学 位 論 文

# Development and evaluation of a mental health promotion intervention among Chinese women living in Japan
(在日中国人母親へのメンタルヘルス促進の介入プログラムの開発・評価)

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## Abstract

**Background:** Chinese women have constituted the largest foreign female population in Japan since 2006. Mental health problems among immigrant women have been observed in countries with high immigration rates. Immigrant women in Japan, particularly Chinese women, lack adequate and effective social support mechanisms, leading to distress and social isolation. Following the outbreak of coronavirus disease 2019 (COVID-19), Chinese women living in Japan are highly concerned about COVID-19, which is significantly associated with their poor psychological well-being. It is necessary to provide appropriate social support to improve the mental health of Chinese women living in Japan. However, few studies focused on improving immigrant women's mental health in Japan, including Chinese women.

**Aims:** This study aims to develop a mental health promotion intervention and evaluate the effect of the intervention among Chinese women living in Japan.

**Methods and Results:** This study was systematically conducted as follows.

**Study I:** A systematic review was performed to identify and analyse the effectiveness of previous interventions for improving immigrant women's mental Reviews and Meta-Analysis checklist. Studies from December 1948–August 2021 were retrieved from four databases: MEDLINE, CINAHL, EMBASE, and Cochrane Library. The data were summarized using narrative analysis. Eight studies met the inclusion criteria and were included in the final analyses. There was a lack of effective health. This systematic review used the Preferred Reporting Items for Systematic interventions to improve immigrant women's mental health. Depression as a significant variable was emphasized in the evaluation of immigrant women's mental health. All possible

healthcare providers of future clinical interventions for immigrant women should first consider the needs of the targeted immigrant women.

**Study II:** A qualitative study was conducted to explore the parenting and mental health promotion needs of Chinese women living in Japan and provide recommendations to guide interventions. Semi-structured in-depth interviews were conducted. Participants included 15 Chinese women aged 28–39 years who were pregnant or rearing a child younger than six years old in Japan. Thematic analysis was performed for data analysis. More than half of the participants experienced mental health problems, such as depressive symptoms and parenting stress. Four themes relating to their needs were identified: concrete support, information provision, caring and understanding, and social network building. Information provision and social network building were emphasized as practical social support mechanisms to improve the mental health of Chinese women living in Japan.

**Study III:** An Internet-based intervention was developed, which involved the participants utilising an information provision application and attending online parenting workshops. Meanwhile, a quasi-experimental pre- and post-intervention test with a control group design was used to evaluate the effect of the intervention. Sixty-four Chinese women who were rearing a child younger than six years old were recruited from online groups. The intervention group (IG, n=32) participated in the online workshops once a week for six weeks and accessed the application, whereas the control group (CG, n=32) did not. The outcome measures included mental health distress, depression, social support, and parenting stress, applying the 12-item General Health Questionnaire, the Center for Epidemiological Studies Depression Scale, the Child-rearing Stress Scale, and the Multidimensional Scale of Perceived Social Support, respectively. Data were collected during the period February to April 2022. Data

analysis was performed using repeated-measures analysis of variance. The study found that the intervention group showed a significant improvement in mental health distress ($F = 9.555$, $p = 0.003$, $\eta^2 = 0.134$) and a decrease in depression ($F = 13.078$, $p = 0.001$, $\eta^2 = 0.174$) compared with the control group. There were no significant differences in social support ($F = 0.128$, $p = 0.722$, $\eta^2 = 0.002$) and parenting stress ($F = 0.390$, $p = 0.535$, $\eta^2 = 0.006$) between the groups. The participants in the intervention group highly appraised the mental health promotion programme, especially the online parenting workshops.

**Conclusions:** The intervention significantly improved the depression and mental health distress of Chinese women living in Japan but did not affect social support and parenting stress. The long-term effect of the Internet-based intervention with more than two repeated measures should be considered for future evaluation. The findings suggest that informational provision applications and online parenting workshops could be utilised to assist immigrant women with multicultural backgrounds in attempting to improve their mental health status and quality of life. This study makes a significant contribution to the future practice of cross-cultural healthcare since Internet-based interventions to address immigrant women's mental health difficulties are lacking, even though access to the Internet is widely available.

