CULTURAL AND SOCIOECONOMIC DETERMINANTS OF POSTPARTUM DEPRESSION AND PERCEIVED STRESS OF CHINESE WOMEN AT CHILDBEARING AND CHILD-REARING STAGES

A Dissertation

by

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ABSTRACT

To decrease the proportion of women delivering a live birth experiencing mental illness is one of the goals for Healthy People 2020. Maternal women in developing countries suffer disproportionally from mental illnesses. China, as the most populous nation in the world, used to have the highest suicide rate among women at reproductive ages. This dissertation aimed to explore the demographic, socioeconomic, and cultural factors that influenced or correlated to the mental health of women at postpartum and the childrearing stages.

This dissertation contains one systemic literature review examining factors associated with postpartum depression and two quantitative studies on factors related to women's perceived stress at childrearing stages. The quantitative studies utilized secondary data from the China Health and Nutrition Survey. The dissertation found that factors which pertain to Chinese culture, society, or medical resources play a significant role in Chinese women's postpartum depression, such as mother-in-law and daughter-in-law relationship, "doing the month", and insufficient maternal medical services and resources. The analysis yielded that significant predictors for the mental health of rural and non-rural women were different from each other. Further, in non-rural areas, unemployed women at the childrearing stages residing in non-rural areas in China have higher perceived stress than their employed counterparts.

This dissertation study found that Chinese women at childbearing and childrearing stages are a vulnerable population, but yet remain highly understudied.

Socioeconomic and cultural factors are found to play an essential role in the mental health of Chinese women at childbearing and childrearing stages. The dissertation study provides implications for future policymaking and public health practice. The identification of risk factors and current programs for postpartum depression are a useful reference for future programs targeted to prevent postpartum depression (PPD). The finding of the dissertation suggests the society pay attention to the mental health of the emerging population of the full-time homemakers in non-rural areas under the new policy.

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The first manuscript was written up with several discussions with Dr. Ping Ma, Department of Health Promotion and Community Health Sciences, School of Public Health. And Margaret Foster from Texas A&M University library assisted the data search process.

All other work conducted for the dissertation was completed by the student independently.

NOMENCLATURE

BDI	Beck Depression Inventory
CBT	Cognitive behavior therapy
CCDC	Chinese Center for Disease Control and Prevention
CHNS	China Health and Nutrition Survey
CNY	Chinese Yuan
DSM	Diagnostic and Statistical Manual of Mental Disorders
EPDS	The Edinburgh Postnatal Depression Scale
GHQ	General Health Questionnaire
IPT	Interpersonal psychotherapy
PPD	Postpartum Depression
PSS-14	14-item Perceived Stress Scale

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1. INTRODUCTION

1.1. Maternal Mental Health

Maternal mental health is highly related to the wellbeing of both mothers and infants. Globally, 10% of the pregnant women and 13% of the postpartum women experienced postpartum mental disorder, mainly depression (World Health Organization, 2018). Improving maternal health is one of the eight United Nations Millennium Development Goals (MDG). To decrease the proportion of women delivering a live birth experiencing mental illness is also one of the goals for Healthy People 2020 (Office of Disease Prevention and Health Promotion, 2018).

Maternal mental health issues have a lot of insidious effects on mothers and children. Mental illnesses during the perinatal period can develop into chronic and more severe mental illnesses (World Health Organization, 2018). Mental health problems can also lead to suicide, which is a leading cause of maternal death in developed countries and some developing countries (Oates, 2003), and a leading cause of death for women at reproductive age in the world two most populous countries, China and India (Miranda & Patel, 2005). The negative impact of mental illnesses of women does not limit to mothers, it also adversely affects children's health and development. Maternal depression impairs women's ability to function and bond to the baby thereafter have a negative impact on infants and children's physical, emotional, behavior, and cognitive development (World Health Organization, 2008b).

1.2. Prenatal Mental Health in Developing Countries

Social determinants are important cause of mental illnesses for women after childbirth (World Health Organization, 2008a). Women in developing countries are more susceptible to develop into mental health problems because they are more likely to be exposed to the risk factors (Prince et al., 2007). Those risk factors include poor socioeconomic status, less valued social roles and status, unintended pregnancy, and gender-based violence (Prince et al., 2007). One in three to one in five women in developing countries suffer from a significant mental health problem during pregnancy and after childbirth; the rate is a lot higher than in developed countries, which is about one in ten (World Health Organization, 2008a; World Health Organization, 2018). The prevalence of postpartum mental disorders is also higher in the developing countries than developed countries, which were 20% and 13%, respectively (Fisher et al., 2012; World Health Organization, 2018).

1.3. Mental Illnesses at the Child-Rearing Stage

Besides the postpartum period, women at childbearing age are also at an increased risk for mental problems. Child-rearing stage, which refers to the stage between the birth of the first child and turning age six of the youngest child, is the stage where families have the highest burden. Because of the traditional gender role, women undertake more childcare burden than men do. Women at the child-rearing stage are also under tremendous stress and at higher risk for mental health problems. Especially in China, the social and economic determinants put women at the child-rearing age at tremendous stress, thus have a higher risk for mental illnesses. The backgrounds of

China social and economy will be demonstrated in the following section.

1.4. Background in China Relating to the Mental Health of New Mothers

Currently, China is the most populous country in the world (United Nations Department of Economic and Social Affairs, Population Division, 2017). China, as one of the world's earliest civilization, has a long history and profound culture and traditions. The social economic culture is also different from western countries. Social determinants have been mentioned as important cause of mental health problems in pregnant women and mothers (World Health Organization, 2008a). The factors among the Chinese society and culture that may relate to the mental health of women at postpartum or child-rearing stages are listed as below.

1.4.1. Stigma of Mental Illnesses and Limited Mental Care Resources

China is among the cultures in which mental illnesses are heavily stigmatized (Teng, Blackmore, & Stewart, 2007). Under these cultures, women are under shame, stigma, and fear of being labeled mentally ill (Teng et al., 2007). A study found that Chinese American women had a worse stigma on depression than the Caucasian women (Georg Hsu et al., 2008). Because of the stigma, Chinese women and women in other Asian countries expressed somatic complaints when they suffer from mental health problems (Bashiri & Spielvogel, 1999; Kim & Buist, 2005). The stigma was also found to prevent people from attending postpartum mental illness care (Teng et al., 2007).

Additionally, developing countries have very limited mental health resources as compared to the developed countries. Low and middle-income countries, with more than 80% of the world population, have less than 20% of the mental health resources (Patel,

2010). All these reasons make maternal mental health a challenging issue for developing countries, including China.

1.4.2. The Childcare System in China

Another factor that adds stress on new Chinese mothers is the under-developed childcare services for children from the day of their birth to three years old in China. There are a few policy and regulations for childcare services for children under the age of three. The nursery enrollment rate for birth to three-year-old children in China is as low as 4% (Qi & Melhuish, 2017). Therefore, children between the ages of 0-3 were mainly cared for in households by parents or grandparents (Qi & Melhuish, 2017). Under these circumstances, some women chose to leave the job market to take care of the child after giving birth to him or her.

1.4.3. Women in the Workplace

China has kept a high female labor participation rate since 1990. In 2000, the female employment rate was 70%, ranking the first in the world. At present, the labor participation rate of Chinese women is still higher than the world level and Chinese women's labor participation is regarded as a normal routine (H. Lee, Chu, & Dong, 1997). Women are expected to work after marriage and childbirth (H. Lee et al., 1997). A study in two major cities in China reported that the majority of Chinese women went back to work after childbirth (Yi & Chien, 2002).

Under this social norm, women who left the job market after childbirth take on pressure from the Chinese society and family. Homemakers are regarded as having no contribution to the society, and their sacrifice to the family is not recognized and

respected by the family, as it should be.

1.4.4. Extended Family Culture in China

Co-residence with other family members, usually parents or parent-in-laws, is common in China during the child-rearing stage. Co-residing with parents typically includes providing help with cooking, housework, and childcare. However, it is also a significant source of family conflict. One study with mentally ill Chinese women indicated that their mental health was strongly influenced by relationships (Hsiao, Klimidis, Minas, & Tan, 2006). Mother-in-law and daughter-in-law conflict, or even co-residing with mother-in-law, has been reported to be associated with postpartum depression (Mao, Zhu, & Su, 2011a; Y. Wang, Li, Wang, Wang, Zhang, Gong, Ma, Wang, Wang, & Qiu, 2017).

1.5. Theoretical Framework

1.5.1. Social Ecological Model

The social-ecology model fits adequately well with the socioeconomic and cultural influence on the mental health of Chinese women. The social-ecological model emphasized that behavior was shaped by the social environment (McLeroy, Bibeau, Steckler, & Glanz, 1988). The social-ecological model includes multiple layers, which are *individual, interpersonal, community, organizational,* and *policy* level. The *individual* level identifies biological and personal history factors. Some of the factors are age, education, income, etc. The *interpersonal* level refers to interpersonal relations such as marital status, family, friends, co-workers, etc. The *organizational level* refers to the organizations that people live in. It includes school, work place, and others. The

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community level refers to the community settings, the built environment, the childcare system, social norms, culture, and tradition. The *policy* level refers to laws and policies regarding the resources allocation and restrictions for some behavior. The mental health of the women at the child-rearing age is influenced by Chinese society at multiple levels. To improve the mental health of these women, multiple efforts are needed from the Chinese society.

1.5.2. Family Life Circle

Family life circle refers to the emotional and intellectual stages one passes through from childhood to retirement years as a member of a family (Mattessich & Hill, 1987). Understanding family life circle has its unique importance to the sound development of family and the family members. One important stage of the family life circle is childbearing and child-rearing stages, which encompasses three stages: parenting young children, parenting school-aged children, and parenting adolescents (Mattessich & Hill, 1987). Parenting young children (younger than 6 years old) demands the most amount of time from both mothers and fathers, as noted by Higgins, Duxbury, and Lee (Higgins, Duxbury, & Lee, 1994). Because of the traditional gender role, women at this stage are under a lot of stress, which includes but not limits to childcare stress, work-life balance, social isolation, and new challenges in marital relationship.

1.6. Dissertation Aim

This dissertation aims to explore the demographic, socioeconomic, and cultural factors influencing or related to the mental health of women with children birth to six years old. Special focus will be put on the culture and social environment of China. To

accomplish this objective, the dissertation will include the following specific aims;

1. To provide the background on mental health and the socioeconomic backgrounds of China that related to the mental health of women with children birth to six years old (Introduction).

2. To comprehensively explore the prevalence, risk factors, and intervention programs for postpartum depression among Chinese women from conducting a systematic literature review (Section 2).

3. To examine the cultural and socioeconomic factors that correlate to the mental health of women with children under the age of seven and compare the differences in the influential factors among rural and non-rural women from a national representative dataset (Section 3).

4. To examine if employment status is related to the mental health of women with children under the age of seven in non-rural areas which have a relatively high female employment rate (Section 4).

5. To provide discussion and implications of findings from the dissertation (Conclusion).

2. POSTPARTUM DEPRESSION AMONG CHINESE WOMEN: A SYSTEMATIC LITERATURE REVIEW OF RISK FACTORS AND INTERVENTIONS

2.1. Introduction

Postpartum depression (PPD) is defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM V-TR) as a major depressive disorder with depressive symptoms onset within four weeks postpartum (Castillo et al., 2007).

Postpartum period, referring to the periods between immediately after childbirth and six months after childbirth (Romano, Cacciatore, Giordano, & La Rosa, 2010), is a critical period for women' mental health. The World Health Organization has previously stated that there is an increased physical and emotional demand on women during the postpartum period (World Health Organization, 2008b). A systematic literature review carried out by Stewart et al. (2003) found that the rates of first onset of depression and severe depression during postpartum period are three times higher than other periods of women's life (Stewart, Robertson, Dennis, Grace, & Wallington, 2003).

Depression is the most common maternal mental problem during the postpartum period (World Health Organization, 2008b). The estimated major depression occurrence rate was 12-13% during the postpartum period from western countries (Vivien et al. 2008). Postpartum depression prevalence is even higher in developing countries (World Health Organization, 2018). A meta-analysis indicates that the prevalence of postpartum depression in developing countries was 20% (Fisher et al., 2012).

Postpartum depression has several insidious effects on mothers and children as

described in the following parts. Depression during the perinatal period can develop into chronic and more severe depression (World Health Organization, 2018). Postpartum depression can also lead to suicide, which is a leading cause of maternal death in developed countries and some developing countries (Oates, 2003), and a leading cause of death for women at reproductive age in the world two most populous countries, China and India (Miranda & Patel, 2005).

