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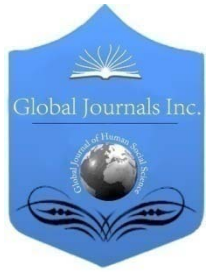

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Ecological Risk Factors of Depressive Symptoms in Chinese Youth: A Literature Review

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Keywords: *youth depressive symptoms, chinese contexts, prevalence, ecological risk factors.*

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Ecological Risk Factors of Depressive Symptoms in Chinese Youth: A Literature Review

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I. Introduction

Among the many challenges confronting children and adolescents globally, few if any is more urgent than depression. Childhood and adolescence onset depression has been associated with greater rates of depression recurrence (Merry, McDowell, Wild, Bir, & Cunliffe, 2004), faster relapse rates (Alloy et al., 2006b), increased chronicity of episodes and longer duration of illness (Lewinsohn, Shankman, Gau, & Klein, 2004). Further, a number of longitudinal cohorts studies have tested the developmental continuity between youth and adulthood diagnoses, and found that the link is both homotypic and heterotypic, i.e., youth depressive symptoms lead to adult depression and other types of mental illness (Stringaris & Goodman, 2009; 2013). Depressive episodes in childhood and adolescence often trigger debilitating ripples across multiple life domains, including poor academic achievement at school, conflicting relationships with family members and peers (Kaminer, Conor, & Curry, 2007), and the most serious outcome is suicide (Centers for Disease Control, 2015). Suicide attempts are the leading cause of hospitalization for Chinese youths as well as the leading cause of death in China (Hesketh, Ding, & Jenkins, 2002).

In 2014, an estimated 2.8 million youth aged 12 to 17 in the United States had at least one major depressive episode in the past year (Substance Abuse and Mental Health Services Administration, 2014). This number represented 11.4% of the U.S. youth population (SAMHSA, 2014). These figures, however, may be an underestimate of depressive symptoms among youth. Besides major depression, recent reports suggested an increasing number of children and adolescents experience depressed mood, subsyndromal symptomatic symptoms, and minor depression (Lewinsohn et al., 2004). Thus, the focus of the present review is on youth depressive symptoms. It is important to assess not only clinical depression but also the presence of depressive symptoms that might lead to a more severe disorder in the future. In the current review, depression refers to the presence of depressive symptoms.

Sharply contrasted with the amount of research conducted in U.S., very limited epidemiological studies on youth depressive symptoms have ever been conducted in the three Chinese contexts of mainland China, Hong Kong, and Taiwan. Even though no official estimate of prevalence is available in these areas, there have several attempts to identify the presence, prevalence, and ecological risk factors of youth depression there recently. Since it has been found that Chinese youth has not been spared from depressive symptoms (Zgambo, Kalembo, He, & Wang, 2012) and the demand for effective and efficient prevention and intervention continues to rise, a comprehensive systematic review is needed to provide an empirical rationale for future research and preventive intervention programs for Chinese youth.

Importantly, it is well-known that although depression could be identified across diverse cultural contexts, cultural differences in the expression, manifestation, reporting, and predicting factors of depression had been well established among racial groups (American Psychiatric Association, 2013).Thus, identifying context-relevant factors which made Chinese youth susceptible to depression is critical for this largest

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ethnic group in the world. As the word *depressed* is absent from Chinese language until the end of 20th century, and certain Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnosis do not correspond equivalently to the categories of symptoms recognized by Chinese population (Kalibatseva & Leong, 2011), examining depressive symptoms among youths from Chinese contexts would sieve out cultural phenomenon, and ultimately decrease misdiagnosis and undertreatment of depression among the target population.

The current review seeks to accomplish two purposes. First, an up-to-date summary of youth depression literature in mainland China, Hong Kong, and Taiwan will be provided, with an emphasis on prevalence of depressive symptoms among Chinese children and adolescents. Second, to systematically review research articles that studied the associations between ecological risk factors and youth depressive symptoms, and to figure out context-relevantrisk factors for Chinese youth.

II. Method

a) Search Strategy

Since research on child and adolescent depressive symptoms are relatively few in the Chinese context, the initial search aims to be inclusive than limiting. Electronic databases (MEDLINE,Web of Science, JSTOR, ERIC, PsycINFO, and Google Scholar) were searched for empirical studies that examined depressive symptoms among Chinese youth. Search terms, including 'depressive symptoms among Chinese children and adolescents', 'youth depression in China', 'ecological risk factors associated with Chinese youth depression', 'depression prevalence among Chinese youth', 'childhood and adolescence mental health in China', were sought across all databases.

