



Published in final edited form as:

*Gerontology*. 2015 December ; 62(1): 71–80. doi:10.1159/000437420.

## The Association between Elder Mistreatment and Suicidal Ideation among Community-Dwelling Chinese Older Adults in the U.S

**XinQi Dong,**

Rush Institute for Healthy Aging, Rush University Medical Center, 1645 West Jackson, Suite 675, Chicago, IL

**Ruijia Chen,**

Rush Institute for Healthy Aging, Rush University Medical Center, 1645 West Jackson, Suite 675, Chicago, IL 60612, USA

**Bei Wu,**

ADAPT Center / Center for the Study of Aging, Duke University, Durham, North Carolina, USA

**Ning Jackie Zhang,**

College of Health and Public Affairs, University of Central Florida, Orlando, Florida, USA

**Ada Chan Yuk-Sim Mui, and**

Columbia University, New York, N.Y., USA

**Iris Chi**

University of Southern California, Los Angeles, Calif., USA

### Abstract

**Background**—Elder mistreatment and suicidal ideation are important public health concerns among aging populations. However, very few studies have been conducted to explore the association between elder mistreatment and suicidal ideation.

**Objectives**—To examine the association between elder mistreatment and suicidal ideation among Chinese older adults in the U.S.

**Methods**—Guided by a community-based participatory research approach, this study conducted in-person interviews with Chinese older adults aged 60 years and older in the Greater Chicago Area from 2011–2013. Elder mistreatment was assessed by a 10-item instrument derived from the Hwalek-Sengstok Elder Abuse Screening Test (H-S/EAST) and the Vulnerability to Abuse Screening Scale (VASS). Suicidal ideation was assessed by the ninth item of the Patient Health Questionnaire (PHQ-9) and the Geriatric Mental State Examination-Version A (GMS-A).

**Results**—Overall, 3,159 Chinese older adults participated in this study and the mean age was 72.8. After controlling for age, gender, education, income, medical comorbidities, depressive symptoms, and social support, elder mistreatment was significantly associated with increased risk

for 2-week suicidal ideation (OR 2.46, 95% CI 1.52 – 4.01) and 12-month suicidal ideation (OR 2.46, 95% CI 1.62 – 3.73). With respect to gender differences, the study found that the association remained significant in older women but not in older men after adjusting for all confounding factors.

**Conclusion**—As the largest epidemiology study conducted among Chinese older adults in the U.S., this study suggests that elder mistreatment was a risk factor for 2-week and 12-month suicidal ideation in older women but not in older men. Longitudinal studies should be conducted to explore the mechanisms through which elder mistreatment links with suicidal ideation.

### Keywords

suicidal ideation; elder mistreatment; Chinese; older adults

## INTRODUCTION

Elder mistreatment, which refers to the intentional actions that result in harm or create a serious risk of harm to a vulnerable older adult or a caregiver's failure to satisfy the elder's basic needs and safe living conditions [1], is a growing public health and human rights issue. It is suggested that one in ten older adults has suffered from elder mistreatment in the previous year [2]. Existing literature, albeit limited, has found that elder mistreatment may lead to physical and cognitive function declines [3;4], mental health problems [5;6], and mortality [7]. Although previous research has documented potential adverse outcomes of elder mistreatment, there is a dearth of research on its association with suicidal ideation, a growing health issue among older adults.

Due to age-related declines in physical function and mental health as well as decreases in social network, older adults are prone to a high risk of suicidal ideation [8–10]. Research has indicated that the worldwide prevalence of suicidal ideation in older adults ranges from 2.6% to 16.7%, depending on the methodologies used such as study settings, measurements, and recruitment strategies [11]. Suicidal ideation has been found to be a significant risk factor for both suicide attempts and completed suicide among older adults. For example, Waern et al. studied 85 elderly aged 65 years and older who died by suicide and found that 28.2% of the cases had suicidal ideation during the year proceeding suicide [12]. In order to prevent suicidal behavior among older adults, knowledge of factors associated with suicidal ideation is crucial.

Extant literature has documented a variety of sociodemographic, physical, and mental health factors that are associated with suicidal ideation [8;10;13]. Using data from the Canadian Community Health Survey, Corna et al. found that being male, younger, widowed, having lower social support, and having higher psychological distress were associated with increased likelihood of suicidal ideation among adults aged 55 years and older [8]. A cross-sectional study of Chinese older adults aged 60 years and above in Hong Kong suggested that lower physical function, poor mental health, and financial and relationship problems were associated with increased risk for suicidal ideation [10]. In a study of 1,061 older patients aged 60 years and over in Australia, depressive feelings were significantly associated with suicidal ideation [9]. A growing body of literature has also examined the

association between traumatic experience and suicidal ideation. This line of research consistently suggests that traumatic events have positive association with victims' suicidal ideation [14–16]. Further, a cross-national analysis of data from the WHO World Mental Health Survey demonstrates that among the traumatic events, interpersonal violence had the strongest effect on suicidal behavior [17]. Unfortunately, these studies primarily focused on child abuse and intimate partner violence [18], whereas the association between elder mistreatment and suicidal ideation has not yet been well established.

The interplay of elder mistreatment and suicidal ideation may vary by cultural, racial, and ethnic backgrounds. In Confucian philosophy where harmony is highly valued, unfavorable interpersonal relationships may carry stigma and decrease older adults' self-esteem to a large extent. Earlier studies that examined the association between interpersonal relationship and suicidal ideation have been focused on family dysfunction [19;20]. Little research, however, has been conducted to understand the association between elder mistreatment and suicidal ideation. To the best of our knowledge, only one study explored the association between elder mistreatment and suicidal ideation in Chinese older adults. Wu et al. conducted a survey with 2,039 Chinese older adults and found that elder mistreatment was associated with increased risk for suicidal ideation [21]. Nevertheless, the study was restricted to older adults in rural China, and thus the finding may not be generalizable to Chinese older adults in the U.S., who have different socio-economic backgrounds, are enrolled in different health care systems, and who tend to be confronted with significant linguistic and cultural barriers [22–26].