The negative impact of PPD of women does not only limited to mothers, it also adversely affects children's health and development. Maternal depression impairs women's ability to function and bond to the baby, thereafter having a negative impact on infants and children's physical, emotional, behavior, and cognitive development (World Health Organization, 2008b). Friedman and Resnick (2009) indicate that infants of depressed mothers were more likely to have behavioral and cognitive deficits because of mothers' negative parenting activities (Friedman & Resnick, 2009). A meta-analysis conducted by Beck (Beck, 1998) indicated that maternal depression had a significant negative effect on children's development. Maternal depression was also found to be related to mothers' maternal behavior that related to children's health, such as not using car seats, smoking, and not administrating vitamins to children (Leiferman, 2002).

Postpartum depression is a challenging issue for China, for reasons including but not limited to the stigma attached to mental illnesses in Chinese culture (Teng et al., 2007) and the undeveloped mental health care services in China. Additionally, China has cultures in which mental illnesses are heavily stigmatized (Teng et al., 2007). A previous study found that Chinese American women had a worse stigma on depression

than the Caucasian women (Georg Hsu et al., 2008). Within the Chinese culture, women are under shame, stigma, and fear of being labeled mentally ill (Teng et al., 2007). Because of the stigma, Chinese women and women in other Asian countries expressed somatic complaints when they suffer from mental health problems (Bashiri & Spielvogel, 1999; Kim & Buist, 2005). Stigma from PPD has also been found to prevent people from attending postpartum mental illness care (Teng et al., 2007). Furthermore, the health care system for postpartum mental health is not as developed and the mental health resources are limited. As previously reported, low and middle-income countries, with more than 80% of the world population, have less than 20% of the mental health resources (Patel, 2010). Postpartum depression screening was only conducted in a small proportion of health care institutes. Depression counseling services are not common in China either.

Maternal mental illnesses are preventable and treatable, and identifying risk factors would be helpful for programs designed and implemented to prevent postpartum depression. Current existing prevention programs are a reference for future program designing and planning. The risk factors for postpartum depression and current programs have been summarized in the published western literature (C. Dennis & Hodnett, 2007; C. L. Dennis, 2005; Robertson, Celasun, & Stewart, 2003; Robertson, Grace, Wallington, & Stewart, 2004; Sockol, Epperson, & Barber, 2013; Stewart et al., 2003; Vigod, Villegas, Dennis, & Ross, 2010). However, mental health was determined greatly by social determinants (World Health Organization, 2008a). There is an enormous difference in the social structure, economic development, social norms, and medical

resources from the western and eastern world. China has a unique history, culture, as well as social and economy development mode, and the social determinants of China is quite different from any other countries. Moreover, China has experienced great change in recent years in various aspects from society to economy and policy. Those changes include the implementation and relax of the one-child policy, the open and reform policy and fast development of the economy, and the high female labor participation culture. All those policies and socioeconomic factors might have an influence on the mental health of the postpartum women. There is a conflict and infusion between the traditions and new concepts after the implementation of the open and reform policy. A literature review is in necessary to summarize the risk factors for postpartum depression for the women of the current society in China.

To the knowledge of the author, no systematic literature review has been conducted to comprehensively examine and summarize the risk factors for postpartum depression among Chinese women. One systematic literature was conducted by Klainin and Arthur (2008), which explored the risk factors for postpartum depression in four Asians countries. However, because of the vast difference in the culture among Asians in different areas, this literature review did not comprehensively examine risk factors for postpartum depression in Chinese culture. More than that, the systematic review was conducted ten years ago, therefore the immerging changes in Chinese society was not represented in that review. The current literature review will fill the gap in the current literature by comprehensively examining the risk factors and prevention programs for postpartum depression for Chinese women. Special attention will be paid to the factors

that pertain to Chinese culture and society. The objectives of this literature review are to critique the research methods of the current studies, identify gaps in the current literature, and provide implication for future studies. Future intervention programs can target the risk factors as well as tailors the program to Chinese women.

2.2. Methods

2.2.1. Data Retrieval

A thorough systematic review was conducted through online search engines and journal databases between September 2017 and March 2018. Studies were sought which explored risk factors for postpartum depression and among Chinese women and intervention studies targeting postpartum depression among Chinese women. The following keywords were included for the search: depression, depressive disorder, postpartum, postnatal, puerperium, postpartum period, and China or Chinese. Keywords were entered individually or in combination with others.

There were two steps in the search process. In the first step, keywords were entered into the following journal databases: Medline, Embase, Global health, and PsycINFO. After screening the articles retrieved from the above search, articles meeting the inclusion criteria were identified. In the second step, the reference list of the included articles and articles that cite the included articles were retrieved to identify more studies. Inclusion and Exclusion Criteria

2.2.1.1. Inclusion Criteria

To be included in the review, the studies should (a) be published in a peer-reviewed journal between January 2000 and March 2018; (b) examine risk factors for

postpartum depression or intervention studies for postpartum depression; (c) take postpartum depression as the main outcome variable; (d) examine postpartum depression with reliable measurement like Edinburgh Postpartum Depression Scale or scales with equal validity; (e) the measurement time should before one year postpartum; (f) be empirical studies either qualitative or quantitative; and (g) be conducted in China among Chinese women.

2.2.1.2. Exclusion Criteria

Articles were excluded for three reasons. First, studies were excluded if the participants were Chinese women immigrated to other countries. The reason to exclude these articles is that women immigrated to other countries are influenced by the local cultures, but this review aims to explore the risk factors of postpartum depression (PPD) under Chinese society and culture. In addition, biological risk factors, such as blood type or serum leptin level, are beyond the scope of this review; therefore studies focusing on biological factors were excluded. Besides, women with concurrent MMD (Major mood disorders) were excluded because this review aims to explore the risk factors for postpartum depression.

2.2.2. Quality Appraisal

To assess the overall quality of the evidence, we followed the framework developed by the Joanna Briggs Institute, and assigned a "yes", "no", or "unclear" based on the evidence provided for each outcome by the study. Components included in the risk of bias assessment differed by study design. For all studies, we assessed selection bias, confounding, and measurement. For cohort and longitudinal studies, we also

assessed attrition bias. For randomized control trials (RCTs), we also assessed detection bias, attrition bias, and any other sources of biases relevant to the study. Because of the heterogeneity in the study design, the studies with different designs were listed in different tables.

2.2.3. Data Extraction

Information relevant to this review was extracted from each included article by using the literature review matrix method. The following information was retrieved for each study examining risk factors for postpartum depression: setting, region of the study, participants, sample size, study design, research methods, measurement of PPD, cutoff point of the measurement for PPD, measurement time, prevalence of PPD, and risk factors for PPD. For intervention studies, type of the program, implementation, control group, and outcome were extracted from each study.

2.3. Results

2.3.1. Characteristics of the Studies

Forty-two peer-reviewed articles published between January 2000 and March 2018 examining risk factors or reporting prevention programs for postpartum depression were included in this literature review. A flow chart with the process was displayed in figure 1. Among the 42 articles, 32 are surveillance studies examining risk factors for postpartum depression, and 10 are intervention studies reporting the intervention programs.
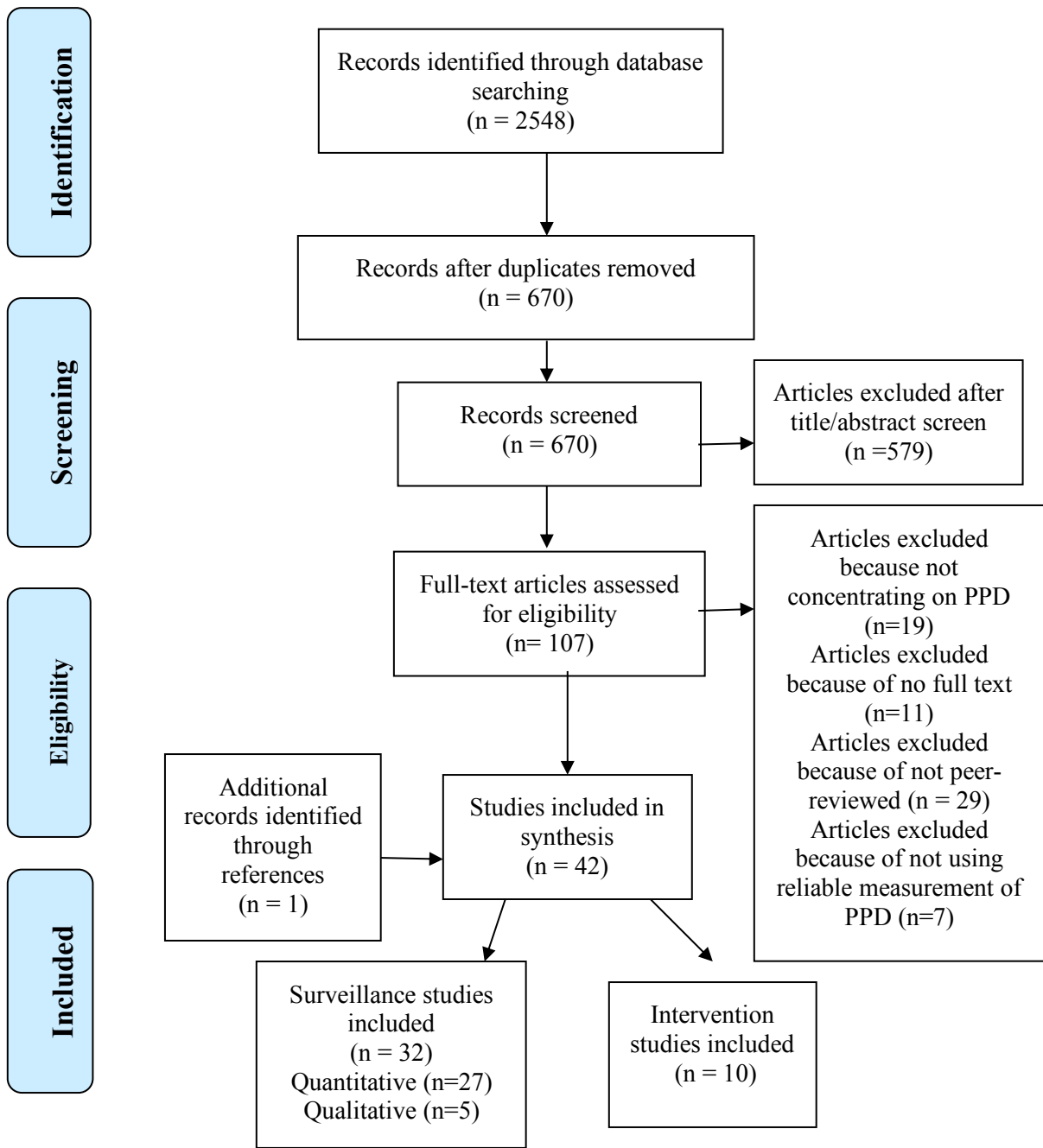
Figure 2.1 Flow chart of data retrieval

For studies exploring the risk factors, 27 studies were quantitative studies, and five are qualitative studies. Table 2.1 shows the characteristics of the included studies. Edinburgh Postpartum Depression Scale (EPDS) is the most frequently used measurement of PPD. For the surveillance studies, 28 studies used the EPDS to examine the postpartum depression. Three studies used structured interview according to the Diagnostic and Statistical Manual IV criteria to further diagnose postpartum depression (S. W. Chan, Levy, Chung, & Lee, 2002; D. T. Lee, Yip, Leung, & Chung, 2000; Siu, Leung, Ip, Hung, & O'Hara, 2012). For the identification of postpartum depression, 13 is the most used cutoff point, as 17 of the 32 articles used 13 as the cutoff point. Besides, six articles used 10. The prevalence of PPD ranges from 6.7% to 31.2% varies by population, measurement scale, and cutoff point.