Articles were included if they were peer-reviewed empirical articles that conducted in mainland China, Hong Kong, and Taiwan among children and adolescents aged 7 to 18 years old from 2000 to 2015 in English or Chinese. Given the large amount of variation existing in diagnosis of depression, development heterogeneity, and socio cultural contexts, studies that a) tackled clinical depression and any other kinds of internalizing problems (e.g., anxiety, somatic complaints, or social withdrawal) among youth, b) sampled participants younger than 7 or older than 18 years old, and c) surveyed sites outside of mainland China, Hong Kong or Taiwan were excluded. This process resulted in 89 evidence-based articles by screening abstracts. These articles were further screened for eligibility by scrutinizing full texts, and 32 were obtained and included in the review. Further, the bibliographies of these article as were then reviewed for additional sources pertinent to the study purposes. This process yielded an additional 5 journal articles. Summing up, 37 articleswere included in the current review.

III. Data Extraction

The author read each article and input information relevant to the research purposes into a database. In order to address the purposes of the current review, sample characteristics, measurements on depressive symptoms, and primary ecological risk factors from each article were compiled and organized into substantive clusters and shown in Table 1.

IV. Results

a) Study Characteristics

Characteristics of the 37 selected studies were shown in Table 1. The 37 articles had a mean sample size of 2,366subjects (sd=3,610; median=1,162; ranging from 258 to 18,341). Approximately 70% (n=26) of the studies were performed in mainland China, 14% (n=5) were conducted in Hong Kong, and the rest (n=6) in Taiwan. Among the studies conducted in mainland China, the capital city Beijing and urban Hunan provinces in mid-south have been studied most, whereas rural inland areas were studied the least.Among the articles included in the current review, 25 (68%) studies employed cross-sectional research design, whereas 12 (32%) employed longitudinal design.

b) Depressive Symptoms Measurements

In most studies, depressive symptoms were measured solely by self-report instruments. The 37 studies employed 12 measurements on depressive symptomatology, with the Child Depressive Inventory (CDI; *n*=13, 35%), the Center for Epidemiological Studies Depression Scale (CES-D; *n*=10, 27%), and the Beck Depression Inventory (BDI; *n*=5, 14%) being the most commonly applied. Other measurements include Depression Self-Rating Scale for Children (Fan, Zhang, Yang, Mo, & Liu, 2011), British Psychiatric Morbidity of Children Survey (Hesketh et al., 2002), Reynolds Adolescent Depression Scale (Lau & Kwok, 2000), Adolescent Depressive Mood Self-Evaluation Checklist (Lin et al., 2013), Depression Screen Scale for Children and Adolescents (Lin, Hsieh, & Lin, 2013; Lin, Hsieh, & Tung, 2012), Revised Childhood Anxiety and Depression Scale (Lu et al., 2013), depression subscale of Child Behavior Checklist (Tepper et al., 2008), Symptom Checklist-90-Revised (Wu, 2007), and a summative scale from Taiwan Youth Project (Sze, Hsieh, Lin, & Chen, 2013).

c) Presence and Prevalence of Youth Depressive Symptoms

Children and adolescents have historically been thought not to be susceptible to depressive symptoms,

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particularly in Chinese contexts. In mainland China, the dramatic political and economic changes through the previous half century influence the actual prevalence of emotional disorders, such as depression and its reporting. When the personality cult of Mao Zedong prevailed in China, his bias on mental illness stigmatized the patients, manipulated public's perceptions, and impeded psychiatric treatment (Kleinman, 1986). Based on Mao's perspective, the outdated political systems, feudalism and capitalism were the chief culprits causing mental illness (Kleinman, 1986). The sociologist Arthur Kleinman has conducted multiple studies on mental illness in China. His book *Social Origins of Distress and Disease: Depression, Neurasthenia, and Pain in Modern China* (1986) stated that from clinicians to patients, no one admitted that mental health problems existing in contemporary China. Because people who opposed the communist regime or leaders, and/or advocated for personal rights were seen as mentally sick in China (Tsai & Levenson, 1997), patients who suffered from mental health problem have to ignore, deny and hide their mental disorder. Consequently, a commonly held view suggests that Chinese adults and youth, suffer little, if any, from mental illnesses such as depression (Yip, 2005). However, the current review has made it clear that this is not accurate. The prevalent rates of depressive symptoms among children and adolescents in mainland China ranged from 5.9% (Tepper et al., 2008) to 33% (Hesketh et al., 2002).

Western concepts of mental health are more immersed in Hong Kong and Taiwan due to historical reasons (Yip, 2005). Since Hong Kong and Taiwan are areas where traditional Chinese culture are mingled with Western modern culture, depressive symptoms are less often obscured by stigma, misconception, and shame compared with the mainland. That said, the reporting of prevalent rates among sampled youth in Hong Kong and Taiwan did not differ much from children and adolescents in the mainland. The studies conducted on Hong Kongese and Taiwanese youth psychological adjustment reported the prevalent rates ranging from 10% (Lin et al., 2012) to 20.9% (Chan, 2012).

