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<RRH>*Running head: Earthquake and Iintimate Ppartner Vviolence*

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<AT>Full title: Female Victimization and Intimate Partner Violence Aafter the May 12, 2008, Sichuan Earthquake

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<AB>Abstract

This study investigates the impact of the earthquake that occurred on May 12, 2008 in Sichuan, China, upon stressed families already experiencing domestic violence. We hypothesized that cumulative postdisaster stress would increase marital aggression and that the well-being of victims would deteriorate following the quake. A total of 186 women were recruited for theis study. Results show that all types of family violence, including

psychological aggression and physical violence between partners, increased after the earthquake. We provided preliminary evidence that psychological aggression was significantly associated with the detrimental effects ~~up~~on victims' mental and physical functioning. The findings support the need for violence assessment among victims of earthquakes, and we recommend that violence prevention be considered as part of the intervention during such natural disasters.

<KW>**Keywords:** t~~T~~rauma; earthquake; intimate partner violence; Chinese

<TX-Drop>On May 12, 2008, an 8.0-magnitude earthquake struck the northwestern part of Sichuan p~~P~~rovince in China, killing about 70,000 people and leaving ~~over~~ more than 18,000 missing, 370,000 injured, and 4 million homeless. The area affected by the quake exceeded 440,442 ~~square kilometers~~km^2, and it was felt as far ~~away~~ as Beijing and Shanghai, which were 1,500 and 1,700 ~~kilometers~~km away, respectively, from the epicenter. Unlike many other traumatic events, earthquakes usually happen with no warning. Large-scale natural disasters can leave their traces on the population for an entire generation, and their impact can be widespread, severe, and ongoing (Choul et al., 2004).

<tx>Research shows that earthquake exposure is associated with multidimensional impairment in the quality of life, including in both the physical and the psychological domains (Norris et al., 2002). Disaster victims often have more somatic complaints (Smith & Freedy, 2000), poorer sleep quality (Mellman, David, Kulick-B~~b~~ell, Hebding, & Nolan, 1995), and more illnesses, sleep disruption, and physiological indicators of stress and immune functioning (Inoue-Sakurai, Maruyama, & Morimoto, 2000) than the norm. Additionally, deterioration of health is found most commonly in persons with preexisting physical illness (Chiu, Hu, Lue, Chen, & Hsieh, 2002). In addition to causing property

damage and substantial injury and threat to life, earthquakes can also lead to serious psychological and mental sequelae among victims. Disaster victims are likely to be associated with an increased prevalence of psychiatric morbidity, for example, posttraumatic stress disorder (PTSD), depression, anxiety, sleep disorders, and substance abuse (Chen et al., 2007; Choul et al., 2004; Hizli, Taskintuna, Isikli, Kilic, & Zileli, 2009; Lazaratou et al., 2008). Among the range of possible psychological problems, PTSD has been found to be the most prevalent type of psychiatric morbidity after a disaster (Acierno et al., 2007; Kumar et al., 2007).

Recent research shows the unique impact of an earthquake upon powerless groups of people who lack strength or resources, or the authority or capacity to act, such as children, ethnic minorities, and women (Anastario, Shehab, & Lawry, 2009; Norris et al., 2002; Perilla, Norris, & Lavizzo, 2002). Children are highly vulnerable to postdisaster distress (Norris et al., 2002) and conflict within the family (Herrenkohl, Sousa, Tajima, Herrenkohl, & Moylan, 2008), owing to their lower education (Palmieri, Canetti-Nisim, Galea, Johnson, & Hobfoll, 2008) and limited coping skills and cognitive ability (Wang et al., 2009). Young people are also at greater risk of developing mental health problems, especially PTSD, compared with adults (Norris et al., 2002; Salmon & Bryant, 2002). Ethnic minorities such as Latinos and non-Hispanic Blacks are more adversely affected by natural disasters than the majority (Perilla et al., 2002). African Americans are also more vulnerable to the effects of stress and change resulting from a disaster than their Anglo-American counterparts (Norris, Perilla, Ibañez, & Murphy, 2001), possibly because they lack access to social support or resources to cope with disaster and, thus, are at risk of developing PTSD after a trauma (Breslau et al., 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris et al., 2001).

