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Elder Mistreatment and Psychological Distress among U.S. Chinese Older Adults

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Introduction

Elder mistreatment is a substantial public health issue associated with both morbidity (Dong, 2005) and mortality (Dong et al., 2011), especially among those with psychological distress (Acierno et al., 2019) and social isolation (Dong et al., 2009). Elder mistreatment is defined as an intentional single, repeat action, or lack of action that causes harm or risk of harm to an older adult (World Health Organization, 2018). Elder mistreatment has several subtypes, including physical mistreatment (e.g., slapping, kicking), psychological/emotional mistreatment (e.g., yelling, swearing at), sexual mistreatment (e.g., unwanted touching, unwanted rough/violent sexual activity, rape), financial exploitation (e.g., stealing money), and caregiver neglect (Centers for Disease Control and Prevention, 2018). An estimated 5% to 10% of older adults experience elder mistreatment in the U.S. each year (Rosen et al., 2017). Prevalence rates differ depending on the type of elder mistreatment. In a systematic review and meta-analysis of 52 studies across 28 countries, the pooled elder mistreatment prevalence rate in community settings was 15.7% for any elder mistreatment, 11.6% for psychological mistreatment, 2.6% for physical mistreatment, 0.9% for sexual mistreatment, 6.8% for financial mistreatment, and 4.2% for neglect (Yon et al., 2017).

Psychological distress is a significant cause of morbidity and mortality, and it imposes an immense burden on individuals, communities, and health services (Batty et al., 2017;

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Declaration of interest statement

The authors declare that they have no competing interests.

Rosness et al., 2016). Compared to physical injury, the impact of elder mistreatment on psychological well-being is often more devastating, and it often takes a long time to recover from the victimization (Cooper & Livingston, 2014; Dong et al., 2013). Most studies reported that elder mistreatment was associated with negative mental health outcomes in U.S. older adults, such as anxiety, depression, and posttraumatic stress disorder (PTSD) (Acierno et al., 2019; Begle et al., 2011; Luo & Waite, 2011; Wong & Waite, 2017). For example, Luo and Waite (2011) examined a representative sample of 2,744 older adults from the National Social Life, Health and Aging Project (NSHAP). They found that older adults with any mistreatment (verbal, financial, or physical) reported higher levels of depression, anxiety, and perceived stress than those without (Luo & Waite, 2011). Acierno et al. (2019) examined 774 older adults in the National Elder Mistreatment Study. They found that financial mistreatment appears to be associated with an increased likelihood of depression, anxiety, and PTSD (Acierno et al., 2019). However, these studies only examined specific types of mistreatment on psychological well-being, rather than all the subtypes of elder mistreatment, including psychological, physical, financial, sexual mistreatment, and caregiver neglect. In addition, we only have a rudimentary knowledge of the associations between elder mistreatment and psychological distress in minority populations in the U.S.

Chinese Americans are the oldest and largest Asian population in the U.S. Approximately 16% of the 4.4 million U.S. Chinese population was over age 65. More than 80% of Chinese older adults residing in the U.S. were foreign-born, and about 30% of them immigrated to the U.S. at the age of 60 or over (Dong, Wong, et al., 2014). Filial piety, traditional Chinese culture, dictates children have an obligation to obey, respect, support, and care to aging parents, whereas disrespect may be considered as a form of mistreatment toward older adults (Chang & Dong, 2014). However, modernization and industrialization have changed the family structures and the expectations related to the intergenerational filial support of older adults (Lan, 2002; Ng, Phillips, & Lee, 2002). The younger generations of Chinese are less adherent to traditional Confucian principles of filial piety (Dong, Chen, Fulmer, et al., 2014; Hsiao et al., 2006). The different expectations of fulfilling filial obligations can intensify family conflicts that predispose older adults to elder mistreatment. In the context of immigration, older Chinese Americans may also face great challenges of acculturation stress, health care access, and linguistic and cultural barriers (Chao et al., 2018; Tam & Neysmith, 2006). Language and cultural barriers can increase the risk of social isolation and exacerbate frailty, and further dispose U.S. Chinese older immigrants to develop a higher risk of elder mistreatment (Dong, Chen, Fulmer, et al., 2014; Tam & Neysmith, 2006).

Compared to the general population, the Chinese population was less acculturated among U.S. immigrant groups (Shinagawa, 2008). Although there is a growing body of literature of elder mistreatment in the Chinese communities, the majority of studies on elder mistreatment focused on Chinese older adults in Mainland China (Fang et al., 2018; Fang et al., 2019; Wu et al., 2012). Up to our knowledge, there is limited research related to the associations between subtypes of elder mistreatment and psychological distress among U.S. Chinese older adults. The purpose of the present study was to examine: (1) whether U.S. Chinese older adults with mistreatment are more likely to have anxiety symptoms and depressive symptoms compared to those without mistreatment; (2) the unique contributions

of subtypes of elder mistreatment on anxiety symptoms and depressive symptoms among U.S. Chinese older adults.