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Table1: General characteristics of included studies

Study (design)	Area	Measurement	Prevalence rate	Mean level of depressive symptoms	Sample size	Mean Age	Potential risk factors										
							Age	Gender	Cognitions	Life events	Family environment	Family structure	Family SES	Paren-ting practices	Academic performance	Peer relationships	Relationships with teachers
Abela et al. (2011) (L[a])	Hunan, Changsha(U[b]), Liuyang(R[c])	CES-D[d]	22.2% (urban youth) 27.7% (rural youth) at initial assessment	32.66 (urban girls) 31.51 (urban boys) 34.23 (rural girls) 32.98 (rural boys)	558 (urban youth; 250 boys, 308 girls) 592 (rural youth;313 boy, 279 girls)	16.22 (urban youth) 16.32 (rural youth)			√	√							
Auerbach et al. (2010) (L)	Hunan, Yue Yang(U);Canada, Montreal	CES-D	-----	12.16, 12.36, 12.02, 11.35, 10.32, 8.96, 10.00 (Chinese adolescents at initial level and follow-up #1 to #6 respectively) 13.84, 12.95, 11.37, 9.96, 12.83 (Canadian adolescents at initial level and follow-up #1 to #4 respectively)	405 Chinese adolescents (202 boys, 203 girls); 118 Canadian adolescents (54 boys, 64 girls)	16.18 (Chinese youth) 15.17 (Canadian youth)		√	√	√							
Chan (2012) (C[e])	Hong Kong	CDI[f]	20.9%	27.35 (dysphoric group) 12.30 (asymptomatic group)	326 (160 boys, 166 girls)	11.7			√								
Chan (2013) (C)	Tianjin, Shenzhen, Shanghai, Xi'an, Wuhan, Hong Kong	BDI-II[g]	-----	-----	18,341 (9,776 boys, 8,565 girls)	15.9				√							
Chen et al. (2012) (L)	Beijing(U)	CDI-S[h]	-----	-----	1,162 (580 boys, 582 girls)	9.17										√	
Chen et al. (2000) (L)	Shanghai(U)	CDI	-----	-----	258 (137 boys, 121 girls)	11.92								√			
Chen et al. (2013) (L)	Beijing(U)	CDI	-----	8.12 (Time 1) 6.92 (Time 2)	1,171 (591 boys, 580 girls)	9.33			√						√		
Cohen et al., 2013	Hunan-Chang	CES-D	-----	13.18, 12.83, 12.45, 12.13, 11.81, 12.24 (follow-up #1 to #6)	558 (urban youth; 248 boys, 310 girls)	16.26			√								

(L)	sha(U) Liuyang(R)				592 (rural youth; 305 boys, 287 girls)												
Dong et al. (2002) (C)	Beijing & Tianjin(U)	CDI (child-report); BDI[i] (parent-report)	-----	12.26 (youth from divorced families) 9.99 (youth from intact families) 29.99 (youth from divorced families) 27.77 (youth from intact families)	348 (166 boys, 182 girls)	12.22						√		√			
Fan et al. (2011) (C)	Sichuan-Dujiangyang(R & U)	DSRSC[j]	24.5%	11.10 (girls scored 11.92, boys 10.13)	2,081 (956 boys, 1125 girls)	14.6 (boys) 14.5 (girls)	√	√		√							
Fang et al. (2009) (C)	Henan (R)	CES-D	-----	-----	1,625 (826 boys, 799 girls)	12.85				√							
Greenberger et al. (2000) (C)	Tian Jin(U) & U.S.	CES-D	-----	1.94 (Chinese boys) 2.03 (Chinese girls) 1.80 (U.S. boys) 2.06 (U.S. girls)	502 (Chinese sample; 259 boys, 243 girls) 201 (U.S. sample; 93 boys, 108 girls)	17.6 (Chinese sample) 16.6 (U.S. sample)		√		√	√			√	√	√	
He et al. (2012) (C)	Hubei-Xiantao(R)	CDI	15.3%(left-behind youth) 6.0% (not left-behind youth)	11.44 (left-behind youth) 8.02 (not left-behind youth)	875 (556 boys, 319 girls)	11.08 (left-behind youth) 11.01 (not left-behind youth)				√			√				
Hesketh et al. (2002) (C)	Zhejiang-Hangzhou(R), Chuna n(U)	BPMCS[k]	33%	-----	784 (urban sample; 369 boys, 415 girls) 792 (rural sample; 401 boys, 391 girls)	13.9 (urban sample) 14.4 (rural sample)		√				√	√		√		
Jia et al. (2009) (C)	Nanjing, New York City	CDI	-----	.31 (Chinese sample) .28 (U.S. sample)	706 (Chinese sample; 350 boys, 356 girls) 709 (U.S. sample; 342 boys, 367 girls)	12.26 (Chinese sample) 12.36 (U.S. sample)								√		√	√
Lau & Kwok (2000) (C)	Hong Kong	RADS[l]	----	-----	2,706 (1,353 boys, 1,353 girls)	12 (Grade 7) 13 (Grade 8) 14 (Grade 9)					√						
Li & Zhang (2008) (C)	Areas near Beijing(R)	BDI	-----	-----	398 (167 boys, 227 girls)	16.63									√	√	