<H1>**GENDER DIFFERENCES IN COPING WITH TRAUMA**

<txf>Scholars have also addressed gender differences in the manifestation of PTSD symptomatology. Women appear to be more vulnerable with respect to the psychological effects of an earthquake (Chen et al., 2007; Choul et al., 2004; Frans, Rimmöe, Aberg, & Fredrikson, 2005; Hizli et al., 2009; Kuo, Wu, Ma, Chiu, & Chou, 2007; Lai, Chang, Connor, Lee, & Davidson, 2004; Lazaratou et al., 2008; Wang et al., 2009). Even when no significant difference exists in the severity of exposure, females reported more PTSD symptoms than males (Bal, 2008). Specifically, women were nearly three times more likely than men to exhibit PTSD symptoms after a natural disaster (Kumar et al., 2007). One possible underlying mechanism is the biological differences between men and women; previous research has found that women are born more physiologically reactive to traumatic stimuli than men (Norris et al., 2001).

<tx>Although several studies have addressed health problems, including psychological distress in women survivors of devastating earthquakes, few have examined the effects of disaster-related stress upon family relationships, especially families with domestic violence. Previous research has shown that intimate partner violence (IPV) rates increased within the year following a disaster and did not return to baseline during the protracted phase of displacement (Anastario et al., 2009; Larrance, Anastario, & Lawry, 2007). Postdisaster IPV was 4.6 times higher among respondents after adjusting for potential confounders (Anastario et al., 2009). Women experiencing IPV consistently displayed greater vulnerability than men to developing PTSD and being injured, and they felt more fears (Arias & Corso, 2005; Bonomi, Anderson, Rivara, & Thompson, 2009; Phelan et al., 2005; Romans, Cohen, Forte, Du Mont, & Hyman, 2008). Stress may affect the general state of deprivation, increase sensitivity to negative stimuli, and lead to more frequent interactions with other angry persons, which finally contribute to criminal behavior such as aggression towards

others (Agnew, 1999). Therefore, stress resulting from adverse circumstances increases the vulnerability of families to disruption and conflict (Margolin, Gordis, Medina, & Oliver ~~et al.~~, 2003; Shipman, Rossman, & West, 1999).

Additionally, with high levels of stress already draining women's coping resources, battered women may have difficulty coping with the additional stress resulting from exposure to trauma (Margolin et al., ~~Gordis, Medina, & Oliver,~~ 2003). Abused women have consistently been found at higher risk for mental disorders, including depression, anxiety, substance use, musculoskeletal disorders, and female reproductive disorders (Bermudez, Matud, & Buela-Casal, 2009; Bonomi, Anderson, Reid, et al., 2009; Kim, Park, & Emery, 2009) and cognitive dysfunction (Clements & Ogle, 2009; Vung, Ostergren, & Krantz, 2009), which may reduce their ability to cope with disaster sequelae and make it harder to recover from trauma.

<H1>**GENDER INEQUALITY AND INTIMATE PARTNER VIOLENCE**

<txf>Scholars have considered IPV to be rooted in gender inequality and to emerge from gendered coercive relations of power and control (Davies, Ford-Gilboe, & Hammerton, 2009). They have consistently found women's power disadvantages to be a crucial risk factor for IPV (Jonzon, Vung, Ringsberg, & Krantz, 2007; Panchanadeswaran et al., 2007; Pulerwitz, Gortmaker, & DeJong, 2000). IPV can be regarded as a power differential, with a female being in a relatively powerless position against a male. The prevalence rate of husband-to-wife violence is higher in couples with gender differentials in power, especially when the wife is in an inferior position to the husband (Tang & Lai, 2008). Male abusers often believe they have higher status and exclusive rights over others (Brandl & Horan, 2002). They often use power and control tactics over their victims to increase their partners' feelings of powerlessness ~~in order~~ to retain privileges and control of their victims (Buelna,

Ulloa, & Ulibarri, 2009; Sonis & Langer, 2008). ~~Since~~ Because economically disadvantaged women are more likely to be abused (Chan, 2005; Lau, 2005; Tang & Lai, 2008; Tiwari et al., 2008), researchers have hypothesized that employment increases a woman's status within the family by her financial support thereof, making her less vulnerable to abuse (Vyas & Watts, 2009). At the same time, employed women may not be immune from abuse when their abusive and controlling partners feel they are being challenged and so use violence to regain control (Chan & Straus, 2008; Jonzon et al., 2007; Krishnan et al., 2010; Rocca, Rathod, Falle, Pande, & Krishnan, 2009).