Although there is evidence that suicidal ideation and elder mistreatment are prevalent among Chinese older adults in the U.S. [27;28], we are unaware of any study that examines the association between elder mistreatment and suicidal ideation in this population. Further, prior studies documented that Chinese older women were more likely to experience suicidal ideation than older men [10;29], implying that there may be gender differences in factors associated with suicidal ideation. Building upon this previous study, the purposes of this study were to: 1) explore the association between elder mistreatment and suicidal ideation among Chinese older adults in the U.S.; and 2) understand gender differences with respect to the association between suicidal ideation and elder mistreatment.

## METHODS

### 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 over in the greater Chicago area. The project was initiated by a synergistic community-academic collaboration among the Rush Institute for Healthy Aging, Northwestern University, and many community-based social services agencies and organizations throughout the greater Chicago area.

## Study Design and Procedure

In order to ensure study relevance to the well-being of the Chinese community and increase community participation, the PINE study implemented extensive culturally and linguistically appropriate community recruitment strategies strictly guided by a community-based participatory research (CBPR) approach. The formation of this community-academic partnership allowed us to develop appropriate research methodology in accordance with the local Chinese cultural context, in which a community advisory board (CAB) plays a pivotal role in providing insights and strategies for conducting research. Board members were community stakeholders and residents. Over twenty social services agencies, community centers, health advocacy agencies, faith-based organizations, senior apartments and social clubs served as the basis of study recruitment sites.

Community-dwelling older adults aged 60 years and over and who self-identified as Chinese were eligible to participate in the study. Out of 3,542 eligible older adults approached, 3,159 agreed to participate in the study from 2011 to 2013, yielding a response rate of 91.9 %. In order to ensure cultural and linguistic sensitivity, trained multicultural and multilingual interviewers conducted face-to-face home interviews with participants in their preferred language and dialects, such as English, Cantonese, Taishanese, Mandarin, or Teochew. Based on the available census data drawn from the 2010 U.S. Census 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 [30]. The study was approved by the Institutional Review Boards of the Rush University Medical Center. Further in-depth details of the PINE study design are published elsewhere [31].

## Measurements

### Independent Variable

**Elder Mistreatment:** The elder mistreatment instrument used in this study was derived from items first developed by Hwalek and Sengstock (Hwalek-Sengstock Elder Abuse Screening Test) in 1986 and then modified by Scholfield and Mishra (the Vulnerability to Abuse Screening Scale) in 2003 [32;33]. Modified VASS has been administered in Chinese elderly populations both in mainland China and the U.S. [34;35]. Participants were asked if they had the following experience after they turned 60: 1) family conflicts at home; 2) felt uncomfortable with someone in the family; 3) felt that nobody wanted them around; 4) been told by someone that they caused too much trouble; 5) been afraid of someone in the family; 6) felt that someone close tried to hurt or harm them; 7) been neglected or confined; 8) been called a name or put down; 9) been forced by someone to do things; 10) someone took belongings without permission. A “yes” response to any of the above questions was considered as having experienced elder mistreatment in the present study. Modified VASS has been administered in Chinese elderly populations in mainland China [34;35]. The scale has demonstrated good reliability in this study sample, with Cronbach’s alpha of 0.80.

### Dependent Variable

**Suicidal Ideation:** Given that prior research has shown that factors associated with suicidal ideation during extended periods of time may be different from more recent ones [36], this

study assessed suicidal ideation in the previous two weeks and in the last twelve months, to better elucidate the association between elder mistreatment and suicidal ideation. Suicidal ideation in the previous two weeks was assessed by the ninth item of the Patient Health Questionnaire (PHQ-9), a screening instrument for depressive symptoms over the past two weeks [37]. Participants were asked how often they thought they would be better off dead or of hurting themselves in some way over the last two weeks. Questions were categorized as 1) not at all; 2) several days; 3) more than half the days; and 4) nearly every day. Any affirmative response to option 2 through option 4 was defined as having 2-week suicidal ideation. Suicidal ideation in the past twelve months were measured by the Geriatric Mental State Examination-Version A (GMS-A), which is a semi-structured interview guide designed for the elderly [38]. Participants were asked: have you ever felt suicidal or wished to be dead in the past twelve months. The question elicited a yes or no answer. A “yes” response to the above question classified a respondent as having 12-month suicide ideation. The Chinese version has been validated in earlier studies [(10)

### **Confounding Variables**

**Sociodemographic Characteristics:** Basic sociodemographic information included age (years), gender, years of education, and annual personal income.

**Medical Comorbidities:** To assess medical comorbidities, participants were asked if they had ever been told by a doctor, nurse, or therapist that they had: 1) heart disease, heart attack, coronary thrombosis, coronary occlusion, or myocardial infarction; 2) stroke or brain hemorrhage; 3) cancer, malignancy, or a tumor of any type; 4) high cholesterol; 5) diabetes, sugar in the urine, or high blood sugar; 6) high blood pressure; 7) a broken or fractured hip; 8) thyroid disease; or 9) osteoarthritis or inflammation or problems with joints. The number of medical comorbidities was calculated by totaling the number of “yes” responses to the nine items listed earlier.

**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 (DSM-IV) depression symptom criteria [37]. Participants were asked if they had the following symptoms in the last two weeks: 1) changes in sleep; 2) changes in appetite; 3) fatigue; 4) feelings of sadness or irritability; 5) loss of interest in activities; 6) inability to experience pleasure, feelings of guilt or worthlessness; 7) inability to concentrate or making decisions; and 8) feeling restless or slowed down. The ninth item of PHQ-9 was used to assess 2-week suicidal ideation, as described previously. Respondents indicated answers to each question on a four-point scale ranging from 0 = “not at all” to 3 = “nearly every day”. Participants who indicated their answers other than “not at all” to any of the eight questions were considered as having any depressive symptoms. The PHQ-9 has been validated among Chinese Americans and has good inter-rater reliability [39]. The standardized Cronbach’s alpha of PHQ-9 in the PINE study was 0.82.