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# Chapter I Introduction

Chinese women have constituted the largest foreign female population in Japan since 2006. Mental health problems among immigrant women have been observed in countries with high immigration rates. Immigrant women in Japan, particularly Chinese mothers, lack adequate and effective social support mechanisms, leading to distress and social isolation. Following the outbreak of coronavirus disease 2019 (COVID-19), Chinese women living in Japan were highly concerned about COVID-19, which was significantly associated with their poor psychological well-being. It is necessary to provide appropriate social support to improve the mental health of Chinese women living in Japan. However, few studies focused on improving immigrant women's mental health in Japan, including Chinese women. Thus, the purpose of this dissertation is to develop a mental health promotion intervention and evaluate the effect of the intervention among Chinese women living in Japan.

This dissertation comprises five chapters. Chapter I provides the dissertation overview and introduces the mental health status of Chinese women living in Japan. Chapter II presents a systematic review to identify the effectiveness of previous interventions for improving mental health among immigrant women. Chapter III describes a qualitative study to explore parenting and mental health promotion needs and provide development recommendations and evidence for the intervention. Chapter IV illustrates the development of an internet-based mental health promotion intervention that involved an information provision application and online parenting workshops, and depicts a quasi-experimental study to evaluate the effect of the intervention. Chapter V discusses the relevance of the Internet-based mental health

promotion intervention program to healthcare and nursing practice, the limitations and implications of the current study, and directions for future research.

## 1.1 Background

The number of international migrants was approximately 281 million in 2020, accounting for 3.6% of the global population (UN Department of Economic and Social Affairs, 2022). The health determinants of international migrants vary considerably between the countries of migration and destination due to their different backgrounds (Aldridge et al., 2018). Meanwhile, the process of migration and resettlement is recognized as a stress-inducing phenomenon associated with high mental health risks (Bhugra, 2004). Thus, international migration and mental health is a highly complex and nuanced topic that must be explored—particularly, immigrant women's mental health.

Women exhibit a high risk of postpartum depression during pregnancy and post childbirth (Liu et al., 2022). Compared with the native population, the immigrant population has been identified as experiencing greater problems in depression and anxiety (Bas-Sarmiento et al.2017). Thus, immigrant women might exhibit exceptionally higher risk than non-immigrant women. Immigrant women from low- and middle-income countries experienced perinatal depression relating to their children's mental health and highlighted social support as a protective factor (Fellmeth et al., 2017). Consequently, providing mental health support for immigrant women is recommended to prevent postpartum depression and strengthen public health policy (O'Mahony & Clark, 2018).

The World Health Organization (WHO) developed the Mental Health Action Plan 2013–2030, and updated a Comprehensive Mental Health Action Plan in 2021 to

call for international, regional and national partners to promote menta health and well-being for all people. Even though coronavirus disease 2019 (COVID-19) has led to an over 30% drop in international migration movements in 2020, the immigrant population still accounts for a high proportion of the population in many countries, such as 29.9% in Switzerland, 26.8% in New Zealand, 20.0% in Sweden, 14.0% in the Netherlands, and 13.7% in the USA (Organisation for Economic Co-operation and Development [OECD], 2021). Among the high proportions of immigrant populations, immigrant women account for more than half of the resident migrants in most countries (OECD, 2021). Thus, promoting the mental health of immigrant women is necessary.