Methods

Population and Setting

Data were derived from the baseline cohort of the Population Study of Chinese Elderly in Chicago (PINE), a community-engaged, population-based epidemiological study. The PINE study was conducted to examine key sociocultural determinants of health and well-being in community-dwelling Chinese older adults in the Greater Chicago Area. The research team worked with the community advisory board to determine the measurements of physical, cognitive, psychological, and social wellbeing of Chinese older adults. They conducted a thorough literature review on global Chinese population to select the established measurements. In addition, they developed the questions based on the suggestions of the community advisory board and epidemiological experts if no existing measurements are available to use. The reliability and validity of the instruments were established through intensive review by a panel of experts. A synergistic community-academic collaboration among Rush Institute for Healthy Aging, Northwestern University, and many community-based social services agencies and organizations initiated the project throughout the Greater Chicago Area. The PINE study implemented extensive culturally and linguistically appropriate recruitment strategies through a community-based participatory research approach with a random block census study of the Chinese community in Chicago. The inclusion criteria of participants included: (1) adults older than 60 years; (2) self-identified as Chinese; and (3) resided in the Greater Chicago Area. The trained bilingual research assistants conducted face-to-face interviews with participants in their preferred language, including Mandarin, Cantonese, Toishanese, Teochew dialect, or English. Data analyzed in this study were drawn from the first-wave PINE study data collected from 2011 to 2013. Eligible participants were 3,542 Chinese older adults. The response rate was 91.9% (N = 3,157) (Dong, Wong, et al., 2014). The institutional review board at Rush University Medical Center in Chicago, Illinois approved this study. Written informed consent was obtained from each study participant.

Measurements

Confounding Factors: Social Demographic Characteristics—Social and demographic characteristics, including age (subsets: 60–64, 65–69, 70–74, 75–79, 80 years and above), years of education completed (0–8, 9–12, 13 and above), annual income (\$0–4,999; \$5,000–9,999 \$10,000–14,999; \$15,000 and more), marital status (married, separated, divorced, widowed), number of children (0, 1, 2–3, 4 and more), overall health status (very good, good, fair, poor), quality of life (very good, good, fair, poor), and health status changes over the past year (improve, some, worsened) were identified for each participant.

Elder Mistreatment—To screen elder mistreatment, we used a 10-item self-report instrument, derived from the Whale–Sengstock Elder Abuse Screening Test (H-S/EAST) (Hwalek & Sengstock, 1986) and the Vulnerability to Abuse Screening Scale (VASS)

(Schofield & Mishra, 2003). Participants were asked if they (1) had family conflicts at home; (2) felt uncomfortable with someone in the family; (3) felt that nobody wants them around; (4) had been told by someone that they gave too much trouble; (5) had been afraid of someone in the family; (6) felt that someone close tried to hurt or harm them; (7) had been neglected or confined; (8) had been called names or put down; (9) had been forced by someone to do things; and (10) had belongings taken without permission. Response to each question is “yes” or “no”. A “yes” response to any questions defined a participant as having experienced elder mistreatment. The reliability of the modified scale from H-S/EAST and VASS in the PINE study was excellent (Cronbach’s $\alpha = .80$) (Chang et al., 2014). For the elder mistreatment subtypes, psychological mistreatment was assessed with eight-items in the modified Conflict Tactic Scale (CTS), including variables such as screamed or threatened participants (Straus et al., 1996). Physical mistreatment was assessed with the modified ten CTS items, with variables such as hit, slapped, pushed, or kicked participants. The modified CTS has been tested with Cronbach’s α of 0.69 to 0.95 (Chou, 2000; Straus & Gelles, 1990). Sexual mistreatment was assessed with one item asking participants if they have been touched in private areas when they did not want to be. Financial exploitation was assessed with 17 items, including asking participants if they were forced/pressured to change/sign legal or financial documents (Conrad et al., 2008). For caregiver neglect, unmet needs for activities of daily living (ADL) and instrumental activities of daily living (IADL) were used. For example, participants were asked if someone was available to assist with preparing meals and doing housework when they need help (Katz & Akpom, 1976; Lawton & Brody, 1969).

Anxiety Symptoms—The presence of anxiety symptoms was measured with the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A). Participants were asked if they currently experienced anxiety symptoms, including (a) felt tense or wound up; (b) had a frightened feeling as if something awful is about to happen; (c) had worrying thoughts; (d) cannot sit at ease and feel relaxed; (e) had a frightened feeling like butterflies in the stomach; (f) had feelings of restless; or (g) had feelings of panic. Responses to each item were on a 4-point scale ranging from 0 (not at all) to 3 (most of the time). A total score ranges from 0 to 21, with a score of 8 and more indicating clinical anxiety (Zigmond & Snaith, 1983). The reliability of the HADS-A in the PINE study was excellent (Cronbach’s $\alpha = .80$) (Dong, Chen, et al., 2014).