<tx>Because powerless women are already in a vulnerable position within the family, this may affect their ability to cope with trauma sequelae when exposed to a disaster. Lack of social support and resources, as well as a lower economic status and lower education, are the factors most associated with the vulnerability of women exposed to trauma (Chen et al., 2007; Choul et al., 2004; Hizli et al., 2009; Kumar et al., 2007; Lai et al., 2004; Palmieri et al., 2008; Wang et al., 2009). Women with less education may be less resilient in recovering from trauma because of their poorer coping skills, lower self-esteem, and lower insight (Wang et al., 2009). Women are more vulnerable to exposure to disasters owing to their inferior financial role, gender role stereotypes, and cultural attitudes, which in turn account for the higher prevalence of PTSD among them (Bal, 2008; Kumar et al., 2007; Ranasinghe & Levy, 2007).

The impact of a traumatic event interacts with several factors, including the event itself, the damage it causes, the severity of exposure, a victim's personal history, and contextual issues, which combine to produce a stressful effect ~~up~~on the life of the survivor (Lazaratou et al., 2008; Wang et al., 2009). Given the severe psychiatric stress resulting from an earthquake, we hypothesized that cumulative postdisaster stress would increase the

prevalence of IPV and lead to deterioration of the well-being of victims after the Sichuan earthquake.

<H1>**METHOD**

<H2>**Participants and Recruitment**

<txf>Following the 5/12 Sichuan earthquake, the Chinese government established temporary shelters for survivors whose houses had been destroyed in the quake. On June 24, 2008, the second author of this articlepaper and her colleagues went to one of the temporary shelters, Du Jiang Yan Community A, to deliver services and support to the survivors. This shelter was located along the Min rRiver, in Sichuan pProvince, near the capital Chengdu, with over more than 2,000 households and 6,000 people. Cooperating with local community organizations, community services aimed at investigating and supporting the lives of women after a disaster were launched in November, 2008. All women recipients of services who met the inclusion criteria during the study period were invited to participate in the study. These criteria consisted of being a Chinese woman, aged 18 or aboveolder, giving informed consent, being married or cohabiting, or having a child. The participants were interviewed face-to-face by research assistants trained to conduct household research interviews with victims. Once respondents were identified as having been abused, they were encouraged to seek help and provided with necessary information for referral. All participants provided informed consent prior to their interviews, and were informed they could refuse to answer any question. Confidentiality of the data was guaranteed. The ethics committee of the Shanghai Normal University approved the procedures.

Table 1 shows the demographic information for the participants. Through convenience sampling, A total of 186 women were successfully recruited through convenience sampling. About 32% and 51% of the respondents were aged younger

thanbelow 40 and 51% were from 41 to 60 years old, respectively. About 57.5% had a monthly household income below lower than RMB1000, which was very low compared with other cities in the mMainland. Such low income was probably attributable to the high unemployment rate (34.4%) and low education levels among those respondents. Over More than half (58.6%) had received below lower than a high school level of education (equivalent to Grades 9 or below lower in the United States). About 6.5% of women respondents were physically or mentally challenged. A great majority were married or cohabiting (81.7%), whereas 14% were separated or divorced, or their partner was deceased. About 81% of the women had children, one-fifth of whom were aged 14 years or belowyounger.

<Insert [Table 1 about here>]

<H2>**Measures**

<H3>***Demographic Ccharacteristics*.** We used demographic questions to collect the demographic and socioeconomic characteristics of the respondents and their families. These included items asking for information about the respondent's age, level of education, number of children in the family, marital status, employment status, occupation, and health condition.