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Lin et al. (2013) (C)	Taiwan(R)	DSSCA[m]	16.1%	17.42	881 (444 boys, 437 girls)	9.61						√	√				
Lin et al. (2012) (C)	Taiwan(R)	DSSCA	17.9%	18.3	559 (276 boys, 283 girls)	9.68							√				
Lin et al. (2013) (C)	Taiwan(U)	ADMSEC[n]	-----	-----	606 (281 boys, 325 girls)	13.24					√			√			
Liu (2003) (C)	Taiwan(R & U)	CDI	10%		454 (224 boys, 210 girls)	12								√			
Liu et al. (2009) (C)	Anhui, Chongqing, Guizhou(R)	CDI	-----	41.6 (range-26-76)	592	10-17	√										
Lu et al. (2013) (C)	Fujian (R & U)	RCADS[o]	-----	23.59	459 (250 boys, 209 girls)	10.98			√	√							
Luo et al. (2011) (C)	Chongqing, Guizhou, & Anhui (R)	CDI	-----	-----	950 (416 boys, 534 girls)	15.1										√	√
Ng & Hurry (2011) (C)	Hong Kong	BDI	-----	10.59 (boys) 13.04 (girls)	1,199 (567 boys, 632 girls)	16.4		√	√		√						
Sun et al. (2012) (C)	Chengdu, Hangzhou, Harbin, Kunming, Qingdao, Shenyang, Wuhan(R)	CES-D (adapted version)	-----	-----	12,449 (5,976 boys, 6,473 girls)	Range from 11-18							√				
Stewart et al. (2004) (L)	Hong Kong & U.S.	BDI-II	25% (Hong Kong sample) 18% (U.S. sample)	12.50 (Hong Kong boys) 15.45 (Hong Kong girls) 9.22 (U.S. boys) 13.40 (U.S. girls) at Time 1	1,771 (Hong Kong sample; 873 boys, 898 girls) 501 (U.S. sample; 198 boys, 303 girls)	15.70			√								

Sze et al. (2013) (L)	Taiwan(R & U)	Items from Taiwan Youth Project	-----	10.29 at initial assessment	2,690 (1,378 boys, 1,312 girls)	13.3 at initial assessment	√	√			√					
Tang et al. (2010) (C)	Hubei- Wuhan(R & U)	CDI	-----	11.9 (boys perceived overweight) 12.0 (girls perceived overweight)	1,144 (665 boys, 479 girls)	13.9			√							
Tepper et al. (2008) (C)	Shandong(U)	CBCL[p] (depression subscale)	5.9% (youth report) 0.9% (parent report) 0.8% (teacher report)	4.8-9.6 (youth report) 1.5 (parent report) 2.0 (teacher report)	4,858 children (2,499 boys, 2,359 girls) 1,362 adolescents (822 boys, 540 girls)	10.5 (child sample) 14.6 (adolescent sample)	√	√								
Wang et al. (2015) (C)	Chong qing (R & U)	CDI	24.8%	-----	4,857 (2,595 boys, 2,262 girls)	13	√			√	√		√			
Wu (2007) (L)	Taiwan(U)	SCL-90-R[q]	-----	61.31 (time1) 62.82 (time2) 65.48 (time3)	1,343	7th grade at initial assessment								√		
Wu et al. (2010) (L)	Chengdu, Hangzhou, Harbin, Qingdao, Shenyang, Wuhan. Kunming(U)	CES-D	-----	-----	5,164 (2,520 boys, 2,644 girls)	15.45		√					√	√		
Xie et al. (2006) (C)	Wuhan, Chengdu, Kunming, Hangzhou(U)	CES-D	-----	5.11 (girls misperceived overweight) 4.61 (boys misperceived overweight)	6,863 (3,312 boys, 3,551 girls)	10th grade			√							
Yang et al. (2010) (L)	Hunan Liuyang (R) Changsha(U)	CES-D	22.9%	15.17, 13.39, 11.35, 11.00, 10.02, 11.66 (initial status and follow-up #1 to #5)	623 (299 boys, 314 girls)	16.03				√					√	
Yu & Seligman (2002) (C & L)	Beijing(U)	CDI	6.2%	10.30	187 (98 boys, 89 girls)	10.81	√	√	√		√	√	√	√	√	
Zhang et al.,2013(C)	Shandong(R & U)	CES-D	----	.70	1,297 (684 boys, 613 girls)	13.9 (Grade 8) 14.8 (Grade 9)				√	√				√	√	√