Depressive Symptoms—The presence of depressive symptoms was measured with the Patient Health Questionnaire (PHQ-9). The PHQ-9 consists of nine questions and assesses each of the nine Diagnostic and Statistical Manual of Mental Disorders depression symptom criteria (American Psychiatric Association, 1994). Participants were asked how often they have been bothered by the following depressive symptoms in the last two weeks: (a) loss of interest in activities; (b) depressed mood; (c) changes in sleep; (d) feeling tired; (e) changes in appetite; (f) feelings of guilt or worthlessness; (g) trouble concentrating; (h) feeling restless or slowed down; and (i) suicidal thoughts. Responses were given on a 4-point scale (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day). The total score ranges from 0 to 27, with a score of 5 and more indicating clinical depression

(Kroenke et al., 2001). The reliability of PHQ-9 in the PINE study had good validity and excellent reliability (Cronbach's $\alpha = .82$) (Chang et al., 2014).

Data Analysis

Descriptive statistics were used to summarize elder mistreatment, anxiety symptoms/anxiety, and depressive symptoms/depression of the participants. The Wilcoxon signed-rank tests were used to compare the differences of anxiety symptoms and depressive symptoms between the participants with or without different types of elder mistreatment. Chi-square tests were applied to test the differences of older adults with and without clinical anxiety and clinical depression between the participants with or without different types of elder mistreatment. Negative binomial regressions were used to examine the unique contributions of subtypes of elder mistreatment towards the development of anxiety symptoms and depressive symptoms, respectively. Logistic regressions were used to examine the unique contributions of subtypes of elder mistreatment towards the development of clinical anxiety and clinical depression, respectively. Rate ratios (RRs), odds ratio (ORs), 95% confidence intervals (CIs), and significance levels were reported. All statistical analyses were conducted using SAS, Version 9.2 (SAS Institute Inc., Cary, North Carolina).

Results

Sample Characteristics

Of the 3,157 Chinese older adults, the mean age was 72.8 ± 8.3 years (range 60–105), and the mean education was $8.7 \pm SD 5.1$ years. 1,829 (57.9%) of participants were female, and 2,687 (85.1%) had an annual income of less than ten thousand. 927 (29.4%) had smoked in their lifetime and 457 (14.5%) regularly consumed alcohol. The overall prevalence rate of elder mistreatment in the PINE study was 15.14% ($n=475$). Among the participants with elder mistreatment, 308 (9.79%) had psychological mistreatment, 33 (1.04%) had physical mistreatment, 6 (0.19%) had sexual mistreatment, 291 (9.3%) had financial exploitation, and 331 (11.15%) had caregiver neglect (Li et al., 2019).

Elder Mistreatment and Anxiety Symptoms

There were significant differences in anxiety symptoms/anxiety between participants with and without any mistreatment, psychological mistreatment, physical mistreatment, financial exploitation, and caregiver neglect [Table 1]. Anxiety symptoms and anxiety were significantly associated with marital status, overall health status, quality of life, and health change over the last year. After controlling the confounding factors, participants with any mistreatment ($RR = 1.76$, 95% CI: 1.57–1.98, $p < .001$), psychological mistreatment ($RR = 1.76$, 95% CI: 1.53–2.02, $p < .001$), physical mistreatment ($RR = 1.56$, 95% CI: 1.03–2.36, $p < .05$), financial exploitation ($RR = 1.24$, 95% CI: 1.06–1.44, $p < .01$), and caregiver neglect ($RR = 1.44$, 95% CI: 1.25–1.66, $p < .001$) were more likely to have anxiety symptoms [Table 3]. With regard to clinical anxiety as categorized with cut-off value of HADS-A, every one point higher in any mistreatment ($OR = 3.15$, 95% CI: 2.33–4.27, $p < .001$), psychological mistreatment ($OR = 2.79$, 95% CI: 1.98–3.93, $p < .001$), physical mistreatment ($OR = 3.42$, 95% CI: 1.42–8.27, $p < .01$), financial exploitation ($RR = 1.66$, 95% CI: 1.11–2.48, $p < .05$), and caregiver neglect ($OR = 2.15$, 95% CI: 1.50–3.10, p

< .001) was associated with higher risk of anxiety. However, sexual mistreatment was not associated with anxiety symptoms ($p = 0.83$) and clinical anxiety ($p = 0.98$) [Table 3].