<H3>***Partner Vviolence*.** The Abuse Assessment Screen (AAS;) (Soeken, McFarlane, Parker, & Lominack, 1998) was modified to identify cases of partner violence. The AAS has been translated in Chinese and was validated with demonstrated satisfactory measurement accuracy for identifying intimate partner violenceIPV among Chinese women (Tiwari, et al., 2007). The Chinese AAS addresses emotional and physical violence separately for all three time periods (lifetime, the preceding year, and during pregnancy). To adapt to the respondents of this study, we did not include the items referring to the pregnantcy period. The item measuring sexual violence was excluded because it was too sensitive for the respondents to respond. A Hhigh non-response rate would be expected. As a result, we used three items to

measure exposure to psychological aggression, physical violence, and fear. The selected items have been individually validated by the Chinese Revised Conflict Tactics Scales. The specificity estimates of the Chinese AAS for psychological and physical abuse were higher than 89%, whileereas the sensitivity estimates varied from 45.2% to 65.8%. The sensitivity improved in the screening for more severe cases (66.7%). The positive predictive values were higher than 88%, and the negative predictive values varied from 66% to 93% (Tiwari, et al., 2007). Subjects were asked at the interview about the number of incidents of psychological aggression and physical violence perpetrated against themselves, from the occurrence of the earthquake until the time of the interview (i.e., from May to November, 2008). The responses included never, once, twice, 3 times, 4 times, 5 times or more, and none since the quake but having occurred before it. The responses for the item about fear included being very afraid, being afraid, and having no fear. The respondents also reported whether they had witnessed interparental violence in their childhood with reference to the same items of the Chinese AAS.

<H3>***Physical and Mmental Hhealth.*** We used the standard SF-12, an abbreviated form of the medical outcomes study (MOS) Short--Form Health Survey, to assess health-related quality of life. The standard SF-12 consists of 12 items, grouped under the physical health summary and mental health summary scales. The higher the scale score, the better the corresponding quality of life. In this study, for Chinese participants, we used the Chinese-specific SF-12, which has been validated and found to have satisfactory psychometric properties compared with the standard SF-12 (Lam, Tse, & Gandek, 2005). Cronbach's alphaα for the 12 items in this study was 0.682.

<H2>**Data Analysis**

<txf>We used descriptive statistics to report the sociodemographic characteristics of the

respondents, as well as the prevalence rates of different types of family violence. We described continuous data, including the physical and mental functioning among different violence groups, as means and standard derivations, and we used a one-way analysis of variance (ANOVA) for comparisons between means. We used a nominal significance level of 5% and adopted SPSS version 17 for the statistical analysis.

<H1>**RESULTS**

<H2>**Prevalence of Violence**

<txf>Table 2 presents the occurrence rates of different types of family violence reported by the respondents. The lifetime prevalence of psychological aggression was 27.6%, with participants reporting being abused mainly by their spouse or ex-spouse (48%), a stranger (42%), a known person (38%), or a family member (36%). The lifetime prevalence of physical violence, on the other hand, was 11.6%, with nearly 52% of respondents being abused by a spouse or ex-spouse, 42.9% by a known person, 28.6% by a family member, and 19% by a stranger.

<tx>The prevalence of psychological aggression before the Sichuan earthquake was 10.5%, and perpetrated mainly by a family member (68.4%), a spouse or ex-spouse (67.9%), or a known person (52.7%). After the earthquake, the prevalence of psychological aggression increased to 19.3%, with respondents reporting they were abused mainly by a stranger (45.8%) or a spouse or ex-spouse (37.1%). The preearthquake prevalence of physical violence was 5.0%, which increased to 6.6% after the quake. Spouses or ex-spouses and known persons made up most of the perpetrators of physical violence both before and after the quake, 77.8% and 55.6% before, respectively, and 33.3% and 33.3% afterwards, respectively.

Of the 186 respondents, 19.3% had felt fear at some point in their life towards a

family member (68.6%), a spouse or ex-spouse (34.3%), a stranger (28.6%), and a known person (17.1%).

<Insert {Table 2 about here>}

<H2>**Prevalence of Witnessed Parental Violence**

<txf>The respondents reported witnessing more father-to-mother violence (8.8%) compared with mother-to-father violence (5.0%). The types of physical violence used most often included hitting, beating, kicking, or physically hurting the victim, accounting for 81.2% of father-to-mother violence and 88.9% of mother-to-father violence.

<H2>**Respondents' Physical and Mental Functioning**

<txf>Table 3 examines and compares the mean scores for three groups. Compared with the group experiencing no violence, respondents suffering psychological aggression after the quake scored significantly lower in terms of physical and mental health, whereas those suffering such aggression before the quake showed no significantce difference in physical and mental health compared with the no-violence group. Regarding physical violence perpetrated by abusers, respondents suffering preearthquake physical violence scored significantly lower on mental health compared with those experiencing no violence. The results also showed that witnessing parental violence played a significant role in the respondents' physical health, with those who had witnessed such violence scoring significantly lower on physical functioning than those in the no-violence group.