**Social Support:** We assessed the current levels of social support by asking both the positive aspects of social support and negative aspects of social support. Regarding positive aspects

of social support, participants were asked how frequent they were able to open to or seek help from their spouses, family members, and friends. As for negative social support, participants were asked how frequently they felt they were demanded too much or criticized by their spouses, family members, and friends. Respondents indicated answers to each question on a 3-point scale ranging from 1 = “hardly ever” to 3 = “often”. Negative aspects of social support were recoded as 1 = “often” to 3 = “hardly ever”. Social support was calculated as the sum of all twelve items.

### Data Analysis

We first used chi-square tests and t-tests to compare sociodemographic characteristics, medical comorbidities, depressive symptoms, social support, and elder mistreatment among older adults with and without 2-week and 12-month suicidal ideation among the general populations. We then separated the analysis by gender to understand the sociodemographic and socioeconomic characteristics in women and men, respectively. To examine the association between elder mistreatment and suicidal ideation, we utilized logistic regression models to control for potential confounding factors, which were drawn from literature review. Model A was adjusted for basic sociodemographic characteristics, including age and sex. The next model (Model B) added additional socioeconomic variables, including education and income. In Model C, we added the number of medical comorbidities to the previous model. We then added depressive symptoms as a potential confounder into Model D. In the final model (E), we added social support and all other confounders into the analysis with suicidal ideation as the dependent variable. Odds ratios (ORs), 95% confidence intervals (CIs), and p-values were reported for multivariate analyses. The multivariate analysis was then repeated among men and women separately. The Hosmer-Lemeshow goodness-of-fit test was used in assessing the overall goodness of fit of the models. All statistical analyses were conducted using SAS, Version 9.2 (SAS Institute Inc., Cary).

## RESULTS

### Characteristics of All Participants by the Presence of Suicidal Ideation

Overall, 1,862 (58.9%) older women and 1,297 (41.1%) older men participated in this study, and the average age of all participants was 72.8. A total of 4.7% of the older women and 1.9% of the older men reported 2-week suicidal ideation; 6.5% of the older women and 2.6% of the older men had 12-month suicidal ideation. The prevalence of elder mistreatment in older women and older men was 15.8% and 14.3%, respectively.

Older adults with 2-week suicidal ideation were more likely to be older women, with lower educational levels, with more medical comorbidities, with heart disease, report osteoarthritis, inflammation, or problems with joints, with higher levels of depressive symptoms, and have lower social support.

Likewise, older adults who experienced 12-month suicidal ideation were more likely to be older, women, have lower educational levels, with more medical comorbidities, with heart

disease, with osteoarthritis, inflammation, or problems with joints, with higher levels of depressive symptoms (, and report lower social support (Table 1).

### **Characteristics of Older Women and Older Men by the Presence of Suicidal Ideation**

Chinese older women with 2-week suicidal ideation differed significantly from those without suicidal ideation by age, number of medical comorbidities, heart disease, osteoarthritis, inflammation, or problems with joints, depressive symptoms, and social support. On the other hand, older women with 12-month suicidal ideation were more likely to be with older age, have heart disease, with more medical comorbidities, have osteoarthritis, inflammation, or problems with joints, report greater levels of depressive symptoms, and have lower social support.

Older men who were with 2-week suicidal ideation were more likely to have a greater number of medical comorbidities, endorse depressive symptoms, and have lower social support than those without 2-week suicidal ideation. Compared with older men without 12-month suicidal ideation, those with 12-month suicidal ideation were more likely to have stroke, depressive symptoms, and lower social support (Table 2).

### **The Prevalence of Elder Mistreatment by the Presence of Suicidal Ideation**

The prevalence of elder mistreatment by suicidal ideation is shown in Table 3. Older adults who experienced 2-week suicidal ideation (42.7% vs. 14.1%,  $p < 0.001$ ) and 12-month suicidal ideation (40.7% vs. 13.9%,  $p < 0.001$ ) had significantly higher prevalence of elder mistreatment than those without suicidal ideation.

In older women, the prevalence of elder mistreatment among those with 2-week (42.4% vs. 14.5%,  $p < 0.001$ ) and 12-month suicidal ideation (40.5% vs. 14.1%,  $p < 0.001$ ) was significantly higher than those without suicidal ideation. Similar findings were found in older men; those who experienced 2-week (44.0% vs. 13.7%,  $p < 0.001$ ) and 12-month suicidal ideation (41.2% vs. 13.6%,  $p < 0.001$ ) also reported significantly higher rates of elder mistreatment.

### **Association between Elder Mistreatment and 2-week and 12-month Suicidal Ideation among All Participants**

The association between elder mistreatment and 2-week and 12-month suicidal ideation among all participants is presented in Table 4. In the full model that controlled for age, gender, years of education, income, medical comorbidities, depressive symptoms, and social support, older adults who experienced elder mistreatment were 2.46 times more likely to report 2-week suicidal ideation (OR 2.46, 95% CI 1.52–4.01) and 2.46 times more likely to experience 12-month suicidal ideation (OR 2.46, 95% CI 1.62–3.73) than those who did not experience elder mistreatment. The model fit indexes to the data were good (Hosmer-Lemeshow test:  $p > 0.05$ ).

## Association between Elder Mistreatment and Suicidal Ideation in Older Women and Older Men

Table 5 presents the association between elder mistreatment and suicidal ideation in older women and older men. After adjusting for age, gender, education, income, medical comorbidities, depressive symptoms, and social support, older women with elder mistreatment were more likely to experience 2-week suicidal ideation (OR 2.60, 95% CI 1.47–4.57) and 12-month suicidal ideation (OR 2.65, 95% CI 1.63–4.32) than older women without elder mistreatment.

However, among older men, after adding social support into the final model, no significant association between elder mistreatment and suicidal ideation was found, indicating that social support may mediate the association between elder mistreatment and suicidal ideation in older men.

## DISCUSSION

This study, to our knowledge, is the first to examine the association between elder mistreatment and suicidal ideation among Chinese older adults in the U.S. In this study, elder mistreatment was significantly associated with increased risk for 2-week and 12-month suicidal ideation among all the participants. However, of greater interest, after adding social support into the full model, the association remained significant in older women but not in older men. The findings of this study provide important empirical support for possible preventions and interventions for reducing suicidal ideation among U.S. Chinese older populations.

