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Risk and protective factors associated with domestic abuse among older Chinese in the People's Republic of China

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ABSTRACT

Objectives: To identify risk and protective factors associated with elder abuse among older Chinese with cognitive and physical impairment in the People's Republic of China (PRC).

Methods: 1002 dyads of care recipients and family caregivers were interviewed.

Results: The mutually reported rates were 9.7%, 0.8%, 33.2%, and 39.7% for psychological abuse, physical abuse, financial exploitation, and caregiver neglect respectively. Caregiver burden, care recipient neuropsychiatric symptoms, and cognitive impairments are prominent risk factors, while protective factors associated with multiple abuse subtypes include caregiver's use of emotion-focused and solution-focused coping, perception of familism, and premorbid relationship rewards. Distinct factors were observed for respective forms of abuse. Psychological abuse with family poverty; Caregiver neglect with caregiver's substance use and poor physical health; Financial exploitation with caregiver's neurotic personality, as well as care recipient's younger age, absence of chronic illness, and co-residence between the caregiver and care recipient.

Discussion: Both similar and distinct factors were observed for different forms of abuse, potentially useful for designing prevention and intervention programs.

1. Introduction

Elder abuse is a human rights violation and public health priority that requires immediate action from the Governments, health service providers, and policy makers (WHO, 2002). Despite various definitions, two key concepts of elder abuse are that actions or omissions leading to harm to an older adult, and that this occurs in a relationship of trust (Pillemer et al., 2016). Elder abuse not only imposes negative health consequences on the victims, including institutionalization, hospital admission, increased morbidity, and mortality, but also brings a detrimental impact to families and the society (Yan, 2015). Given the growing number of older population, the magnitude and costs of elder abuse will surely increase.

There has been a lack of effective strategies to prevent elder abuse. Without reliable screening instruments, healthcare practitioners tend to underrate older people at high-risk situations (Burnes et al., 2015). Awareness initiatives and public education programs targeting at healthcare professionals, victims, and perpetrators remain underdeveloped (Pillemer et al., 2016). To address these practical difficulties, risk factors identification is essential, as it largely predicts timely detection of abuse cases and development of efficacious prevention strategies (Johannesen & LoGiudice, 2012). However, there is a paucity of studies that inform these efforts.

Elder abuse can manifest different patterns depending on settings and population characteristics. Most elder abuse cases occur in domestic settings and older people with cognitive and physical impairment tend to be more vulnerable to such abuse than their unimpaired counterparts (5.4–62.3% in Fang & Yan, 2018 vs. 3.2–27.5% in Cooper, Katona et al., 2008, Cooper, Selwood et al., 2008). This is perhaps due to their heavy reliance on caregiver support and isolation from social networks (Yan, 2014).

1.1. Elder abuse in the People's Republic of China (PRC)

Elder abuse cannot be interpreted without considering the sociocultural context in which it occurs. Family care remains predominant for cognitively and physically impaired older adults in the PRC, due to the shortage and high costs of formal care services (Yan, 2014). However, lessened conformity to traditional values of familism and filial piety resulting from increased exposure to Western values suggests that older persons can no longer expect care or guarantee immunity from maltreatment in the family (Yan & Tang, 2004). In fact, elder abuse in older Chinese community-dwellers (20.0%–40.0% Dong et al., 2010; Wu et al., 2012; Yan & Tang, 2004) was found to be more prevalent

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than that in their Western counterparts (1.0%–21.5% in Cooper, Katona et al., 2008, Cooper, Selwood et al., 2008). Similar to observation made in other countries, older Chinese with compromised cognitive and physical functioning are at an elevated risk of caregiver-perpetrated abuse (42.3%–62.3% in Yan, 2014; Yan & Kwok, 2011). In view of the huge number of older Chinese (222 million), with nearly one-fifth living with cognitive and physical impairment (44.2 million) (National Bureau of Statistics of China, 2016), it is projected that elder abuse will pose a challenging social problem in the PRC, requiring urgent multi-disciplinary efforts to alleviate.

1.2. Risk and protective factors

Accumulative research has been conducted to identify factors associated with elder abuse in caregiving context. Inconsistent findings, however, were yielded depending on the differences in methodology and abuse subtypes examined. On the part of the care recipients, findings have converged on the role of older in age (Burnes et al., 2015), cognitive impairment (VandeWeerd et al., 2013), neuropsychiatric symptoms (Cooper et al., 2010), physical disabilities, and ADL impairments (VandeWeerd & Paveza, 2008) as risk factors of various forms of abuse. Inconclusive results were found for the role of chronic conditions: whilst early research found that such conditions increased the risk of neglect (Fulmer et al., 2005), another recent study has identified it as a protective factor against physical abuse (Yan, 2014). On the other hand, caregiver's physical health status (Beach et al., 2005), care burden (Yan, 2014), and substance use (VandeWeerd et al., 2013) are prominent factors associated with both psychological and physical abuse. Additionally, neglectful caregiving tends to involve caregivers high in neuroticism (Fulmer et al., 2005). On the relational level, caregivers who perceive higher rewards from the premorbid dyadic relationship are less likely to engage in potentially harmful behaviors (Williamson & Shaffer, 2001). On the socio-contextual level, family poverty and a shared living environment (Yan & Kwok, 2011) both increase the risk of psychological and physical abuse.

