



Adverse childhood experiences and psychological well-being in a rural sample of Chinese young adults

Lixia Zhang^{a,*}, Joshua P. Mersky^b, James Topitzes^b

^a Department of Social Work, University of Northern Iowa, 1227 W 27th St, Sabin Hall 257, Cedar Falls, IA 50614, United States

^b Helen Bader School of Social Welfare, University of Wisconsin-Milwaukee, United States

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ABSTRACT

Background: International interest in adverse childhood experiences (ACE) is on the rise. In China, recent research has explored the effects of ACEs on health-related outcomes, but little is known about how ACEs impact the psychological functioning of rural Chinese youth as they make transition to adulthood.

Objective: This study is aimed to assess the prevalence and psychological consequences of ACEs among a group of rural Chinese young adults.

Participants and settings: 1019 rural high school graduates from three different provinces of China participated in this study.

Methods: A web-based survey was used to assess ten conventional ACEs and seven other novel ACEs using the Childhood Experiences Survey. Using validated brief measures, six indicators of psychological functioning were assessed: anxiety, depression, perceived stress, posttraumatic stress, loneliness, and suicidality. Descriptive and correlational analyses of all ACEs were performed, and multivariate regressions were conducted to test associations between ACEs and study outcomes.

Results: Three-fourths of Chinese youth endorsed at least one of ten conventional ACEs. The most prevalent ACEs were physical abuse (52.3 %) and domestic violence (43.2 %). Among seven new adversities, prolonged parental absence (37.4 %) and parental gambling problems (19.7 %) were most prevalent. Higher conventional ACEs scores were significantly associated with poorer psychological functioning, and each type of new adversity was associated with one or more psychological problems.

Conclusion: ACEs were prevalent among rural Chinese young adults and had deleterious effects on their psychological well-being. Further work is needed to address ACEs by developing culturally appropriate assessment practices, interventions, and policy responses.

1. Introduction

For more than two decades, the study of adverse childhood experiences (ACE) has added to our understanding of how harmful conditions early in life can contribute to later morbidity and mortality. The field has not reached consensus on how to define and measure ACEs, though most studies have followed the example of the seminal CDC-Kaiser Permanente Adverse Childhood Experiences Study (Felitti et al., 1998) by focusing on certain forms of child maltreatment and household dysfunction. Research has consistently demonstrated that these conventional ACEs are prevalent and associated with a dose-response relationship between the

* Corresponding author.

E-mail address: lixia.zhang@uni.edu (L. Zhang).

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number of ACEs individuals report and their risk of poor health-related outcomes (Mersky, Janczewski, & Topitzes, 2017; Hughes et al., 2017).

International interest in ACEs is also on the rise. Replicating findings from the U.S., researchers from western, developed countries have found that ACEs are prevalent and deleterious to physical and mental health (e.g., Bellis, Lowey, Leckenby, Hughes, & Harrison, 2014; Cuijpers et al., 2011; Müller et al., 2015). Confirmatory findings have also begun to emerge from developing countries in Africa, South America, and Asia (e.g., Ding, Lin, Zhou, Yan, & He, 2014; Okello, De Schryver, Musisi, Broekaert, & Derluyn, 2014; Ramiro, Madrid, & Brown, 2010; Soares et al., 2016). The following section summarizes the extant ACE research in China, a rapidly developing country with the world's largest population.

1.1. ACE research in China

The first known ACE study in China examined 2073 Chinese medical college students in Anhui province (Xiao, Dong, Yao, Li, & Ye, 2008). The authors found that over two-thirds (68.9 %) of participants reported at least one of ten ACEs, the most prevalent of which were physical neglect (26.9 %), physical abuse (26.7 %), and household mental illness (23.0 %). ACEs prevalence estimates have fluctuated in subsequent studies, due at least partly to differences in measurement protocols and sample populations. Despite this variation, and with few exceptions (e.g., Lee et al., 2011), most studies in China indicate that the proportion of adults with one or more ACEs ranges from 45 % to 77 % (Chang, Jiang, Mkandarwire, & Shen, 2019; Cui et al., 2013; Fan et al., 2011; Guo, Cao, & Cui, 2014; Ji & Wang, 2017; Ma, Dai, Ru, Liu, & Liu, 2013; Nie et al., 2015).

While prevalence rates have varied, studies have consistently shown that ACEs are associated with an array of poor health-related outcomes among Chinese adults. For example, higher cumulative ACEs scores have been linked to chronic diseases such as hypertension, diabetes, and coronary heart disease (Chang et al., 2019; Nie et al., 2015). Mental health problems like depression, psychosis, dissociation, alcohol abuse, and posttraumatic stress disorder have also been found at higher rates among Chinese adults that have been exposed to ACEs (Chang et al., 2019; Ding et al., 2014; Fung, Ross, Yu, & Lau, 2019; Xiao et al., 2008).

Despite the emergence of ACE research in China, further study is needed to address limitations in the literature. Most studies of ACEs in Chinese samples have not been disseminated in journals that meet accepted standards for high scientific quality. As of this writing, only five studies of ACEs in China have been published in ranked journals with known impact factors (Chang et al., 2019; Ding et al., 2014; Fung et al., 2019; Lee et al., 2011; Xiao et al., 2008). Moreover, most research has examined some combination of 10 ACEs that were assessed in the Adverse Childhood Experiences Study, and it is unclear whether these are the most common and consequential childhood adversities in China.

In recent years, researchers have increasingly issued calls to improve our understanding of ACEs and their consequences by developing expanded measures that include other common adversities (Mersky et al., 2017; Cronholm et al., 2015; Finkelhor, Shattuck, Turner, & Hamby, 2013; Wade, Shea, Rubin, & Wood, 2014). The imperative to expand the conventional ACEs framework owes partly to its omission of adversities that occur outside the household (Mersky et al., 2017). Recent studies suggest, for example, that adding adversities such as peer victimization and community violence may improve the validity of ACEs assessments (Mersky et al., 2017; Finkelhor, Shattuck, Turner, & Hamby, 2015).