Elder mistreatment appears to be significantly associated with suicidal ideation after controlling for several important confounders. This finding is consistent with a study conducted in Hubei, China, which suggests that elder mistreatment was a risk factor for suicidal ideation among 2,039 Chinese older adults [21]. Several potential mechanisms may help explain the association between elder mistreatment and suicidal ideation among Chinese older adults. In a culture where respect for elders is highly valued, elder mistreatment may evoke feelings of shame, decrease older adults' self-esteem, and render thoughts that life is not worth living. In addition, older adults who experience elder mistreatment may be less likely to engage in social activities, which may increase their risk of loneliness and depression [40], and ultimately lead to suicidal ideation. This may be especially true among immigrant older adults. As many immigrant older adults, especially newcomers, may have experienced a decline in size of social network during the course of immigration, they may depend more on their family members or trusted friends. Thus, if victimized by their trusted ones, these older adults may feel more helpless and are less able to cope with the stress. Another possible explanation is that abusive acts may induce physical injuries that could potentially exacerbate physical function declines and decrease older adults' willingness to live [41]. The findings also demonstrate that degrees of the association between elder mistreatment and suicidal ideation seem to be influenced greatly by depressive symptoms. Further studies may need to explore how depressive symptoms interact with elder mistreatment and suicidal ideation among this population.



Interestingly, elder mistreatment was associated with 2-week and 12-month suicidal ideation in older women but not in older men. This finding is in contrast to a study conducted in Sweden, in which elder mistreatment was associated with greater risk for suicidal ideation in older men than older women [42]. In Chinese culture, women tend to play subordinate roles, which may expose them to financial, education and employment disadvantages. Therefore, when being mistreated, older women may have fewer resources for recovery than older men. Compared with Chinese older men, older women may also have less effective coping strategies. For example, when facing life stress and trauma, women tend to employ passive coping strategies such as rumination while men are more likely to use active coping strategies [43]. Therefore, elder mistreatment may have more deleterious impact on women's mental health. It should be noted that elder mistreatment was associated with suicidal ideation in older men when controlling for sociodemographic characteristics, medical comorbidities, and depressive symptoms. However, after adding social support, no significant association was found, indicating that social support may protect male elder mistreatment victims from suffering from suicidal ideation.

The findings of this study should be interpreted in light of several limitations. First, elder mistreatment and suicidal ideation are all self-reported, which may be subject to reporting bias. Of importance is the fact that our findings are strengthened by the utilization of the community-based participatory research approach, which enabled us to obtain the trust of the participants and thus might help us reduce potential reporting bias. Second, this study used a cross-sectional design and we were unable to clarify the time sequence of elder mistreatment and suicidal ideation and to establish the temporal association between elder mistreatment and suicidal ideation. Future longitudinal studies should elucidate the mechanisms through which elder mistreatment links with suicidal ideation. Third, although the study has adjusted for potential confounders, there might be unknown or unmeasured confounders that we failed to include in the analysis. Finally, we did not examine the association between elder mistreatment subtypes such as psychological mistreatment and physical mistreatment with suicidal ideation. We believe that future studies should be carried out to understand the association between specific subtypes of elder mistreatment and suicidal ideation.

Despite the limitations, this study has many important implications for research, policy and community social service development. As elder mistreatment was significantly associated with increased risk for suicidal ideation, increased research efforts should be devoted into developing effective elder mistreatment prevention and intervention programs. Community service organizations should improve education on elder mistreatment to enhance public awareness of the issue. Given the mediating effect of social support on the association between elder mistreatment and suicidal ideation among older men, community organizations and family members should increase support and care to older adults who have been mistreated so as to prevent suicidal ideation arising from elder mistreatment.

From a clinical point of views, this study highlights the importance of screening for elder mistreatment among Chinese older adults. Clinicians should be knowledgeable about potential markers of elder mistreatment to facilitate the detection of the issue. When health professionals suspect elder mistreatment, detailed histories should be gathered, especially

regarding psychosocial and cultural aspects. In addition to early detection, healthcare professionals should also improve their knowledge of reporting and treatment of elder mistreatment. Special attention should be placed on older women who suffer from elder mistreatment, given their heightened risk for suicidal ideation.

## CONCLUSION

This study suggests that elder mistreatment was associated with increased risk for suicidal ideation among Chinese older adults in the U.S., but the association was only significant among older women after adjusting for all potential confounders. Longitudinal studies should be conducted to explore the mechanisms through which elder mistreatment links with suicidal ideation.

## Acknowledgments

Dr. Dong was supported by National Institute on Aging grants (R01 AG042318, R01 MD006173, R01 CA163830, R34MH100443, R34MH100393 & RC4 AG039085), Paul B. Beeson Award in Aging, The Starr Foundation, American Federation for Aging Research, John A. Hartford Foundation and The Atlantic Philanthropies.