Table 2.1 Characteristic of the included studies

Study design	Region	Urban/rural	Setting	Participants	Measurement of PPD	Measurement time	Prevalence	Authors
Cross-sectional	Mainland: Xinjiang Northwestern China	Urban and rural	Hospital	1263 (640 Han, 623 Kazak)	EPDS (13)	6 weeks postpartum	14.6%, Kazak (16.1%), Han (13.1%)	Chen et al, 2018
Cross-sectional (secondary data)	Hong Kong	Urban	Hospital	181 first-time Chinese mothers	EPDS (9/10)	6 weeks postpartum	Not reported	Ngai, et al, 2010
Cross-sectional (secondary data)	Mainland: Changsha	Urban	Community	882 women delivered with live births	EPDS (10)	4 weeks postpartum	6.70%	Liu et al, 2017
Cross-sectional	Mainland: Guangzhou	Urban	Community	1823 delivery women	EPDS (13), Hamilton Depression Scale	4 weeks postpartum	27.37%	Deng et al, 2014
Cross-sectional	Mainland: Fujian	Not specified	Hospital	376 pairs of new parents	EPDS (13)	6-8 weeks postpartum	14.90%	Mao, et al, 2010
Cross-sectional	Mainland: Beijing	Urban	Hospital	342 Chinese women	EPDS (13)	6-8 weeks postpartum	15.50%	Wan, et al, 2009
Cross-sectional	Mainland: Shenzhen	Urban	Hospital	1266 puerperal women	EPDS (13)	14–60 days postpartum	11.80%	Wang et al, 2017
Cross-sectional	Mainland: Guangzhou	Not specified	Hospital	130 couples	EPDS (13)	6-8 weeks postpartum	13.80%	Gao, et al, 2008
Cross-sectional	Mainland: Fuzhou	Urban	Not specified	197 Postpartum Chinese women	BDI	6 weeks postpartum	25%	Wang et al, 2003
Cross-sectional	Mainland: Changsha	not specified	Hospital	300 Chinese women	EPDS (13)	6 weeks postpartum	17.30%	Xie, et al, 2007
Cross-sectional	Mainland: Tianjin	not specified	not mentioned	1592 Chinese women	EPDS (12)	6-12 weeks postpartum	29.40%	Yan et al, 2017
Descriptive repeated measures design	Mainland: Wuhan	Urban	Hospital	198 healthy childbearing women	EPDS (10, 13)	3 days and 6 weeks postpartum	22%	Liu, et al, 2014
Longitudinal	Mainland: Jinan	Mainly urban 90.4%	Hospital	276 Chinese women	EPDS (12)	Prenatal, 1 week and 4 weeks postpartum	15.56%	Li et al, 2016
Longitudinal	Mainland: Jinan	Mainly urban 90.4%	Hospital	240 Chinese women	EPDS (12)	Prenatal, 1 week and 4 weeks postpartum	16.30%	Li et al, 2017

Table 2.1 Continued

Study design	Region	Urban/rural	Setting	Participants	Measurement of PPD	Measurement time	Prevalence	Authors
Longitudinal	Hong Kong	Urban	Hospital	Chinese women admitted to the postnatal ward (n=220)	BDI, GHQ, and DSM-IV	6 weeks postpartum	11.70%	Lee. et al, 2000
Longitudinal	Mainland: Chongqing	Urban	Hospital	213 Chinese women	EPDS (12)	3-7 days postpartum	16.43%	Shi, et al, 2017
Prospective cohort study	Hong Kong	Urban	Hospital	805 Chinese women	EPDS, SCID-I, and BDI	2 months postpartum	15.70%	Siu, et al, 2012
Prospective cohort study	Mainland: Changsha	Not specified	Hospital	534 Chinese women	EPDS (13)	2 weeks postpartum	19.29%	Xie et al, 2009
Prospective cohort study	Mainland: Changsha	Urban	Hospital	215 Chinese women	EPDS (13)	4-6 weeks postpartum	31.20%	Zhang, et al, 2011
Prospective cohort study	Mainland: Beijing	Urban	Hospital	214 parturient preparing for a vaginal delivery	EPDS (10)	6 weeks postpartum	24.3% in general, (14.0% in epidural labor analgesia and 34.6% in no epidural	Ding et al, 2014
Prospective cohort study	Hong Kong	Urban	Hospital	959 Hong Kong Chinese women	EPDS (10)	3-month postpartum	Not reported	Lee. et al, 2004
Prospective cohort study	Hong Kong	Urban	Hospital	385 HK Chinese postpartum women	EPDS (13)	6 weeks postpartum	19.80%	Leung, et al, 2005
Prospective cohort study	Mainland: Hunan	Urban	Hospital	534 pregnant women	EPDS (13)	2 weeks postpartum	19.30%	Xie et al, 2009
Prospective cohort study	Mainland: Hunan	Urban	Hospital	534 pregnant women	EPDS (13)	2 weeks postpartum	19.30%	Xie, et al, 2010
Prospective cohort study	Mainland: Changsha	Urban	Hospital	534 delivery women	EPDS (13)	2 weeks postpartum	19.3% (21.7% in cesarean delivery and 10.9% in vaginal birth)	Xie, et al, 2011
Prospective cohort study	Mainland: Changsha	Urban	Hospital	534 delivery women	EPDS (13)	2 weeks postpartum	19.30%	Xie, et al, 2011
Prospective longitudinal study	Hong Kong	Urban	Hospital	A convenience sample of 200 childbearing couples in Hong Kong	The General Health Questionnaire (GHQ) (4/5)	6 months postpartum	11.50%	Ngai & Ngu, 2015
Semi-structured interview (Skype and QQ)	Mainland: all around the country	Not specified	Online	38 Chinese women	Self-reported	N/A	22/38	Tang et al, 2016

Table 2.1 Continued

Study design	Region	Urban/ rural	Setting	Participants	Measurement of PPD	Measurement time	Prevalence	Authors
Semi-structured interview	Hong Kong	Urban	Clinic	25 Chinese women	EPDS (10)	6 weeks postpartum	N/A	Chan et al, 2003
Semi-structured interview	Hong Kong	Urban	Participants' home	11 depressed Hong Kong Chinese mothers	EPDS (13)	6 weeks and 6 months postpartum	N/A	Leung, et al, 2004
Semi-structured interview	Mainland: an industrial city in southeast China	Not specified	Hospital	50 first time mother with EPDS score >13	EPDS (13)	6-8 weeks postpartum	N/A	Gao, et al, 2009
Semi-structured interviews	Hong Kong	Urban	Clinic	35 women diagnosed with postnatal depression	EPDS (10), DSM-IV criteria	Not mentioned	N/A	Chan. et al, 2001

Notes:
EPDS: The Edinburgh Postnatal Depression Scale
BDI: Beck Depression Inventory
GHQ: General Health Questionnaire
DSM: Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders

Ten intervention studies were included in the systematic review; six are Mainland studies sand four are Hong Kong studies. Table 2.2 shows the characteristics of the intervention studies. The sample size ranges from 110 to 397 participants for the included studies. Most programs only included women in the intervention, and only two studies also involved spouses in the program. The study setting of all the included studies was within a hospital. Six studies implemented the program during the prenatal period, while four studies implemented at the postnatal period. Of the 10 interventions, four are cognitive behavior therapy intervention, three are interpersonal psychotherapy, two are psych-educational programs, and one is an empowerment training program. Nine of the ten included studies used randomized controlled trial design to evaluate the program, and one study used one quasi-experimental design. All the studies used EPDS as a tool to measure postpartum depression. Among the ten studies, two studies further used Structured Clinical Interview for DSM Disorders (SCID) to diagnose postpartum depression. All the interventions are effective in preventing postpartum depression among Chinese women, as presented by the study results.

Table 2.2 Characteristics of the intervention studies

References	Region	Study design	Setting	Participants	Program	Implementation	Control group	Measurement of PPD	Outcomes
Gao et al., 2012	Mainland China	Randomized controlled trial	Hospital	Primiparous women at gestation 28 weeks (n=194)	Interpersonal psychotherapy (IPT)-oriented program	Two 90 min group antenatal education sessions and one telephone follow up within 2 weeks after delivery	Routine childbirth education	EPDS, 13	The intervention group had less depressive symptoms (t = 2.39, p = 0.018) group at 3 month postpartum
Gao et al, 2010	Mainland China	Randomized controlled trial	Hospital	Primiparous women at gestation over 28 weeks (n=194)	Interpersonal-psychotherapy (IPT)-oriented childbirth education program	Two 90 min group antenatal education sessions and one telephone follow up within 2 weeks after delivery	Routine childbirth education	EPDS, 13	The intervention group had significantly fewer depressive symptoms (t = 3.76, p = 0.000) at 6 weeks
Gao et al, 2015	Mainland China	Randomized controlled trial	Hospital	Primiparous women at gestation 37-40 weeks (n=180)	Interpersonal-psychotherapy (IPT)-oriented postnatal program	One hour education session before discharge and one telephone follow-up within the 2 weeks after discharge	Routine childbirth education	EPDS, 13	The intervention group had significantly fewer depressive symptoms (t = 2.24; p = 0.026) at 6 weeks postpartum
Huang et al, 2015	Mainland China	Randomized controlled trial	Hospital	Primiparous women with singleton at 31 weeks and spouses (n=200)	Emotion management (based on the principles of CBT)	Not specified	Routine prenatal education	EPDS, PHQ-9, and SCID	EPDS score of intervention group was significant lower at 42 days postpartum
Leung et al, 2016	Hong Kong	Randomized controlled trial	Hospital	Women with EPDS score >=10 at 6-8 weeks postpartum (n=164)	Cognitive behavioral approach	Six weekly 2 hour group intervention session	Booklet with information	EPDS, 10	Intervention group reported a significant reduction in EPDS score at 3 months and 6 months, the control group only had significant reduction in EPDS score at 6 months.

Table 2.2 Continued

References	Region	Study design	Setting	Participants	Program	Implementation	Control group	Measurement of PPD	Outcomes
Mao et al, 2012	Mainland China	Randomized controlled trial	Hospital	Primiparous women with single birth with a 32 weeks gestation (n=240) (husband as secondary participants)	Emotional Self–Management Training Program	Four weekly group sessions and one individual counseling session	Standard antenatal education: four 90-min sessions conducted by obstetrics nurses	EPDS, PHQ-9, and SCID	The mean score of EPDS was significantly lower in the intervention group at 6 weeks postnatal
Ngai et al, 2015	Hong Kong	Randomized controlled trial	Hospital	Postnatal women with EPDS score >=10 (n=397) at 2-3 postpartum day	Cognitive-behavioral therapy (telephone-based)	Five weekly telephone-administered CBT from 1 to 5 weeks postpartum.	Standard care (stay in hospital for 2-3 days, come back for checkup at 6 weeks)	EPDS, 10	Telephone-based CBT was associated with significantly lower depressive symptoms compared with standard care
Ngai. et al, 2009	Hong Kong	Quasi-experimental design with repeated measures	Hospital	Primiparous women with singleton and at gestation 12-35 weeks (n=184)	Psychoeducation program based on the concept of learned resourcefulness	Three 1-hour sessions of learned resourcefulness training	Routine childbirth education: 6-weekly 2-h sessions focusing on pregnancy, childbirth, and basic child care.	EPDS, 10	The intervention group had significant improvement in overall reduction in depressive symptoms (p = 0.01) from baseline to 6 months postpartum.
Tiwari et al, 2005	Hong Kong	Randomized controlled trial	Hospital	Pregnant women at gestation 18-30 weeks abused by intimate partners (n=110)	Empowerment training	30 minutes one on one interview	Standard care with information of resources in the community	EPDS, 10	Significantly fewer women in the intervention group had postnatal depression at follow up

Table 2.2 Continued

References	Region	Study design	Setting	Participants	Program	Implementation	Control group	Measurement of PPD	Outcomes
Zhao et al, 2017	Mainland China	Randomized controlled trial	Hospital	Pregnant women with medically defined complications and spouses (n=352)	Psychoeducation program (couple-separated)	Six 1.5 hour sessions couple-separated psychoeducational program	Routine obstetrical care	EPDS (9, 13) and PDSS	The intervention group had significantly less minor and major depression than the control group (p < .05).

2.3.2. Risk Factors

2.3.2.1. Demographic Factors

Demographics such as maternal age (S. Liu et al., 2017a), first-time mothers (Shi, Ren, Li, & Dai, 2018), and mothers from one-child family (A. Deng, Jiang, Luo, & Xiong, 2014b) were mentioned as risk factors for postpartum depression. Socioeconomic status factors such as low education level (D. T. Lee et al., 2000; S. Wang, Jiang, Jan, & Chen, 2003), low income or financial difficulties (D. T. Lee et al., 2000; Wan et al., 2009), and bad housing condition (A. Deng et al., 2014b; D. T. Lee et al., 2000) were also reported as risk factors for postpartum depression.