Since caregiving involves intensive interaction between the family caregivers and the older adults receiving care, it is important to examine and develop coping mechanisms for caregivers. Although no studies have examined the direct association between coping strategies and abuse, there is evidence showing that solution-focused and emotion-focused coping strategies improve the psychological wellbeing of and the quality of care given by caregivers (Cooper, Katona et al., 2008, Cooper, Selwood et al., 2008).

Despite important contributions these studies have made to current literature, they have notable measurement and definitional limitations that undermine the validity of factors identified. For instance, one of these studies included maltreatment committed by stranger (Peterson et al., 2014), which does not constitute as elder abuse as it falls outside of the elder abuse definitional boundaries of a relationship with trust. Similarly, two studies (Cooper, Katona et al., 2008, Cooper, Selwood et al., 2008, 2010) used the general terminology of "abuse or potentially harmful behaviors" without differentiating abuse subtypes examined, presumptuously assuming that the same factors are associated with different forms of abuse. Two other studies (VandeWeerd & Paveza, 2008; VandeWeerd et al., 2013) did not establish clinically meaningful threshold for positive elder abuse caseness. Furthermore, most of these studies have solely relied on caregiver reports or clinician's observation to obtain information of abuse (Cooper et al., 2010; VandeWeerd & Paveza, 2008; VandeWeerd et al., 2013; Yan & Kwok, 2011; Yan, 2014). Although this reliance could be due to the concern that care recipients' cognitive deficits may undermine the reliability of data, doing so has also discarded potentially valuable data helpful to interpret abuse from the older victim' perspectives.

1.3. The present study

Given the limitations discussed above, the present study identifies risk and protective factors associated with the different abuse subtypes among community dwelling older Chinese with physical and cognitive impairments in the PRC. To reduce reporting bias and to improve data validity, elder abuse was reported by both the caregivers and the care recipients, and measured with validity and clinically meaningful thresholds.

The Framework of Sociocultural Context, which was specifically developed by the National Academies (NAS, 2003) to explain elder abuse, guides the present empirical analysis. Inspired by the ecological model, the adopted model synthesizes a transactional process to capture contributors on intrapersonal, dyadic, intergenerational, and contextual levels to elder abuse (National Research Council, 2003).

2. Methods

The study protocol has been approved by the ethical committee of the authors' affiliated university. A sample of community-dwelling older Chinese and their family caregivers was recruited on a voluntary basis from the geriatric and neurological outpatient departments of three public hospitals in Guangdong Province of the PRC.

Inclusion criteria were: 1) the care recipient must be a community-dwelling older Chinese aged 55 or above, 2) the medical record of the care recipient must show mild to moderate cognitive impairment (score of 0.5–2 on the Clinical Dementia Rating Scale or 9–27 on the Mini-Mental State Examination) and/or physical impairment (assessment made by physicians as presented on the medical reports), 3) the medical record of the care recipient must not show any psychiatric disorder other than the said cognitive and physical impairment 4) family caregivers must be providing at least four hours of care per week, and 5) both the care recipient and the caregiver must be capable of communicating in Mandarin, Cantonese, or Chiu Chow dialect.

Data were collected between September 2015 and February 2016. One thousand and two hundred dyads of care recipients and caregivers were referred to this study, of which 168 dyads declined to take part due to illiteracy or time constraints. Using listwise deletion to manage missing data, 1002 out of 1032 sets of questionnaires were eventually included, yielding a response rate of 83.5%. No significant differences were found between participating and non-participating older persons in terms of gender ($\chi 2 = 1.793$, $p = .818$), age ($t = 1.290$, $p = .840$), and their kinship to caregivers ($\chi 2 = 0.348$, $p = .840$).

All participants provided written informed consent after being thoroughly informed of the study purposes and relevant confidentiality and ethical issues. Questionnaire interviews were administered to the caregivers and face-to-face interviews to the care recipients at separate rooms. Three research assistants with a master's degree in medicine collected data. Information related to the care recipients' chronic illness, cognitive, and psychiatric status was extracted from their medical records by a collaborating clinical team (including one chief physician, two attending physicians, and three residents specializing in geriatrics). The clinical team and all research assistants had all been well trained on knowledge about elder abuse before data collection commenced.

2.1. Measures

Demographic characteristics collected included age, gender, and educational attainment of the care recipient; age, gender, kinship, substance use, and employment status of the caregiver; number of co-residing days; and whether the family was living below poverty line.