As of December 2019, the number of foreign residents in Japan were 2,933,137, hitting a record high (Ministry of Justice, 2021). With the increasing number of foreign residents, the Japanese Ministry of Internal Affairs and Communications developed a Multicultural Coexistence Promotion Plan to help immigrants adapt to life in Japan. This has been in place since 2006. Based on this plan, each region in Japan provides livelihood support for foreign parents, such as creating a maternal and child health handbook in multiple languages, expanding parenting classes, and providing interpretation services for parents in nursery schools. This is helping Japan to become a multicultural society. Despite having been provided with social support, immigrant women in Japan still experience numerous difficulties associated with acculturation and child-rearing, such as adapting to a new culture, the language barrier, and numerous mental distress (Kita et al., 2015; Luo & Sato, 2020). However, few studies focused on the mental health of immigrant women in Japan. Besides, as immigrant populations are not a homogeneous group, their mental health issues should be considered and studied separately per their various backgrounds. Thus, this study focused on the largest number of immigrant women group in Japan—Chinese women.

## 1.2 The number of Chinese women living in Japan

Since the 1980s, there has been a growing number of immigrant workers in Japan owing to labor shortages (Kawai, 1993) and as of December 2021, the number of foreign residents in Japan was approximately 2,760,635, accounting for 2.2% of the Japanese population. Although the coronavirus disease 2019 (COVID-19) has led to a 5.9% decrease in foreign migration movements in Japan from the end of 2019 to 2021, the population of foreign residents has increased by 35.7% increase compared with the last major flux, which arose as a result of the Tohoku earthquake in 2012 (Ministry of Justice, 2022). Chinese immigrants were not the most prolific foreign group in Japan until 2007, when they exceeded the number of Korean immigrants (Ministry of Justice, 2022). As of December 2021, Chinese nationals constitute the largest group in Japan, with 716,606 Chinese nationals accounting for 26.7% of the foreign population (Ministry of Justice, 2022). For status of residence among Chinese residents in Japan, 'permanent resident' status accounted for the majority at 41.4%, followed by 'student' status at 13.5%, and 'technical, humanities, and international services' status at 11.3% (Ministry of Justice, 2022). Since Japan is not a traditional immigrant country, as the general rule, applicants became eligible to apply for permanent residency after 10 continuous years of residency in Japan. Thus, the current major reasons for Chinese residents living in Japan are study and work.

Since 2006, Chinese women have constituted the largest foreign female population in Japan. Meanwhile, the rate of Chinese women marrying Japanese men increased by 13.8% from 1995 to 2015 (Ministry of Justice). Chinese women have gradually become a noteworthy group in Japan. According to the latest data from Ministry of Justice (2022), Chinese women have constituted the largest foreign female

population in Japan, accounting for 27.8% of the overall population as of December 2021.

### 1.3 Metal health of Chinese women living in Japan before the COVID-19

In general, Chinese women raising preschool children experience higher parenting stress compared to Japanese, Korean, and Brazilian women (Shimizu, 2004). This higher parenting stress is also evident in a relatively old survey among Chinese women who are caring for their preschool-aged children in Japan (You & Emori, 2010). In contrast to Japanese women who believe that mothers should focus on taking care of their children and take on most of the responsibility of child-rearing, Chinese women believe that parents should share the responsibility of child-rearing and generally obtain social support from their community and family, especially the woman's mother and mother-in-law (Mori et al., 2012). Due to the different child-rearing values, Chinese women in Japan have difficulty obtaining child-rearing support from their mothers-in-law. Meanwhile, the child-rearing backing of the woman's mother is also difficult to obtain because of living in a foreign country. Therefore, Chinese women are prone to experiencing stress related to child-rearing, given the lack of social support for child-rearing in Japan, which relates to maintaining traditional culture and adapting to new child-rearing customs (Jin et al., 2016). These factors and the lack of effective social support may affect their mental health and well-being. Furthermore, a high level of parenting stress can give rise to serious health problems such as depression and sleep deprivation (Han & Kim, 2017; Da Estrela et al., 2018). The parenting stress of immigrant women was reported to associate with social support (Kim, 2018). Hence, the research questions 'what is the level of mental health, parenting stress, and social support among Chinese women in Japan?' and 'what are the relationships between

mental health, social support, and parenting stress among Chinese women in Japan?' were considered.