2.3.2.2. Psychosocial Factors

Low self-esteem among women(S. Wang et al., 2003) or anxiety-prone personality (Siu et al., 2012) were significant predictors for postpartum depression. In addition to personalities, women's history of depression before or during pregnancy is associated with PPD. Before pregnancy, women's history of depression or other psychiatric disorders were associated with a higher risk for postpartum depression (D. T. Lee, Yip, Leung, & Chung, 2004; D. T. Lee et al., 2000). Personal experience was such as the history of child maltreatment and physical and emotional neglect were also found to be associated with postpartum depression (Li, Long, Cao, & Cao, 2017a). During pregnancy, depression (D. T. Lee et al., 2000; S. S. Leung, Martinson, & Arthur, 2005; Shi et al., 2018; Siu et al., 2012) and psychological abuse (Y. Zhang, Zou, Cao, & Zhang, 2012) were reported to be associated with a higher risk for postpartum depression. In the postpartum period, prolonged baby blues (D. T. Lee et al., 2000), high

EPDS score at delivery or three days after delivery (Ding, Wang, Qu, Chen, & Zhu, 2014a), partners' depression (L. -. Gao, Chan, & Mao, 2009; Mao, Zhu, & Su, 2011b; F. -. Ngai & Ngu, 2015), childcare stress (L. -. Gao et al., 2009; S. S. Leung et al., 2005; Mao et al., 2011b; F. Ngai & Chan, 2011), and concern over the infants health (Y. Zhang et al., 2012) were all reported to be associated with postpartum depression.

2.3.2.3. Obstetric Factors and Infant Health

A variety of factors during pregnancy are associated with postpartum depression. Unplanned or unexpected pregnancy (Chen et al., 2018; Y. Zhang et al., 2012), past miscarriage or abortion experience (Chen et al., 2018; D. T. Lee et al., 2000; Shi et al., 2018), and difficult pregnancy experience(Wan et al., 2009) were reported to correlate to postpartum depression. Pregnancy complications such as gestational hypertensive disorders were reported to be associated with a higher risk for postpartum depression(S. Liu et al., 2017b). Besides, one study stated insufficient folic acid supplementation(Yan et al., 2017) and one study reported frequent exposure to mobile phones(S. Liu et al., 2017b) as risk factors for postpartum depression. Also, premature delivery was associated with an increased risk for postpartum depression(S. Liu et al., 2017b). Two studies showed that attending childbirth classes decreased the risk of postpartum depression (Ding et al., 2014a; Wan et al., 2009). Infant sleep time, low birth weight, weight at four weeks, and multiple infants are associated with an increased risk for postpartum depression (S. Liu et al., 2017b; Mao et al., 2011b).

2.3.2.4. Factors Pertains to Chinese Culture and Society

2.3.2.4.1 Social Support and Doing the Month

Social support is an important factor correlated to PPD. In the family-centered Chinese culture, social support mainly refers to family support (R. Xie et al., 2010), which refers to support from women' parents, parents-in-law, and husbands. Inadequate social support, including family support, either prenatal or postnatal, was mentioned as a risk factor for postpartum depression in Mainland China (A. Deng, Xiong, Jiang, Luo, & Chen, 2014b; L. -. Gao et al., 2009; Li, Long, Cao, & Cao, 2017b; Mao et al., 2011b; Tang, Zhu, & Zhang, 2016a; Tang, Zhu, & Zhang, 2016b; S. Wang et al., 2003; R. Xie, He, Koszycki, Walker, & Wen, 2009a; R. Xie, He, Koszycki, Walker, & Wen, 2009b; R. Xie et al., 2010) and Hong Kong (S. S. Leung et al., 2005; F. -. Ngai & Ngu, 2015; F. Ngai & Chan, 2011). A qualitative study found social support in China is highly embedded in the culture (Tang et al., 2016a). For example, culture affects what support women expect from different family members and how women communicate with family members on their needs for social support (Tang et al., 2016a).

Social support is closely related to doing the month, a ritual of postpartum confinement support. Doing the month, also known as Zuo yuezi, is a ritual of one month's confinement and recuperation immediately after delivery. Traditionally, during this month, new mothers are supposed to rest, stay indoors doing nothing, eat special postpartum food, abstain from cold foods, and avoid bathing and touching cold water (S. Lee, Yang, & Yang, 2013). During this month, mothers or mothers-in-law of the puerperal will come to help. From the included articles, doing the month has a

conflicting effect on postpartum depression. A Hong Kong study reported that doing the month is associated with better social support and lower risk for postpartum depression (D. T. Lee et al., 2004). However, in a Mainland study, adherence to doing the month was reported to be positively correlated to postpartum depression (Y. Liu, Maloni, & Petrini, 2014). A qualitative study also reported that doing the month contributed to postpartum depression (L. Gao, Chan, You, & Li, 2010).

2.3.2.4.2. Poor Relationship with Mother-in-Law

Dissatisfied relationship or inharmony with mother-in-law predicted postpartum depression (A. Deng et al., 2014b; L. Gao et al., 2010; D. T. Lee et al., 2004; Mao et al., 2011b; Siu et al., 2012). Living with parents-in-law or having the mother-in-law as the caregiver during postpartum period was reported to be a risk factor for Han Chinese women (Chen et al., 2018; Y. Wang et al., 2017a; Y. Wang et al., 2017b). Harmony with mother-in-law was reported to be a protective factor for mothers' depression(Shi et al., 2018). Qualitative studies also reported controlling and powerful in-laws as a contributor to women's depression (S. W. Chan et al., 2002). Chinese families attach high importance to family harmony. Family relationship matters a lot to women's mental health.

2.3.2.5. Medical Resources Related Factors: Cesarean Section and Epidural Analgesia

A study conducted in a community in Guangzhou found that delivery mode is significantly associated with postpartum depression (A. Deng et al., 2014b). In another study with a cohort of Chinese women with high rates of non-medically indicated

cesarean sections, cesarean section was associated with an elevated risk for PPD, as reported in a study conducted in a sample with a high rate of Cesarean section in Hunan province in China (R. Xie et al., 2011). The study found that the rate of PPD was twice in women who had a cesarean delivery as of in women who delivered vaginally (R. Xie et al., 2011). The mechanism of the effect of C-section on postpartum depression remains understudied.

The use of epidural analgesia was also reported to be as a protective factor for postpartum depression. In a prospective cohort study conducted in Beijing, the postpartum depression incidence rates for women received epidural labor analgesia and those who did not were 14.0% (15 of 107) and 34.6% (37 of 107), respectively (Ding et al., 2014a).

2.3.2.6. Gender Preference and One-Child Policy

The preference for a male infant is common in Chinese society. Five studies reported that giving birth to a female infant was positively associated with postpartum depression (Chen et al., 2018; A. Deng et al., 2014b; L. Gao et al., 2010; D. T. Lee et al., 2000; R. Xie et al., 2007). One study also mentioned that the one-child policy exuberates the situation because people only have one chance to give birth to a male child (L. Gao et al., 2010). Family members' disappointment or dissatisfaction to the birth of a female baby is a big psychological burden for women (A. Deng et al., 2014b; D. T. Lee et al., 2000; R. Xie et al., 2007). The other reasons for the increased risk for PPD for women giving birth to a female infant are the less social support and family support they received (R. H. Xie et al., 2011; R. Xie et al., 2009a).

2.4. Discussion

2.4.1 Major Findings

This systematic literature review comprehensively examined the risk factors for postpartum depression among Chinese women. Different types of factors related to postpartum depression and current prevention programs are identified from this systematic literature review. Cultural factors, interpersonal relationships (especially mother-in-law and daughter-in-law relationship), social support, and insufficient maternal medical services and resources stand out from the findings.

2.4.1.1. Cultural Factors: Doing the Month, in-Law Relationship, and Social Support

Cultural factors play a significant role in the mental health of Chinese women. Interpersonal relationship, doing the month, and social support, the three of them are highly correlated and impose effects on puerperal's mental health.

2.4.1.1.1. Doing the Month

Doing the month is the most important way of postpartum social support. As reported in the included articles, doing the month has contradictory effects on the mental wellbeing of the women. On one hand, women can get a lot of support from the mother or the mother in law, which is beneficial for their mental health. On the other hand, some rituals of doing the months are out of dates, such as the restriction on personal hygiene and dental hygiene, and the restriction on diet. The sense of independence, health knowledge, and the spread of the western values make women question some doing the month rituals, and conflicts between modern medical practice and traditional beliefs

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were developed. However, women usually follow the rituals as a deferring to the mother or mother in law to avoid family discord. In this case, adherence to doing the month increases stress and postpartum depression.

Doing the month, as a traditional postpartum ritual, has a long history, and it is still highly valued and popular as a major guideline in postnatal care. However, doing the month is always a "folk" practice, and it received little attention from formal education and clinical settings. Some rituals are out of date. For example, the limitation to personal hygiene and dental hygiene and the unbalanced diet is neither necessary nor beneficial to women's health. The health department, public health organizations, and hospitals should provide more guidance in doing the month practice.

2.4.1.1.2. Social Support

A qualitative study found social support in China is highly embedded in the culture (Tang et al., 2016a). For example, culture affects what support women expect from different family members and how women communicate with family members on their needs for social support (Tang et al., 2016a). In addition, because of the tradition of doing the month; women have the expectation of getting social support. If they do not get the expected social support, they feel disappointed. For example, women expect social support from parents in law, and the discrepancies between expected and perceived available social support is one of the major contributors to the stress associated with postpartum depression (Tang et al., 2016a). Conversely, although it is consistent in the study results that postpartum social support is beneficial for women, the situation is different when taking Chinese society and culture into account. Due to the

intense contact between mother in law and daughter in law during the postpartum period, the relationship between mother in law and daughter in law is intensified, which offset the benefit of the social support provided by mother in law. Therefore, in China, when talking about social support, it is important to see who is the provider of the support, and the relationship between the caregiver and the mother.

2.4.1.1.3. Family Relationship

Interpersonal relationship is essential for Chinese women's mental wellbeing. China is a country where the family relationship is highly valued. The psychological well-being of postpartum women is also influenced by family relationships, especially the mother-in-law and daughter-in-law relationship. As mentioned earlier, during the period of doing the month, mother-in-law of the puerperal lives in the household to take care of the infant, the puerperal, and the housework. Studies have reported that living together during the doing the month period intensified the relationship between the mother-in-law and daughter-in-law.

Therefore, the interpersonal relationship can be a superior intervention point for postpartum depression prevention programs. Hence, cognitive behavior therapy programs targeting interpersonal relationships are good intervention points in China. Overall, culture factors stand out from the various factors for postpartum depression. Program to prevent postpartum depression for Chinese women should take the culture factors into consideration in designing programs for Chinese women.

2.4.1.2. Medical Services and Resources: Cesarean Section and Epidural Analgesia

Medical services have a great impact on Chinese women's postpartum mental wellbeing. It is reflected mainly in two aspects, the lack of epidural and the high rate of Caesarean section, also known as C-section, which are correlated to each other. Efforts should be made to improve the ability to provide epidural analgesia and bring down the high C-section rate.

There is a large space for improvement for Chinese women's delivery experience. China has a very high rate of Caesarean births, which is among the highest in the world. The WHO suggested cesarean delivery rate is 10-15%; however, in China, cesarean delivery is unnaturally high, which is 37% in 2018 (Betrán et al., 2016). The Cesarean section delivery was reported to be a risk factor for postpartum depression. These results should be interpreted in Chinese society. A majority of these surgeries were non-clinically indicated cesarean sections, which are performed because of social reasons. The reasons include: the low rate of analgesia use in China, the state that children born before September 1st can start school one year earlier, the perception that some date can bring fortune to the baby, perception that cesarean section delivery is safer, as well as high profit of performing cesarean section delivery (X. Deng, 2008; Ding, Wang, Qu, Chen, & Zhu, 2014b; R. Xie et al., 2011). Efforts should be made to decrease the Cesarean section delivery rate among Chinese women. China should make efforts to bring down the non-medically indicated cesarean section. The findings from this study have important implications for other developing countries with high cesarean rates.

On the contrary, the epidural analgesia rate is very low among Chinese women. The

lack of epidural analgesia is also related to the high cesarean section rate of Chinese women as the rate of cesarean delivery was significantly decreased in puerperal who received epidural analgesia (Ding et al., 2014a). Epidural analgesia use is positively associated with the postpartum wellbeing of women. China should make efforts to increase the ability to provide epidural analgesia in delivery.