Care recipient neuropsychiatric symptoms were measured using the Neuropsychiatric Inventory (Cummings, 1997). The Chinese version has shown good internal consistency ($\alpha = 0.82$) and inter-rater reliability (ICC = 0.98) (Wang et al., 2012). Caregivers rated on a four-point scale the frequency at which the care recipients displayed each of the

listed symptoms in the surveyed month, with a higher score indicating a more frequent display of neuropsychiatric symptoms.

Care recipient cognitive impairment was assessed using the Mini-Mental State Examination (Folstein et al., 1975). The Chinese version has demonstrated good inter-rater reliability (ICC = 0.91), good sensitivity (80–90%), and specificity (80–100%) for dementia diagnosis (Huang et al., 2008). Care recipients with a higher level of cognitive impairment were assigned higher scores.

Care recipient IADL impairment was measured using the Lawton Instrumental Activities of Daily Living (Lawton & Brody, 1969). The Chinese version has demonstrated satisfactory internal consistency (α = 0.86), interrater reliability (ICC = 0.99), and predictive validity (78%) (Tong & Man, 2002). Care-recipients' capability in performing IADL was rated on a four-point scale with a higher score indicating more severe impairment.

Health-related data of the older persons were gathered from the medical records reviewed. Mild to moderate cognitive impairment refers to diagnosis of mild cognitive impairment (MCI), or mild to moderate Alzheimer's disease, vascular dementia, dementia with Lewy bodies, and Parkinson's disease. Physical impairment is defined as physical disability that restricts any major life activity, poliomyelitis, sensory impairment, or cerebral palsy. Chronic conditions assessed included cardio-cerebrovascular disease, chronic respiratory disease, urological disease, digestive system disease, anemia, endocrine and metabolic disease, motor system disease, and tumor.

Caregiver's sense of familism was assessed using the validated Attitudinal Familism Scale (α = 0.83) (Lugo Steidel & Contreras, 2003). Forward and backward translation was used to ensure the compatibility of the Chinese translation with the original version. Caregivers were asked to indicate on a five-point scale whether they agreed or disagreed with each statement, with a higher score suggesting a stronger adherence to familism.

Caregiver perceived burden was measured using the Zarit Burden Interview (Zarit et al., 1980). The Chinese ZBI has demonstrated good internal and inter-rater reliability (α = 0.89; ICC = 0.88) (Ko et al., 2008). Caregivers responded on a five-point scale with a higher score indicating a greater perceived burden.

Caregiver coping strategies were measured using the Brief COPE Inventory (Carver, 1997). The emotion-focused and solution-focused subscales have displayed satisfactory internal consistency (α = 0.72 and 0.84 respectively) (Cooper, Katona et al., 2008, Cooper, Selwood et al., 2008). The Chinese version (BCI-CV) has shown desirable factorial validity and internal reliability (α = 0.83) (Qiu & Li, 2008). Caregivers rated the frequency at which they used each coping option on a five-point scale with a higher score indicating more frequent use.

Caregiver physical health was measured using the Suboptimal Health Status Questionnaire (Yan et al., 2009). The SHSQ has demonstrated excellent test-retest and internal reliability among Chinese community-dwellers (ICC = 0.93; α = 0.93) (Yan et al., 2009). Caregivers rated on a five-point scale the frequency at which they experienced each of the listed symptoms over the past 12 months, with a higher score indicating poorer physical health.

Caregiver neuroticism was assessed using the neuroticism subscale of the NEO Five-Factor Inventory (Costa & McCrae, 1992). The Chinese version has demonstrated satisfactory internal reliability (α = 0.81) (Leung et al., 2013). Caregivers rated each item on a five-point scale with a higher score indicating a higher level of neuroticism.

Premorbid relationship rewards was measured using the Relationship Rewards Scale (Williamson & Shaffer, 2001). The RRC has displayed desirable internal reliability (α = 0.81) (Williamson & Shaffer, 2001). The RRC was first translated into Chinese and then back translated to ensure compatibility with the original version. Caregivers rated on a four-point scale the frequency at which they perceived their past relationship with their care-recipients as rewarding, with a higher score indicating greater perceived rewards.

Elder abuse was assessed using a 37-item scale that covers psychological abuse, physical abuse, financial abuse, and caregiver neglect by family caregivers over the past 12 months. The psychological aggression and physical assault subscales from the Revised Conflict Tactic Scale (Straus et al., 2012) were used to measure psychological and physical abuse respectively. The Chinese version has an internal consistency α ranging from 0.64 to 0.79 for the psychological aggression subscale and 0.69 to 0.86 for the physical assault subscale (Yan & Kwok, 2011; Yan, 2014). A three-item scale based on the Pillemer criteria was developed to assess caregiver neglect (Pillemer & Finkelhor, 1988). Financial exploitation was measured using 14 items adapted from the Old Adult Financial Exploitation Measure (α = 0.96) (Conrad et al., 2010). Both caregivers and care-recipients rated each item on a five-point scale with a higher score indicating more frequent abuse and neglect.

