



Factors associated with psychological resilience in left-behind children in southwest China



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ABSTRACT

Psychological resilience of Chinese left-behind children (LBC) remains under-studied. In this cross-sectional survey, we intended to analyze factors associated with resilience in a large group of LBC. One-stage random cluster sampling was used to select 2898 LBC aged between 10 and 17 years in Yunnan province of southwestern China. Face-to-face interview was used to collect relevant information from the participants. Resilience was measured by the Resilience Scale for Chinese Adolescents (RSCA). Multivariate logistic regression models revealed that having a better educated mother, feeling closer to people living in the same residence, and having more close friends were associated with higher psychological resilience in LBC. LBC who felt less close to people living in the same residence were consistently lower in all five dimensions of resilience. Compared with LBC with 2 or less close friends, LBC with more close friends had significantly greater resilience in goal concentration, family support, and interpersonal assistance. Higher mother's education level was related to higher resilience in emotion regulation, family support, and interpersonal assistance. Our findings suggest that dimension-specific intervention measures should be developed and implemented to improve psychological resilience of LBC.

1. Introduction

Positive psychology stresses protective rather than risk factors of mental health (Harvey and Delfabbro, 2004). Although the existing literature is still limited, in recent years, psychological resilience has been identified to be associated with the emotional problems in children and adolescents (Hjemdal et al., 2011, 2007; Aboobaker et al., 2019; Singh et al., 2019). In the field of psychology, the concept of resilience was first described early in 1988 by Norman Garmezy (Haggerty and Sherrod, 1994). Nevertheless, a common definition of resilience has still not been universally accepted. Practically, resilience can be understood as characterized by a set of factors that protect an individual from hazardous consequences of maladaptation (Rutter, 1987).

Along with rapid economic development and urbanization, increasing numbers of migrant workers from impoverished inland rural areas have been flooding to big cities in China. Because of household registration barriers, along with high urban living costs, these workers typically leave their children at home. This growing disadvantaged population is known as the left-behind children (LBC). In China, LBC generally includes children who are under 18 years of age and have been left behind by one or both of their migrated parents for at least 6

months (Su et al., 2013). By 2013, there were over 60 million LBC in China (China Women's Federation, 2013), and more than one-third of LBC were in west regions (Ministry of Civil Affairs of the PRC, 2016).

In the last two decades, concerns regarding to the health status, especially mental health status of LBC have been accumulating. Compared to non-left-behind children (NLBC), LBC report higher risks of depression (He et al., 2012; Cheng and Sun, 2015), anxiety (Cheng and Sun, 2015; Zhao et al., 2014), and other psychological problems (Man et al., 2017). More recently, a meta-analysis by Dong et al. revealed that resilience of LBC was also worse than their non-left-behind counterparts (Dong et al., 2019).

In LBC, lower level of resilience has been linked to higher prevalence of depression (Wu et al., 2017), loneliness (Ai and Hu, 2016), and deteriorated mental health (Shi et al., 2016). Therefore, it is imperative to determine factors associated with or influencing resilience in Chinese LBC. Very few studies have examined this topic, with limited findings (Li et al., 2018; Guo et al., 2015). Since resilience is multi-dimensional (Birhanu et al., 2017) it is also important to consider separate component factors of resilience.

The aim of our study was to analyze factors associated with psychological resilience in a large group of Chinese LBC chosen by a population-based probability sampling design, so as to inform resilience

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Table 1
General characteristics of study participants, Yunnan, China, 2019.