Moreover, mental health services should be enhanced to meet the needs of the Chinese people. Currently, there is a considerable gap in mental health resources in China. Mental health services have been a low priority in China due to various historical reasons (Xiang, Yu, Sartorius, Ungvari, & Chiu, 2012). Training of mental health counselors should be attached more importance.

2.4.2. Gaps in the Literature and Implication for Future Research

There is an immense gap in the diversity of the study population. For example, almost all the studies recruited participants from hospitals or communities in big cities. None of the studies included women residing in rural areas as the participants. In China, there is a large disparity between rural and urban areas. The risk factors for postpartum depression among women in rural areas need to be studied. Furthermore, minorities are not sufficiently studied. There are 55 ethnic groups in China, each of which has a unique culture and habits. The mental health of minority women in China also remains understudied. There are also some special groups; for example, there are a large number of rural-to-urban migrant workers. Their maternal mental health was also understudied.

Moreover, some improvement is yet to make in the methodology of the studies. First, the measurement of postpartum depression should adopt more rigorous and

objective scales. All the included articles used reliable instruments, mostly EPDS, to measure postpartum depression. However, Cox suggested that EPDS is used for screening of postpartum depression in the community setting, and further assessment was needed for the diagnosis of clinical depression (Cox, Holden, & Sagovsky, 1987). Few current studies utilized further diagnosis as presented from the included studies. Last but not least, most studies used convenient sampling methods, so the sample might not be representative of the population. The generalizability of the study results might be compromised.

2.4.3. Implication for Practice

2.4.3.1. Screening for Postpartum Depression

Screening for postpartum depression can identify postpartum depression at an early stage; after that, treatment and intervention can be applied at an early stage to avoid unfavorable outcomes. However, the screening rate is very low in China at the current stage because there is no guideline for postpartum depression screening in China. Guidelines for PPD screening should be developed to increase the proportion of women receiving screening for postpartum depression.

2.4.3.2. Childbirth Education

There is a stigma for postpartum depression and other mental diseases and issues in Chinese society. Women themselves, their husbands, other family members, and the entire society have low awareness and acceptance for postpartum depression. Childbirth education programs can be a good way of increasing the knowledge, awareness, and acceptance of postpartum depression for women and their family members. Childbirth

classes prepare women with better knowledge of childbirth and postpartum life (Ding et al., 2014a; Wan et al., 2009). It also provides women with a place to communicate with each other and get informational and emotional support (Ding et al., 2014a). Since cultural factors have been identified as important from published literature, culture-appropriate education and intervention programs should be developed to improve women's postpartum mental wellbeing. Chinese women get very little to no support and understanding from their family members in terms of postpartum depression because the family members are not very knowledgeable regarding postpartum depression. Because of the high involvement of the family members in postpartum care, in order for health education programs to be effective, health education programs should incorporate family members. However, prenatal education is not as popular as in industrialized countries. In the future, the government can subsidize the hospital for providing childbirth classes for women (Wan et al., 2009).

The existing postpartum depression prevention programs are mainly delivered face-to-face and mostly in urban areas. These traditional programs cannot reach rural areas. Phone-based programs should be a great opportunity for postpartum depression prevention programs since smartphones are popular in almost everywhere in China. As a phone-based intervention program has been reported its effectiveness by Ngai and colleagues in Hong Kong (Ngai et al, 2015), more smartphone-based programs should be developed and implemented in China.

2.4.4. Strengths and Limitations

There are several strengths of this study. A librarian conducted the literature research, guaranteeing the comprehensive coverage of most of the relevant literature. This systematic literature review included both qualitative studies and qualitative studies, which can cover a broader picture of the risk factors with various in-depth, to display a more detailed picture of risk factors for postpartum depression among Chinese women. This systematic literature review included both surveillance and intervention studies for postpartum depression, providing comprehensive information for postpartum intervention among Chinese women. This systematic review specifically examined the Chinese culture and look closely to examine the cultural influence on postpartum depression. For programs designing to prevent postpartum depression, program designers can target on the identified risk factors, and can refer to the current effective programs.

There are also some limitations for this systematic literature review. First of all, studies published in Chinese are not included in this review; risk factors and intervention programs from the Chinese literature are lost. The reason the authors decided not to include the articles published in Chinese is that those articles are not peer-reviewed articles, which might not be as rigorous as the peer-reviewed articles. Secondly, this study focused on sociocultural factors pertaining to postpartum depression among Chinese women, biological factors were not examined in this study because the authors believe that biological factors should not have big difference from the western nations.

2.4.5. Conclusions

This project was undertaken to examine factors associated with Chinese women's postpartum depression and existing programs designed to prevent postpartum depression to have a comprehensive understanding of PPD in Chinese culture. This study has found that generally, culture factors play an important role in Chinese women's postpartum depression. Programs designed to prevent postpartum depression should take full consideration of the cultural and societal background of China. The existing intervention programs are lacking in quantity and diversity. Future programs are suggested of more forms such as programs implemented via mobile phones.

3. CHINESE RURAL-URBAN DISPARITY AND THE SOCIO-CULTURAL PREDICTORS FOR THE PERCEIVED STRESS OF RURAL CHINESE WOMEN AT CHILD-REARING STAGE

3.1. Introduction

In the year 2016, China had approximately 589,73 million rural individuals, which comprised more than 40% of the total population. Previous literature has reported a significant discrepancy between rural and urban areas in various aspects of China, such as the living environment, educational level, economic status, health care resources, social security, social norms, and even some policies (Chang, 2009; China National Statistics Bureau, 2017; Zhang, Ci, & Zhan, 2017; Gao, Yang, Zhang, & Li, 2018). For instance, China has experienced fast economic growth in recent decades, but the increase is imbalanced and unfair for rural and urban areas (China National Statistics Bureau, 2017). The urban-rural resident's per capita income ratio was as high as 2.72 in the year 2016 (National Bureau of Statistics, 2017). Additionally, the social welfare system has a discrepancy in rural and urban areas. Compared to urban residents, rural Chinese residents received substantially less public assistance (S. Zhang, Ci, & Zhan, 2017).

As it relates to health, compared to urban residents, rural residents have fewer health care providers and less access to medical care resources (Q. Gao, Yang, Zhang, & Li, 2018). Similarly, the education system and resources have inequalities between rural and urban areas. Therefore, the education outcome and quality have a substantial disparity (Q. Gao et al., 2018). Likewise, the family planning policy is different in rural

areas from urban areas. In urban areas, each family can only have one child, while in rural areas, each family can have a second child if the first child is a girl, as stipulated by the policy. As a result, there are less "only child families" in rural than in urban areas. Living in the countryside also means that there are more restrictive social norms, particularly for women (Chang, 2009), and the gender role is more limiting in rural areas than in non-rural areas (Chang, 2009).

At one time, suicide rates among Chinese rural women' was the highest in the world (Pritchard, 1996). Suicide is the leading cause of death for young women in China. In recent years, although there is a remarkable decline in the suicide rate, it yet remains high, suicide rates is 2-5 times higher in rural areas than in urban areas in China (Weiyuan, 2009). However, there is a significant gap in current literature with regard to rural Chinese women's mental health. Previous studies on women's mental health mainly focused on women in urban areas (A. Deng, Xiong, Jiang, Luo, & Chen, 2014a; A. Deng, Jiang, Luo, & Xiong, 2014a; Tang et al., 2016a). The mental health of rural Chinese women is underrepresented and remains insufficient.

Stress contributes to mental disorders such as anxiety and depression, and physical health problems such as high blood pressure and heart diseases (National Institute of Mental Health, 2018). Chronic stress increases the risk of developing depression and anxiety in some people (National Institute of Mental Health, 2019). The mental health of women at early motherhood is highly related to the cognitive development of the children (World Health Organization, 2008b). Knowing the associated factors for women's mental health at early motherhood is essential in

preventing suicide and improving the development of the children. Identifying factors related to women's stress might be a promising way of prevention.

To date, there is inadequate number of studies that exclusively examine women at child-rearing stages as an integrated group. Additionally, the mental health of the rural women remains highly understudied. The analysis of this study aims to explore the influence of the social and environmental factors on the mental health of rural Chinese women with children under the age of six. This article will examine factors related to the mental health of mothers with children depending on their rural and non-rural status. Given that the rural women are understudied, this study will give special attention to the rural population.

3.2. Methods

3.2.1. Sample and Dataset

This study used the China Health and Nutrition Survey (CHNS) data. CHNS is an ongoing open cohort, international collaborative project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute for Nutrition and Health (NINH, former National Institute of Nutrition and Food Safety) at the Chinese Center for Disease Control and Prevention (CCDC). The CHNS was designed to comprehensively examine the health, nutrition, and family planning of China population and the influence of the social and economic transformation of Chinese society on the health and nutritional status of its population (China Health and Nutrition Survey, 2018). The survey was conducted in 1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009, 2011, and 2015.

The China Health and Nutrition Survey (CHNS) is a nationally representative survey. The survey includes nine provinces that vary substantially in geography, economic development, public resources, and health indicators. Samples were drawn from each province by using a multistage, cluster random process. Counties in each province were stratified by income, and a weighted scheme was applied to select four counties randomly. Villages and townships in each county were randomly chosen to be included in this survey (China Health and Nutrition Survey, 2018).

This study used the 2015 CHNS survey data. For the 2015 CHNS survey, 360 communities, 7,319 households, and 20,914 individuals were included. A total of 617 women with children under the age of seven were targeted for this study. 17 women reported that the children were not live at the survey, and were excluded from the analysis. A total of 600 women were included in the analysis.

3.2.2. Dependent Variables

Perceived Stress. Perceived stress was measured by the Chinese version of the 14-item Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983). The PSS is the most widely used psychological instrument that measures the perception of stress. The instrument had an established reliability (r=0.85) and correlated in a predicted way with other measures of stress such as Job Responsibilities Scale and life events scales (Cohen et al., 1983). The Chinese version of the PSS-14 scale has been tested for the reliability and validity with various populations with satisfactory psychometric properties (Cronbach's alpha=0.85) (D. Y. Leung, Lam, & Chan, 2010). The fourteen-item self-report instrument with a five-point scale was included in the survey.

Participants were asked about their feeling and thoughts during the past month. They rated each question on the five-point Likert Scale, which are 0 (strongly agree), 1 (somewhat agree), 2 (not sure), 3 (somewhat disagree), and 4 (strongly disagree). The PSS-14 score was obtained by summing across all 14 items after reverse coding item 4, 5, 6, 7, 9, 10, and 13. A higher stress score indicates higher perceived stress and is considered a risk factor for a clinical psychiatric disorder (Cohen et al., 1983). I calculated the reliability of PSS-14 for the sample of this study, and the Cronbach's alpha value is 0.79, which is good considering that .70 is the cutoff value for being acceptable.

3.2.3. Independent Variables

China is a nation that has a long history and vibrant cultures and traditions. Culture and traditions have an impact on the mental health of women. This study focused on the influence of Chinese society and culture to the stress level of women with young children. Therefore factors that pertain to Chinese culture and social norms were included in this analysis.

Demographic characteristics. Demographics such as age, marital status, household income, educational attainment (high school or less), and ethnicity were controlled. The analysis also controlled for the region (western, central, and eastern China).

Rural or non-rural residing. Rural or non-rural residing is a binary variable. The rural area refers to villages, and the non-rural areas include the urban, county capital, and suburban areas.

Whether the mother is the only child at her family of origin. Previous literature reported that mother as the only child in her family of origin was associated with a higher rate of postpartum depression.

Gender of the child. Traditionally, male children are more preferred than female children in Chinese culture. It is still a phenomenon in many regions of China. Therefore, the gender of the child was included in this study.

Whether the husband lives at home. In China, a proportion of rural population migrates from rural areas to urban areas to make a living, who are called migrant workers. The authors were wondering whether the husband lives at home or not is associated with women's stress level.

Whether co-reside with parents or in-laws. Co-residence has been reported to contribute to women's postpartum depression (Y. Wang et al., 2017). The author wants to know if co-residence is related to higher or lower stress.

3.2.4. Data Cleaning

Data cleaning was conducted using Stata/SE 15.0. Outliers and missing data were addressed. For missing data, I first identified if the missing value is Missing Completely at Random (MCAR), Missing at Random (MAR), or Missing Not at Random (MNAR) (Poston & Conde, 2014). For the 600 women, 18 women didn't have value for their household income, nine women didn't report on the perceived stress scale, and seven women didn't report whether their husband regularly lives at home or not. To be noticed, for the Perceived Stress Scale, I added the 14 items together to get the sum of the perceived stress score, and then I divided the PSS score by 14 to get the average score.