2.2. Data analysis

Psychological abuse was defined as positive response to three or more items on the CTS2 psychological aggression subscale (Beach Criteria; Beach et al., 2005). Physical abuse was defined as positive response to any item on the CTS2 physical assault subscale (Pillemer criteria; Pillemer & Finkelhor, 1988). Caregiver neglect was defined as any unmet need or deprivation of services committed by a co-residing family caregiver (Dong Criteria; Dong, 2014). Financial exploitation was defined as positive response to any item on the adapted OAFEM (Conrad Criteria; Conrad et al., 2010). As a portion of care recipients in this study had moderate cognitive impairment, caregiver reports were also considered as a parallel validity check. Only reports agreed by both the care recipient and the caregiver were included as abuse positive cases in the analysis.

Data were analyzed using SPSS 21.0. Demographic characteristics and major variables were examined using descriptive statistics. Ideally, the Actor-Partner Interdependence Model (APIM) would be a suitable strategy to integrate a conceptual view of interdependence in caregiver and care recipient relationships (Cook & Kenny, 2005), as the APIM allows for simultaneously estimating the effect of the same variables from both parties of a dyad on the outcome of the dyadic relationship (Fitzpatrick et al., 2016). However, it is not applicable to the present study, as we did not adopt a dyadic approach to collect or measure independent variables of elder abuse. Therefore, logistic regression analyses were conducted to identify associated factors of respective abuse subtypes. In the first step, bivariate, unadjusted logistic regression was performed on all potential independent variables individually to explore their associations with elder abuse subtypes outcomes. During the second step, logistic linear models were used simultaneously for all independent variables. Considering the relatively small proportion of positive abuse cases, selection of independent variables into the multivariate models was based on the significance in bivariate analysis ($p < .05$). Multicollinearity diagnoses were conducted prior to the performance of logistic regression. Of particular concern, the lack of enough positive cases of physical abuse (n = 8) was likely to generate over fit of the regression model, which might then reflect random error rather than the genuine relationships. Therefore, physical abuse was omitted from subsequent logistic regression analysis.

3. Results

3.1. Sample characteristics

The participants were 1002 older patients and their family caregivers. Over half of the family caregivers (52.6%, n = 527) were male and their age ranged from 18 to 82 (mean = 47.24; SD = 11.99). More than half of the older care-recipients were also male (55.6%, n = 557), with an age range of 55–90 (mean = 68.72; SD = 8.72). Medical reports indicated that the majority of care recipients had a diagnosis of dementia (79.8%, n = 800), chronic illness other than dementia

Table 1
Descriptive statistics for major variables: categorical variables were presented as number (%) and continuous variables as median (range) and mean (SD) (n = 1002).

Caregiver characteristics	
Age	46 (18-82); 47.24 (11.99)
Gender	
Female	475 (47.4%)
Male	527 (52.6%)
Kinship to the older person	
Spouse	195 (19.5%)
Adult child	595 (59.4%)
Other family member	212 (21.2%)
Employment status	
Full-time employment	584 (58.3%)
Part-time employment	154 (15.4%)
Retired	21 (2.1%)
Unemployed	243 (24.3%)
Suboptimal health status (range 25—125) [0.910]	33 (25-72); 34.8 (8.55)
Emotion-focused coping (range 5-20) [0.669]	10 (5-16); 10.21 (0.059)
Solution-focused coping (range 3-12) [0.678]	8 (3-11); 8.32 (0.041)
Perceived care burden (range 0-88) [0.762]	37 (24-85); 37.81 (5.87)
Little or no burden (0-20)	0 (0.0%)
Mild (21-40)	728 (72.7%)
Moderate (41-60)	270 (26.9%)
Severe (61-88)	4 (0.4%)
Familism (range 18-90) [0.864]	69 (47-90); 70.14 (7.24)
Care-recipient's characteristics	
Age	68 (55-90); 68.72 (8.72)
Gender	
Female	445 (44.4%)
Male	557 (55.6%)
Chronic illness	838 (83.6%)
Diagnosis of physical disabilities (on medical reports)	698 (69.7%)
Physical impairment (IADL) (range 9-36) [0.958]	15 (9-36); 16.34 (7.29)
Diagnosis of dementia (on medical reports)	800 (79.8%)
Cognitive impairment (MMSE) (range 0-30) [0.928]	17 (6-30); 17.97 (6.54)
None/ little (0-3)	168 (16.8%)
Mild (4-9)	156 (15.6%)
Moderate (10-21)	678 (67.7%)
Neuropsychiatric symptoms (range 12-48) [0.836]	17 (12-26); 17.42 (2.52)
Socio-contextual Characteristics	
Living below local poverty line	150 (15.0%)
Number of co-residing days	30 (0-30); 20.51 (12.61)

Data presented as [internal consistency Cronbach's α]; number (%); median (range); mean (SD).

Table 2
Rates of abuse (n = 1002).