Note: a. L=longitudinal; b. U=urban; c. R=rural; d. CES-D= Center for Epidemiological Studies Depression Scale; e. C=cross-sectional; f. CDI= Child Depressive Inventory; g. BDI-II= Beck Depression Inventory, version II; h. CDI-S= Child Depressive Inventory, short version; i. BDI= Beck Depression Inventory; j. DSRSC= Depression Self-rating Scale for Children; k. BPMCS= British Psychiatric Morbidity of Children Survey; l. RADS= Reynolds Adolescent Depression Scale; m. DSSCA= Depression Screen Scale for Children and Adolescents; n. ADMSEC= Adolescent Depressive Mood Self-Evaluation Checklist; o. RCADS= Revised Childhood Anxiety and Depression Scale; p. CBCL= Child Behavior Checklist; q. SCL-90-R= Symptom Checklist-90-Revised

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d) Ecological Risk Factors

Many ecological risk factors have been associated with Chinese youth depressive symptoms, and they could be categorized into individual-level, family-level, school-level, and society-level.The following part elaborated each risk factor in detail.

e) Individual-level risk factors

Age and gender: Six studies assessed age as a potential predictor of depressive symptoms among Chinese children and adolescents. Consistent with the national evaluation of youth depression in U.S. (SAMHSA, 2014), rates of depressive symptoms increase dramatically as children approach puberty in Chinese contexts (Fan et al., 2011; Sze et al., 2013; Tepper et al., 2008). The onset of depressive symptoms is most likely to emerge between 12- and 15-years of age (Fan et al., 2011; Sze et al., 2013; Tepper et al., 2008). One study suggests that children are susceptible to depressive symptoms as early as 9 years old (Yu & Seligman, 2002). Across studies there is a convergence of findings that reaching the age to take National High School/College Entrance Examinationmakes youth at greater risk of depressive symptoms (Sze et al., 2013; Wang et al., 2015), due to the extremely competitive nature of these exams. For left-behind children in villages, age at separation from parents is a better predictor of depressive symptoms than chronological age (Liu, Li, & Ge, 2009). For example, using a rural youth sample from Anhui, Chongqing, and Guizhou in which areas most peasants migrated to cities in search of employment opportunities, Liu and colleagues (2009) examined the importance of age at separation from parents versus chronologic age in predicting youth depressive symptoms. Children who were separated from parents at a younger age reported more depressive symptoms, and the effect of age at separation did not vary by the children's chronological age (Liu et al., 2009).

Gender also plays a critical role in the development of youth depressive symptoms.Nine studies examined gender as a potential predictor of depressive symptoms among Chinese youth and revealed a mixed picture. Five of these nine studies found female youth reported significantly higher level of depressive symptoms than did their male counterparts (Fan et al., 2011; Greenberger, Chen, Tally, & Dong, 2000; Hesketh et al., 2002; Ng & Hurry, 2011; Wu et al., 2010), as well as greater occurrence of depressive episodes, increased severity level and more suicide attempts among girls (Hesketh et al., 2002). Researchers attribute these findings to prevailing son preference phenomenon in Chinese society where family social capital availability is different for boys and girls to draw upon. Another possible explanation could be boys who were depressed were more likely to act out, which might not be fully captured by depressive symptoms scales. There were two studies finding boys reported higher scores in depressive symptom scales than girls (Auerbach, Eberhart, & Abela, 2010; Yu & Seligman, 2002). Additionally, two studies argued that the level of depressive symptoms did not differ between boys and girls both cross-sectionally (Tepper et al., 2008) and longitudinally (Sze et al., 2013).

Cognitions: Eleven studies provided support for negative cognitions as a predictor of increases in depressive symptoms. Cognitive theories of depression such as Beck's cognitive theory, hopeless theory (Abela et al., 2011) and Seligman's learned helplessness theory (Yu & Seligman, 2002) are potent predictors of future increases in depressive symptoms and disorder among youth. Cognitive theories explain depression by understanding the cognitions that control an individual's views of the self, the world, and future, and how information about the self, the world and future are processed. A variety of factors and processes contribute to the emergence and stabilization of negative cognitions such as physical figures (Tang et al., 2010; Xie et al., 2006), temperaments (i.e., shyness-sensitivity, Chen et al., 2013), attributional styles(Yu & Seligman, 2002), and stressful life events (Abela et al., 2011; Auerbach et al., 2010). Negative cognitions tend to be internal (i.e., specific to self), stable (i.e., consistent over time), and global (i.e., generalized across life domains) (Cohen et al., 2013; Stewart et al., 2004; Yu & Seligman, 2002). Additionally, the negative cognitive style was linked to youth depression through the mediation and moderation of perceived low sense of control (Auerbach et al., 2010), negative coping styles (Chan, 2012; Ng & Hurry, 2011), and threat perception bias (Lu et al., 2013). Particularly, distorted cognition on self-weight is significant on adolescent depression. Adolescents who perceived themselves as overweight were more likely to experience depressive symptoms than those who perceived themselves as normal or underweight, regardless of their actual weight status (Tang et al., 2010; Xie et al., 2006).