To address these research questions, the author conducted a cross-sectional study on Chinese women in Japan with at least one child under the age of 6, between 1 March and 31 October 2019 (Luo & Sato, 2021a). The results showed that Chinese women in Japan demonstrated high levels of parenting stress and low levels of mental health. Significant associations were found among mental health, parenting stress, and social support. Meanwhile, based on the 'social support theory' (Norbeck & Tilden, 1988), the mediating effect of parenting stress on social support and mental health was found (Figure 1.1).

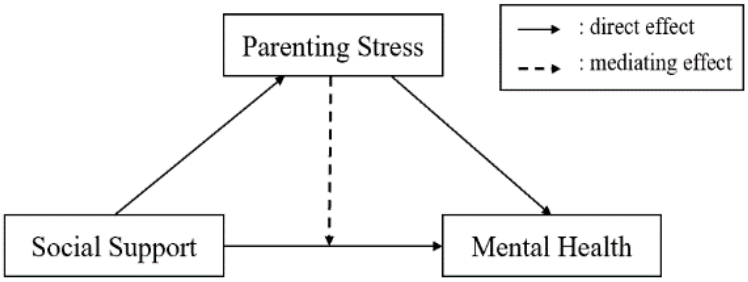



**Figure 1.1 The relationships of mental health, parenting stress, and social support**

Based on these findings, there are three suggestions for the mental health promotion of Chinese women living in Japan. First, social support could be directly provided to improve mental health. This suggestion has been generally implemented for immigrant populations in many countries including Japan (Kita et al. 2015). Second, mental health support providers need to focus on stress not only from the acculturation process but also from the child-rearing process among immigrant women. Some mental health promotion programs and interventions only focused on cross-cultural stress while ignoring parenting stress among immigrant women (Baiden & Evans, 2020; López-Zerón et al., 2020). Third, since parenting stress could influence the

effectiveness of mental health support, more attention needs to focus on parenting stress to ensure the effectiveness of mental health support to avoid wasting social resources. A practical and evidence-based mental health promotion program for immigrant Chinese women living in Japan should be developed.

### 1.4 Metal health of Chinese women living in Japan during the COVID-19

Since December 2019, the novel coronavirus SARS-CoV-2 has been spreading rapidly throughout the world. Numerous countries and regions have taken various prevention and control measures and strategies to reduce the spread of COVID-19 transmission, such as lockdowns, imposing physical distancing, staying at home, and restricting group events (Telles et al., 2021; Shah et al., 2020). In Japan, the government urged residents to establish a 'new lifestyle' based on avoiding places corresponding to the 'three Cs' (closed spaces, crowded places, and close-contact settings) and implementing necessary countermeasures such as physical distancing, wearing a mask, and washing hands (Government of Japan, 2020). Although these measures have proven effective in slowing the spread of the disease, they inevitably resulted in a substantial negative effect on mental and physical health and well-being among various populations (Wang et al., 2021; Shaukat et al., 2020), including people living in Japan (Stickley et al., 2021).

Due to the COVID-19 outbreak, the general female population in Japan experienced poor mental health, with a significantly increased suicide rate (Ueda et al., 2021). Immigrant women, as a minority group, experienced more mental health problems than native women (Daoud et al., 2019). A qualitative study on the immigrants in the United States reported that the COVID-19 pandemic affects immigrants' mental health (Rocha et al., 2021). The author inferred that immigrant

women in Japan might experience a low level of mental health status following the outbreak of the COVID-19 pandemic.

Besides, due to the ongoing pandemic, the Chinese government declared a lockdown from January 23, 2020, and announced stricter testing and two-week quarantine measures for people wanting to enter China (Chinazzi et al., 2020). These measures placed the Chinese women in Japan in a stressful situation and made it challenging for them to return to China. Therefore, the author proposed that the mental health status of Chinese women in Japan might have been severely affected by the COVID-19 outbreak, thus necessitating further investigation.