Characteristics	All (N = 2898) Mean (SE.)/N (%)	Boys (N = 1504) Mean (SE.)/N (%)	Girls (N = 1394) Mean (SE.)/N (%)	p value
Demographics				
Age (Years)	13.95 (0.51)	13.89 (0.49)	14.01 (0.54)	0.33
Grade				0.03
Elementary school	748 (25.81)	396 (26.33)	352 (25.25)	
Junior high school	1622 (55.97)	861 (57.25)	761 (54.59)	
Senior high school	528 (18.22)	247 (16.42)	281 (20.16)	
Age of father	39.45 (0.43)	39.74 (0.57)	39.14 (0.27)	0.32
Age of mother	37.78 (0.41)	38.10 (0.49)	37.44 (0.32)	0.19
Ethnicity				0.01
Han	532 (18.36)	277 (18.42)	255 (18.29)	
Zhuang	1624 (56.04)	804 (53.46)	820 (58.82)	
Miao	605 (20.88)	350 (23.27)	255 (18.29)	
Other	137 (4.73)	73 (4.85)	64 (4.59)	
Socioeconomic status				
Education level of father				0.36
Elementary school and below	2386 (82.33)	1227 (81.58)	1159 (83.14)	
Junior high school and above	512 (17.67)	277 (18.42)	235 (16.86)	
Education level of mother				0.41
Elementary school and below	2705 (93.34)	1400 (93.09)	1305 (93.62)	
Junior high school and above	193 (6.66)	104 (6.91)	89 (6.38)	
Left-behind status				
Parents migration style				10 ^{-2.92}
Single parent	175 (6.08)	97 (6.48)	78 (5.64)	
Both parents	2703 (93.92)	1399 (93.52)	1304 (94.36)	
Contact frequency with migrated parents (week)	1.26 (0.02)	1.33 (0.03)	1.19 (0.06)	0.39
Average time spent with migrated parents (month/year)	2.06 (0.09)	2.11 (0.05)	2.01 (0.14)	0.49
Number of other people living with the participant				0.04
0 (Live by self)	186 (6.42)	110 (7.31)	76 (5.45)	
1	484 (16.70)	240 (15.96)	244 (17.50)	
2	890 (30.71)	480 (31.91)	410 (29.41)	
3	716 (24.71)	374 (24.87)	342 (24.53)	
4 and above	622 (21.46)	300 (19.95)	322 (23.10)	
Social support				
Closeness to people living with the participant				10 ^{-2.33}
Very close	1443 (52.59)	751 (53.07)	692 (52.07)	
Close	898 (32.73)	480 (33.92)	418 (31.45)	
Normal and below	403 (14.69)	184 (13.00)	219 (16.48)	
Number of close friends				0.06
2 and below	445 (15.36)	204 (13.56)	241 (17.29)	
3-5	1083 (37.37)	566 (37.63)	517 (37.09)	
6 and above	1370 (47.27)	734 (48.80)	636 (45.62)	
RSCA score				
Sum	94.42 (0.64)	94.90 (0.75)	93.90 (0.55)	0.17
Dimension 1 (Goal concentration)	3.77 (0.04)	3.81 (0.04)	3.72 (0.05)	0.11
Dimension 2 (Emotion regulation)	3.15 (0.04)	3.23 (0.06)	3.07 (0.03)	0.10
Dimension 3 (Positive perception)	3.71 (0.03)	3.71 (0.02)	3.70 (0.05)	0.84
Dimension 4 (Family support)	3.55 (0.01)	3.55 (0.01)	3.55 (0.01)	0.72
Dimension 5 (Interpersonal assistance)	3.42 (0.02)	3.38 (0.03)	3.46 (0.01)	0.30

intervention measures and strategies in this vulnerable population.

2. Material and method

2.1. Study design

This study was implemented in Yunnan province in southwest China. Guangan county, which is affiliated with the Wenshan Zhuang and Miao Ethnic Minorities Autonomous Prefecture, reports the largest number of LBC in Yunnan and was chosen as the study site. A one-stage randomized cluster sampling method was used to select participants: among a total of 18 rural townships within Guangan, 3 were randomly selected. All eligible LBC residents (who lived in the area for no less than a consecutive 6 months per year) in the 3 chosen townships were included as study subjects. The survey was implemented from June 26 to July 6, 2018.