Even within the home environment, many salient experiences are omitted from most ACE research. For example, ACE studies typically measure parental divorce and separation, though other sources of parental loss and family dissolution in childhood are also harmful. For instance, a prolonged parental absence increases the risk of poor psychological outcomes (Mersky, Topitzes, & Reynolds, 2013; McLanahan, Tach, & Schneider, 2013), which is a particular concern in rural areas of China where many adults leave their families to seek economic opportunities in urban areas (All-China Women's Federation, 2013; National Bureau of Statistics, 2019). The death of a parent or sibling can also be a profound event, although research on the long-term effects of these experiences has produced mixed results (Green et al., 2010; Fletcher, Mailick, Song, & Wolfe, 2013; Luecken, 2008). Given that health-related outcomes vary as a function of income and socioeconomic status (Chen, Martin, & Matthews, 2006), ACE studies may also be strengthened by incorporating questions related to poverty and economic hardship. Moreover, problem gambling appears to be pervasive in many Chinese communities (Loo, Raylu, & Oei, 2008; Zhao & Peng, 2010), and one study found that parental gambling was associated with adolescent suicidality (Xing et al., 2010).

1.2. Study aims

The current study examines the prevalence and psychological consequences of ACEs and other potential adversities in a sample of rural Chinese young adults. Two main research questions are addressed:

- 1 What are the prevalence and inter-correlations of conventional ACEs and other adversities in a sample of rural Chinese youth?
- 2 Does exposure to a greater number of ACEs increase the risk of poor psychological outcomes among rural Chinese youth?

2. Methods

2.1. Participants and research design

For this study, 7986 rural high school graduates were recruited from six boarding high schools in China that are located in small counties of three provinces: Hebei, Anhui and Jiangsu. The six schools are all typical high schools that many rural children attend to

complete their high school education. From 2016 to 2018, cohorts of recent graduates were recruited annually from each school using private email addresses that were collected from students in the first, second, and third year of high school. Unlike the United States, where most students attend high school for four years, Chinese students typically attend high school for three years. Once students turned 18 years old and graduated from high school, a web-based survey was distributed to them via [Qualtrics \(Provo, UT\)](#).

The survey asked participants about their family background, including ACEs and their current mental health and well-being. A back-translation method was used to translate the survey into Mandarin Chinese. The first author translated the English survey into Mandarin, and then three independent raters translated the survey from Mandarin to English. Discrepancies between different translations were discussed by all translators until consensus was reached. Before the survey was distributed to study participants, the research team conducted pre-testing and cognitive interviewing with 20 Chinese young adults.

To promote participation, notifications were emailed prior to distributing the survey link, and multiple reminder emails with the survey were delivered to non-respondents. Nearly 24 % of the sample ($n = 1888$) could not be reached because the emails were undeliverable. Of the 6098 individuals to whom an email could be delivered, 1019 completed the questionnaire, yielding a net response rate of 18 %.

Study participation was voluntary and confidential, and no personal identifying information was collected. Respondents received a 25 Yuan (approximately US\$3.80) Amazon China gift card after completing the survey. All study protocols were approved by administrators of the six high schools and the institutional review board (IRB) at large public university in the Midwestern United States.

2.2. Measures

2.2.1. Adverse childhood experiences

Participants completed the Childhood Experiences Survey (CES), a measure of 10 conventional ACEs and seven other potential adversities: family financial hardship, food insecurity, homelessness, peer victimization, parental absence, death of parent or sibling, and violent crime victimization. Previous research found that the CES had good internal consistency, test-retest reliability, and concurrent validity in a low-income sample of women in the US ([Mersky et al., 2017](#)).

For this study, the CES was modified in two ways. First, the question about homelessness was omitted because most participants attended boarding school for several years prior to turning age 18. Second, the following question was added to assess problem gambling: "Before age 18, did you live with parent(s) who had a gambling problem?" Participants who indicated that their parent(s) gambled were coded 1; all other participants were coded 0. For all other operational definitions, please see [Mersky et al. \(2017\)](#).

2.2.2. Anxiety symptoms

Anxiety symptoms were measured using the Generalized Anxiety Disorder-7 (GAD-7) scale, which is a brief screen that has been shown to have good internal consistency, test-retest reliability, and convergent validity ([Spitzer, Kroenke, Williams, & Lowe, 2006](#)). A translated version of GAD-7 has been validated in a Chinese sample of patients with epilepsy ([Tong, An, McGonigal, Park, & Zhou, 2015](#)). In the present sample, the GAD-7 demonstrated good internal consistency ($\alpha = 0.89$).

2.2.3. Depressive symptoms

Depressive symptoms were measured using the Patient Health Questionnaire (PHQ-9), a widely used screen that has good internal reliability and criterion-related validity ([Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006](#); [Kroenke, Spitzer, & Williams, 2001](#)). Studies also have shown that the Chinese version of PHQ-9 is a valid and reliable tool ([Du, Yu, Ye, & Chen, 2017](#); [Wang et al., 2014](#)). The PHQ-9 demonstrated good internal consistency in the study sample ($\alpha = 0.86$).

2.2.4. Global perceived stress

The 4-item version of the Perceived Stress Scale (PSS-4; [Cohen & Williamson, 1988](#)) was used as a global measure of perceived stress. The measure has been validated in English- and Chinese-speaking samples ([Lee, 2012](#); [Warttig, Forshaw, South, & White, 2013](#)). In the present sample, internal reliability of the PSS-4 was 0.74.

2.2.5. Posttraumatic stress

Posttraumatic stress was measured using the 4-item Primary Care PTSD Screen, a widely used brief screen that has been shown to have good test-retest reliability ([Prins et al., 2003](#)). Participants who answered "yes" to any three items were coded "positive" for probable posttraumatic stress disorder.

2.2.6. Loneliness

Loneliness was measured using total scores on the 4-item short form of UCLA Loneliness Scale, which assesses subjective feelings of loneliness or social isolation ([Russell, Peplau, & Cutrona, 1980](#)). Research suggests that the UCLA Loneliness Scale has acceptable internal consistency ([Russell, 1980](#)); internal reliability in this study was 0.84.

2.2.7. Suicidal ideation

Suicidal ideation was measured by a single question: *During the past 12 months, did you ever seriously consider attempting suicide?* An affirmative response to this question indicated suicide intention (1 = yes; 0 = no).

2.2.8. Covariates

Demographic information collected from participants was used to measure several indicators that were modeled as covariates, including participant sex (1 = male). Participants indicated the education status of their mother and father, yielding separate measures ranging from 1 (elementary school or less) to 6 (some college or more). In addition, participants reported their mother's and father's employment status (1 = unemployed; 0 = employed full-time or part-time). An ordinal measure of family economic status was created using an economic ladder question (Koczan, 2016; Stillman, Gibson, McKenzie, & Rohorua, 2015) that asks respondents to compare their family's status to the status of other families on a scale from 1 (poorest) to 10 (richest). Participants also reported the number of siblings they had (0; 1; 2; 3 or more) and if parent had been a migrant worker (1 = yes).