	Overall	Male	Female
Psychological abuse			
Any act of psychological abuse	398 (39.7%)	196 (37.2%)	202 (42.5%)
Psychological abuse (Beach criteria)	97 (9.7%)	45 (8.6%)	52 (10.9%)
Physical abuse			
Any act of physical abuse (Pillemer criteria)	8 (0.8%)	3 (0.57%)	5 (1.05%)
Financial exploitation			
Any act of financial exploitation (Conrad criteria)	333 (33.2%)	152 (28.8%)	181 (38.1%)
Caregiver neglect			
Any act of neglect	477 (47.6%)	243 (46.1%)	234 (49.3%)
Caregiver neglect (Dong criteria)	398 (39.7%)	193 (36.6%)	205 (43.2%)
Co-occurrence of abuse			
Two or more abuse subtypes	205 (20.5%)	86 (16.3%)	119 (25.1%)
Three or more abuse subtypes	32 (3.2%)	10 (1.9%)	22 (4.6%)
All four abuse subtypes	–	–	–

Data presented as number (%).

(83.6%, n = 838), and physical disabilities (69.7%, n = 698). Most family caregivers were adult children of the care-recipients (59.4%, n = 595), with the rest being spouses (19.5%, n = 195), or other family members (21.2%, n = 212). The majority of the participating households (85.0%, n = 852) were living above the local poverty line. Sample characteristics were shown in Table 1, where categorical variables were presented as number (%), and continuous variables as median (range) and mean (SD) (Tables 2 and 3).

3.2. Rates of elder abuse

Adopting a dyadic approach, data related to elder abuse were reported by care recipients and triangulate by family caregivers. Using clinically significant thresholds, caregiver neglect was the most common in this sample (39.7%, n = 398), followed by financial exploitation (33.2%, n = 333), psychological abuse (9.7%, n = 97), and physical abuse (0.8%, n = 8). Co-occurrence of multiple forms of abuse was common with 20.5% (n = 205) and 3.2% (n = 32) of the dyads reporting respectively two and three forms of abuse. For all abuse subtypes, rates of abuse were higher among female than among male older adults.

3.3. Risk and protective factors

3.3.1. Psychological abuse

Older persons with cognitive impairment (OR = 1.249, 95% CI = 1.206–1.362), dementia diagnosis (OR = 1.933, 95% CI = 1.356–2.588), and neuropsychiatric symptoms (OR = 1.340, 95% CI = 1.193–1.505), but without chronic illness (OR = 0.536, 95% CI = 0.374–0.857), were more likely to be psychologically abused. On the part of the family caregivers, protective factors identified included emotion-focused (OR = 0.841, 95% CI = 0.765–0.928) and solution-focused coping strategies (OR = 0.420, 95% CI = 0.313–0.739), pre-morbid relationship rewards (OR = 0.631, 95% CI = 0.541–0.728), and belief in familism (OR = 0.938, 95% CI = 0.908–0.977). However, perceived care burden (OR = 1.466, 95% CI = 1.203–1.859) was found to be a risk factor. On contextual level, family poverty was positively associated with psychological abuse (OR = 1.381, 95% CI = 1.192–1.611).

3.3.2. Caregiver neglect

Older persons with cognitive impairment (OR = 1.534, 95% CI = 1.352–1.789), dementia diagnosis (OR = 2.223, 95% CI = 1.128–4.538), and neuropsychiatric symptoms (OR = 1.828, 95% CI = 1.327–2.439) were at an increased risk of caregiver neglect. Family caregivers who used substance (OR = 2.106, 95% CI = 1.537–2.884), had a poor health status (OR = 1.025, 95% CI = 1.000–1.051), and perceived a higher degree of care burden (OR = 1.382, 95% CI = 1.232–1.802) were more likely to engage in neglectful caregiving. However, caregiver neglect was less likely to involve caregivers who used emotion-focused (OR = 0.960, 95% CI = 0.927–0.994) and solution-focused coping strategies (OR = 0.643, 95% CI = 0.422–0.868), as well as those who perceived a higher degree of familism (OR = 0.626, 95% CI = 0.502–0.882) and pre-morbid relationship rewards (OR = 0.726, 95% CI = 0.658–0.812).

3.3.3. Financial exploitation

Financial exploitation was more likely to occur among younger elders (OR = 0.927, 95% CI = 0.905–0.943) suffering from cognitive impairment (OR = 1.362, 95% CI = 1.319–1.405), dementia (OR = 1.863, 95% CI = 1.334–2.479), neuropsychiatric symptoms (OR = 1.517, 95% CI = 1.387–1.659), but not chronic illness (OR = 0.550, 95% CI = 0.403–0.874).

Although caregivers using emotion-focused coping (OR = 0.819, 95% CI = 0.762–0.917) and having a stronger belief in familism (OR = 0.943, 95% CI = 0.913–0.979) were less likely to engage in financial exploitation, those high in neuroticism (OR = 1.103, 95% CI = 1.058–1.150) and those co-residing with care recipients (OR = 1.242, 95% CI = 1.127–1.389) had a greater propensity to do

Table 3
Risk and protective factors for abuse (n = 1002).