Study inclusion was based upon the commonly used definition of LBC: age under 18 years, one or both parents migrated, and the separation exceeded a consecutive 6 month in the last year (Zhou and Duan, 2006). Because we also intended to investigate suicidal behaviors

among LBC, and it has been suggested that only children aged above 10 years can fully understand the concept of suicide (Mishara, 1999), thus LBC aged under 10 years were excluded. Other exclusion criteria include: illiteracy, unconsciousness, severe mental illnesses (schizophrenia, bipolar disorder, paranoid personality disorder, schizoaffective disorders, mental disorders due to epilepsy, mental retardation), auditory dysfunction (moderate to profound hearing loss), speech and language impairment (apraxia, dysarthria, speech sound disorders, voice disorders, language-based learning disabilities, selective mutism, aphasia), refusal to participate. The study protocol was approved by Ethics Review Board of Kunming Medical University.

2.2. Variables and definitions

Relevant information of the participants was collected through face-to-face interviews with a structured questionnaire instrument. Prior to interview, written consents were collected from legal guardians of the participants. Oral consents from the children themselves were also obtained for LBC over 12 years of age. General information, which includes demographics, socioeconomic status (SES), social support, and

left-behind features, was measured by a questionnaire developed by the investigators. Development of the questionnaire contains four stages: 1) We put forward a group of candidate questions based on literature review; 2) The preliminary questionnaire was developed after consulting 10 experts in this field; 3) The preliminary questionnaire was validated in a pre-sample of 269 LBC; 4) Revisions were made to form the final questionnaire.

Psychological resilience was ascertained by the Resilience Scale for Chinese Adolescents (RSCA) designed by Hu and Gan, 2008. The RSCA contains 27 items that reflect the following 5 dimensions of resilience: goal concentration, emotion regulation, positive perception, family support, and interpersonal assistance. Each item can be assigned a score of 1–5 based on the questionnaire responses. A maximum RSCA score is 135, with higher score representing a better level of resilience.

2.3. Statistical analysis

Descriptive statistics were used to illustrate characteristics of the study participants. Univariate logistic regression models were used preliminarily to screen for possible factors associated with resilience at a nominal significance level of 0.10. A threshold of positive resilience at RSCA score ≥ 94 was used as the regression outcome variable. Multivariate logistic regression modeling was subsequently used to estimate adjusted associations between identified covariates and resilience. Nominal significance level for statistics was set at 0.05, two-tailed. All analyses were run by R (Version 3.3.3, The R Foundation for Statistical Computing, Vienna, Austria).

3. Results

3.1. General characteristics of participants

Based on the criteria described above, we initially identified 3011 LBC. Among these, 28 refused to participate, 10 were later confirmed over-age, and 75 were excluded because of missing information, leaving 2898 LBC that were included in the analyses, with a response proportion of 96.6%. General characteristics of the study participants are described in Table 1. The summary RSCA score ranged from 46 to 134, with a mean of 94.4. Average scores of the five dimensions of RSCA were 3.77, 3.15, 3.71, 3.55, and 3.42, respectively. There was no significant difference in resilience between left-behind boys and girls. The reliability of RSCA was ideal in this study, with a calculated Cronbach's alpha of 0.77 (bootstrap 95%CI: 0.76–0.79).

3.2. Factors associated with resilience

Univariate logistic regression identified the following factors potentially associated with resilience: age, age of father, grade in school, educational levels of the parents, contact frequency with migrated parents, average time spent with migrated parents, feelings of closeness to people living in the same residence, and number of close friends. However, after multivariate adjustment, only educational level of mother, closeness to people living in the same residence, and number of close friends were related to resilience, all in the positive direction (Table 2).

3.3. Factors associated with components of resilience

We further analyzed the five components of resilience individually. Medians of the average scores of the components were used to dichotomize the study subjects, at: 3.80, 3.17, 3.75, 3.67, and 3.50. Multivariate logistic regression models revealed that, among all considered variables, sex, grade, educational level of mother, closeness to people living with the participant, and number of close friends were the most associated factors of the resilience components. Among these factors, LBC who felt less close to people living with them had lower

Table 2
Univariate and multivariate logistic regression model results for factors associated with resilience.