Only women who didn't put any value to the perceived stress scale were identified as a missing value. Besides, every woman reported their age, region of living, rural or non-rural residing, marital status, educational attainment, and ethnicity, whether they are the only child in her family of origin, and whether they live with mother in law. A total of 33 missing value were identified and the missing rate was 5.5%. List wise deletion was used since the missing data was minimal. In addition, descriptive statistics and visual inspection were performed to check for outliers. After that, regression diagnostics (leverage, residual, and influence) were used to identify and handle outliers. No observation was identified as outliers in this analysis. After deleting the missing value, 567 women were included in this analysis.

3.2.5. Data Analysis

First, descriptive analysis was conducted to provide demographic characteristics of the sample. Chi-square test was performed to see the correlation between variables. T-test was performed to examine the difference in the stress level between rural women and non-rural women in China. Afterward, linear regression analysis was conducted to examine the related factors for the stress level of rural women. Three linear regression models were constructed. In the first model, both rural and non-rural women were included to examine factors associated to their mental health. In the second and third model, the analysis was performed separately for rural and non-rural women. Factors pertaining to Chinese society and culture, as well as the demographic characteristics, were included in the model.

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3.3. Results

3.3.1. Sample Characteristic

Table 3.1 shows the characteristics of the women. The mean age of the women was 30.61 years. Most of the women (98%) were married. A majority of them did not have a college degree (78.51%) and lived in rural areas (71.24%). The average household income of the included families was 77,457 RMB. A little more than half of them were employed (50.59%).

The table also shows the discrepancy between rural participants and non-rural participants. A majority of the rural women (77.67%) did not have a high school degree, while more than two-thirds of the non-rural women had a high school degree. There was also a discrepancy between rural and non-rural participants in their household income. The average household income for non-rural participants was almost 100 thousand Chinese Yuan (CNY), while the average household income for rural participants was only 60 thousand CNY. Also, 30% of the non-rural women were the only child in her family of origin, while only 10% of the rural participants were the only child of her family of origin. Besides, twice husbands of the rural women did not live at home compared to those of the non-rural women. For the employment status, 63% of the non-rural women were employed, while only 37% of the rural women were employed.

The chi-square test results show that there was a significant association between rurality and education (p<0.05), rurality and mother as the only child (p<0.05), rurality and husband living at home (p<0.05), and between rurality and women's employment status (p<0.05).

Table 3.1 Sample characteristic, ever-married women (n=574)

	Whole sample (n=574) Number, mean (SD) or %	Non-rural (n=256) Number, mean (SD) or %	Rural (n=318) Number, mean (SD) or %
Age (mean ± SD), years	30.61	30.99	30.30
Education			
<High school	335 (58.36%)	88 (34.38%)	247 (77.67%)
>= High school	239 (41.64%)	168 (65.63%)	71 (22.33%)
Marriage (n=572)			
Married	565 (98.78%)	252 (99.21%)	313 (98.43%)
Divorced	5 (.87%)	2 (.79%)	3 (.94%)
Widowed	2 (.35%)	0	2 (.63%)
Household income (mean ± SD)	77674.05 (91040.29)	99596.51 (112351.8)	60025.78 (64242.59)
Low income	384 (66.90%)	140 (54.69%)	244 (76.73%)
Middle income	125 (21.78%)	72 (28.13%)	53 (16.67%)
High income	65 (%11.32)	44 (17.19%)	21 (6.6%)
Ethnicity			
Han Chinese	497 (86.59%)	229 (89.45%)	268 (84.28)
Minorities	77 (13.41%)	27 (10.55%)	50 (15.72)
Mother as only child			
Only child	110 (19.16)	78 (30.47%)	32 (10.06%)
Not only child	464 (80.84)	178 (69.53%)	286 (89.94%)

Table 3.1 Continued

	Whole sample (n=574) Number, mean (SD) or %	Non-rural (n=256) Number, mean (SD) or %	Rural (n=318) Number, mean (SD) or %
Husband living at home (n=567)			
Not living at home	121 (21.34%)	37 (14.57%)	84 (26.84%)
Living at home	446 (78.66%)	217 (85.43%)	229 (73.16%)
Co-reside with parents			
Not co-reside	206 (35.89)	104 (40.63%)	102 (32.08%)
Co-reside	368 (64.11)	152 (59.38%)	216 (67.92%)
Child gender			
Male	313 (54.53%)	134 (52.34%)	179 (56.29%)
Female	261 (45.47%)	122 (47.66%)	139 (43.71%)
Employment status			
Employed	282 (49.13%)	162 (63.28%)	120 (37.74%)
Unemployed	292 (50.87%)	94 (36.72%)	198 (62.26%)
Perceived stress	23.86 (6.00)	23.25 (5.70)	24.36 (6.20)

Notes: Han Chinese are an East Asian ethnic group and nation native to China, they compromised 91.6% of the total population

3.3.2. T-test

An independent-sample t-test was conducted to compare the perceived stress in rural women and non-rural women. The results indicated a significant difference in the score for rural women (M=24.36, SD= .35) and non-rural women (M=23.25, SD=. 36); (t (572)=-2.20, p = .028). These results suggested that rural or non-rural living mattered in the perceived stress of women. Specifically, our results suggested that rural women had a significantly higher level of perceived stress. The effect size (Cohen's d) was 0.18, which indicate a small effect. The means for the perceived stress for rural and non-rural women were likely not very different.

3.3.3. Multiple Regression Results

The chi-square test and the t-test results suggest that rural or non-rural residing was highly correlated to women's education level, rate of the only child, rate of husbands living at home, employment rate, and perceived stress. So three regression models were constructed, with two models examining the perceived stress of the rural and non-rural women separately.

Table 3.2 shows the multiple regression results of the whole sample, including the rural and non-rural population. This model explains 7.6% of the women's perceived stress (adjusted R2=. 0758, F (9, 557)=6.16, p<. 001). Compared to east China, women in central and western China perceived significantly higher stress, after controlling for demographics and socioeconomic factors. In specific, Women in western China perceived the highest stress, which was 1.83 points higher than women in east China (β=0.114, p<. 05; B=1.83, p<. 05). Besides, women in central China perceived 1.74

scores higher stress than women in east China (β=0.146, p<. 05; B=1.74, p<. 01), and women in east china perceived the lowest stress. Education level was significantly associated with women's perceived stress after controlling for demographics and socioeconomic factors. Women with a high school degree perceived 1.17 scores less stress than those without a high school degree (β=-.107, p<. 05; B=-1.17, p<. 05). Household income was significantly associated with women's perceived stress after controlling for demographics and socioeconomic factors. Compared to the low-income group, women from middle-income families perceived two scores lower stress (β=-.107, p<. 05; B=- 1.301, p<. 05). Besides, age was also a significant predictor for postpartum depression (β=0.102, p<. 05; B =-.11, p<. 05). One year increase in age was associated with 0.11 score of perceived stress. Besides, rural or urban residence (β =. 02, p>. 05; B=. 279, p>. 05), whether husband lives at home (β =-.048, p>. 05; B=-.697, p>. 05), whether the mother is the only child (β =-.045, p>. 05; B=-.677, p>. 05), and whether live with mother-in-law (β =-.039, p>. 05; B=-.462, p>. 05) were not significantly associated with women's perceived stress.

Table 3.2 Multiple regression results (n=567)

Characteristics	Coef.	S.E	β	t	Sig.
Age*	0.112	0.047	.102	2.37	0.018
Rural	.279	0.560	.023	.50	.618
Region*					
Middle	1.741	.588	.146	2.96	.003
West	1.832	.763	.114	2.40	.017
Education*					
>High school*	-1.174	.574	-.097	-2.05	.041
Household income *	-1.921	.798	-.102	-2.41	.016
Husband lives at home	-.697	.607	-.048	-1.15	.252
Mother as only child	-.677	.683	-.045	-.99	.322
Live with mother in law	-.462	.523	-.039	-.88	.377

Multiple regression analysis was used to investigate predictors for the mental health of rural women and non-rural women. The results of the regression indicated that the predictors explained 5.6% (R^2=. 0566, $F_{(7,305)}$=3.67, p<. 001) and 7.7% (R^2=. 0769, $F_{(8,245)}$=3.64, p<. 001) of the variance for rural women and non-rural women's mental health, respectively. The significant predictors for rural and non-rural women's mental health were different from each other. For rural women, education (whether finished high school) (β =- .16, p<. 05; B=-2.29, p<. 05;) and whether husband lives at home (β = -.12, p<. 05; B=-1.71, p<. 05;) predicted the mental health of mothers at the child-rearing stage. For non-rural women, education (whether finished college) (β = -.13, p<. 05; B=-1.57, p<. 05), household income (β = -.16, p<. 05; B=-2.38, p<. 05), and whether the mother is the only child (β = -.13, p<. 05; B=-1.66, p<. 05) predicted the mental health of mothers at the child-rearing stage.

Table 3.3 Multiple regression results, rural (n=313)

Characteristics	*Coef.*	S.E	β	t	Sig.
Age	.116	0.065	.104	1.77	.078
Eduhigh*	-2.294	.842	-.156	-2.73	.007
Household income	-1.067	1.376	-.043	-.78	.439
Only child	.395	1.164	.019	.34	.735
Husband living at home*	-1.710	.777	-.123	-2.20	0.028
Mother in law	-1.063	.734	-.085	-1.45	.148

Table 3.4 Multiple regression results for non-rural women (n=254)

Characteristics	*Coef.*	S.E	β	t	Sig.
Age	0.078	0.068	.074	1.14	0.254
Education*	-1.565	.756	-.134	-.2.07	.040
Household income *	-2.382	.972	-.158	-2.45	.015
Only child*	-1.662	.806	-.134	-2.06	.040
Husband living at home	.064	.981	.004	.07	.948
Live with mother in law	.231	.746	.020	.31	.757

3.4. Discussion

This study took a separate view on the perceived stress of rural and non-rural Chinese women, with a particular focus on rural Chinese women. The results of the study show that rural women perceived higher stress than non-rural women. Cheng and colleagues (2010) supported the finding of this study by reporting that rural population's mental health is worse than urban population (Cheng, Xue, Zhao, Liu, & Jiang, 2010). However, this result does not remain significant after controlling for demographics and social determinants.

Although there was no significant difference in the perceived stress between rural and non-rural women, the predictors for the mental health of the two groups were different. For rural women, educational attainment level (having a high school degree or not) and whether husband regularly living at home were significantly associated with the mental health of women at child-rearing stages. For non-rural women, education (having a college degree or not), household income, and whether the mother is the only child in her family of origin were associated with women's mental health. This makes sense because of the discrepancies in the socio-cultural climate, economic development, and other aspects between rural and non-rural areas in China.

Rural women should be treated differently than non-rural women in regards of their mental health issues. When designing health promotion programs, we should keep in mind the disparity in the critical factors for women's mental health in different regions. In addition to the rural and non-rural disparity, there was also a discrepancy in eastern, central, and western China. The western and middle regions are the resource-

deficiency areas in China, and what also lack are the mental health resources. Related departments should consider the results of the study when allocate resources to different regions. Resource allocation should consider the significant difference in the perceived stress for women living in different regions.

This study indicates that the perceived stress of the rural women with a high school degree was lower than those without a high school degree. A study in Hebei province (a province in northern China) supported the finding of the present study (Cheng, Xue, Zhao, Liu, & Jiang, 2010). The study found that people with lower education level (primary school and middle school) had poorer mental health, compared to the population with high school diploma and higher (Cheng, Xue, Zhao, Liu, & Jiang, 2010). The current education level among Chinese women is low, as only one-third of the rural women in this study had a high school degree. Education investment should be broadly promoted in China, especially in rural areas.

Among rural women, those whose husbands do not regularly live at home had higher perceived stress. In rural China, due to low income from farming, many people relocate to other cities to make a living. These people are called rural-to-urban migrant workers. In the year 2017, there are 287 million migrant workers in China (National Bureau of Statistics, 2016). In the year 2010, there was a mass suicide event among migrant workers, which occurred in Shenzhen, Guangdong province in China. Afterwards, the society had paid particular attention to the mental health of the migrant workers (J. Chan & Ngai, 2010; J. Chan, 2013; Lin et al., 2011; Linping, Guanghuai, & Zhongwei, 2011). Among the migrant workers, a large proportion of them were married

males. In the present study, more than one fourth (26%) of the rural women reported that their husbands did not regularly live at home. Women whose husbands do not regularly live at home perceived more stress than those whose husband live at home after control for demographics. The mental health of the wives of the migrant workers should also be given further attention. Future research efforts should focus primarily on this population.