	Psychological abuse		Caregiver neglect		Financial exploitation	
	Bivariate model (95% CI)	Multivariate model (95% CI)	Bivariate model (95% CI)	Multivariate mode (95% CI)	Bivariate model (95% CI)	Multivariate mode (95% CI)
Caregiver						
Age	1.026** (1.009, 1.062)	1.034 (0.931, 1.065)	0.951*** (0.940, 0.962)	0.987 (0.945, 1.018)	0.996 (0.985, 1.007)	
Substance use	0.924 (0.608, 1.406)		2.140*** (1.661, 2.756)	2.106*** (1.537, 2.884)	0.982 (0.752, 1.282)	
Suboptimal health status	1.048* (1.026, 1.070)	1.005 (0.966, 1.046)	0.965*** (0.951, 0.980)	1.025* (1.000, 1.051)	1.016* (1.001, 1.032)	0.986 (0.958, 1.015)
Neuroticism	1.037 (0.994, 1.082)		0.965 (0.903, 1.032)	1.044 (0.944, 1.154)	1.057*** (1.027, 1.087)	1.103*** (1.058, 1.150)
Burden	1.589*** (1.328, 1.962)	1.466** (1.203, 1.859)	1.469** (1.349, 1.859)	1.382* (1.232, 1.802)	0.989 (0.966, 1.012)	
Emotion-focused coping	0.862*** (0.795, 0.938)	0.841*** (0.765, 0.928)	0.941*** (0.918, 0.965)	0.960** (0.927, 0.994)	0.929** (0.913, 0.946)	0.819* (0.762, 0.917)
Solution-focused coping	0.526** (0.373, 0.786)	0.420* (0.313, 0.739)	0.713** (0.571, 0.937)	0.643* (0.422, 0.868)	1.006 (0.974, 1.025)	
Care recipient						
Age	0.956* (0.945, 0.984)	0.970 (0.931, 1.011)	0.947 (0.913, 1.069)		0.928*** (0.912, 0.944)	0.927** (0.905,0.943)
Chronic illness	0.643** (0.436, 0.889)	0.536* (0.374, 0.857)	0.862 (0.612, 1.215)		0.541** (0.393, 0.766)	0.550* (0.403, 0.874)
Physical disabilities	1.034* (0.721, 0.949)	1.782 (0.528, 1.329)	1.249*** (1.141, 1.389)	1.079 (0.968, 1.213)	0.955 (0.859, 1.061)	
Dx of dementia	1.958** (1.537, 2.612)	1.933* (1.356, 2.588)	2.362** (1.314, 4.608)	2.223*** (1.128, 4.538)	1.935** (1.457, 2.506)	1.863* (1.334, 2.479)
Cognitive impairment	1.372*** (1.339, 1.459)	1.249* (1.206, 1.362)	1.659** (1.488, 1.887)	1.534* (1.352, 1.789)	1.488*** (1.465, 1.511)	1.362** (1.319, 1.405)
Neuropsychiatric symptoms	1.411*** (1.293, 1.540)	1.340*** (1.193, 1.505)	1.933*** (1.537, 2.526)	1.828** (1.327, 2.439)	1.317*** (1.242, 1.397)	1.517*** (1.387, 1.659)
Impairment in IADL	1.047** (1.018, 1.076)	1.013 (0.969, 1.056)	0.887 (0.869, 1.006)		1.004 (0.986, 1.023)	
Relational						
Pre-morbid relationship rewards	0.646*** (0.560, 0.737)	0.631*** (0.541, 0.728)	0.821*** (0.766, 0.887)	0.726*** (0.658, 0.812)	0.506** (0.323, 0.741)	1.066 (0.963, 1.180)
Socio-contextual						
No. of coresiding days per month	0.999 (0.982, 1.015)		0.991 (0.981, 1.001)		1.324*** (1.218, 1.456)	1.242*** (1.127, 1.389)
Living below local poverty line	1.461** (1.291, 1.635)	1.381** (1.192, 1.611)	1.098** (1.034, 2.217)	1.063 (0.744, 1.808)	0.662*** (0.463, 0.948)	0.914 (0.549, 1.523)
Cultural factor						
Familism	0.958* (0.929, 0.993)	0.938*** (0.908, 0.977)	0.728*** (0.612, 0.945)	0.626** (0.502, 0.882)	0.923*** (0.901, 0.943)	0.943** (0.913, 0.979)
Model fit statistics for the adjusted model		Nagelkerke R square = 0.271 Hosmer-Lemeshow goodness of fit test (X2 = 1.667, df = 8, p = 0.891)		Nagelkerke R square = 0.231 Hosmer-Lemeshow goodness of fit test (X2 = 13.979, df = 8, p = 0.082)		Nagelkerke R square = 0.324 Hosmer-Lemeshow goodness of fit test (X2 = 4.781, df = 8, p = 0.781)

so.