Variables	Univariate model (Event: RSCA score ≥ 94)		Multivariate model (Event: RSCA score ≥ 94)	
	Crude OR	90% CI	Adjusted OR	95% CI
Age (+1 year)	1.06	1.00–1.12	1.10	1.04–1.18
Sex (Girls)	0.89	0.78–1.01		
Age of father (+5 years)	0.93	0.89–0.98	0.93	0.87–0.99
Age of mother (+5 years)	0.96	0.89–1.03		
Grade (Ref: elementary school)				
Junior high school	0.90	0.86–0.94	0.79	0.62–1.01
Senior high school	1.28	1.08–1.51	1.01	0.58–1.77
Ethnicity (Ref: Zhuang or Miao)				
Other	0.93	0.86–1.01		
Education of father (Ref: elementary school and below)				
Junior high school and above	1.39	1.06–1.82	1.22	0.81–1.84
Education of mother (Ref: elementary school and below)				
Junior high school and above	1.63	1.25–2.11	1.64	1.23–2.19
Parents migration style (Ref: single parent)				
Both parents	0.90	0.80–1.02		
Contact frequency with migrated parents (+1 per week)	0.90	0.83–0.97	0.91	0.85–0.97
Average time spent with migrated parents (+1 month)	1.02	1.01–1.04	1.03	1.00–1.06
Number of other people living with the participant (Ref: 2 and below)				
3 and above	0.96	0.89–1.04		
Closeness to people living with the participant (Ref: very close)				
Close	0.72	0.64–0.80	0.68	0.59–0.78
Normal and below	0.45	0.40–0.50	0.44	0.37–0.53
Number of close friends (Ref: 2 and below)				
3–5	1.75	1.66–1.85	1.66	1.51–1.83
6 and above	2.76	2.64–2.88	2.45	2.31–2.58

resilience in all five components; compared with LBC with 2 or less close friends, LBC with more close friends had significantly elevated resilience in goal concentration (3–5 friends: OR = 1.32, 95%CI: 1.08–1.61; 6 friends and above: OR = 1.57, 95%CI: 1.30–1.90), family support (3–5 friends: OR = 1.31, 95%CI: 1.02–1.67; 6 friends and above: OR = 1.90, 95%CI: 1.41–2.55), and interpersonal assistance (3–5 friends: OR = 1.79, 95%CI: 1.62–1.97; 6 friends and above: OR = 2.23, 95%CI: 1.93–2.57); a better educated mother was related to higher resilience in emotion regulation (OR = 1.19, 95%CI: 1.05–1.34), family support (OR = 1.67, 95%CI: 1.54–1.82), and interpersonal assistance (OR = 1.37, 95%CI: 1.21–1.55) (Fig. 1).

4. Discussion

In this population-based cross-sectional survey, we examined factors associated with psychological resilience in Chinese LBC. Our results suggest that perceived closeness to people living with the subject, number of close friends, and maternal education are the most important factors associated with resilience, positively, in LBC. These findings may be relevant for informing intervention measures for disadvantaged LBC.

Because of the collectivist culture in China, migrated parents typically entrust their LBC to the grandparents (Song et al., 2018). It has been estimated that about 70 percent of LBC were left to such care in both-parent-migrated families (China Women's Federation, 2013). In our study, we found that 81% LBC were living with and supervised by their grandparents. Therefore, closeness to people living with LBC largely reflects grandparent-child bonding. It has been reported that grandparents can influence the self-esteem of their grandchildren (Iseki and Ohashi, 2014). Self-esteem is intimately related to resilience,