<Insert {Table 3 about here>}

<H1>**DISCUSSION**

<txf>Although it is impossible to compare situations across different catastrophic events or study samples, prevalence rates remain a useful type of data in measuring the impact of trauma. All types of family violence, including psychological aggression between partners and physical violence between partners, increased after the earthquake. We also examined the influence of family violence ~~up~~on the quake survivors, especially battered women. Physical violence occurring before the quake, in particular, had a harmful effect on women's mental health, ~~while~~ and women experiencing psychological aggression also suffered poorer physical health and mental functioning.

<tx>Psychological aggression, including verbal aggression perpetrated by a husband, is not necessarily benign for a woman. The results of th~~e present~~is study are in line with those of previous studies, suggesting that the psychological victimization women endure is more detrimental to their individual well-being than physical victimization (Arias & Pape, 1999; Coker, Smith, Bethea, King, & McKeown, 2000; Follingstad, Rutledge, Berg, Hause, & Polek, 1990; Lawrence, Yoon, Langer, & Ro, 2009). Women reporting psychological victimization are at risk of mental disorders such as depression, anxiety, PTSD, and other emotional problems, including increased feelings of shame, guilt, fear, and stress (Follingstad, 2009). In addition, previous studies assessing the physical health status of battered women have also found a relationship between psychological aggression and women's self-reported limitations in activities and roles owing to their physical health, as well as their perceptions of their health (Coker et al., 2000; Straight, Harper, & Arias, 2003). Substance abuse, which is significantly associated with psychological aggression, may also explain role limitations resulting from the status of one's physical health (Coker et al., 2002).

~~But~~ However, our study addresses only the general status of physical and mental health without exploring specific health problems. Furthermore, given that different forms of psychological aggression may produce specific outcomes ~~up~~on victims (Coker et al., 2002),

future research is needed to determine which types of psychological aggression might have an adverse impact on mental and physical functioning and related factors ~~in order~~ to attenuate the effects of psychological victimization.

Our study does have ~~a number of~~several limitations, ~~since~~ because its design limits the interpretation of the findings. First, the present findings are subject to selection bias through convenience sampling. The~~e~~is study is specific for women who experienced the Sichuan earthquake and were receiving services and support, and so its findings may not be generalized to other populations or other types of disasters. The prevalence of family violence in and its impact on this other population would vary owing to different levels of exposure to the earthquake. Second, the study design was cross-sectional, thus, preventing determination of a causal relationship between the earthquake and IPV. Third, the data were based on self-reported measures, which can be influenced by memory error or denial. Results based on a retrospective design may also limit the strength of the conclusions. Fourth, the pre~~—~~earthquake and postearthquake periods were not equal in basis, leading to a possible underestimation of the prevalence of family violence after the quake. The preearthquake period referred to the lifetime of the respondents prior to the earthquake, whereas data collected after the quake covered only a 6-month reference period, which was a relatively short duration to determine physical and psychological adjustment. Fifth, ~~since~~ because our study did not control demographic factors, the results may be confounded by age, sex, current marital status, or severity of exposure to the quake. Previous studies have found that older victims scored lower on every quality-of-life subscale, regardless of the severity of exposure to an earthquake (Choul et al., 2004). Future research should include analysis of other associated factors, like life stressors (Cano ~~and~~ & Vivian, 2001). Specifically, a comprehensive and psychoepidemiologic model of distress can be adopted in the future study

of disasters to include exposure to stressors, vulnerability, and psychological and social resources (Vitaliano, Maiuro, Bolton, & Armsden, 1987).

Despite these limitations, this study is one of the first to examine the lives of battered women after the Sichuan earthquake. Additionally, the results provide preliminary evidence that family violence occurs more frequently after an earthquake. Identifying populations vulnerable to the psychological sequelae following a disaster and, hence, its impact upon a family already experiencing domestic violence is essential. Of the different types of family violence, psychological aggression after an earthquake is especially detrimental to both the physical and mental health of victims. Given that specific types of aggression have different consequences for individual functioning, efforts at prevention or treatment that assess family violence should study separately the full construct of aggressive behaviors, including nonphysical violence. Because the literature on this subject is sparse, the present study thus makes an important and valuable contribution to understanding the impact of an earthquake upon battered women. Information from the vulnerable group of women has also been useful in providing them effective psychological assistance and intervention.