Elder Mistreatment and Depressive Symptoms

There were significant differences of depressive symptoms and depression between participants with and without any mistreatment, psychological mistreatment, physical mistreatment, financial exploitation, and caregiver neglect [Table 2]. Depressive symptoms and depression were significantly associated with age, income, marital status, overall health status, quality of life, and health change over the last year [Table 4]. Participants with any mistreatment (RR = 2.11, 95% CI: 1.83–2.43, $p < .001$), psychological mistreatment (RR = 2.12, 95% CI: 1.78–2.51, $p < .001$), physical mistreatment (RR = 1.82, 95% CI: 1.10–2.99, $p < .05$), financial exploitation (RR = 1.33, 95% CI: 1.11–1.60, $p < .01$), and caregiver neglect (RR = 1.48, 95% CI: 1.24–1.77, $p < .001$) were more likely to report more depressive symptoms. There was no significant association between sexual mistreatment and depressive symptoms ($p = 0.07$). With regard to clinical depression as categorized with cut-off value of PHQ-9, every one point higher in any mistreatment (OR = 3.32, 95% CI: 2.61–4.21, $p < .001$), psychological mistreatment (OR = 3.10, 95% CI: 2.35–4.09, $p < .001$), financial exploitation (OR = 1.51, 95% CI: 1.11–2.05, $p < .01$), and caregiver neglect (OR = 2.19, 95% CI: 1.65–2.89, $p < .001$) was associated with higher risk of depression. Physical mistreatment ($p = 0.08$) and sexual mistreatment ($p = 0.07$) were not associated with clinical depression [Table 4].

Discussion

This study represents the large-scale population-based epidemiological study of the associations between different types of elder mistreatment and psychological distress in community-dwelling U.S. Chinese older adults. Adding to the existing literature on elder mistreatment among older Chinese Americans (Dong, 2017; Dong, Chang, et al., 2014; Dong, Chen, Fulmer, et al., 2014; Dong et al., 2011), our study demonstrated that participants with any mistreatment, psychological mistreatment, physical mistreatment, financial exploitation, and caregiver neglect were more likely to have anxiety symptoms and depressive symptoms. Sexual mistreatment was not associated with symptoms of anxiety and depression. The rate of psychological distress differed based on the type of mistreatment. Our findings corroborate previous research that older adults who had mistreatment exposure increased the risk of developing psychological distress, such as anxiety, depression, loneliness, and PTSD (Choi et al., 2018; Dong et al., 2013; Evandrou et al., 2017; Fisher & Regan, 2006; Wong & Waite, 2017). For example, Wong and Waite (2017) reported that older adults who experienced verbal and financial mistreatment had anxiety symptoms and more frequently and more intense feelings of loneliness. Choi et al. (2018) reported that elder mistreatment (e.g., being refused physical contact, verbal threats, and/or being excluded from decision-making about personal issues) was strongly associated PTSD in elderly people in South Korea. In addition, a prior study by Evandrou et al. (2017) reported that older adults who experienced some forms of physical or emotional mistreatment or violence had a higher prevalence of psychological distress than found in the general older population.

The present study found that caregiver neglect was the most common form of elder mistreatment in U.S. Chinese older adults. This finding was consistent with our previous study in Mainland China (Dong, Simon, Odwazny, & Gorbien, 2008). However, our findings were inconsistent with a systematic review and meta-analysis from 52 community-based studies that psychological mistreatment was the most frequently reported type of mistreatment (Yon et al., 2017). It is likely that different definitions of mistreatment, assessment tools, and sampling procedures employed for the study account for the inconsistency of the results.

Psychological Mistreatment

In our study, psychological mistreatment was found to be significantly associated with anxiety symptoms and depressive symptoms. Our findings support the previous research among the older adults in the U.S. who experienced psychological/emotional abuse had significantly increased odds of reporting depression or anxiety (Fisher & Regan, 2006). Psychological mistreatment is a powerful predictor of a victim's psychosocial problems (Tolman & Bhosley, 1991). Older adults who experienced psychological mistreatment may internalize the perpetrator's verbal aggression, which may lead to developing a lower sense of self-efficacy and helplessness, further leading to emotional distress. In turn, older adults who have negative self-efficacy may interpret potentially neutral interpersonal interactions as hostile and coercive, resulting in anxiety and depression (Begle et al., 2011). Due to the influence of filial piety, Chinese older adults may identify the following incidents as psychological mistreatment, such as feeling disrespect, silent treatment, lack of love and affection, intense level of child care, isolation of elderly grandparents from grandchildren, and offspring's blaming of elderly parents for their mental illness caused by acculturative stress (Lee et al., 2014).

Physical Mistreatment

Our study showed that older adults who experienced physical mistreatment were more likely to have anxiety and depressive symptoms than those who did not. Particularly, our participants who experienced physical mistreatment had the highest odds of reporting anxiety. Our findings supported the previous study that women who suffered physical mistreatment had significantly more severe depressive symptoms, psychiatric comorbidities, and physical illnesses than non-mistreated women (Scholle et al., 1998). However, our findings were inconsistent with the study by Begle et al. that physical mistreatment was not significantly associated with negative emotional symptoms (e.g., feeling anxious, depressed, or irritable) among 902 older adults residing in South Carolina (Begle et al., 2011).

Sexual Mistreatment

Our study found that sexual mistreatment was not associated with symptoms of anxiety and depression. Only six participants reported symptoms of anxiety and depression; and one participant met clinical anxiety as measured with HADS-A and clinical depression as measured with PHQ-9. However, sexual mistreatment was found to be associated with multiple psychiatric disorders, including lifetime diagnosis of anxiety disorders, depression, eating disorders, PTSD, and attempted suicide in the previous studies (Chen et al., 2010; Flores et al., 2018). It is possible that our sexual mistreatment victims kept silent and did not

report the mistreatment incident because traditional Chinese culture holds that being raped is shameful and should be kept private. The small sample size may lead to insufficient power to detect significant differences.