2.3. Data analysis

Statistical analyses were performed using SPSS version 23 and involved three main procedures. First, a descriptive analysis was conducted to estimate the means and proportions of all study variables. Second, phi (ϕ) coefficients were produced from a correlation analysis of all childhood adversities. Third, three multivariate regression models were run to test associations between ACEs and study outcomes. The first model tested relations between categorical ACEs scores and psychological outcomes, with each value (1, 2, 3, 4 or more) compared against a reference group who reported 0 ACEs. A second model estimated the associations between a cumulative ACEs index score (range 0–10) and psychological outcomes, and a third model replicated this analysis while adding seven other potential adversities, described above. All dichotomous outcomes were analyzed with logistic regression, and continuous measures were analyzed with Ordinary Least Squares (OLS) regression. All multivariate models controlled for sex, maternal and paternal education, maternal and paternal employment, family economic status, and number of siblings.

3. Results

Results from descriptive analyses are presented in Table 1. Among the 10 conventional ACEs, the most prevalent were physical abuse (52.3 %) and domestic violence (43.2 %), and the least prevalent were emotional abuse (6.0 %) and physical neglect (4.7 %). Altogether, 75.0 % of participants endorsed at least one of the 10 conventional ACEs, 45.9 % endorsed two or more ACEs, and 11.2 % endorsed four or more ACEs (not shown). For the seven other adversities assessed, the prevalence rates were as follows: parental absence (37.4 %), problem gambling (19.7 %), death of parent or sibling (14.3), violent crime victimization (9.5 %), family financial hardship (8.0 %), peer victimization (3.5 %), and food insecurity (3.2 %).

Table 2 shows the correlations between conventional ACEs and other potential childhood adversities. Results indicated that most of the adversities assessed were intercorrelated, although the magnitude of association for most correlations was small (i.e., $r \sim .10$). The largest coefficient observed was the correlation between domestic violence and physical abuse ($r = 0.34$).

Table 3 presents results from two multivariate models, including one that tested relations between categorical ACE scores and indicators of psychological functioning. Results showed that, with increasing ACE values, there was an increased likelihood of poor psychological outcomes. To illustrate, compared to participants with no ACEs, the odds of suicidal ideation was 3.74 (CI = 1.80–7.74) for participants with one ACE, 4.25 (CI = 2.00–9.05) for participants with two ACEs, 5.97 (CI = 2.72–13.10) for participants with three ACEs, and 15.46 (CI = 7.27–32.89) for participants with four or more ACEs. A second regression model also indicated that conventional ACEs index score was associated with anxiety ($B = .59$; CI = .40–.78), depression ($B = .93$; CI = .72–1.14), perceived stress ($B = .46$; CI = .35–.58), loneliness ($B = .37$; CI = .28–.46), posttraumatic stress (OR = 1.43; CI = 1.29–1.59), and suicidal ideation (OR = 1.62; CI = 1.44–1.83).

Results in Table 4 are from multivariate analyses of psychological outcomes regressed on the conventional ACEs index score and other potential adversities. The total conventional ACE score was significantly associated with all psychological outcomes. Each of the seven potential adversities were significantly related to one or more mental health outcomes.

4. Discussion

This study is the first to describe the prevalence and consequences of ACEs and other potential adversities in a rural sample of young adults in China. Results indicated that 75 % of participants reported at least one of 10 conventional ACEs and 46 % reported exposure to multiple ACEs. These prevalence figures are higher than previously published estimates in China (e.g., Ding et al., 2014; Lee et al., 2011; Xiao et al., 2008) and in the general U.S. population (Green et al., 2010; Merrick, Ford, Ports, & Guinn, 2018), and they are more comparable to rates that have been documented in low-income samples in the U.S. (Mersky et al., 2017; Chung et al., 2010; Topitzes, Pate, Berman, & Medina-Kirchner, 2016). Thus, research suggests that ACEs are widely distributed in China, but they may not be equally distributed by socio-economic status or geographic region.

Among 10 indicators of adversity that are commonly assessed in the ACE literature, physical abuse was the most prevalent (52.3 %). By way of comparison, a meta-analysis by Ji and Finkelhor (2015) estimated that the lifetime prevalence of child physical abuse in China is 36.6 %. The higher prevalence reported in this study may be related to the rural composition of the sample. One recent investigation of rural families in the Shandong province found that the self-reported prevalence of child physical violence was 50.0 % (Wang, Chen, Zhao, Feng, & Song, 2018), and a related analysis showed that rates of child physical violence were higher among rural families than more educated, urban-dwelling families (Wang, Chen, & Lyu, 2019). The findings underscore the need for further research into rural and urban variation in corporal punishment and physical abuse in China along with differences in parenting norms that may help to explain this variation (Yue et al., 2016).

Table 1
Description of Study Measures (N = 1019).

Variable	% or mean (SD)
Demographics	
Age (range 18–21)	18.6 (0.8)
Sex (male = 1)	53.0
Father education (range 1–6)	3.1 (1.5)
Mother education (range 1–6)	2.5 (1.5)
Father unemployed	12.0
Mother unemployed	26.9
Father or mother a migrant worker	71.3
Number of siblings (range 0–4)	1.0 (0.9)
Family economic status (range 1–10)	4.1 (1.4)
Mental Health Outcomes	
Anxiety symptoms (range 0–21)	5.6 (4.2)
Depressive symptoms (range 0–27)	5.9 (4.8)
Perceived stress (range 0–16)	6.1 (2.7)
Posttraumatic stress	21.6
Loneliness (range 0–8)	3.3 (2.1)
Suicidal ideation	14.2
Conventional ACEs	
Emotional abuse	6.0
Physical abuse	52.3
Sexual abuse	10.6
Physical neglect	4.7
Emotional neglect	8.2
Domestic violence	43.2
Household mental illness	8.5
Household substance abuse	13.0
Household crime	8.5
Parental divorce or separation	8.0
Cumulative ACE score (range 0–10)	1.6 (1.5)
Other Childhood Adversities	
Family financial hardship	8.0
Food insecurity	3.2
Problem gambling	19.7
Peer victimization	3.5
Parental absence	37.4
Death of parent or sibling	14.3
Violent crime victimization	9.5

Note. ACEs = adverse childhood experiences.