To assess the mental health status and the risk factors associated with poor mental health of Chinese women in Japan following the COVID-19 outbreak, the author performed a cross-sectional survey in October 2020 (Luo & Sato, 2021b). As a results, over 95% of Chinese women in Japan reported that the pandemic affected their daily lives and resulted in concerns about the pandemic. Chinese women in Japan experienced a low level of mental and high COVID-19 were associated with poor mental health. These findings provide evidence for policymakers, public health nurses, and social supporters to maintain and improve the well-being of Chinese immigrant women and immigrant women in Japan, especially in terms of mental health, during the COVID-19 pandemic.

Following the outbreak of COVID-19, all support and events to assist the adaption process of foreign residents, such as interpretation services, childcare seminars, and child-rearing meet-ups, have been suspended. Previous studies indicated that due to the COVID-19 restrictions, various populations experienced a low level of social activity, which consequently influenced their physical and mental health (Shepherd et al., 2021; Jacob et al., 2020). The lack of necessary social activities may

be a noteworthy reason for the effect on immigrant Chinese women's physical and mental health. Thus, the next step needs to update the support plan for immigrant women to provide available mental health promotion approach—such as online seminars and meet-ups—during these extraordinary periods to improve their health status.

## 1.5 Purpose of the dissertation

The purpose of this dissertation is to develop a mental health promotion intervention among Chinese women living in Japan and to evaluate the effect of the intervention.

To establish an evidence-based mental health promotion intervention, the study program was systematically conducted step by step. The chapters of this dissertation are organized according to the steps of the study. The aims of each chapter as follows:

Chapter I: To provides the overview of the dissertation and introduces the mental health status of Chinese women living in Japan.

Chapter II: To identify and analyze the effectiveness of previous interventions for promoting immigrant women's mental health and explore a scientific method for developing the mental health promotion intervention among Chinese women living in Japan.

Chapter III: To explore parenting and mental health promotion needs and to provide development recommendations and evidence for the mental health promotion intervention among Chinese women living in Japan.

Chapter IV: To develop a mental health promotion intervention and evaluate the effect of the intervention among Chinese women living in Japan.

Chapter V: To discuss the relevance of the mental health promotion intervention program to healthcare and nursing practice, the limitations and implications of the current study, and directions for future research.

## 1.6 Definitions

### 1.6.1 Mental health

Mental health is a state of mind characterized by emotional well-being, good behavioral adjustment, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relationships and cope with the ordinary demands and stresses of life (VandenBos, 2007). Generally, mental health is a state of wellbeing in which an individual realizes his or her abilities, can cope with the normal stresses of life, can work productively, and is able to make contribution to his or her or their community (WHO, 2001).

### 1.6.2 Mental health promotion

Mental health promotion was defined as assisting people to acquire the knowledge and information they need to promote and protect their mental well-being, focusing on two primary outcomes, including promoting high levels of mental well-being and preventing the onset of mental health conditions life like depression.

### 1.6.3 Parenting stress

Parenting stress is a distinct type of stress that arises when parenting demands exceed the expected and actual resources available to the parents that permit them to succeed in the parent role (Deater-Deckard et al., 2017).

### 1.6.4 Social support

Social support is the provision of assistance or comfort to others, typically to help them cope with biological, psychological, and social stressors. Support may arise

from any interpersonal relationship in an individual's social network, involving family members, friends, neighbors, religious institutions, colleagues, caregivers, or support groups (VandenBos, 2007).

## 1.7 Chapter Summary

In summary, this chapter has elaborated the background of the study on the number and mental health status of Chinese women in Japan before and after the COVID-19 outbreak, the purpose of the study, terms definitions, and an overview of this dissertation.