## References

- Wallace RB, Bonnie RJ. Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America. 2003
- Acierno R, Hernandez MA, Amstadter AB, Resnick HS, Steve K, Muzzy W, et al. Prevalence and correlates of emotional, physical, sexual, and financial abuse and potential neglect in the United States: The National Elder Mistreatment Study. *American journal of public health*. 2010; 100(2): 292. [PubMed: 20019303]
- Dong X, Simon MA. Is impairment in physical function associated with increased risk of elder mistreatment? Findings from a community-dwelling Chinese population. *Public Health Rep*. 2010 Sep; 125(5):743–53. [PubMed: 20873291]
- Dong X, Simon M, Rajan K, Evans DA. Association of cognitive function and risk for elder abuse in a community-dwelling population. *Dement Geriatr Cogn Disord*. 2011; 32(3):209–15. [PubMed: 22095098]
- Begle AM, Strachan M, Cisler JM, Amstadter AB, Hernandez M, Acierno R. Elder mistreatment and emotional symptoms among older adults in a largely rural population: the South Carolina elder mistreatment study. *Journal of interpersonal violence*. 2010
- Mouton CP, Rodabough RJ, Rovi SL, Brzyski RG, Katerndahl DA. Psychosocial effects of physical and verbal abuse in postmenopausal women. *The Annals of Family Medicine*. 2010; 8(3):206–13.
- Dong X, Simon M, Mendes de LC, Fulmer T, Beck T, Hebert L, et al. Elder self-neglect and abuse and mortality risk in a community-dwelling population. *JAMA*. 2009 Aug 5; 302(5):517–26. [PubMed: 19654386]
- Corna LM, Cairney J, Streiner DL. Suicide ideation in older adults: relationship to mental health problems and service use. *The Gerontologist*. 2010:gnq048.
- Pfaff JJ, Almeida OP. Detecting suicidal ideation in older patients: identifying risk factors within the general practice setting. *British journal of general practice*. 2005; 55(513):269–73. [PubMed: 15826433]
- Yip PS, Chi I, Chiu H, Chi Wai K, Conwell Y, Caine E. A prevalence study of suicide ideation among older adults in Hong Kong SAR. *International journal of geriatric psychiatry*. 2003; 18(11): 1056–62. [PubMed: 14618559]
- Almeida OP, Draper B, Snowdon J, Lautenschlager NT, Pirkis J, Byrne G, et al. Factors associated with suicidal thoughts in a large community study of older adults. *The British Journal of Psychiatry*. 2012; 201(6):466–72. [PubMed: 23209090]

12. Waern M, Beskow J, Runeson B, Skoog I. Suicidal feelings in the last year of life in elderly people who commit suicide. *The Lancet*. 1999; 354(9182):917–8.
13. Vanderhorst RK, McLaren S. Social relationships as predictors of depression and suicidal ideation in older adults. *Aging & mental health*. 2005; 9(6):517–25. [PubMed: 16214699]
14. Alhusen JL, Frohman N, Purcell G. Intimate partner violence and suicidal ideation in pregnant women. *Arch Womens Ment Health*. 2015 Mar 10.
15. Martin G, Bergen HA, Richardson AS, Roeger L, Allison S. Sexual abuse and suicidality: gender differences in a large community sample of adolescents. *Child abuse & neglect*. 2004; 28(5):491–503. [PubMed: 15159067]
16. Yanqiu G, Yan W, Lin A. Suicidal ideation and the prevalence of intimate partner violence against women in rural western China. *Violence Against Women*. 2011 Oct; 17(10):1299–312. [PubMed: 21997463]
17. Stein DJ, Chiu WT, Hwang I, Kessler RC, Sampson N, Alonso J, et al. Cross-national analysis of the associations between traumatic events and suicidal behavior: findings from the WHO World Mental Health Surveys. *PLoS One*. 2010; 5(5):e10574. [PubMed: 20485530]
18. Calder J, McVean A, Yang W. History of abuse and current suicidal ideation: Results from a population based survey. *Journal of Family Violence*. 2010; 25(2):205–14.
19. Chen SX, Wu WC, Bond MH. Linking family dysfunction to suicidal ideation: Mediating roles of self-views and world-views. *Asian Journal of Social Psychology*. 2009; 12(2):133–44.
20. Yip PS, Chi I, Chiu H, Chi Wai K, Conwell Y, Caine E. A prevalence study of suicide ideation among older adults in Hong Kong SAR. *International journal of geriatric psychiatry*. 2003; 18(11):1056–62. [PubMed: 14618559]
21. Wu L, Shen M, Chen H, Zhang T, Cao Z, Xiang H, et al. The relationship between elder mistreatment and suicidal ideation in rural older adults in China. *Am J Geriatr Psychiatry*. 2013 Oct; 21(10):1020–8. [PubMed: 23567377]
22. Dong X, Li Y, Simon MA. Social engagement among U.S. Chinese older adults--findings from the PINE Study. *J Gerontol A Biol Sci Med Sci*. 2014 Nov; 69(Suppl 2):S82–S89. [PubMed: 25378453]
23. Dong X, Chen R, Simon MA. Anxiety among community-dwelling U.S. Chinese older adults. *J Gerontol A Biol Sci Med Sci*. 2014 Nov; 69(Suppl 2):S61–S67. [PubMed: 25378450]
24. Dong X, Chen R, Simon MA. The prevalence of medical conditions among U.S. Chinese community-dwelling older adults. *J Gerontol A Biol Sci Med Sci*. 2014 Nov; 69(Suppl 2):S15–S22. [PubMed: 25378445]
25. Dong X, Chen R, Simon MA. Experience of discrimination among U.S. Chinese older adults. *J Gerontol A Biol Sci Med Sci*. 2014 Nov; 69(Suppl 2):S76–S81. [PubMed: 25326642]
26. Dong X, Chen R, Li C, Simon MA. Understanding depressive symptoms among community-dwelling Chinese older adults in the Greater Chicago area. *J Aging Health*. 2014 Oct; 26(7):1155–71. [PubMed: 25239971]
27. Dong X, Chen R, Fulmer T, Simon MA. Prevalence and correlates of elder mistreatment in a community-dwelling population of U.S. Chinese older adults. *J Aging Health*. 2014 Oct; 26(7):1209–24. [PubMed: 25239973]
28. Dong X, Chen R, Wong E, Simon MA. Suicidal ideation in an older U.S. Chinese population. *J Aging Health*. 2014 Oct; 26(7):1189–208. [PubMed: 25005173]
29. Yen Y-C, Yang M-J, Yang M-S, For L, Chun S, Chen H, et al. Suicidal ideation and associated factors among community-dwelling elders in Taiwan. *Psychiatry and clinical neurosciences*. 2005; 59(4):365–71. [PubMed: 16048440]
30. Simon MA, Chang E-S, Rajan KB, Welch MJ, Dong X. Demographic Characteristics of US Chinese Older Adults in the Greater Chicago Area Assessing the Representativeness of the PINE Study. *Journal of aging and health*. 2014; 26(7):1100–15. [PubMed: 25239968]
31. Dong X, Wong E, Simon MA. Study design and implementation of the PINE study. *Journal of aging and health*. 2014 0898264314526620.
32. Hwalek MA, Sengstock MC. Assessing the Probability of Abuse of the Elderly: Toward Development of a Clinical Screening Instrument. *Journal of Applied Gerontology*. 1986 Dec 1; 5(2):153–73.