We also found that 43.2 % of participants reported household domestic violence, exceeding prior estimates in China (Ding et al., 2014; Fan et al., 2011; Lee et al., 2011; Xiao et al., 2008). Again, the higher prevalence observed in this study may be attributable to the rural and economically disadvantaged composition of the sample. Research has shown that Chinese women are at increased risk of domestic violence if they are of low socioeconomic status or reside in rural areas (Parish, Wang, Laumann, Pan, & Luo, 2004; Tang & Lai, 2008). The findings are noteworthy given that only 8.0 % of participants reported parental divorce/separation. Research suggests that many Chinese parents avoid divorce/separation due to concerns about social stigma, economic hardship, and fears of harming their children or losing them altogether (Chen & Shu, 2017; Platte, 1988). It is possible that, for some adults, these concerns override the threat of domestic violence.

On the other end of the spectrum, physical neglect was the least prevalent ACE (4.7 %) in this study. This result contradicts the findings of Xiao et al. (2008), who found that physical neglect was the most prevalent ACE (26.9 %). Xiao and colleagues used five statements from the Childhood Trauma Questionnaire (CTQ) to measure physical neglect: 1) I did not have enough to eat; 2) I knew there was someone to take care of me and protect me; 3) My parents were too drunk or too high to take care of me; 4) I had to wear dirty clothes; 5) There was someone to take me to the doctor if I needed it. Compared to the single item used in this study, the CTQ may be a more sensitive measure of physical neglect. Yet, it is also possible that the CTQ items capture not only physical neglect but also other risks that are correlated with physical neglect. For instance, item number two appears to be related to both physical and emotional neglect, while item number three introduces parental substance misuse. Our findings align with another recent study by Wang, Lin, and Cao (2018), who reported that the prevalence of physical neglect was 4.9 %.

Our study also makes a unique contribution to the literature by examining seven other significant adversities that are not typically incorporated in ACE research. Among these items, we found that prolonged parental absence (37.4 %) was the most prevalent, which may be linked to the rapid development of the Chinese economy in the past three decades. During this period, nearly 290 million adults are believed to have moved from rural agricultural areas to metropolitan areas (National Bureau of Statistics, 2019).

Table 2
Co-Occurrence of Adverse Childhood Experiences.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Physical abuse	–															
2. Sexual abuse	0.13															
3. Psychological abuse	0.20	0.11														
4. Physical neglect	–0.03	0.01	0.10													
5. Emotional neglect	0.04	0.05	0.26	0.22												
6. Household substance abuse	<i>0.08</i>	0.04	0.01	0.03	0.08											
7. Household mental illness	<i>0.07</i>	0.04	0.12	0.05	0.13	0.11										
8. Domestic violence	0.34	0.14	0.19	0.01	0.08	0.17	0.09									
9. Household incarceration	0.10	0.14	0.09	0.03	0.05	0.13	0.11	0.18								
10. Parental divorce/separation	0.09	0.17	0.05	0.02	0.04	<i>0.08</i>	0.14	0.13	0.14							
11. Family financial problem	0.04	0.05	0.11	0.10	0.05	<i>0.07</i>	0.10	<i>0.08</i>	0.09	0.10						
12. Food insecurity	0.05	0.03	0.05	0.12	0.09	0.05	0.12	<i>0.08</i>	0.04	0.05	0.33					
13. Gambling	0.09	0.17	0.06	–0.04	0.06	0.18	0.06	0.12	0.16	0.08	<i>0.07</i>	0.02				
14. Parental absence	0.13	0.08	0.09	0.02	0.13	<i>0.07</i>	0.10	0.13	0.14	0.27	0.05	0.05	0.15			
15. Death of parent or sibling	0.09	0.04	<i>0.06</i>	0.03	0.11	0.01	0.01	0.14	0.02	0.04	0.09	0.04	0.08	<i>0.07</i>	0.12	
16. Peer victimization	0.13	0.05	0.20	0.08	0.15	0.12	0.06	0.06	0.04	0.06	0.10	0.21	0.04	0.01	0.00	
17. Violent crime victimization	0.18	0.04	0.10	0.04	0.12	0.10	0.08	0.10	0.08	0.09	0.01	0.09	0.04	0.14	<i>0.07</i>	0.25

Note. Coefficients in boldface are significant at $p < .01$ and coefficients in italics are significant at $p < .05$.

Table 3
Multivariate Analysis of Associations between ACEs and Mental Health Outcomes.

Outcome	Number of ACEs	β or OR (95 % CI)
Anxiety symptoms	0	(referent)
	1	0.92 (.194–1.64)*
	2	0.85 (.07–1.64)*
	3	2.11 (1.19–3.03)**
	≥ 4	2.74 (1.77–3.70)**
	Total Score (0–10)	.59 (.40–.78)**
Depressive symptoms	0	(referent)
	1	0.92 (.11–1.73)*
	2	1.23 (.35–2.11)*
	3	2.82 (1.78–3.85)**
	≥ 4	4.29 (3.21–5.36)**
	Total Score (0–10)	.93 (.72–1.14)**
Perceived stress	0	(referent)
	1	0.62 (.18–1.06)*
	2	0.54 (.06–1.02)*
	3	1.48 (.93–2.04)**
	≥ 4	2.24 (1.66–2.82)**
	Total Score (0–10)	.46 (.35–.58)**
Posttraumatic stress	0	(referent)
	1	1.42 (.87–2.33)
	2	1.71 (1.02–2.87)*
	3	4.07 (2.38–6.96)**
	≥ 4	4.32 (2.51–7.45)**
	Total Score (0–10)	1.43 (1.29–1.59)**
Loneliness	0	(referent)
	1	0.41 (.05–0.76)*
	2	0.81 (.43–1.20)**
	3	1.16 (.71–1.61)**
	≥ 4	1.71 (1.24–2.17)**
	Total Score (0–10)	.37 (.28–.46)**
Suicidal ideation	0	(referent)
	1	3.74 (1.80–7.74)**
	2	4.25 (2.00–9.05)**
	3	5.97 (2.72–13.10)**
	≥ 4	15.46 (7.27–32.89)**
	Total Score (0–10)	1.62 (1.44–1.83)**

Note. ACEs = adverse childhood experiences. β = unstandardized coefficient. OR = odds ratio. CI = confidence interval. Ten conventional ACEs are analyzed as a cumulative index. Multivariate regressions controlled for sex, parent education and employment, family economic status, and number of siblings. * $p < .05$, ** $p < .01$.

Consequently, one in three children in rural China lives without one or both parents (All-China Women's Federation, 2013). In addition, nearly 20 % of participants reported that at least one of their parents had a problem with gambling, which supports prior research indicating that gambling is prevalent in rural areas of China (Zhao & Peng, 2010).