4. Discussion

4.1. Rates of abuse

Compared to studies examining older adults with cognitive or physical impairment in Western countries, the current study yielded lower rates for physical (9.3% in Wiglesworth et al., 2010) and psychological abuse (32.7% in Cooper et al., 2010), caregiver neglect (55.0% in Cooney & Howard, 1995), and financial exploitation (34.0% in Boyd Associates for Age NI & Alzheimer's Society, 2011). One explanation of the lower rates obtained points to the more restrictive definitions and caseness threshold criteria for all abuse subtypes examined, adopted to minimize the odds of type 1 error. Alternatively, it could also be attributed to the older Chinese and their family caregivers' reluctance to report abuse. Cultural values such mistrust with third party intervention and desire to secure family reputation might have accounted for this tendency (Yan, 2015). Possibly due to people's tolerance to abuse involving cognitively and physically impaired older

persons in general (Dong, 2015), rates cited in this study were higher than those in general older Chinese (Dong & Simon, 2013; Yan & Tang, 2004). Consistent with previous findings, elder abuse in this sample was gendered-based, with females being more vulnerable than males in all forms of abuse (Dong & Simon, 2010). This might partially be a result of traditional values of patriarchy and patrilineality that dominate Chinese families (Thurston et al., 2016).

Caregiver neglect is the most pervasive form of abuse in this sample. In concurrence with this finding, the past decade has seen Chinese women who have traditionally assumed the roles of primary family caregivers joining the workforce, thereby limiting their availability to provide intensive hands-on care to senior family members (Cong & Silverstein, 2011). Similarly, consistent with earlier observations (Yan & Kwok, 2011), physical abuse was found to be relatively less common. Many may have been deterred from committing physical abuse in fear of serious social condemnation and potential legal consequences. The high prevalence of financial exploitation, on the other hand, can be partially attributed to Chinese cultural values, where adult children inherit all family resources from their aging parents (Cong & Silverstein, 2011). As a result, adult children may feel entitled to manipulate the wealth of their aging parents, who at the same time tolerate such behaviors. This phenomenon has also been observed in other Asian regions such as South Korea (Moon et al., 1993) and India (Shah et al., 1995).

4.2. Risk and protective factors

Although some identical factors predicted various forms of abuse, divergent risk and protective factors were found for each respective abuse subtypes. Particularly, financial exploitation seemed to have a unique cluster of risk and protective factors, suggesting that although different abuse subtypes share some similar latent risk and protective profile, fundamental differences among overt behaviors (abuse), omissions (neglect), and exploitation (financial exploitation) potentially exists.

4.3. Care recipient factors

The finding that care recipient neuropsychiatric symptoms (Teipel et al., 2015), cognitive impairment, and clinical dementia diagnosis (Cooper et al., 2010) increased the risk of all forms of mistreatment under examination was consistent with previous findings. These cognitive and neuropsychiatric symptoms can impair older adults' capacity for cognitive functioning, self-care, meaningful communications, and financial management, potentially diminishing their ability to protect themselves or to escape from escalating abuse and exploitation. These symptoms might also create more opportunities for unmet needs and services, leading to an elevated risk of neglectful caregiving.

We found younger care recipients to be more vulnerable to financial exploitation. Some official data suggest that compared to the old-olds (77 or above), young olds in the PRC (55–76 years of age) are more likely to possess personal wealth equivalent to $100,000 or more (1.2% vs 17.1%) (Sichuan Poverty Alleviation & Migration, 2013). It is possible that their greater financial resources make them more likely to become targets of financial exploitation. Alternatively, according to socioemotional selectivity theory (Carstensen et al., 1999), aging is linked to relative preference for positive over negative information in both memory and attention. Thus, old-old people may be less likely to recall and report exploitation.

Contrary to theoretical assumptions, chronic illness was negatively related to physical and psychological abuse, and financial exploitation. This finding, in accordance with a previous Chinese population study (Yan, 2014), might reflect reporting bias that frail older persons with chronic conditions can be less prone to disclose abused experiences for fear of losing caregivers' support. Alternatively, it is possible that more frequent and regular contact with medical practitioners may remind the caregivers that their performance is constantly monitored, thus making them more self-aware and less likely to engage in abusive and exploitive behaviors.

4.4. Caregiver factors

Consistent with previous findings (Yan, 2014), care burden was identified as a prominent predictor for physical and psychological abuse, and caregiver neglect. Caregiver burden has been associated with the development of hostile attitude and conflictive family relationships that pose an increased risk of domestic violence (Lin & Giles, 2013). Our results supported an earlier investigation, which concluded that caregivers with poorer physical health have an increased propensity to neglect their care-recipients (Fulmer et al., 2005). Additional stress from physical health problems can distract caregivers from caregiving responsibilities, potentially leading to caregiver neglect.

In line with existing literature (Jogerst et al., 2012), our results indicated a positive relationship between caregiver substance use and neglect. Impairment in judgment and physical and mental health resulting from substance use may lead to caregivers neglecting their responsibilities and the needs of care recipients (Herrenkohl et al., 2013).