33. Schofield MJ, Mishra GD. Validity of self-report screening scale for elder abuse: Women's Health Australia Study. *Gerontologist*. 2003 Feb; 43(1):110–20. [PubMed: 12604752]
34. Dong X, Beck T, Simon MA. Loneliness and mistreatment of older Chinese women: does social support matter? *J Women Aging*. 2009; 21(4):293–302. [PubMed: 20183154]
35. Dong X, Simon MA, Gorbien M. Elder abuse and neglect in an urban chinese population. *J Elder Abuse Negl*. 2007; 19(3–4):79–96. [PubMed: 18160382]
36. Chiu HFK, Dai J, Xiang YT, Chan SSM, Leung T, Yu X, et al. Suicidal thoughts and behaviors in older adults in rural China: a preliminary study. *International journal of geriatric psychiatry*. 2012; 27(11):1124–30. [PubMed: 22252964]
37. American Psychiatric Association. *Dignostic and statistical manual of mental disorders*. Washington, DC: American Psychiatric Association; 1994.
38. Copeland JRM, Dewey ME. Neuropsychological Diagnosis (GMS-HAS-AGECAT Package). *International Psychogeriatrics*. 1991; 3(Supplement S1):43–9.
39. Yeung A, Fung F, Yu SC, Vorono S, Ly M, Wu S, et al. Validation of the Patient Health Questionnaire-9 for depression screening among Chinese Americans. *Compr Psychiatry*. 2008 Mar; 49(2):211–7. [PubMed: 18243896]
40. Dong X, Simon MA, Gorbien M, Percak J, Golden R. Loneliness in older Chinese adults: a risk factor for elder mistreatment. *Journal of the American Geriatrics Society*. 2007; 55(11):1831–5. [PubMed: 17944895]
41. Dong X, Simon MA. Is impairment in physical function associated with increased risk of elder mistreatment? Findings from a community-dwelling Chinese population. *Public Health Rep*. 2010 Sep; 125(5):743–53. [PubMed: 20873291]
42. Olofsson N, Lindqvist K, Danielsson I. Fear of crime and psychological and physical abuse associated with ill health in a Swedish population aged 65–84 years. *Public health*. 2012; 126(4): 358–64. [PubMed: 22386619]
43. Matud MP. Gender differences in stress and coping styles. *Personality and individual differences*. 2004; 37(7):1401–15.

**Table 1**

Comparisons of Characteristics of Study Participants by Suicidal Ideation

	2-Week Suicidal Ideation		12-Month Suicidal Ideation	
	Yes 111 (3.5%)	No 3,019 (96.5%)	Yes 151 (4.8%)	No 2,979 (95.2%)
Age, M (SD)	74.4 (8.6)	72.7 (8.2) *	74.4 (8.5)	72.6 (8.2) #
Sex, N (%)				
Men	25 (22.5)	1,292 (42.8)	34 (22.5)	1,283 (43.1)
Women	86 (77.5)	1,725 (57.2) +	117 (77.5)	1,694 (56.9) +
Education, M (SD)	7.7 (5.3)	8.8 (5.0) *	7.8 (5.5)	8.8 (5.0) *
Income, N (%)				
\$0 – \$4,999	47 (42.7)	989 (33.0)	58 (38.7)	978 (33.1)
\$5,000–\$9,999	54 (49.1)	1,554 (51.9)	77 (51.3)	1,531 (51.8)
\$10,000 – \$14,999	9 (8.2)	299 (10.1)	13 (8.7)	295 (10.0)
\$15,000 – \$19,999	0	68 (2.3)	1 (0.7)	67 (2.3)
Over \$20,000	0	87 (2.9)	1 (0.7)	86 (2.9)
Medical Comorbidities, M (SD)	2.6 (1.5)	2.0 (1.5) +	2.5 (1.5)	2.0 (1.5) +
Heart Disease, N (%)	27 (24.3)	445 (14.8) #	38 (25.2)	434 (14.6) +
Stroke, N (%)	8 (7.2)	169 (5.6)	12 (8.0)	165 (5.5)
Cancer, N (%)	6 (5.4)	159 (5.3)	7 (4.6)	158 (5.3)
High Cholesterol, N (%)	59 (54.1)	1,448 (48.2)	80 (53.7)	1,427 (48.1)
Diabetes, N (%)	32 (28.8)	657 (21.8)	40 (26.5)	649 (21.8)
High Blood Pressure, N (%)	70 (63.1)	1,647 (54.7)	91 (60.3)	1,626 (54.7)
Broken or Fractured Hip, N (%)	13 (11.7)	210 (7.0)	14 (9.3)	209 (7.0)
Thyroid Disease, N (%)	13 (11.7)	256 (8.5)	18 (11.9)	251 (8.4)
Osteoarthritis, Inflammation, or Problems with Joints, N (%)	61 (55.5)	1,154 (38.3) +	79 (52.7)	1,136 (38.2) +
Depressive Symptoms, M (SD)	10.0 (6.3)	2.3 (3.5) +	8.7 (6.3)	2.3 (3.5) +
Social Support, M (SD)	29.2 (3.6)	31.2 (3.4) +	29.3 (3.6)	31.2 (3.3) +

\* p<0.05,

1000  
+ p<0.001  
, p<0.10  
#

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 2**  
Comparisons of Characteristics of Study Participants by Suicidal Ideation in Older Women and Older Men