Most ACEs were intercorrelated, though effect sizes were smaller in this rural, low social economic status (SES) Chinese sample than estimates from studies of low-income samples in the U.S. (Mersky et al., 2017; Larkin & Park, 2012). One potential explanation is that familial and extrafamilial adversities may be more randomly distributed among the rural, low SES population in China than in the U.S., where risk has been shown to concentrate at high levels in low-income groups (Halfon, Larson, Son, Lu, & Bethell, 2017; Slopen et al., 2016). It is also possible that the Childhood Experiences Survey omitted certain salient adversities that accumulate within rural Chinese households, and that further work is needed to develop a culturally validated assessment of ACEs in China.

On the other hand, we replicated a long line of international research that indicates greater ACEs exposure increases the risk of mental health problems, including anxiety and depression (Mersky et al., 2013; De Venter, Demuyttenaere, & Bruffaerts, 2013; Hughes et al., 2017) as well as global stress and posttraumatic stress (Mersky et al., 2017; Frewen, Zhu, & Lanius, 2019; Nurius, Green, Logan-Greene, & Borja, 2015). We also confirmed the positive relationship between ACEs scores and loneliness, an important indicator of psychological functioning that has received limited attention in the literature to date (Wong, Dirghangi, & Hart, 2019). Supporting findings from the Adverse Childhood Experiences Study (Dube et al., 2001), we found a particularly strong relationship between childhood adversity and suicidality. Moreover, extending recent investigations of expanded ACE assessments (Cronholm et al., 2015; Finkelhor et al., 2015; Mersky et al., 2017), we found that seven new adversities explained significant variance in psychological outcomes after controlling for a conventional 10-item ACEs score and background characteristics. Taken together, the findings

Table 4
Multivariate Analysis of Associations between Conventional ACEs Index, New ACEs and Mental Health Outcomes.

	Anxiety symptoms B (95 % CI)	Depressive symptoms B (95 % CI)	Perceived stress B (95 % CI)	Posttraumatic stress OR (95 % CI)	Loneliness B (95 % CI)	Suicidal ideation OR (95 % CI)
Cumulative ACE score	.31 (.10–.51)**	.58 (.35–.80)**	.34 (.21–.46)**	1.27 (1.12–1.43)**	.25 (.15–.35)**	1.47 (1.28–1.69)**
Family financial problems	1.44 (.35–2.53)**	2.21 (.99–3.43)**	1.02 (.37–1.68)**	1.51 (.83–2.75)	.52 (–.01–1.05)	1.00 (.48–2.09)
Food insecurity	.24 (–1.44–1.91)	–.34 (–2.22–1.55)	–.12 (–1.15–.91)	2.90 (1.17–7.23)*	–.33 (–1.14–.49)	1.07 (.36–3.18)
Gambling	.82 (.13–1.51)*	1.01 (.26–1.77)**	.41 (–.02–.83)	1.41 (.94–2.11)	.32 (–.01–.65)	1.13 (.71–1.82)
Parental absence	.55 (–.03–1.13)	.70 (.07–1.34)*	.35 (–.01–.70)	1.06 (.74–1.52)	.14 (–.14–.43)	1.44 (.95–2.20)
Death of parent or sibling	.59 (–.20–1.38)	.33 (–.53–1.19)	.37 (–.11–.86)	1.72 (1.10–2.69)*	.54 (.16–.92)**	1.45 (.87–2.44)
Peer victimization	3.27 (1.67–4.88)**	3.48 (1.69–5.27)**	.88 (–.10–1.85)	4.11 (1.71–9.87)**	1.22 (.46–1.99)**	1.84 (.73–4.63)
Violent crime victimization	1.17 (.19–2.15)*	2.11 (1.04–3.19)**	.18 (–.42–.78)	1.65 (.95–2.85)	.49 (.02–.97)*	2.09 (1.15–3.79)*

Note. ACEs = adverse childhood experiences. B = unstandardized coefficient. OR = odds ratio. CI = confidence interval. Ten conventional ACEs are analyzed as a cumulative index. Multivariate regressions controlled for sex, parent education and employment, family economic status, and number of siblings. * $p < .05$, ** $p < .01$.

confirm that elevated levels of childhood adversity are associated with an array of poor psychological outcomes while also pointing to the need to explore adverse experiences outside of the conventional 10-item ACEs score.

4.1. Limitations

Study limitations include the non-random, convenience sampling frame, which included high school graduates from certain rural areas of China. Although the schools selected typify those that rural children attend, results may not be generalizable to all rural children who attended high school or to older and more urban Chinese samples. Generalizability also may be limited by study's low response rate (18 %), which is a common challenge with web-based surveys (Sánchez-Fernández, Muñoz-Leiva, & Montoro-Ríos, 2012), and by the fact that sampling frame included only high school graduates. Thus, the sample may not represent the experiences of rural youth who dropped out of school or that did not attend high school at all. The study also relied on self-report data, which have well-known limitations (Hardt & Rutter, 2004). For instance, retrospective accounts of ACEs may be subject to recall bias. More specifically, most participants resided in boarding schools for several years prior to graduating from high school, which raises validity questions about their assessments of certain household conditions. In addition, due to the retrospective, cross-sectional design, causal inferences should be avoided. It is plausible, for example, that participants' psychological functioning could affect their perception of past events and thus their recollections of childhood.

4.2. Implications & future directions

Despite increasing scientific attention to childhood adversity in China, this is the first known study of ACEs in a rural Chinese population. The higher levels of cumulative adversity reported here as compared to prior studies in urban Chinese samples may imply that children who are raised in poor, rural households in China are at a particularly high risk of ACEs and their associated consequences. It is uncertain to what degree these findings generalize to the Chinese population. Representing more than 18 % of the world's population, there is a great need for a large, nationally representative study in China to generate prevalence estimates of ACEs overall and in various population subgroups.

The rates of interpersonal violence reported here are especially concerning, as more than half the sample indicated that they had been physically abused. Although the Chinese constitution protects children and youth from maltreatment by law (Article 49), it does not define maltreatment or stipulate what penalties caregivers face if they maltreat their children. China also lacks a mandatory reporting system for suspected child maltreatment. Moreover, Article 12 states that child custody may be deprived if parents abuse their children, though there are no guidelines for residential care of children after they have been removed from their caregivers' custody. The foster care system in China mainly serves orphans and abandoned children rather than abused and neglected children (Xu, Bright, & Ahn, 2018). In recent years, the Chinese government has taken some steps to protect children. For example, in 2011 the government launched the National Program for Child Development, and in 2013 China's ministry of Civic Affairs initiated a pilot child protection program (Man, Barth, Li, & Wang, 2017). Future work in this area could continue to advance public policy by using ACEs research to marshal a case for stronger child protection policies and programs in China.