The study supported the hypothesis that socioeconomic status is associated with women's stress level. In the current study, education is a significant predictor for women's perceived health in rural areas where the education level is very low. Meanwhile, household income is a significant predictor in non-rural areas. The author speculated that socioeconomic status is particularly important for women's mental health in developing countries, because the income and educational level is lower. Although the mechanisms behind the associations are still unclear, the government should undoubtedly promote education, economy, etc.

3.4.1. Implication for Future Studies

China has a large number of women living in rural areas. The rural areas in China have their unique climate in socio-culture, economy, and population. There is an enormous difference in rural and non-rural areas, including in the determinants of women's mental health. However, very few studies have been conducted on their mental health status and related factors. Future studies should pay more attention to rural women's mental health, which might demand more time, resource, and human as in urban areas. Also, the academic administrative department should support more research among the rural population.

3.4.2. Strengths and Limitations

There are some limitations of this study. First, the sample size is relatively small. Second, the study sample was ever-married women, which failed to control for married and unmarried mothers, although the unmarried birth rate is very low in China. Lastly, due to the nature of secondary data analysis, this analysis did not precisely address all relevant variables. For instance, social support might be a vital factor for postpartum depression but is not included in the analysis. Despite the limitations, there are also several strengths for this study. First of all, this study used a nationally representative sample. Second, combining with Chinese society, this study views women's mental health from a new perspective: taking women at child-rearing stages as an integrated group. Last, this study took the understudied rural Chinese women as the target group, filling the gap in the current literature that lacks study on the mental health of the rural women.

3.4.3. Conclusions

This study examined predictors for rural and non-rural women's mental health at the child-rearing stage. The hypothesis that predictors for perceived stress for rural and non-rural women are different was supported. The results indicated that education (high school or lower), and whether husband lives at home were significant predictors for rural women's mental health at child-rearing stages. While for non-rural women, education (college or lower), household income, and whether the mother is the only child were the significant predictors for their perceived stress. Future studies should focus more on the mental health of rural women at child-rearing stages since the literature status quo has a

substantial gap in the study of rural Chinese women's mental health. Besides, health policies and medical resource allocation should consider the disparity in rural and non-rural areas and the disparity in associated factors for women's mental health.

4. IS EMPLOYMENT STATUS A PREDICTOR FOR THE PERCEIVED STRESS OF CHINESE WOMEN WITH CHILDREN UNDER THE AGE OF SIX?

4.1. Introduction

Family life circle refers to the emotional and intellectual stages one passes through from childhood to retirement years as a member of a family (Mattessich & Hill, 1987). The family life circle has its unique importance to the sound development of family and the family members. Two crucial areas of the family life circle are the childbearing and child-rearing stages, which encompasses three stages: parenting young children, parenting school-aged children, and parenting adolescents (Mattessich & Hill, 1987). Parenting young children (younger than six years old) demands the most amount of time from both mothers and fathers, as noted by Higgins and colleagues (Higgins et al., 1994). Because of the traditional gender role, women at this stage are under tremendous stress, which includes but is not limited to childcare stress, work-life balance, social isolation, and new challenges in the marital relationship resulting from becoming parents.

Chinese urban women at child-rearing stages are in a dilemma with work and childcare for two reasons, the first being the social norms that are favorable of female workforce participation and second, the deficiency in the childcare system. In China, female labor force participation is widespread, and public opinion endorses gender equality and is more favorable of female employment. China has held high female labor participation rates for decades. In China, women's labor participation is regarded as a

normal routine, and women are expected to work after marriage and childbirth (H. Lee et al., 1997). A study in two major cities in China reported that the majority of Chinese women went back to work after childbirth (Yi & Chien, 2002).

Although the female labor force participation rates are high, there are not adequate institutional accommodations (e.g., family-friendly policies) to reconcile work and family. For instance, the early childhood care and education system are disadvantaged to support dual-earner families. To date, the public childcare service has not formed a complete and adequate system. For children ages 0-3 years, there are a deficient number of early childhood facilities. The nursery enrollment rate for birth to three-year-old children in China is as low as 4% (Qi & Melhuish, 2017). Children between the ages of 0-3 were mainly cared for in households by parents or grandparents (Qi & Melhuish, 2017). Further, for children 3-6 years, the policy, management, and regulations are not complete and advanced.

Therefore, childcare for preschool-aged children is an issue for Chinese dual-income families. Intergenerational childcare is the norm among the Chinese society. However, not all grandparents can undertake childcare responsibility for objective or subjective reasons. Also, intergeneration conflict is one of the most common family conflicts. Confronted by childcare pressures, some women who prefer to work may have to resign from jobs and stay at home, even at the cost of personal scarification. In recent years, the full-time homemakers are a growing population in China, especially after the repeal of the family planning policy (aka one-child policy) in the year 2015. However, these women are under much stress under the current Chinese socioeconomic status and

social norms. In the year 2017, a Chinese browser reported that stay-at-home mothers ranked third among all Chinese mothers in the anxiety level, which is only after those in the fields of finance and technology from big data analysis (UC Browser, 2017).

A series of reasons contributed to their stress. First, the social norm has not changed yet to provide them with good public opinions. The mainstream opinion is that women should be independent and have their own career. Homemaking is regarded as having no contribution to society and is not recognized and respected by society and even the family. Also, Chinese homemakers are lacking in the areas of social security and social connections compared to their counterparts in other countries (Posmontier & Horowitz, 2004). Furthermore, stress may also come from parents' high expectation, especially for those with a college degree or the only child in her family. Finally, women worry about being behind professionally by peers, missing promotion opportunities, and difficulties they will face when they try to re-enter the job market (Zhaopin, 2016).

Previous literature has been conducted examining the association between employment status and mental health of married women. However, the results are inconsistent with each other (Ahmad-Nia, 2002; Hyde, Klein, Essex, & Clark, 1995; Riley & Keith, 2004; Treas, van der Lippe, & Tai, 2011). It is usually held that country characteristics, such as GDP, social spending, women's labor force participation, liberal gender ideology, and public childcare are essential in determining the influence of employment status on women's mental health (Treas et al., 2011). As the socioeconomic and cultural contexts are different in other countries, the findings of studies conducted in other countries may not apply to the situation in China.

In China, very few studies have been conducted to examine the influence of employment status on married women's mental health. Particularly, to the knowledge of the author, no previous literature has examined the working mothers and stay at home mothers with preschoolers in China. There is a significant gap in the literature on the mental health of unemployed mothers with preschoolers in China. This study aims to explore if the mental health of Chinese homemakers with children under the age of six is better or worse than their employed counterparts in non-rural areas, where the social norm favored female labor participation. The research question for this study is: "Is employment status (employed or unemployed) a predictor for the mental health of Chinese women at the child-rearing stage?"

4.2. Methods

4.2.1. Sample and Dataset

This study used the China Health and Nutrition Survey (CHNS) data. CHNS is an ongoing open cohort, international collaborative project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute for Nutrition and Health (NINH, former National Institute of Nutrition and Food Safety) at the Chinese Center for Disease Control and Prevention (CCDC). The CHNS was designed to comprehensively examine the health, nutrition, and family planning of China population and the influence of the social and economic transformation of Chinese society on the health and nutritional status of its population (China Health and Nutrition Survey, 2018). The survey was conducted in 1989, 1991,

1993, 1997, 2000, 2004, 2006, 2009, 2011, and 2015. This study used the 2015 CHNS survey data.

The China Health and Nutrition Survey (CHNS) is a nationally representative survey. The survey includes nine provinces that vary substantially in geography, economic development, public resources, and health indicators. Samples were drawn from each province by using a multistage, cluster random process. Counties in each province were stratified by income, and a weighted scheme was applied to select four counties randomly. Villages and townships in each county were randomly chosen to be included in this survey (China Health and Nutrition Survey, 2018).

For the 2015 CHNS survey, 360 communities, 7,319 households, and 20,914 individuals were included. A total of 617 women with children under the age of seven were targeted for this study. 17 women reported that the children were not live at the survey and were excluded from the analysis. A total of 600 women giving birth to a live child within the past seven years were preliminarily included. Further, the selection criteria for this study include 1) women giving birth to live infants during the past four months to seven years, 2) women living in the non-rural areas of China, which include urban areas, county capitals, and suburban areas. Women within four months postpartum were excluded because women do not need to work within four months after childbirth as four months is the average length of maternal leave in China. The reason I select non-rural women is that the female labor participation rate in rural areas is low, and women are not expected to work in rural areas. After applied the selection criteria, a total of 269 women were included in the analysis.

4.2.2. Dependent Variables

Perceived Stress. Perceived stress was measured by the Chinese version of the 14-item Perceived Stress Scale (PSS) (Cohen et al., 1983). The PSS is the most widely used psychological instrument that measures the perception of stress. The instrument had an established reliability (r=0.85) and correlated in a predicted way with other measures of stress such as Job Responsibilities Scale and life events scales (Cohen et al., 1983). The Chinese version of the PSS-14 scale has been tested for the reliability and validity with various populations with satisfactory psychometric properties (Cronbach's alpha=0.85) (D. Y. Leung et al., 2010). The fourteen-item self-report instrument with a five-point scale was included in the survey. Participants were asked about their feeling and thoughts during the past month. They rated each question on the five-point Likert Scale, which are 0 (strongly agree), 1 (somewhat agree), 2 (not sure), 3 (somewhat disagree), and 4 (strongly disagree). The PSS-14 score was obtained by summing across all 14 items after reverse coding item 4, 5, 6, 7, 9, 10, and 13. A higher stress score indicates higher perceived stress and is considered a risk factor for a clinical psychiatric disorder (Cohen et al., 1983). I calculated the reliability of PSS-14 for the sample of this study, and the Cronbach's alpha value is 0.74, which is good considering that .70 is the cutoff value for being acceptable.

4.2.3. Independent Variables

Employment status. Employment status was measured by asking "are you presently working". There are two answers to this question, No (0), Yes (1).

Demographic characteristics. Demographics such as age, marital status, household income, educational attainment (high school or less), and ethnicity were controlled.

Gender of the child. Traditionally, male children are more preferred than female children in Chinese culture. It is still a phenomenon in many regions of China. Therefore, the gender of the child was included in this study.

Whether the mother is the only child at her family of origin. Previous literature reported that the mother as the only child in her family of origin was associated with a higher rate of postpartum depression.

Whether the husband lives at home. In China, a proportion of rural population migrates from rural areas to urban areas to make a living, who are called migrant workers. The authors were wondering whether the husband lives at home or not is associated with women's stress level.

Whether co-reside with parents or parents-in-law. Co-residence has been reported to contribute to women's postpartum depression (Y. Wang et al., 2017). The author wants to examine if co-residence is related to higher or lower perceived stress.

4.2.4. Data Cleaning

Data cleaning was conducted using Stata/SE 15.0. Outliers and missing data were addressed. For missing data, I first identified if the missing value is Missing Completely at Random (MCAR), Missing at Random (MAR), or Missing Not at Random (MNAR) (Poston & Conde, 2014). For the 269 women, 10 women didn't have value for their household income, three women didn't report on the perceived stress scale, and two

women didn't report whether their husband regularly lives at home or not. To be noticed, for the Perceived Stress Scale, I added the 14 items together to get the sum of the perceived stress score, and then I divided the PSS score by 14 to get the average score. Only women who didn't put any value to the perceived stress scale were identified as a missing value. Besides, every woman reported their age, region of living, rural or non-rural residing, marital status, educational attainment, and ethnicity, whether they are the only child in her family of origin, and whether they live with mother in law. A total of 15 missing value were identified and the missing rate was 5.6%. List wise deletion was used since the missing data was minimal. In addition, descriptive statistics and visual inspection were performed to check for outliers. After that, regression diagnostics (leverage, residual, and influence) were used to identify and handle outliers. No observation was identified as outliers in this analysis. After deleting the missing value, 254 women were included in this analysis.