There is a lack of examination on the link between caregiver coping and elder abuse in current literature, except for one study, which identified a predictive effect of dysfunctional coping on psychological and physical abuse (Cooper et al., 2010). We found that emotion-focused and solution-focused coping reduced the likelihood of various forms of mistreatment. While caregivers using emotion-focused coping tend to reduce their anger intensity and impulse of abuse by virtue of perceiving their caregiving responsibilities as less stressful, those using solution-focused coping tend to reduce abuse impulse through directly altering the caregiving stressors that cause distress (Carver, 1997; Cooper, Katona et al., 2008, Cooper, Selwood et al., 2008). The result that solution-focused coping did not diminish the odds of financial exploitation implied different mechanism underlying such abuse and the need of exploring alternative coping methods to reduce it.

In this sample, family caregivers with a higher level of neuroticism demonstrated a greater tendency to financially exploit their care recipients. Caregivers high in neuroticism are prone to frustration and compulsive buying that can pose an enhanced risk of financial exploitation (Donelly et al., 2012).

4.5. Relational factors

In line with previous observations (Cooper et al., 2010), pre-morbid relationship rewards was a protective factor against physical abuse, psychological abuse, and caregiver neglect. Caregivers who find their relationship with their care recipient rewarding may perceive their caregiving responsibility as simply a continuation of the previous rewarding relationship rather than an additional burden.

4.6. Socio-contextual factors

The current finding that a greater number of co-residing days increased the likelihood of financial exploitation can be a result of a shared living environment that provides greater access to the wealth and resources of care recipients. As expected, family poverty increased the odds of psychological abuse. Shortage of economic resources has been conceptualized as a contextual stressor that contributes to family tension and caregiver-care recipient conflicts (Burnes et al., 2015).

4.7. Cultural values

Our results showed that caregiver adherence to the cultural value of familism was a protective factor against all abuse subtypes examined. Caregivers with a strong belief in familism tend to value family closeness and prioritize the benefits of their family members over their own

needs (Lugo Steidel & Contreras, 2003), possibly making them less likely to abuse their care-recipients connected with them by kinship.

5. Limitations

Several limitations are present in the present study. The first limitation points to the use of convenience sampling. Although we have recruited a relatively large sample, the generalizability of the present findings is limited and the resulting data could easily be called into question. Secondly, self-reported data were collected from both care recipients and caregivers to improve validity but such measures are prone to recall decay and subjective biases. Apart from the biases associated with the self-reported measures, no temporal or causal relationship could be inferred due to the nature of the cross-sectional design adopted in the present study. Furthermore, only a selected set of associated factors for elder abuse were included for examination, with many other potentially important factors and confounders such as mental health status and previous trauma are unavailable for analysis. Finally, self-neglect was not studied as an elder abuse subtype, mainly because it is excluded from the conceptual definitions of elder abuse (National Research Council, 2003), due to the lack of a perpetrator. Despite these definitions, this study is unique in utilizing a dyadic approach to simultaneously collect elder abuse data from care recipients and their family caregivers and defining abuse caseness with standard definitional parameters, established measurements, and clinically meaningful thresholds.

6. Implications

Findings from this study present study have important implications for elder abuse interventions and dementia care policy. The high prevalence of elder abuse among older Chinese people with cognitive and physical impairments points to the importance of routine screening. Certain existing screening tools have demonstrated high sensitivity and efficiency (Pisani & Walsh, 2012).

Our results also potentially provide useful tools for healthcare professionals to identify caregivers at risk of poor-quality care and maltreatment. Physically frail caregivers who regularly use substance are particularly appropriate targets for screening, prevention, and intervention efforts. Healthcare workers should also focus on providing caregivers with alternative support that can reduce the intensity of care burden, such as respite services or support group referrals. Available evidence from caregiver interventions has indicated that no single intervention could adequately address all the concerns and issues that family caregivers counter (Gitlin et al., 2016). Instead, interventions using multimodal approach to provide diverse combinations of individual counseling, family mediation, caregiving and coping skills training, behavior-management strategies, case management, and environmental modification, appear to be the most effective at alleviating caregiver distress and abuse impulse (Boots et al., 2014).

Furthermore, our findings could assist healthcare professionals in identifying high-risk older adults for abuse and point to the importance of effective treatments to manage dementia-related behavioral problems (Gitlin et al., 2016). Existing evidence has revealed that higher-intensity treatments with higher duration and frequency are generally more effective than those with lower intensity (Kales et al., 2015). These early-intervention efforts may help prevent potentially abusive situations from deteriorating into actual abuse cases.

On the policy level, a nation-wide mandatory elder abuse reporting system should be established, particularly in medical settings where the majority of older people are frail. Policies and procedures, with adequate statutory power and resources, for responding to possible mistreatment against older adults at risk should be developed at both local and national levels. Relevant local agencies and service providers should also be equipped with sufficient knowledge and skills to handle elder abuse situations. Given the expected difficulties for cognitively impaired older adults to detect and report abuse, community-based outreaching programs and services should also be launched to make help-seeking options and resources available to this vulnerable group.

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