Moreover, although psychological health problems were common among rural Chinese young adults in the current study, mental health problems often go undiagnosed and untreated in China. One study estimated that approximately 173 million Chinese adults have a diagnosable mental illness or psychiatric disorder, and that 158 million of these individuals never sought treatment (Xiang, Yu, Ungvari, Lee, & Chiu, 2012). China faces large gaps in mental health service access (Xiang, Ng, Yu, & Wang, 2018), pointing to the need for reform in China's public health system generally and mental health infrastructure specifically.

In addition to changes at the macro level, specific prevention and intervention strategies that reduce ACEs exposure or mitigate the impact of ACEs should be explored. Luo et al. (2019) called for the dissemination of parenting education messages to rural communities via the Health and Family Planning Commission (HFPC). This recommendation may be feasible given that HFPC is experienced in conducting village outreach and running informational campaigns in rural areas, and its mandate has been changed in 2016 from enforcing China's one-child-policy to improving children's quality of life (Luo et al., 2019). Along with parenting education, the HFPC could offer professional home visiting services and other prevention services for families at high risk of child maltreatment and other ACEs. Since most ACEs take place in the home environment, home visiting services like this have the potential to enhance positive parenting and promote nurturing home environment.

Local health care providers could also collaborate with the HFPC and school social workers or counselors to intervene when child maltreatment is suspected and develop intervention plans to protect children and stabilize families. However, at present, school social work is still in its nascent stage in China (Levine & Zhu, 2010). Although some urban schools in China have counseling offices, most children in rural schools rarely have access to professional school counselor or community-based mental health services (Leuwerke & Shi, 2010). Considering that a substantial proportion of rural Chinese children attend boarding schools, there is a great need for advancements in school-based counseling to address the needs of children who have been exposed to significant adversity and trauma.

Declaration of Competing Interest

The authors report no declarations of interest.

References

- All-China Women's Federation (2013). *Woguo nongcun liushou ertong chengxiang liudong ertong zhuangkuang yanjiu baogao* [National survey report on the situation of left-behind children and migrant children in China] Beijing.
- Bellis, M. A., Lowey, H., Leckenby, N., Hughes, K., & Harrison, D. (2014). Adverse childhood experiences: Retrospective study to determine their impact on adult health behaviors and health outcomes in a UK population. *Journal of Public Health (Oxford, England)*, 36(1), 81–91.
- Chang, X., Jiang, X., Mkandawire, T., & Shen, M. (2019). Associations between adverse childhood experiences and health outcomes in adults aged 18–59 years. *PLoS One*, 14(2), Article e0211850.
- Chen, J., & Shu, X. (2017). *Gender and divorce in China*. Retrieved from Asia Dialogue <https://theasiadialogue.com/2017/10/09/gender-and-divorce-in-china/>.
- Chen, E., Martin, A. D., & Matthews, K. A. (2006). Socioeconomic status and health: Do gradients differ within childhood and adolescence? *Social Science & Medicine*, 62(9), 2161–2170.
- Chung, E. K., Nurmohamed, L., Mathew, L., Elo, I. T., Coyne, J. C., & Culhane, J. F. (2010). Risky health behaviors among mothers-to-be: The impact of adverse childhood experiences. *Academic Pediatrics*, 10(4), 245–251.
- Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan, & S. Oskamp (Eds.). *The social psychology of health: Claremont symposium on applied social psychology* (pp. 31–67). Newbury Park, CA: Sage.
- Cronholm, P. F., Forke, C. M., Wade, R., Bair-Merritt, M. H., Davis, M., Harkins-Schwarz, M., & Fein, J. A. (2015). Adverse childhood experiences: Expanding the concept of adversity. *American Journal of Preventive Medicine*, 49(3), 354–361.
- Cui, N., Cao, F., Li, Y., Long, Z., Li, J., & Dong, F. (2013). Yixue xinsheng de ertongqi buliang jingli de leiji xiaoying yu gongji xingwei [The accumulative effect of adverse childhood experiences and aggressive behaviors among medical college students]. *Chinese Mental Health Journal*, 27(3), 213–214.
- Cuijpers, P., Smit, F., Unger, F., Stikkelbroek, Y., Ten Have, M., & de Graaf, R. (2011). The disease burden of childhood adversities in adults: A population-based study. *Child Abuse & Neglect*, 35(11), 937–945.
- De Venter, M., Demyttenaere, K., & Bruffaerts, R. (2013). The relationship between adverse childhood experiences and mental health in adulthood. A systematic literature review. *Tijdschrift Voor Psychiatrie*, 55(4), 259–268.
- Ding, Y., Lin, H., Zhou, L., Yan, H., & He, N. (2014). Adverse childhood experiences and interaction with methamphetamine use frequency in the risk of methamphetamine associated psychosis. *Drug and Alcohol Dependence*, 142, 295–300.
- Du, N., Yu, K., Ye, Y., & Chen, S. (2017). The validity study of Patient Health Questionnaire-9 items for internet screening in depression among Chinese University students. *Asia-Pacific Psychiatry*, 9(3), <https://doi.org/10.1111/appy.12266>.
- Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: Findings from the Adverse Childhood Experiences Study. *Pediatrics*, 111, 564–572.