	Women				Men			
	2-Week Suicidal Ideation		12-Month Suicidal Ideation		2-Week Suicidal Ideation		12-Month Suicidal Ideation	
	Yes	No	Yes	No	Yes	No	Yes	No
Age, M (SD)	86 (4.7%) 74.6 (8.7)	1,725 (95.3%) 72.7 (8.5) *	117 (6.5%) 74.5 (8.4)	1,694 (93.5%) 72.6 (8.5) *	25 (1.9%) 73.7 (8.7)	1,292 (98.1%) 72.7 (7.9)	34 (2.6%) 74.4 (8.9)	1,283 (97.4%) 72.7 (7.9)
Education, M (SD)	7.0 (5.2)	7.9 (5.0)	7.1 (5.4)	8.0 (5.0)	9.9 (5.0)	9.9 (4.8)	10.4 (5.1)	9.9 (4.8)
Income, N (%)								
\$0 – \$4,999	36 (42.4)	516 (30.1)	45 (38.8)	507 (30.1)	11 (44.0)	473 (36.8)	13 (38.2)	471 (36.9)
\$5,000 – \$9,999	42 (49.4)	936 (54.6)	59 (50.9)	919 (54.6)	12 (48.0)	618 (48.1)	18 (52.9)	612 (48.0)
\$10,000 – \$14,999	7 (8.2)	187 (10.9)	11 (9.5)	183 (10.9)	2 (8.0)	112 (8.7)	2 (5.9)	112 (8.8)
\$15,000 – \$19,999	0	30 (1.8)	1 (0.9)	29 (1.7)	0	38 (3.0)	0	38 (3.0)
Over \$20,000	0	44 (2.6)	0 (0)	44 (2.6)	0	12 (0.9)	1 (2.9)	11 (0.9)
Medical Comorbidities, M (SD)	2.7 (1.6)	2.2 (1.4) #	2.6 (1.5)	2.2 (1.4) #	2.4 (1.0)	1.8 (1.5) *	2.2 (1.4)	
Heart Disease, N (%)	22 (25.6)	223 (12.9) +	32 (27.4)	213 (12.6) +	5 (20.0)	222 (17.2)	6 (17.7)	221 (17.2)
Stroke, N (%)	5 (5.8)	77 (4.5)	5 (4.3)	77 (4.6)	3 (12.0)	92 (7.1)	7 (20.6)	88 (6.9) #
Cancer, N (%)	4 (4.7)	104 (6.0)	5 (4.3)	103 (6.1)	2 (8.0)	55 (4.3)	2 (5.9)	55 (4.3)
High Cholesterol, N (%)	46 (54.1)	903 (52.5)	65 (56.0)	884 (52.4)	13 (54.2)	545 (42.4)	15 (45.5)	18 (54.6)
Diabetes, N (%)	24 (27.9)	379 (22.0)	32 (27.4)	371 (21.9)	8 (32.0)	278 (21.6)	8 (23.5)	278 (21.7)
High Blood Pressure, N (%)	56 (65.1)	977 (56.7)	74 (63.3)	959 (56.7)	14 (56.0)	670 (51.9)	17 (50.0)	667 (52.1)
Broken or Fractured Hip, N (%)	9 (10.5)	145 (8.4)	10 (8.6)	144 (8.5)	4 (16.0)	65 (5.0)	4 (11.8)	65 (5.1)
Thyroid Disease, N (%)	11 (12.8)	191 (11.1)	15 (12.8)	187 (11.1)	2 (8.0)	65 (5.0)	3 (8.8)	64 (5.0)
Osteoarthritis, Inflammation, or Problems with Joints, N (%)	52 (61.2)	769 (44.6) #	67 (57.8)	754 (44.6) #	9 (36.0)	385 (29.8)	12 (35.3)	382 (29.8)
Depressive Symptoms, M (SD)	9.9 (6.3)	2.3 (3.5) +	8.7 (6.3)	3.5 (1.0) +	10.0 (6.3)	2.3 (3.5) +	8.7 (6.3)	2.3 (3.5) +
Social Support, M (SD)	29.5 (3.5)	31.5 (3.3) +	29.6 (3.6)	31.5 (3.3) +	28.0 (3.4)	30.8 (3.4) +	28.2 (3.5)	30.8 (3.4) +

\* p<0.05,

# p<0.01,

$1000 > p > 1$   
+

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript



**Table 3**

Elder Mistreatment by the Presence of Suicidal Ideation in Older Adults

<i>Overall Participants</i>	2-Week Suicidal Ideation			12-Month Suicidal Ideation		
	Yes	No	P	Yes	No	P
Elder Mistreatment	47 (42.7)	425 (14.1)		61 (40.7)	411 (13.9)	
Yes, N (%)						
No, N (%)	63 (57.3)	2,581 (85.9)	<0.001	89 (59.3)	2,555 (86.1)	<0.001
<i>Women</i>	2-Week Suicidal Ideation			12-Month Suicidal Ideation		
Elder Mistreatment	Yes	No	P	Yes	No	P
Yes, N (%)	36 (42.4)	249 (14.5)		47 (40.5)	238 (14.1)	
No, N (%)	49 (57.7)	1,471 (85.5)	<0.001	69 (59.5)	1,451 (85.9)	<0.001
<i>Men</i>	2-Week Suicidal Ideation			12-Month Suicidal Ideation		
Elder Mistreatment	Yes	No	P	Yes	No	P
Yes, N (%)	11 (44.0)	176 (13.7)		14 (41.2)	173 (13.6)	
No, N (%)	14 (56.0)	1,109 (86.3)	<0.001	20 (58.8)	1,103 (86.4)	<0.001