Life events: Eleven studies examined the effect of stressful life events on youth depression. Early childhood adversities and recent negative life events are strong predictors of depressive symptoms among youth. In particular, studies have identified child victimization, illness or death of family members and close peers, family economic loss, dissolution of friendships, achievement problems, and romantic problems (Chan, 2013; Greenberger et al., 2000; Lu et al., 2013; Yang et al., 2010; Zhang et al., 2013) as primary sources of stress associated with depression in children and adolescents.

Most peasants in rural China migrate to cities to make a living, leaving their children to be taken cared by grandparents or other extended family members.

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Studies on rural youth have found that early separation with parents when parents migrate were associated with depression in children and adolescents (He et al., 2012; Wang et al., 2015). For example, Wang and colleagues (2015) surveyed 4,857 left-behind children and adolescents in Chongqing. They found that the early absence of parents and consequent in frequentparent-child communication put youth at greater risk for developing depression.

The 2008 Wenchuan earthquake is the most disastrous earthquake since the 1976 Tangshan earthquake in mainland China. More than 450,000 people are dead, missing, or injured in this devastating disaster, and 4.8 million people homeless (official figures retrieved fromhttp://www.scio.gov.cn/gzdt/ldhd/200809/t222722.htm). Fan et al. (2011) found that the higher degree of exposure to the earthquake was associated with higher level of youth depression. Exposure included youth experienced death, missing, injury of family members, house damage, property loss (other than house damage), and direct witness of the tragic disaster (Fan et al., 2011).

Farmers in Henan province sell blood for additional income to governmental and/or commercial blood centers. The farmers, who were not screened for HIV, hepatitis B/C, or other blood-borne infections, gave blood to collection centers, which "pooled the blood of several donors of the same blood type, separated the plasma, and injected the remaining red-blood cells back into individual donors to prevent anemia" (Fang et al., 2009; p.1054). Farmers often made repeated donations for cash. Such risky practices, along with contaminated medical equipment, contributed to virus spread to many others on a single visit. Many HIV-infected individuals in Henan and other HIV-epicenters progressed to AIDS and subsequently died, leaving their children orphaned. Fang and colleagues (2009) surveyed AIDS orphans, who had lost one or both their parents to AIDS, and who lived with HIV-infected parents. These youths consistently demonstrated poor mental health, including depressive symptoms, loneliness, and hopelessness (Fang et al., 2009).

f) Family-level risk factors.

Family environment: Seven studies examined family environment as a potential factor for youth depressive symptoms. Family relationships and interactions are relevant to understand depression among children and adolescents across diverse cultural backgrounds (Greenberger et al., 2000). Family environments that are less supportive and more conflictual are associated with greater depressive symptoms both concurrently and prospectively. Yu and Seligman (2002) investigated the psychosocial correlates of depression among children and adolescents in Beijing. Depressive symptoms were strongly related to family variables such as lower cohesion, lower expressiveness, and greater conflict. Similarly, Lau and Kwok (2000) examined three domains of family environment, i.e., relationship, personal growth, and system maintenance, and found poorer family environment predicted more depressive symptoms. Assessing longitudinal associations between family environment and youth depression in 2,690 Taiwanese adolescents (mean age = 13), Sze and colleagues (2013) found higher perceived family cohesion in Grade 7 was associated with less increase in depressive symptoms from Grades 9 to 11.

Family structure: Four studies examined family structure and youth depressive symptoms. Family structure is reflected in two forms, one is parents' marital status (single parent versus non-single parent), the other is number of children at home (single child versus non-single child). Divorce rate has continued to grow in recent years in China, studies that compared youth from intact and divorced families found that children in divorced families exhibit higher level of depressive symptoms than children from intact ones (Dong et al., 2002; Lin et al., 2013). These studies provide evidence that single-parent family structure was a significant predictor for youth depressive symptoms in Chinese contexts.

Since the one-child policy from the 1980s, most city dwellers have only one child. Although a large amount of youth is the only one child in the family, very limited studies have examined their psychological development. Only two studies in this review examined the depressive symptoms among the single child versus non-single child. Both studies found depression was less common in single child compared with those with siblings (Hesketh et al., 2002; Yu & Seligman, 2002). More research is needed to conduct on single and non-single children and explore reasons when differences been detected.