- Fan, Y., Pan, H., Zhang, Z., Zhang, N., Wang, C., & Ye, D. (2011). Yixuesheng ertong shiqi buliang jingli yu yingfu fangshi de guanlianxing fenxi [Correlative analysis between ACEs and coping styles among medical college students]. *Chinese Journal of School Health*, 32(7), 774–776.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., ... Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258.
- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2013). Improving the adverse childhood experiences study scale. *JAMA Pediatrics*, 167, 70–75.
- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of adverse childhood experiences. *Child Abuse & Neglect*, 48, 13–21.
- Fletcher, J., Mailick, M., Song, J., & Wolfe, B. (2013). A sibling death in the family: Common and consequential. *Demography*, 50, 803–826.
- Frewen, P., Zhu, J., & Lanius, R. (2019). Lifetime traumatic stressors and adverse childhood experiences uniquely predict concurrent PTSD, complex PTSD, and dissociative subtype of PTSD symptoms whereas recent adult non-traumatic stressors do not: Results from an online survey study. *European Journal of Psychotraumatology*, 10(1), Article 1606625.
- Fung, H. W., Ross, C. A., Yu, C. K. C., & Lau, E. K. L. (2019). Adverse childhood experiences and dissociation among Hong Kong mental health service users. *Journal of Trauma & Dissociation*, 20(4), 457–470.
- Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: Associations with first onset of DSM-IV disorders. *Archives of General Psychiatry*, 67(2), 113–123.
- Guo, W., Cao, F., & Cui, N. (2014). Yixuesheng renji guanxi mingan yu ertongqi buliang jingli: fuxing qingxu de guanxi moxing [Interpersonal sensitivity and adverse childhood experiences among medical college students: The mediating role of negative emotions]. *Chinese Journal of Practical Nursing*, 30(21), 1–5.
- Halfon, N., Larson, K., Son, J., Lu, M., & Bethell, C. (2017). Income inequality and the differential effect of adverse childhood experiences in US children. *Academic Pediatrics*, 17(7), S70–S78.
- Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: Review of the evidence. *Journal of Child Psychology and Psychiatry*, 45(2), 260–273.
- Huang, F. Y., Chung, H., Kroenke, K., Delucchi, K. L., & Spitzer, R. L. (2006). Using the Patient Health Questionnaire-9 to measure depression among racially and ethnically diverse primary care patients. *Journal of General Internal Medicine*, 21(6), 547–552.
- Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., ... Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health*, 2(8), e356–e366.
- Ji, K., & Finkelhor, D. (2015). A meta-analysis of child physical abuse prevalence in China. *Child Abuse & Neglect*, 43, 61–72.
- Ji, S., & Wang, H. (2017). Daxuesheng ertong shiqi buliang jingli jinqi shenghuo shijian yu zhixing gongneng de guanxi [Study on the relationships among adverse childhood experiences, life events and executive function of college students]. *Chinese Journal of School Health*, 38(12), 1831–1834.
- Koczan (2016). *Being poor, feeling poorer: Inequality, poverty and poverty perceptions in the Western Balkans*. Retrieved from <https://www.imf.org/external/pubs/ft/wp/2016/wp1631.pdf>.
- Kroenke, K., Spitzer, R., & Williams, W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16, 606–616.
- Larkin, H., & Park, J. (2012). Adverse childhood experiences (ACEs), service use, and service helpfulness among people experiencing homelessness. *Families in Society*, 93(2), 85–93.
- Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, 6(4), 121–127.
- Lee, S., Guo, W. J., Tsang, A., He, Y. L., Huang, Y. Q., Zhang, M. Y., ... Kessler, R. C. (2011). The prevalence of family childhood adversities and their association with first onset of DSM-IV disorders in metropolitan China. *Psychological Medicine*, 41(1), 85–96.
- Leuwerke, W., & Shi, Q. (2010). The practice and perceptions of school counsellors: A review from urban China. *International Journal for the Advancement of Counselling*, 32, 75–89.
- Levine, K. A., & Zhu, K. (2010). The changing context of China: Emerging issues for school social work practice. *International Social Work*, 53(3), 339–352.
- Loo, J. M. Y., Raylu, N., & Oei, T. P. S. (2008). Gambling among the Chinese: A comprehensive review. *Clinical Psychology Review*, 28(7), 1152–1166.
- Lueken, L. J. (2008). Long-term consequences of parental death in childhood: Psychological and physiological manifestations. In M. S. Stroebe, R. O. Hansson, H. Schut, & W. Stroebe (Eds.). *Handbook of bereavement research and practice: Advances in theory and intervention* (pp. 397–416). Washington, DC: American Psychological Association.
- Luo, R., Jia, F., Yue, A., Zhang, L., Lyu, Q., Shi, Y., ... Rozelle, S. (2019). Passive parenting and its association with early child development. *Early Child Development and Care*, 189(10), 1709–1723.
- Ma, J., Dai, J., Ru, J., Liu, W., & Liu, J. (2013). Yixuesheng xinli jiankang zhuangkuang yu ertongqi buliang jingli de guanxi tantao [Study on the relationship between adult mental health status and adverse childhood experiences among medical college students]. *Chinese Journal of Disease Control & Prevention*, 17(3), 218–221.
- Man, X., Barth, R. P., Li, Y. E., & Wang, Z. (2017). Exploring the new child protection system in Mainland China: How does it work? *Children and Youth Services Review*, 76, 196–202.
- McLanahan, S., Tach, L., & Schneider, D. (2013). The causal effects of father absence. *Annual Review of Sociology*, 39, 399–427.

