mandarin, English; and medical conditions = sum of nine self-reported disease conditions, including heart disease, stroke or brain hemorrhage, high blood sugar or diabetes, high blood pressure, hypercholesterolemia, cancer, a broken or fractured hip, thyroid diseases, and osteoarthritis, inflammation, or problems with joints (scores range from 0–9).

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P < .01,

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$P < .001.$

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