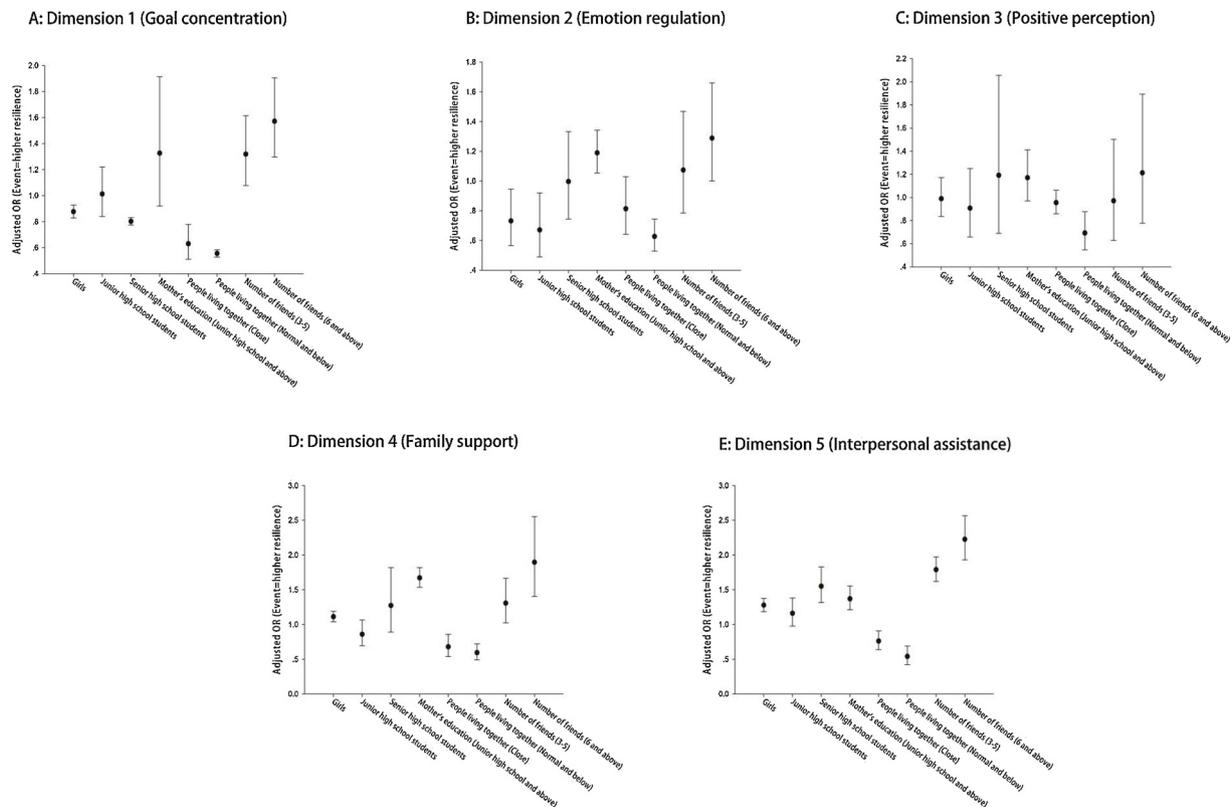


Fig. 1. Adjusted ORs for associated factors by different dimensions of resilience. Panel A: adjusted for ethnicity, father's education; Panel B: adjusted for father's age, mother's age, ethnicity, father's education, contact frequency with migrated parents; Panel C: adjusted for age, mother's age, father's education, average time spent with migrated parents; Panel D: adjusted for age, father's education, average time spent with migrated parents, contact frequency with migrated parents; Panel E: adjusted for father's age, mother's age, ethnicity, father's education, average time spent with migrated parents, contact frequency with migrated parents.

perhaps even as a part of individual resilience (Currie et al., 2004). Moreover, a recently published study reported a mediating role of self-esteem in the association between parent-child relationships and resilience in Chinese NLBC (Tian et al., 2018). Therefore, we suggest that self-esteem may be a mediator in the association between grandparent-child cohesion and resilience. However, as we did not measure self-esteem in this study, this suggestion should be verified in future studies.