Family SES: Eight studies examined family SES as a potential risk factor for youth depressive symptoms. As economic booming and market-oriented economy happened in the last three decades, the variation in individual and family income is increasing. Low family SES was often linked with low parental education (Hesketh et al., 2002;Wu et al., 2010; Yu & Seligman, 2002) and single parenthood (Lin et al., 2013). Expectedly, low family SES predicted high level of youth depression. Additionally, one study argued that the perceived relative family SES rather than the objective SES was more important in understanding Chinese youth depression. In a large-scaled sample of 12,449 middle and high school students from seven major cities in China, Sun and colleagues (2012) explored the associations of self-perceived relative income inequality with depression. The researchers examined two types self-perceived relative income, one is household income relative to peers, the other is household income relative to their own past. The youth who perceived lower family

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SES in either type reported the higher level of depression and stress (Sun et al., 2012).

Parenting practices: Nine studies examined parenting practices as a potential factor on youth depressive symptoms. Negative parenting behaviors (e.g., rejection) and styles (e.g., permissive) were important risk factors for child and adolescent depression (Dong et al., 2002). In contrary, parental warmth had significantly protective contributions to depressive symptoms (Chen et al., 2000; Jia et al., 2009; Liu, 2003). However, the extreme form of parental warmth, i.e., parental indulgence, significantly predicted youth adjustment difficulties (Chen et al., 2000). Appropriate parent-child interactions and parental monitoring protected youth from depressive symptoms (Greenberger et al., 2000; Lin et al., 2013; Wu et al., 2010). Parental indifference (Liu, 2003) and parental unbridle (Lin et al., 2013) predicted more depressive symptoms among youth. Youth who were often verbally or physically punished by parents reported higher level of depression concurrently (Yu & Seligman, 2002) and longitudinally (Wu, 2007). Parenting was also trickled down from parental messages. Child perceptions of parental negative messages regarding themselves, their world, and their future were found to be positively associated with depression, whereas positive messages had an opposite effect (Liu, 2003).

g) School-level risk factors

Academic performance: Six studies have examined academic performance as a potential risk factor for depressive symptoms. Poor academic performance is a predictor of and a consequence of depressive symptoms in children and adolescents. Besides actual academic performance (Greenberger et al., 2000; Hesketh et al., 2002; Yu & Seligman, 2002), subjective self-perceived achievement performance was also predicting in youth depressive symptoms (Li & Zhang, 2008). Additionally, good academic achievement was a buffering factor that served to protect shy-sensitive children from developing depressive symptoms (Chen et al., 2013). In Chinese contexts where education is extremely emphasized, prevailing academic pressure was significantly associated with depression (Zhang et al., 2013).

Peer relationships: Seven studies examined peer relationships as a predictor of depressive symptoms. Considering interpersonal harmony is greatly valued through traditional to contemporary collectivistic Chinese societies, difficulties in peer relationships significantly predicted youth depressive symptoms (Greenberger et al., 2000), whereas caring peer relationships protected youth from depression (Chen et al., 2012; Li & Zhang, 2008). Particularly for youth experiencing stressful life events, including parental migration, family issues, and achievement problems, peer support moderated the association between the occurrence of negative events and depressive symptoms (Luo et al., 2011; Yang et al., 2010), in line with the buffering effect.

Relationships with teachers: Three studies examined relationships with teachers as a risk factor for depressive symptoms. Interpersonal problems with teachers was predictive of depressive symptoms in children and adolescents. For example, in a student sample from the countryside of Chongqing, Guizhou, and Anhui, disharmonious relationships with teachers was significantly associated with youth depressive symptoms, and the negative effect was stronger among adolescents whose parents were absent (Luo et al., 2011).

V. Discussion

Taken together, there is limited research on the prevalence and ecological risk factors of youth depressive symptoms in mainland China, Hong Kong, and Taiwan, leading the current review to suggest youth depression is an underexplored parameter in the arena of Chinese youth psychological adjustment. However, the available research suggests Chinese children and adolescents are not spared from depressive symptoms, having rates ranging from 6% to 33%, and showing strong links between ecological risk factors and youth depression. This review highlights several important correlates of youth depressive symptoms, including age, gender, negative cognitions, stressful life events, family environment, family structure, family SES, parenting practices, academic performance, peer relationships, and relationships with teachers.