Financial Exploitation

Our findings were in line with an earlier study showing that financial exploitation was associated with psychological distress (Acierno et al., 2010; Beach et al., 2010; Financial Industry Regulatory Authority (FINRA) Foundation, 2015; Weissberger et al., 2019). For example, in a previous survey, fraud victims reported having a variety of negative feelings to fraudulent incidents, including sadness, embarrassment, and guilt. In addition, about one-third of respondents reported a serious degree of depression due to a fraudulent incident (FINRA Foundation, 2015). Another recent study showed that older adults who reported financial exploitation were considerably more likely to have depressive symptoms and slightly more likely to have anxiety symptoms (Weissberger et al., 2019). Interestingly, our participants seemed to be tolerant of their financial dependency on their offspring and exploitation they suffered. Compared to participants who experienced psychological, physical mistreatment, and caregiver neglect, those who experienced financial exploitation had the lowest odds of reporting psychological distress. Although older Chinese immigrants tend to be more culturally adapted, our participants may believe in group responsibility and sharing their financial resources with family members as they may be deeply affected by cultural norms of collectivism and family harmony.

Caregiver Neglect

Consistent with our previous study in China (Dong et al., 2008), the present study showed that caregiver neglect was associated with anxiety symptoms and depressive symptoms among U.S. Chinese older adults. Unmet expectations could result in emotional distress in older Chinese adults. Caregivers who experienced higher levels of burden and stress may provide substandard or poor care to meet ADL and IADL needs of older adults. Besides, under the influence of traditional filial piety, our Chinese participants may expect to live with their adult children and be taken care of by adult children. However, they may live separately from adult children after immigrated to the U.S.; and may not receive appropriate frequent calls or regular visits from their children. Also, older parents may be sent to a nursing home by their adult children. The sociocultural isolation and language barrier older Chinese immigrants experience in a nursing home could be considered as abusive because of cultural beliefs in family-based elder care (Lee et al., 2014).

Social Demographic Characteristics

Age, income, marital status, overall health status, quality of life, and health change over the last year were associated with anxiety symptoms and/or depressive symptoms in our participants. Older adults may experience a higher prevalence of psychological distress due to chronic disease, functional disability, and life stress (Kim et al., 2015). The death of a spouse may also increase the risk of psychological distress due to lack of spouse support and increase loneliness (Davies et al., 2016; Siflinger, 2016). Also, the majority of our study participants had never employed in the U.S. job market (Dong, Chen, Li, et al., 2014). The

financial hardships (e.g. lacking social security and employment pensions) could lead to a higher rate of psychological distress.

Limitations

These results should be interpreted with caution. First, this study is representative of Chinese older adults residing in the Greater Chicago Area only. Hence, the finding may not be generalizable to Chinese older adults in other geographic areas. Second, we used self-reported elder mistreatment measures, which may have resulted in response bias. Third, due to the cross-sectional nature of the study, it is unclear whether symptoms of anxiety and depression are a cause or an effect of elder mistreatment. Future longitudinal designs are needed to obtain a more comprehensive understanding of the pathways between elder mistreatment and psychological distress among U.S. Chinese older adults. Lastly, some factors may influence the relationships between elder mistreatment and psychological distress among older Chinese immigrants, such as levels of acculturation, social well-being (e.g., social support and social isolation), and cultural factors (e.g., filial piety and harmony). Future studies are needed to examine the possible mediating or moderating effects of these factors between elder mistreatment and psychological well-being in the U.S. Chinese older adult population.

Implications

This study has important implications for research, practice, and policy. First, our results showed that Chinese older adults who experienced mistreatment were more likely to have anxiety symptoms and depressive symptoms than those who did not. Due to cultural norms and expectations, Chinese older adults may consider elder mistreatment as an egregious violation of many cultural traditions (Dong et al., 2008). In addition, due to the influence of the Chinese cultural values (e.g., face, and harmony), Chinese older adults with elder mistreatment and their families may be reluctant to disclose mistreatment and seek help to protect family reputation (Dong, Chang, et al., 2014). Hence, research is needed to explore the issues of cultural norms and cultural expectations concerning the perception, determinants, and impacts of elder mistreatment and psychological well-being in Chinese older adults. Second, elder mistreatment is a highly sensitive issue in Chinese culture. However, due to the community-based participatory research approach, participants may have been more comfortable sharing their mistreatment incidences, experiences, and feelings in their preferred dialects with the trusting research assistants. We strongly suggest that community-based participatory research approach could be a potential model to explore the issues of elder mistreatment and psychological well-being in different racial/ethnic communities.