- Merrick, M. T., Ford, D. C., Ports, K. A., & Guinn, A. S. (2018). Prevalence of adverse childhood experiences from the 2011–2014 behavioral risk factor surveillance system in 23 states. *JAMA Pediatrics*, 172(11), 1038–1044.
- Mersky, J. P., Janczewski, C. E., & Topitzes, J. (2017). Rethinking the measurement of adversity: Moving toward second-generation research on adverse childhood experiences. *Child Maltreatment*, 22(1), 58–68.
- Mersky, J. P., Topitzes, J., & Reynolds, A. J. (2013). Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: A cohort study of an urban, minority sample in the U.S. *Child Abuse & Neglect*, 37, 917–925.
- Müller, M., Vandeleur, C., Rodgers, S., Rössler, W., Castela, E., Preisig, M., & Ajdacic-Gross, V. (2015). Childhood adversities as specific contributors to the co-occurrence of posttraumatic stress and alcohol use disorders. *Psychiatry Research*, 1–6.
- National Bureau of Statistics (2019). 2018 Nongmingong jiance diaocha baogao [2018 Annual survey of migrant workers]. Retrieved from http://www.stats.gov.cn/tjsj/zxfb/201904/t20190429_1662268.html.
- Nie, J., Yu, H., Wang, Z., Wang, L., Han, J., Wang, Y., ... Shen, M. (2015). Ertongqi buliang jingli yu chengnianhou manxingbing de xiangguanxing yanjiu [Association between adverse experiences in childhood and risk of chronic diseases in adulthood]. *Chinese Journal of Epidemiology*, 36(9), 953–957.
- Nurius, P. S., Green, S., Logan-Greene, P., & Borja, S. (2015). Life course pathways of adverse childhood experiences toward adult psychological well-being: A stress process analysis. *Child Abuse & Neglect*, 45, 143–153.
- Okello, J., De Schryver, M., Musisi, S., Broekaert, E., & Derluyn, I. (2014). Differential roles of childhood adversities and stressful war experiences in the development of mental health symptoms in post-war adolescents in northern Uganda. *BMC Psychiatry*, 14, 260.
- Parish, W. L., Wang, T., Laumann, E. O., Pan, S., & Luo, Y. (2004). Intimate partner violence in China: National prevalence, risk factors and associated health problems. *International Family Planning Perspectives and Digest*, 30, 174–181.
- Platte, E. (1988). Divorce trends and patterns in China: Past and present. *Pacific Affairs*, 61(3), 428–445.
- Prins, A., Ouimette, P., Kimerling, R., Cameron, R., P. Hugelshofer, D. S., Shaw-Hegwer, J., & Sheikh, J. I. (2003). The primary care PTSD screen (PC-PTSD): Development and operating characteristics. *Primary Care Psychiatry*, 9(1), 9–14.
- Qualtrics (May 2018 of use) [Computer software]. Provo: UT. Available from <https://www.qualtrics.com>.
- Ramiro, L. S., Madrid, B. J., & Brown, D. W. (2010). Adverse childhood experiences (ACE) and health-risk behaviors among adults in a developing country setting. *Child Abuse & Neglect*, 34(11), 842–855.
- Russell, D. (1980). The revised UCLA loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39(3), 472–480.
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA loneliness scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39(3), 472–480.
- Sánchez-Fernández, J., Muñoz-Leiva, F., & Montoro-Ríos, F. J. (2012). Improving retention rate and response quality in Web-based surveys. *Computers in Human Behavior*, 28(2), 507–514.
- Slopen, N., Shonkoff, J. P., Albert, M. A., Yoshikawa, H., Jacobs, A., Stoltz, R., & Williams, D. R. (2016). Racial disparities in child adversity in the US: Interactions with family immigration history and income. *American Journal of Preventive Medicine*, 50(1), 47–56.
- Soares, A. L. G., Howe, L. D., Matijasevich, A., Wehrmeister, F. C., Menezes, A. M., & Gonçalves, H. (2016). Adverse childhood experiences: Prevalence and related factors in adolescents of a Brazilian birth cohort. *Child Abuse & Neglect*, 51, 21–30.
- Spitzer, R. L., Kroenke, K., Williams, J., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine*, 166, 1092–1097.
- Stillman, S., Gibson, J., McKenzie, D., & Rohorua, H. (2015). Miserable migrants? Natural experiment evidence on international migration and objective and subjective well-being. *World Development*, 65, 79–93.
- Tang, C. S., & Lai, B. P. (2008). Review of empirical literature on the prevalence and risk markers of male-on-female intimate partner violence in Contemporary China, 1987–2006. *Aggression and Violent Behavior*, 13, 10–28.
- Tong, X., An, D., McGonigal, A., Park, S., & Zhou, D. (2015). Validation of the Generalized Anxiety Disorder-7 (GAD-7) among Chinese people with epilepsy. *Epilepsy Research*, 120, 31–36.
- Topitzes, J., Pate, D. J., Berman, N. D., & Medina-Kirchner, C. (2016). Adverse childhood experiences, health, and employment: A study of men seeking job services. *Child Abuse & Neglect*, 61, 23–34.
- Wade, R., Shea, J. A., Rubin, D., & Wood, J. (2014). Adverse childhood experiences of low-income urban youth. *Pediatrics*, 134(1), 13–20.
- Wang, W., Bian, Q., Zhao, Y., Li, X., Wang, W., Du, J., ... Zhou, M. (2014). Reliability and validity of the Chinese version of the Patient Health Questionnaire (PHQ-9) in the general population. *General Hospital Psychiatry*, 36, 539–544.
- Wang, H., Chen, J., & Lyu, L. (2019). The relationship between parental perception of neighborhood collective efficacy and physical violence by parents against preschool children: A cross-sectional study in a county of China. *International Journal of Environmental Research and Public Health*, 16(13), 2306.
- Wang, H., Chen, J., Zhao, X., Feng, Y., & Song, Y. (2018). PW 0548 Child physical violence by parents among primary school students from a rural area in Shandong province, China. *Injury Prevention*, 24(Suppl. 2).
- Wang, Y., Lin, P., & Cao, F. (2018). Zhongwen ertong shiqi buliang jingli wenjuan xiudingban de xiaodu yu xindu [Validity and reliability of the Chinese version of the revised ACEs questionnaire]. *Chinese Mental Health Journal*, 32(9), 760–764.
- Warttig, S. L., Forshaw, M. J., South, J., & White, A. K. (2013). New, normative, English-sample data for the short form perceived stress scale (PSS-4). *Journal of Health Psychology*, 18(12), 1617–1628.
- Wong, A. E., Dirghangi, S. R., & Hart, S. R. (2019). Self-concept clarity mediates the effects of adverse childhood experiences on adult suicide behavior, depression, loneliness, perceived stress, and life distress. *Self and Identity*, 18(3), 247–266.
- Xiang, Y., Ng, C. H., Yu, X., & Wang, G. (2018). Rethinking progress and challenges of mental health care in China. *World Psychiatry*, 17(2), 231–232.
- Xiang, Y., Yu, X., Ungvari, G. S., Lee, E. H. M., & Chiu, H. F. K. (2012). China's national mental health law: A 26-year work in progress. [https://doi.org/10.1016/S01406736\(11\)61704-2](https://doi.org/10.1016/S01406736(11)61704-2).
- Xiao, Q., Dong, M., Yao, J., Li, W., & Ye, D. (2008). Parental alcoholism, adverse childhood experiences, and later risk of personal alcohol abuse among Chinese medical students. *Biomedical and Environmental Sciences*, 21, 411–419.
- Xing, X., Tao, F., Wan, Y., Xing, C., Qi, X., Hao, J., ... Huang, L. (2010). Family factors associated with suicide attempts among Chinese adolescent students: A national cross-sectional survey. *Journal of Adolescent Health*, 46, 592–599.
- Xu, Y., Bright, C. L., & Ahn, H. (2018). Responding to child maltreatment: Comparison between the USA and China. *International Journal of Social Welfare*, 27(2), 107–120.
- Yue, A., Li, S., Shi, M., Shi, Y., Luo, R., Kenny, K., & Rozelle, S. (2016). Parental behavior and social-emotional development among infants in rural Shaanxi Province, China. Retrieved from <https://reap.fsi.stanford.edu/publication/parental-behavior-and-social-emotional-development-among-infants-rural-shaanxi-province>.
- Zhao, Y., & Peng, Y. (2010). Xiangcun dubo de weihaixing ji zhiliao de xinlujing [The harm of gambling in rural areas and new paths for intervention]. *Legal System and Society*, 23, 203–204.