This review found that the number of validated studies on youth depressive symptoms in the chosen areas is extremely low, especially when such studies are compared with those in Western countries. There are several possible factors leading to this observed phenomenon. First, the modern Western concept of emotional disorder is new to majority Chinese and not well accepted by indigenous people there. While the concept of '*depression* 'was introduced to Asian countries by the end of the 1990s, people are not beginning to recognize depression till recently. Thus, the development of psychosocial research among children and adolescents is still in its infancy in Chinese contexts. Second, since youth mental health is subtle to detect and brings stigma to seeking help, Chinese parents and researchers are more concerned about delinquent behaviors of youth. Chinese parents expect an ideal child who is academic excellent, obedient to authorities (i.e., parents and teachers), maintaining harmonious relationships with peers. Thus youth's emotional development has not been prioritized among parents. Third, there is common belief among Chinese that

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children will self-correct psychological maladjustment if they have any and will "automatically" grow up. Finally, in contrast to Western countries where research institutions and/or governments take the initiative to develop youth depression research, research institutions and/or governments in the three Chinese contexts do not spend much intellectual and financial effort on youth psychological development research. As such, the emphasis on Chinese youth depressive symptoms is far from enough.

The current review reflected that rigorous social science training and the spirit of evidence-based research is at its beginning stage in Chinese contexts. Particularly, the included studies have several limitations in study designs, sampling methods, and outcome measurements. First, majority studies included were cross-sectional in design, limiting the ability to draw conclusions about the direction of causality. More longitudinal studies are needed to examine causality between potential correlates and youth depressive symptoms, due to potential correlates could be predictors and consequences of depressive symptoms among youth (e.g., poor academic achievement). Second, most samples suffer from the lacking of representativeness, which in turn severely restricts the generalize ability of the findings. Majority studies are confined to urban areas, leaving youth in deprived rural areas unstudied, where majority youth population reside in Chinese contexts. Meanwhile, overdependence on convenience samples can be problematic. Third, though the prevalence has been examined widely in the selected studies, only two studies based on Taiwan employed culture-relevant items (Lin et al., 2012; Lin et al., 2013). As the great disparity between Western and Chinese culture, it is possible that the reliable and valid Western measurements employed in these studies might not be reliable and valid for Chinese children and adolescents. If the indigenous measurements have been developed and applied in Chinese contexts, the examination of the prevalence of youth depressive symptoms there might be more accurate. For example, among Western-based measurements, more attention placed on affective and existential symptoms (e.g., depressive mood, helplessness, hopelessness), and put insufficient emphasis upon somatic symptoms (e.g., sleep problems, loss of appetite) through which Chinese populations are more likely to experience emotional dysfunction. The qualitative effort would be great to develop measurements specific for youth from different cultural background.

The current review also revealed that there is comparatively more emphasis on individual deficits rather than system deficits in examining ecological risk factors. There are several possible explanations for this observation. First, influenced by Confucian culture existing for thousand years and political movements in the passing century, individuals accustom to blame him/herself if he/she suffers emotional disorders, and do not attribute psychological maladjustment to contextual factors, though contextual factors are more influential than personal factors in some cases (e.g., one-child policy, economic restructure, and unsafe blood collection procedures). Second, human rights, politics, and religion were not open to discussing in mainland China. Although censorship is decreasing in recent years, social researchers still avoid certain areas to discuss even they are important to examine the research questions.

Looking into the future, researchers in the field of child and adolescent mental wellbeing should focus on the following areas. First, we should rethink about the importance of youth mental health and not mistakenly categorize emotional disorders into delinquent behaviors. Chinese youth are not immune to psychological malfunctioning and problem behaviors might be one of the manifestations of depressive symptoms in Chinese contexts. For example, youth internet addiction was primarily treated as delinquent behaviors until recent research found depressive symptoms caused internet addiction (Ko, Yen, Chen, Yeh, & Yen, 2009).

Second, given the extent of impairment related to youth depressive symptoms, identifying protective factors is critical. Although important gains have been made in identifying factors that place youth at risk for depressive symptoms in the current review, much less progress has been made in identifying protective factors. Child and adolescent development is the dynamic interplay between risk and protective factors whereby risk factors predispose individuals to negative developmental outcomes, and protective factors increase resiliency. Although some youth residing in disadvantaged environments seem to do less well, many children and adolescents are resilient and doing well. As such, the effort spending on identifying protective factors is greatly needed.

The third task that youth depression researchers should undertake is to develop preventive programs for Chinese youth. The fact that youth depressive symptoms are present and prevailing in Chinese contexts, researchers should devote to design and implement guidelines to prevent sub threshold depression. There is a need to educate youth, their parents/caregivers, and teachers on youth mood disorders, including onset and course, co-morbidity and impairment, ecological risk factors, and devastating effects on the lives of children and adolescents. These efforts will help youth, parents, and teachers have a comprehensive understanding of depression, hence delinking associations between biases and depression, "gate keeping" for depressed youth to avoid suicide, and assisting in culturally-informed prevention development.

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