# Chapter II Interventions to improve immigrant women's mental health: A systematic review

## 2.1 Abstract

Immigrant women rearing children and living in a foreign country experience many mental health problems during pregnancy, child-rearing, and acculturation. Mental health problems can be controlled or modified through effective practices. Few studies have examined the role of different types of interventions in alleviating these mental health issues in immigrant women in the perinatal period, and it is unclear whether such interventions are effective. This study aims to identify the effectiveness of interventions for improving immigrant women's mental health and explore the role of these interventions in nursing practice. This systematic review used the Preferred Reporting Items for Systematic Reviews and Meta-Analysis checklist. Studies from December 1948–August 2021 were retrieved from four databases: MEDLINE, CINAHL, EMBASE, and Cochrane Library. This systematic review's protocol was registered at PROSPERO (CRD42020210845). The data were summarised using narrative analysis. Eight studies met the inclusion criteria and were included in the final analyses. The interventions included home visit programmes, asset-building mental health interventions, cognitive-behavioural interventions, nursing interventions, perinatal education interventions, and mindfulness interventions. Home visit programmes and asset-building mental health interventions have reported positive outcomes in improving depressive symptoms and mental health. There are few interventions for improving immigrant women's mental health. Most existing interventions are conducted through group education, but there are no explicit

significant effects. Home visits may be an effective approach for conducting interventions to improve immigrant women's mental health. An effective nursing intervention should be developed, and more research is needed in improving immigrant women's mental health. This review provides evidence for nurses and midwives to practice appropriate and effective approaches and strategies for improving immigrant women's mental health, and suggests possible future interventions for this cohort of immigrant women in the perinatal period.

## 2.2 Introduction

During pregnancy, childbirth, and child-rearing, women generally experience significant physical, mental, and social changes associated with a high risk of depression, anxiety, and stress (Antoniou et al., 2021). Immigrant women experience the challenges of pregnancy and child-rearing and must overcome the difficulties associated with the process of acculturation, such as adapting to a new culture and the language barrier (Luo & Sato, 2021a; Vo, 2021). The mental health problems of immigrant women include high risks of postpartum depression (Ganann et al., 2020; Hung et al., 2012), high anxiety levels (Lee et al., 2014), and the stress of acculturation and parenting (Kim, 2018). It is clear that mental health issues commonly associated with pregnancy and child-rearing are aggravated when the mother is an immigrant. However, due to different cultural backgrounds, social stigma, and unfamiliarity with the host country's medication and health care services, immigrant women still face many difficulties when receiving mental health care services (O'Mahony & Donnelly, 2007).

A previous study demonstrated that mental health interventions could effectively improve depression, anxiety, and psychological wellbeing in the general

population (Lattie et al., 2019). Furthermore, psychological interventions in the primary care setting have been shown to significantly improve prenatal and postpartum depressive symptoms in non-immigrant women (Stephens et al., 2016). Although a small number of studies have examined the role of different types of interventions in alleviating these mental health issues in immigrant women in the perinatal period, it is not clear whether such interventions are effective. Identifying the effectiveness of interventions is necessary to provide evidence for implementing practices to improve immigrant women's mental health. Thus, in this systematic review, the research question considered was: 'What is the effectiveness of the interventions used to improve mental health among immigrant women?'

## 2.3 Aims

The objectives of this systematic review were to identify the effectiveness of interventions for improving mental health among immigrant women and to explore the role of nursing practices in these interventions.

## 2.4 Methods

This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 Statement (Page et al., 2021b), and used the PRISMA checklist (Page et al., 2021a). The protocol for the systematic review was registered at PROSPERO under the registration number: CRD42020210845 (Luo et al., 2020). However, the registered protocol and the actual study differ in one aspect. In the protocol, the registered quality appraisal tool was the Joanna Briggs Institute Critical Appraisal Tools (Tufanaru et al., 2020). Nevertheless, as most of the studies included in the present review used a mixed methods approach,

this systematic review ultimately used the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018a).

### 2.4.1 Data search and selection

A systematic search was performed using the MEDLINE, CINAHL, Embase, and Cochrane Library databases. The primary data search was conducted in January 2021, retrieving studies from December 1948 to January 2021, and the search was limited to English language studies. To update the results and include articles published between January and December 2021, a repeated search was conducted on December 9, 2021. According to Medical Subject Heading terms, a variety of keywords were used. A sample of search terms for this systematic review is presented in Table 2.1. Boolean terms 'AND' and 'OR' were used to include all articles. Additionally, reference lists of the included studies were reviewed to manually search for potentially relevant articles.