For parents, only the educational level of the mother showed independent association with resilience of LBC, especially in dimensions of family support, interpersonal assistance and emotion regulation. Mothers are still the primary caretakers of children, and maternal characteristics may exert great influences on children's wellbeing. It has been suggested that higher maternal education is related to better academic outcomes of children (Harding et al., 2015). Moreover, by using the Strength and Difficulties Questionnaire (SDQ), a comprehensive instrument that measures conduct problems, emotional symptoms, hyperactivity, peer problems and prosocial behaviors (Goodman, 1997), researchers concluded that higher maternal education was associated with reduced prevalence of mental health problems in South African, German, and Spanish adolescents (Cortina et al., 2013; Meyrose et al., 2018; Arroyo-Borrell et al., 2017). As the relationship between maternal education and LBC resilience has seldom been examined, our findings would benefit from replication.

Compared to family support, adolescents are particularly sensitive to peer environments (Crone and Dahl, 2012). A study by van Harmelen et al. showed that friendships were the strongest predictor of immediate resilient psychosocial functioning in UK adolescents (van Harmelen et al., 2017). Our results parallel these findings, as we observed a positive association between number of friends and psychological resilience. A rationale behind this friend-resilience association is uncertain. It is possible that adolescent friendships may boost resilience through offering companionship (Cohen and Wills, 1985), increasing

interpersonal skills (Buhrmester, 1990), supporting social decision-making skills (Jehn and Shah, 1997), and reducing feelings of loneliness (Parker and Asher, 1993). Nevertheless, whether this positive association is completely proportional should be validated, as Falci and McNeely have observed a U-shaped relationship between adolescent mental health and number of friends: both too few and too many friends were related to lower levels of psychological health (Falci and McNeely, 2009).

As opposed to a previous study on Chinese LBC (Guo et al., 2015), we found that after adjusted for age and other factors, grade at school was not significantly associated with psychological resilience. It is possible that differing resilience instruments and target populations have contributed to this discrepancy. As to specific dimensions of resilience, senior high school students were less resilient in goal concentration and more resilient in interpersonal assistance and emotion regulation. This suggests the relevance of grade-specific and dimension-specific resilience intervention measures in LBC.

The major findings of the current study have important implications. They indicate that, among Chinese LBC, those with lower maternal education level, or have fewer close friends are more likely to report deteriorated psychological resilience, and should be targeted for effective intervention. Parenting quality strongly influences the mental health of children (Scott, 2012; Bauman et al., 2006), it is possible that the compromised parenting quality provided by less educated mother impaired psychological resilience of LBC. Although parenting education programs are effective in improving parenting knowledge and skills (Engle et al., 2011), for migrated mothers who are constantly separated from their left-behind children, how to devise and implement effective parenting education should be carefully considered. Besides, school-based peer-support activities could be introduced for resilience-building of LBC, as they were proved effective in general adolescents (Hjemdal et al., 2011; Houck et al., 2002). Moreover, cultivating the closeness

between LBC and their grandparents should also be considered. A previously published study revealed that, parents played significant roles in grandparents-children cohesion in China (Xu et al., 2014), therefore, an inclusive intervention strategy, which incorporates LBC, migrated parents, and grandparents should be adopted.

Several limitations of the current study should be considered. First, a causal relationship for the associations cannot be determined because of the cross-sectional nature of the study. All information analyzed was collected based on self-report, thus the possibility of recall bias exists. However, the questions and outcomes involved in this study are not particularly stigmatizing in western China, and to our knowledge, no public messages about them have been prevalent in the region. Besides, all of our study participants were chosen from a single province of China, with a more diverse ethnic composition than typically seen in other areas in China. Extrapolation of our study results to other areas of China or outside of China should be made with caution.

In this cross-sectional study, we found that a better educated mother, stronger grandparent-child bonding, and having more close friends were associated with higher psychological resilience among Chinese LBC. With respect to the specific components of resilience, the factors sex, school grade, maternal education, grandparent-child bonding and number of friends showed disparate associations. Targeted intervention measures could be devised and implemented to improve psychological resilience of LBC.

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Declaration of Competing Interest

None.

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