In terms of practical and policy implications, the findings underline the need for public and community awareness and improved education for health care professionals. For instance, health care professionals could use elder mistreatment screen tools to improve the detection of elder mistreatment in clinical settings. Since many older adults lack knowledge on help-seeking channels, health care professionals should put efforts into creating a linkage between these services and the aging populations. Besides, social service agencies could

provide emotional, social, and practical support for older adults to decrease the risk of elder mistreatment and psychological distress. Moreover, policymakers should consider cultural issues based on the race/ethnicity of the populations and the types of mistreatment that need to be addressed when developing services, policies, and the criminal justice system in response to the unmet needs.

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Table 1.

Descriptive Statistics of Elder Mistreatment, Anxiety Symptoms, and Anxiety (N=3,157)

	Anxiety symptoms			Anxiety		
	N	Mean $\pm$ SD	<i>p</i> value	No	Yes	<i>p</i> value
Any elder mistreatment						
No	2644	2.33 $\pm$ 3.01	< 0.0001***	2475 (93.61%)	169 (6.39%)	< 0.0001***
Yes	470	4.37 $\pm$ 4.03		377 (80.21%)	93 (19.79%)	
Psychological mistreatment						
No	2817	2.44 $\pm$ 3.10	< 0.0001***	2616 (92.86%)	201 (7.14%)	< 0.0001***
Yes	304	4.59 $\pm$ 4.08		242 (79.61%)	62 (20.39%)	
Physical mistreatment						
No	3091	2.62 $\pm$ 3.24	0.0041**	2836 (91.75%)	255 (8.25%)	0.0009***
Yes	32	5.03 $\pm$ 5.13		23 (71.88%)	9 (28.13%)	
Sexual mistreatment						
No	3117	2.65 $\pm$ 3.28	0.5126	2853 (91.53%)	264 (8.47%)	0.4129
Yes	6	3.33 $\pm$ 3.20		5 (83.33 %)	1 (16.67%)	
Financial exploitation						
No	2831	2.58 $\pm$ 3.23	0.0005***	2604 (92.01%)	226 (7.99%)	0.0076**
Yes	290	3.24 $\pm$ 3.66		253 (87.24%)	37 (12.76%)	
Caregiver neglect						
No	2626	2.44 $\pm$ 3.10	< 0.0001***	2443 (93.03%)	183 (6.97%)	< 0.0001***
Yes	324	3.89 $\pm$ 4.01		271 (83.64%)	53 (16.36%)	

Note. A total score of Hospital Anxiety and Depression Scale (HADS-A) 8 indicates clinical anxiety.

SD = standard deviation.

*
p < 0.05,

**
p < 0.01,

p < 0.001

Table 2.

Descriptive Statistics of Elder Mistreatment, Depressive Symptoms, and Depression (N=3,157)

Depressive symptoms				Depression		
	N	Mean $\pm$ SD	<i>p</i> value	No	Yes	<i>p</i> value
Any elder mistreatment						
No	2650	2.22 $\pm$ 3.69	< 0.0001***	2214 (83.55%)	436 (16.45%)	< 0.0001***
Yes	474	4.93 $\pm$ 5.31		280 (59.07%)	194 (40.93%)	
Psychological mistreatment						
No	2836	2.35 $\pm$ 3.81	< 0.0001***	2321 (82.22%)	502 (17.78%)	< 0.0001***
Yes	308	5.27 $\pm$ 5.55		177 (57.47%)	131 (42.53%)	
Physical mistreatment						
No	3100	2.61 $\pm$ 4.08	< 0.0001***	2479 (79.97%)	621 (20.03%)	0.0139*
Yes	33	6.06 $\pm$ 6.57		20 (60.61%)	13 (39.39%)	
Sexual mistreatment						
No	3127	2.65 $\pm$ 4.13	0.7170	2493 (79.72%)	634 (20.28%)	1.0000
Yes	6	2.17 $\pm$ 3.92		5 (83.33%)	1 (16.67%)	
Financial exploitation						
No	2853	2.56 $\pm$ 4.02	0.0181*	2285 (80.49%)	554 (19.51%)	0.0021**
Yes	291	3.45 $\pm$ 4.97		211 (72.51%)	80 (27.49%)	
Caregiver neglect						
No	2629	2.25 $\pm$ 3.71	< 0.0001***	2184 (83.07%)	445 (16.93%)	< 0.0001***
Yes	329	4.43 $\pm$ 4.88		207 (62.92%)	122 (37.08%)	

Note. A total score of Patient Health Questionnaire (PHQ-9) ≥ 5 indicates clinical depression.

SD = standard deviation.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 3.