Since Because earthquakes affect every country on earth, we should pay attention to the victims, and particularly vulnerable groups such as battered women who are experiencing double traumatization. The results of this study, which included a large sample of earthquake survivors, serve as a direction for future research examining violence among families in postdisaster areas, as well as a practical assessment for evaluating and implementing violence intervention in earthquake settings.

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TABLE 1. Demographic Characteristics of Respondents (*N* = 186)

Characteristics	*N*	%
Age		
18–25	19	10.2
31–40	40	21.5
41–50	59	31.7
51–60	36	19.4
61 or ~~above~~older	32	17.2
Monthly household income (RMB)		
0–999	107	57.5
1,000––1,999	49	26.3
2,000––2,999	10	5.4
3,000––3,999	2	1
4,000 or ~~above~~higher	2	1
No income	15	8.1
Refused to answer	1	.5
Level of education		
~~Below~~ Lower than high school	109	58.6

- High school	53	28.5
- Tertiary level	18	9.7
- Refused to answer	6	3.2
Unemployed	64	34.4
Physically or mentally challenged	12	6.5
Marital Status		
- Married or cohabiting	152	81.7
- Separated or divorced or partner is deceased	26	14.0
- Refused to answer	8	4.3
Have children	151	81.2
Have children aged 14 years old or ~~below~~younger	30	16.1</tb>

<tfn>RMB = Renminbi

<tn>**TABLE 2.** <ta-t>**Lifetime, Preearthquake, and Postearthquake Prevalence of Violence Against Women (*N* = 181)**

<tch>	Lifetime Prevalence (%)	Preearthquake Prevalence (%)	Postearthquake Prevalence (%)
<tb>Psychological aggression (Overall)	27.6	10.5	19.3
By spouse or ex-spouse	48.0	67.9	37.1
By family member	36.0	68.4	14.3
By known person	38.0	52.7	25.7
By stranger	42.0	26.3	45.8
Physical violence (Overall)	11.6	5.0	6.6
By spouse or ex-spouse	52.4	77.8	33.3
By family member	28.6	44.4	16.7
By known person	42.9	55.6	33.3
By stranger	19	22.2	16.7
Fear	19.3		
By spouse or ex-spouse	34.3		
By family member	68.6		

By known person	17.1	
By stranger	28.6	
Witnessed father’s violence	8.8	
Insulted, swore, or threatened	18.8	
Hit, beat, kicked, or physically hurt	81.2	
Witnessed mother’s violence	5.0	
Insulted, swore, or threatened	11.1	
Hit, beat, kicked, or physically hurt	88.9	</tb>

<tn>**TABLE 3.– <ta-t>Physical and Mental Health Differences Between Abused Groups**

<tch>	Physical Health			Mental Health		
	Mean	*SD*	*p* value	Mean	*SD*	*p* value
<tb>Group 1:						
___Psychological aAggression (Postearthquake)	42.18	8.93	0.030[1]*	39.94	8.43	0.003**
__Psychological aAggression (Preearthquake)	48.39	8.51	0.278[2]	44.29	8.68	0.633
___No violence	45.80	7.71		45.63	9.30	
Group 2:			0.142			0.066
___Physical violence (Postearthquake)	40.36	5.25	0.063	41.27	4.86	0.278
___Physical violence (Preearthquake)	42.99	12.15	0.366	37.78	7.15	0.037*
___No violence	45.71	7.97		44.95	9.47	
Group 3:						
___Witnessed pParents' violence	40.48	8.59	0.031*	43.31	9.92	0.708
___No violence	45.62	8.13		44.33	9.31	</tb>

<tfn>Statistically significant (*$p < 0.05$, **$p < 0.01$).

[1] *p* value of *T* test in comparing “Physical violence (postearthquake)” and “No violence.”

[2] *p* value of *T* test in comparing “Physical violence (preearthquake)” and “No violence.”

Statistically significant (*$p < .05$, **$p < .01$).