4.2.5. Data Analysis

Stata 15.0 was used for the data analysis. First, descriptive was performed for the sample characteristics. Then a multiple regression analysis was performed to analyze the association between Chinese women's employment status and their perceived stress. The Analysis controlled for demographics and variables pertaining to Chinese culture and society, such as whether the mother is the only child, whether the family co-reside with parents or parents-in-law, and gender of the child.

4.3. Results

4.3.1. Socio-Demographic Profile of the Sample

  As seen in Table 4.1, the mean age for the included women are 31 years old. The average household income is 99,596 CNY. A majority of the women are married (99%), Han ethnicity (89%), with husband living at home (85%), not only child (70%), have a high school degree (65%), employed (63%), and co-reside with parents or parents-in-law (59%).

Table 4.1 A Sample characteristics, ever-married women, non-rural (n=256)

	Number, mean (SD) or %
Age (mean ± SD), years	30.99
Education	
<High school	88 (34.38%)
>= High school	168 (65.63%)
Marriage	
Married	252 (99.21)
Divorced	2 (.79%)
Widowed	0
Annual household income (mean ± SD)	99596.51 (112351.8)
Low income	140 (54.69%)
Middle income	72 (28.13%)
High income	44 (17.19%)
Ethnicity	
Han	229 (89.45%)
Minorities	27 (10.55%)
Mother as the only child	
Only child	78 (30.47%)
Not only child	178 (69.53%)

Table 4.1 Continued

	Number, mean (SD) or %
Husband living at home	
Not living at home	37 (14.57%)
Living at home	217 (85.43%)
Co-reside with parents	
Not co-reside	104 (40.63%)
Co-reside	152 (59.38%)
Child gender	
Male	134 (52.34%)
Female	122 (47.66%)
Employment status	
Employed	162 (63.28%)
Unemployed	94 (36.72%)
Perceived stress	23.25 (5.70)

4.3.2. Multiple Regression Results

The multiple regression results show that employment status (β =-.13, p<0. 05) was significantly associated with mothers' stress after controlling for age, ethnicity, education, household income, whether mother is the only child in her family of origin, whether the woman's husband regularly lives at home, and whether co-reside with mother-in-law. Employed women have an average 1.58 score lower perceived stress than unemployed women (p<0.05).

Besides, the results show that for non-rural Chinese women, household income (β =-.16, p=0.01) and whether women are the only child in her family of origin (β =-.14, p<0.05) is significantly associated with women's perceived stress after controlling for other variables. Women from middle-income families have a 2.44 points lower perceived stress than women from low-income families. The perceived stress of women who are the only child in her family of origin is 1.7 points lower than those who are not the only child of her family of origin.

Table 4.2 Multiple regression results of the employment status on the mental health of women (n=254)

Characteristics	Coef.	S.E	β	t	Sig.
Age	.07	.07	.07	1.01	0.314
Ethnicity	.88	1.16	.05	.76	.45
High school	-.28	.79	-.02	-.36	.72
Household income *	-2.44	.97	-.16	-2.51	.01
Only child*	-1.70	.81	-.14	-2.11	.04
Husband not at home	.40	1.00	.02	.40	.70
Co-reside with parents or in-law	.26	.74	.02	.36	.72
Employment*	-1.58	.76	-.13	-2.08	.04
_Cons	22.58	2.45	.	9.23	.00

4.4. Discussions

This study aimed to examine whether employment status is associated with the stress level of Chinese women living in non-rural areas with children under the age of six. Because full-time homemakers are a growing population, it is meaningful and necessary to give more attention to their mental health. This study is among the limited number of studies exploring the association between employment status and the stress of women with young children in Chinese society.

The results of this study revealed that employment status was significantly associated with the stress level of women in non-rural China with children under the age of six. Specifically, the stress level of full-time homemakers was significantly higher than the employed mothers. The result was supported by other studies in China (Liang, 2016). Liang indicated that in the current economic and cultural system of China, the mental health of full-time homemakers in urban China was significantly worse than the employed married women (Liang, 2016). However, only a small number of studies have been conducted to examine the association between employment status and mental health of married women, especially among those with pre-school aged children in Chinese society.

There has been a longstanding debate over whether homemakers or working wives are happier than the other worldwide. The results are different from country to country. Previous literature suggested that country characteristics, such as GDP, social spending, women's labor force participation, liberal gender ideology, and public childcare are essential in determining the influence of employment status on women's

mental health (Treas et al., 2011). In other words, socioeconomic and cultural context are significant in the employment status's influence on women's mental health. For instance, in an Iran study, there is no significant difference between working women and non-working women regarding their mental health (Ahmad-Nia, 2002). The reason is that there are extra weights placed on women's traditional roles as wives and mothers (Ahmad-Nia, 2002). However, it is a different story in the US, where homemakers are happier because of the social network and the social welfare for housewives (Hyde et al., 1995). As stated above, the social context matters in the association between employment status and women's mental health. Women in China are in a very different situation, no matter in social security, public attitude for homemaking, or women's role. Further studies should be conducted to explore the association between employment status and the mental health of Chinese women with pre-school aged children.

4.4.1. Strengths and Limitations

4.4.1.1. Limitations

This is a pilot study to examine the stress level of full-time homemakers in China. There are some limitations to this study. First, only limited factors were included in this analysis because of the secondary status of this study. The R-square of the study is only 0.08. For example, willingness to work might be a critical factor correlated to women's mental health, as stated by previous literature (Liang, 2016; Park, 1991). Future studies with self-collected data are suggested to conduct to include all correlated variables.

Second, limited information and details have been provided from this study. The results only revealed that Chinese homemakers have a higher stress level than their

employed counterparts, but reasons contribute to their higher stress were not explored by this study, such as the social life context variables. For instance, the deficient childcare system and the unfriendly social norms towards highly educated homemakers might contribute to full-time homemakers' higher stress. Further qualitative studies are suggested in the future to explore reasons contributed to their higher stress.

Lastly, the correlation study nature of this study limits its ability to define the relationship between women's employment status and women's perceived stress.

4.4.1.2. Strengths

There are several strengths for this study. The study used a nationally representative sample, and the selection process was well designed. Second, this study included factors that pertain to Chinese society and cultural, which were reported to be critical factors related to Chinese women's mental health. Inclusion of these factors helped to make a more accurate prediction of the association.

4.4.2 Implications for Future Research

With the increasing number of full-time homemakers in urban China, more focus should be given to their mental health. Future study can have several directions. First, this study only examined the correlation between employment status and perceived stress. However, women's mental health can be measured in different dimensions. Future research efforts can use other mental health indicators as the primary outcome variable, such as anxiety and depression. Second, previous literature has suggested the necessity of distinguishing the working women by occupational groups when making

comparisons to homemakers (Riley & Keith, 2004). Future studies may divide the working women by their professionals to provide more detailed information.

4.4.3. Implication for Policy and Practice

This study has good practical value to Chinese society. China has ended the one-child restriction, which will produce more full-time homemakers in China. The increase in the number of homemakers and the decrease in female labor participation rate is the trend in non-rural areas in China. Under the two-child policy, Chinese women will take more burdens from the traditional family role and face a lot more challenges in work-life balance. Under these circumstances, the social mechanism and social norms should be modified to provide a better social climate for homemakers. First, Childcare system should be completed in China to provide women the autonomy of choosing to work or becoming a homemaker as previous literature has proved the role "willingness to work" played in women's mental health (Liang, 2016; Park, 1991). For example, the government can encourage the employer and the community to set up childcare facilities in institutes or enterprises. China can learn from countries that have complete early childcare system. Second, social norms on homemakers should be modified in Chinese society. Homemakers should not be stigmatized. The government and public institutions should lead a new concept and social norms that homemaking is a contribution to society. Last but not least, the social mechanism should be modified to provide more social welfare for homemakers.

4.4.4. Conclusions

The growing population of full-time homemakers in urban China is a phenomenon. This study examined whether employment status is associated with women's stress level in non-rural China, where the female employment rate is high and the society is favorable of female labor force participation. The results revealed that the employment status was significantly associated with women's perceived stress. This is a preliminary study examining the association between employment status and women's mental health. A limited number of studies have been conducted to examine the association between employment status and mental health under the new circumstances facing Chinese women. Under the social norm that is unfavorable for highly educated mothers to be a homemaker, this population deserves more attention from the government, public health departments, and academia. Future research is suggested to conduct more on this topic to provide more information.

5. CONCLUSIONS

Maternal mental health is crucial because it is highly related to the well-being of both mothers and children. Maternal and child health is essential to a nation's development because maternal, infants', and children's well-being determines the health of the next generation (Office of Disease Prevention and Health Promotion, 2018).

This dissertation aimed to explore the demographic, socioeconomic, and cultural factors that influenced or were related to the mental health of women at postpartum and the childrearing stages. Particular focus was placed on factors which exclusively pertain to the culture and social environment of China. To accomplish this objective, the dissertation included three aims: (1) to comprehensively explore the prevalence and risk factors for postpartum depression among Chinese women from conducting a systematic literature review, (2) to compare the differences in the cultural and socioeconomic factors related to the mental health of women with children under the age of six among rural and non-rural women from a national representative dataset, and (3) to examine if employment status is related to the mental health of women with children under the age of six in non-rural areas.

To achieve these specific aims, the dissertation utilizes the manuscript format with three papers. Section 2 is a systematic literature review study to comprehensively explore the prevalence, risk factors, and programs for postpartum depression among Chinese women. Section 3 is a quantitative study to compare the differences in the influential factors among rural and non-rural women from a national representative

dataset. Section 4 is a quantitative study to examine if employment status is related to the mental health of women with children under the age of six in non-rural areas which have a relatively high female employment rate.

5.1. Findings and Results

Section 2 found that factors which pertain to Chinese culture, society, or medical resources plays a significant role in Chinese women's postpartum depression, such as mother-in-law and daughter-in-law relationship, doing the month, and insufficient maternal medical services and resources. Section 3 yielded that significant predictors for the mental health of rural and non-rural women were different from each other. For rural women, not attending high school and the husband not living at home were significantly associated with higher stress. However, for non-rural women, women from low-income households and not being the only child in her family of origin, were significantly associated with higher stress. Lastly, section 4 found that unemployed women with preschool age children who reside in non-rural areas in China have higher stress than their employed counterparts.

In sum, this dissertation study found that Chinese women at childbearing and childrearing stages are a vulnerable population, but yet remain highly understudied. Socioeconomic and social-cultural factors play a significant role in Chinese women's mental health. There is a regional gap between the mental health of rural and non-rural Chinese women. The emerging group of Chinese full-time homemakers are vulnerable in regards to their mental health and wellness.

5.2. Implication for Future Research

The mental health of women at childbearing and childrearing stages is largely understudied within the Chinese social context. Future research studies should continue to focus on the mental health of Chinese women at childbearing and childrearing stages. First, previous conducted studies on the mental health of Chinese women remain scarce among this particular population. Previous studies mainly sampled the study participants from hospitals in urban areas. Thus, the rural population, minorities, and some special groups, such as rural to urban migrant workers and their spouses, were not represented. Future studies should pay more attention to these groups of people. Second, socioeconomic and cultural factors are found to play an essential role in the mental health of Chinese women at childbearing and childrearing stages. Future studies are recommended to conduct with self-collected data that encompasses socio-cultural factors. Finally, with the increasing number of full-time homemakers in urban China, further focus should be given to them in regards to their mental health measured with various indicators like anxiety and depression.

5.3. Implication for Practice

The dissertation study also provides implications for future policymaking and public health practice. First, the identification of risk factors for postpartum depression among Chinese women points the direction for policymakers, public health practitioners, and social workers. The current health promotion programs are a useful reference for future programs, which are targeted to prevent postpartum depression among Chinese women. Section 2 provided that future public health policymaking and resource

allocation should fully consider the regional gap between western, central, and eastern areas of China, as well as between rural and non-rural areas China. Finally, the third study suggests the society pay attention to the mental health of the emerging population of the highly educated full-time homemakers in non-rural areas under the new policy. With the release of the universal two-child policy, the improvement of the nursery system should be placed at the top of the agenda. China should incorporate experiences from countries with complete and advanced nursery service and build up the early childcare system as soon as possible.

5.4. Limitations

This study used secondary data to analyze the target research questions. The secondary data nature of the study limits its ability to include all related variables. Future studies are advised to include social context variables in the model to complete a better analysis. Second, the lack of qualitative methodology in the dissertation limits its ability to provide more full details of the problem. Further, perceived stress is not the best indicator of mental health.

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