Elder Mistreatment on Anxiety Symptoms and Anxiety (N=3,157)

Anxiety Symptoms		Model A OR (95% CI)	Model B OR (95% CI)	Model C OR (95% CI)	Model D OR (95% CI)	Model E OR (95% CI)	Model F OR (95% CI)
Age		1.00 (0.99,1.00)	1.00 (0.99,1.00)	1.00 (0.99,1.00)	1.00 (0.99,1.00)	1.00 (0.99,1.00)	0.99 (0.99,1.00) *
Education		0.99 (0.98,1.00)	1.00 (0.99,1.01)	1.00 (0.99,1.01)	1.00 (0.99,1.01)	1.00 (0.99,1.01)	1.00 (0.99,1.01)
Income		0.98 (0.94,1.02)	0.99 (0.95,1.03)	0.99 (0.95,1.03)	0.98 (0.95,1.03)	0.98 (0.94,1.02)	0.98 (0.94,1.02)
Marital status		0.85 (0.76,0.94) **	0.84 (0.76,0.94) **	0.84 (0.76,0.94) **	0.85 (0.76,0.94) **	0.85 (0.76,0.94) **	0.80 (0.72,0.89) ***
Number of children		0.98 (0.95,1.01)	0.98 (0.95,1.01)	0.97 (0.94,1.01)	0.97 (0.94,1.01)	0.97 (0.94,1.01)	0.97 (0.94,1.00)
Overall health status		1.32 (1.25,1.40) ***	1.33 (1.25,1.41) ***	1.36 (1.28,1.44) ***	1.36 (1.28,1.45) ***	1.36 (1.28,1.44) ***	1.31 (1.23,1.40) ***
Quality of life		1.25 (1.17,1.34) ***	1.26 (1.17,1.35) ***	1.25 (1.17,1.34) ***	1.25 (1.17,1.34) ***	1.26 (1.17,1.35) ***	1.24 (1.15,1.33) ***
Health changes		1.14 (1.08,1.21) ***	1.14 (1.08,1.21) ***	1.14 (1.08,1.21) ***	1.14 (1.07,1.21) ***	1.14 (1.08,1.21) ***	1.13 (1.06,1.20) ***
Any elder mistreatment		1.76 (1.57,1.98) ***					
Psychological mistreatment			1.76 (1.53,2.02) ***				
Physical mistreatment				1.56 (1.03,2.36) *			
Sexual mistreatment					0.89 (0.30,2.66)		
Financial exploitation						1.24 (1.06,1.44) **	
Caregiver neglect							1.44 (1.25, 1.66) ***
Anxiety							
Age		0.98 (0.97, 1.00)	0.99 (0.97, 1.00)	0.98 (0.97, 1.00)	0.98 (0.97, 1.00)	0.98 (0.97, 1.00)	0.97 (0.95, 0.99) **
Education		0.98 (0.95, 1.01)	0.99 (0.96, 1.02)	1.00 (0.97, 1.02)	1.00 (0.97, 1.03)	0.99 (0.96, 1.02)	1.01 (0.98, 1.04)
Income		0.86 (0.74, 1.01)	0.89 (0.76, 1.04)	0.89 (0.76, 1.03)	0.88 (0.75, 1.03)	0.87 (0.75, 1.02)	0.85 (0.72, 1.01)
Marital status		0.62 (0.46, 0.84) ***	0.62 (0.46, 0.84) **	0.60 (0.44, 0.80) ***	0.60 (0.44, 0.81) ***	0.60 (0.45, 0.82) **	0.52 (0.38, 0.72) ***
Number of children		0.98 (0.89, 1.08)	0.97 (0.88, 1.07)	0.96 (0.87, 1.06)	0.96 (0.87, 1.05)	0.96 (0.87, 1.06)	0.97 (0.87, 1.07)
Overall health status		2.16 (1.77, 2.64) ***	2.20 (1.80, 2.69) ***	2.28 (1.86, 2.78) ***	2.29 (1.88, 2.80) ***	2.27 (1.86, 2.77) ***	2.11 (1.71, 2.61) ***
Quality of life		1.71 (1.37, 2.13) ***	1.76 (1.41, 2.19) ***	1.71 (1.38, 2.14) ***	1.72 (1.38, 2.14) ***	1.75 (1.40, 2.17) ***	1.69 (1.34, 2.13) ***

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Health changes	1.31 (1.10, 1.57) **	1.30 (1.09, 1.56) **	1.32 (1.10, 1.57) **	1.31 (1.10, 1.57) **	1.31 (1.10, 1.57) **	1.29 (1.07, 1.55) **
Any elder mistreatment	3.15 (2.33, 4.27) ***					
Psychological mistreatment		2.79 (1.98, 3.93) ***				
Physical mistreatment			3.42 (1.42, 8.27) **			
Sexual mistreatment				0.00 (0.00, 5.02E3)		
Financial exploitation					1.66 (1.11, 2.48) *	
Caregiver neglect						2.15 (1.50, 3.10) ***

Note. A total score of Hospital Anxiety and Depression Scale (HADS-A) 8 indicates clinical anxiety.

RR = rate ratio; OR = odds ratio; CI = confidence interval;

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 4.