**Table 4**

Association between Overall Elder Mistreatment and Suicidal ideation

	Outcome: 2-week Suicidal Ideation				
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Age	1.03 (1.00,1.05) *	1.02 (1.00,1.05)	1.02 (0.99,1.04)	1.01 (0.99,1.04)	1.01 (0.99,1.04) *
Female	2.51 (1.59,3.96) +	2.28 (1.43,3.63) +	2.10 (1.31,3.36) #	1.76 (1.06,2.90) *	1.86 (1.12,3.09) *
Years of Education		0.95 (0.91,0.99) #	0.94 (0.90,0.98) #	0.95 (0.91,0.99) *	0.95 (0.91,0.99) *
Income		0.63 (0.47,0.84) #	0.63 (0.46,0.84) #	0.70 (0.50,0.97) *	0.69 (0.49,0.96) *
Medical Comorbidities			1.24 (1.08,1.41) #	1.12 (0.97,1.29)	1.12 (0.97,1.30)
Depressive Symptoms				1.25 (1.21,1.30) +	1.24 (1.20,1.29) +
Social Support					0.94 (0.88,0.99) *
Elder Mistreatment	4.59 (3.09,6.81) +	5.37 (3.54,8.13) +	5.19 (3.42,7.88) +	2.85 (1.79,4.54) +	2.46 (1.52,4.01) +
	Outcome: 12-month Suicidal Ideation				
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Age	1.03 (1.01,1.05) #	1.03 (1.00,1.05) *	1.02 (1.00,1.04)	1.01 (0.99,1.04)	1.01 (0.99,1.04)
Female	2.56 (1.73,3.80) +	2.35 (1.57,3.51) +	2.20 (1.47,3.30) +	1.93 (1.26,2.95) #	2.05 (1.33,3.16) #
Years of Education		0.95 (0.92,0.99) #	0.95 (0.92,0.99) #	0.96 (0.92,0.99) *	0.96 (0.93,1.00)
Income		0.74 (0.59,0.93) *	0.74 (0.59,0.94) *	0.83 (0.65,1.06)	0.82 (0.64,1.05)
Medical Comorbidities			1.18 (1.05,1.32)	1.07 (0.95,1.21)	1.08 (0.95,1.22)
Depressive Symptoms				1.22 (1.19,1.26) +	1.21 (1.18,1.25) +
Social Support					0.93 (0.88,0.98) +
Elder Mistreatment	4.35 (1.08,6.15) +	4.98 (3.47,7.16) +	4.86 (3.38,6.99) +	2.89 (1.94,4.31) +	2.46 (1.62,3.73) +

\* p < 0.05,

# p < 0.01,

+ p < 0.001

**Table 5**  
Association between Elder Mistreatment and Suicidal Ideation in Older Women

Outcome: 2-week Suicidal Ideation					
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Age	1.03 (1.00,1.06) *	1.02 (1.00,1.05)	1.02 (0.99,1.05)	1.01 (0.98,1.04)	1.01 (0.98,1.04)
Years of Education		0.94 (0.89,0.98) #	0.93 (0.89,0.98) #	0.94 (0.90,0.99) *	0.95 (0.90,1.00) *
Income		0.60 (0.42,0.85) #	0.60 (0.42,0.85) #	0.67 (0.45,0.99) *	0.66 (0.44,0.98) *
Medical Comorbidities			1.23 (1.06,1.44) #	1.12 (0.95,1.33)	1.13 (0.95,1.34)
Depressive Symptoms				1.25 (1.20,1.31) +	1.25 (1.19,1.30) +
Social Support					0.95 (0.88,1.01)
Elder Mistreatment	4.51 (2.86,7.09) +	5.46 (3.37,8.85) +	5.30 (3.26,8.59) +	2.92 (1.69,5.03) +	2.60 (1.47,4.57) #
Outcome: 12-month Suicidal Ideation					
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Age	1.03 (1.01,1.05) *	1.02 (1.00,1.05)	1.02 (0.99,1.04)	1.01 (0.98,1.04)	1.01 (0.98,1.04)
Education		0.94 (0.90,0.98) #	0.94 (0.90,0.98) #	0.95 (0.90,0.99) *	0.95 (0.91,0.99) *
Income		0.70 (0.53,0.93) *	0.70 (0.53,0.93) *	0.79 (0.58,1.06)	0.78 (0.58,1.06)
Medical Comorbidities			1.20 (1.05,1.37) #	1.10 (0.95,1.27)	1.11 (0.96,1.28)
Depressive Symptoms				1.22 (1.18,1.27) +	1.22 (1.17,1.26) +
Social Support					0.94 (0.89,1.00) *
Elder Mistreatment	4.32 (2.90,6.43) +	5.22 (3.42,7.96) +	5.09 (3.33,7.78) +	3.03 (1.89,4.84) +	2.65 (1.63,4.32) +
Association between Elder Mistreatment and Suicidal ideation in Older Men					
Outcome: 2-week Suicidal Ideation					
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Age	1.02 (0.97,1.07)	1.02 (0.97,1.07)	1.01 (0.96,1.06)	1.01 (0.96,1.07)	1.02 (0.97,1.07)

Outcome: 2-week Suicidal Ideation					
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Years of Education		0.98 (0.90,1.06)	0.97 (0.90,1.06)	0.96 (0.88,1.05)	0.97 (0.89,1.05)
Income		0.71 (0.42,1.21)	0.71 (0.41,1.23)	0.77 (0.42,1.40)	0.76 (0.41,1.41)
Medical Comorbidities			1.25 (0.96,1.62)	1.10 (0.84,1.44)	1.11 (0.84,1.46)
Depressive Symptoms				1.25(1.17,1.35) +	1.24 (1.15,1.34) +
Social Support					0.91 (0.81,1.01)
Elder Mistreatment	4.93 (2.20,11.05) +	5.23 (2.29,11.94) +	5.04 (2.21,11.51) +	2.72 (1.10,6.73) *	2.13 (0.82,5.56)
Outcome: 12-month Suicidal Ideation					
	Model A	Model B	Model C	Model D	Model E
	OR (95% CI)				
Age	1.03 (0.98,1.07)	1.03 (0.98,1.07)	1.02 (0.98,1.07)	1.02 (0.98,1.07)	1.03 (0.98,1.07)
Education		1.00 (0.93,1.08)	1.00 (0.93,1.07)	0.99 (0.92,1.07)	1.00 (0.93,1.07)
Income		0.86 (0.59,1.24)	0.86 (0.59,1.25)	0.92 (0.62,1.38)	0.92 (0.61,1.39)
Medical Comorbidities			1.11 (0.88,1.40)	1.00 (0.78,1.26)	1.00 (0.78,1.27)
Depressive Symptoms				1.23 (1.15,1.30) +	1.21 (1.14,1.29) +
Social Support					0.89 (0.81,0.99) *
Elder Mistreatment	4.45 (2.20,8.98) +	4.49 (2.19,9.18) +	4.43 (2.16,9.06) +	2.65(1.22,5.76) *	2.05 (0.90,4.64)

\* p< 0.05,

# p<0.01,

+ p<0.001