Elder Mistreatment on Depressive Symptoms and Depression (N=3,157)

Depressive Symptoms	Model A RR (95% CI)	Model B RR (95% CI)	Model C RR (95% CI)	Model D RR (95% CI)	Model E RR (95% CI)	Model F RR (95% CI)
Age	1.01 (1.01, 1.02) ***	1.01 (1.01, 1.02) ***	1.01 (1.01, 1.02) ***	1.01 (1.01, 1.02) ***	1.01 (1.01, 1.02) ***	1.01 (1.01, 1.02)
Education	1.00 (0.99, 1.01)	1.00 (0.99, 1.01)	1.01 (0.99, 1.02)	1.01 (0.99, 1.02)	1.00 (0.99, 1.02)	1.01 (1.00, 1.02)
Income	0.93 (0.89, 0.98) **	0.94 (0.90, 1.00) *	0.93 (0.88, 0.98) **	0.93 (0.88, 0.98) **	0.93 (0.88, 0.98) **	0.92 (0.87, 0.97) **
Marital status	0.84 (0.74, 0.95) **	0.84 (0.74, 0.95) **	0.84 (0.74, 0.95) **	0.83 (0.73, 0.95) **	0.83 (0.73, 0.95) **	0.77 (0.68, 0.89) ***
Number of children	0.98 (0.94, 1.02)	0.97 (0.94, 1.01)	0.97 (0.93, 1.01)	0.97 (0.93, 1.01)	0.97 (0.93, 1.01)	0.95 (0.91, 0.99) *
Overall health status	1.74 (1.62, 1.86) ***	1.74 (1.62, 1.86) ***	1.78 (1.66, 1.91) ***	1.79 (1.67, 1.92) ***	1.78 (1.66, 1.91) ***	1.71 (1.59, 1.84) ***
Quality of life	1.17 (1.08, 1.27) **	1.19 (1.09, 1.29) ***	1.18 (1.08, 1.28) ***	1.18 (1.08, 1.28) ***	1.18 (1.09, 1.29) ***	1.16 (1.06, 1.26) **
Health changes	1.34 (1.25, 1.43) ***	1.35 (1.26, 1.45) ***	1.34 (1.25, 1.43) ***	1.34 (1.25, 1.43) ***	1.34 (1.25, 1.43) ***	1.35 (1.26, 1.45) ***
Any elder mistreatment	2.11 (1.83, 2.43) ***					
Psychological mistreatment		2.12 (1.78, 2.51) ***				
Physical mistreatment			1.82 (1.10, 2.99) *	0.22 (0.04, 1.15)		
Sexual mistreatment					1.33 (1.11, 1.60) **	
Financial exploitation						1.48 (1.24, 1.77) ***
Caregiver neglect						
Depression						
Age	1.01 (1.00, 1.03) *	1.01 (1.00, 1.03)	1.01 (1.00, 1.02)	1.01 (1.00, 1.02)	1.01 (1.00, 1.02)	1.00 (0.99, 1.01)
Education	0.99 (0.97, 1.01)	1.00 (0.98, 1.02)	1.00 (0.98, 1.03)	1.01 (0.99, 1.03)	1.00 (0.98, 1.02)	1.01 (0.99, 1.04)
Income	0.91 (0.82, 1.01)	0.93 (0.84, 1.03)	0.93 (0.84, 1.03)	0.93 (0.84, 1.03)	0.92 (0.83, 1.02)	0.91 (0.82, 1.02)
Marital status	0.75 (0.60, 0.94) *	0.76 (0.61, 0.95) *	0.72 (0.58, 0.90) **	0.72 (0.58, 0.90) **	0.73 (0.58, 0.91) **	0.63 (0.50, 0.80) ***
Number of children	0.97 (0.91, 1.04)	0.97 (0.91, 1.04)	0.96 (0.90, 1.03)	0.97 (0.90, 1.03)	0.97 (0.90, 1.04)	0.95 (0.88, 1.02)
Overall health status	2.48 (2.15, 2.86) ***	2.49 (2.16, 2.87) ***	2.56 (2.23, 2.95) ***	2.60 (2.25, 2.99) ***	2.56 (2.22, 2.95) ***	2.38 (2.05, 2.76) ***

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Quality of life	1.28 (1.10,1.50) **	1.32 (1.13,1.54) ***	1.29 (1.11,1.51) **	1.29 (1.10, 1.50) **	1.31 (1.12, 1.52) ***	1.23 (1.05, 1.45) *
Health changes	1.58 (1.38,1.80) ***	1.58 (1.38,1.80) ***	1.57 (1.38,1.79) ***	1.58 (1.39, 1.80) ***	1.58 (1.39, 1.80) ***	1.61 (1.40, 1.85) ***
Any elder mistreatment	3.32 (2.61,4.21) ***					
Psychological mistreatment		3.10 (2.35,4.09) ***				
Physical mistreatment			2.07 (0.93,4.61)			
Sexual mistreatment				0.00 (0.00, 1)		
Financial exploitation					1.51 (1.11,2.05) **	
Caregiver neglect						2.19 (1.65, 2.89) ***

Note. A total score of Patient Health Questionnaire (PHQ-9) 5 indicates clinical depression.

RR = rate ratio; OR = odds ratio; CI = confidence interval;

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$