**Table 2.1 Search terms**

| | |
|---|---|
| #1 | emigration or immigration or immigrant or emigrant or migrant or foreigner or alien |
| #2 | women or female or mother or mom |
| #3 | intervention or prevention or program or strategy or service or care |
| #4 | mental health or mental competency or mental hygiene or depression or depressive disorder or anxiety or anxiety disorders or affective symptoms or psychological symptoms or psychological distress |
| #5 | #1 AND #2 AND #3 AND #4 |

### 2.4.2 Inclusion and exclusion criteria

The inclusion criteria were as follows: (1) study participants were foreign women who were pregnant, gave birth, or reared children in the destination country; (2) studies performed interventions related to improving mental health, preventing mental

illness, and reducing stress in these populations; (3) study outcomes were appraised using mental health-related variables; and (4) articles were published in English.

The exclusion criteria were: (1) study participants had intellectual disabilities, (2) study participants were immigrant women under 18 years of age, (3) intervention participants did not include immigrant women, (4) study outcome appraisal had no mental health-related variables, (5) studies did not include any intervention, and (6) interventions did not relate to improving mental health.

### 2.4.3 Quality appraisal

Quality assessments were conducted using the 2018 version of the MMAT (Hong et al., 2018a). The MMAT is a critical appraisal tool that can appraise five types of methodological studies, namely qualitative research, quantitative descriptive studies, randomised controlled trials (RCTs), non-randomised studies, and mixed-methods studies. The MMAT includes two screening questions for all study types and five quality criteria in different methodological studies. The responses are categorized as 'Yes', 'No', or 'Cannot tell'. All selected articles were first assessed by the two screening questions; only articles that received a 'yes' received further appraisal using the five quality criteria (Hong et al., 2018b). In the appraisal process of this review, two reviewers independently performed the screening, and each article was appraised until a consensus was reached. If there were any eligibility disagreements, a third reviewer participated in assisting and deciding.

### 2.4.4 Data extraction and analysis

Detailed data extraction included authors, publication year, purpose, study design, participants, sample size, intervention, setting, measures, and the main outcomes for immigrant women. Due to the variability in the measurements used, variables assessed, and differences in target participants in the different studies, it was

impossible to conduct a statistical meta-analysis of the data. Therefore, the data were summarised using narrative analysis.

## 2.5 Results

### 2.5.1 Search results

Study selection was performed following the guidelines of the PRISMA statement (Moher et al., 2009). The search and selection process is illustrated in Figure 2.1. A total of 13,366 studies published from December 1948 to August 2021 were identified from the four databases. After removing duplicate records, 10,404 records were screened by their titles and abstracts. Of the screened studies, 88 were included for full-text review and 80 did not meet the inclusion criteria. Related studies from the reference lists did not meet the inclusion criteria and were excluded. Finally, eight studies were included in the analyses.

### 2.5.2 Description of selected studies

Table 2.2 presents the characteristics of the selected studies. The studies were published between 2000 and 2020. Among the eight selected studies, six were from the United States (Cowell et al., 2000; Karasz et al., 2015; Le et al., 2011; Le et al., 2021; Lutenbacher et al., 2018; Ryan et al., 2018), one was from the Netherlands (Hesselink et al., 2012), and one was from Japan (Jin et al., 2020). The sample size differed significantly, ranging from 8 to 239 people.

Of the eight included studies, two were RCTs (Le et al., 2011; Lutenbacher et al., 2018), one was a quasi-experimental study (Hesselink et al., 2012), and five used mixed methods (Cowell et al., 2000; Jin et al., 2020; Karasz et al., 2015; Le et al., 2021; Ryan et al., 2018). Among the mixed methods studies, one had an initial qualitative interview to identify the intervention contents and target population needs followed by

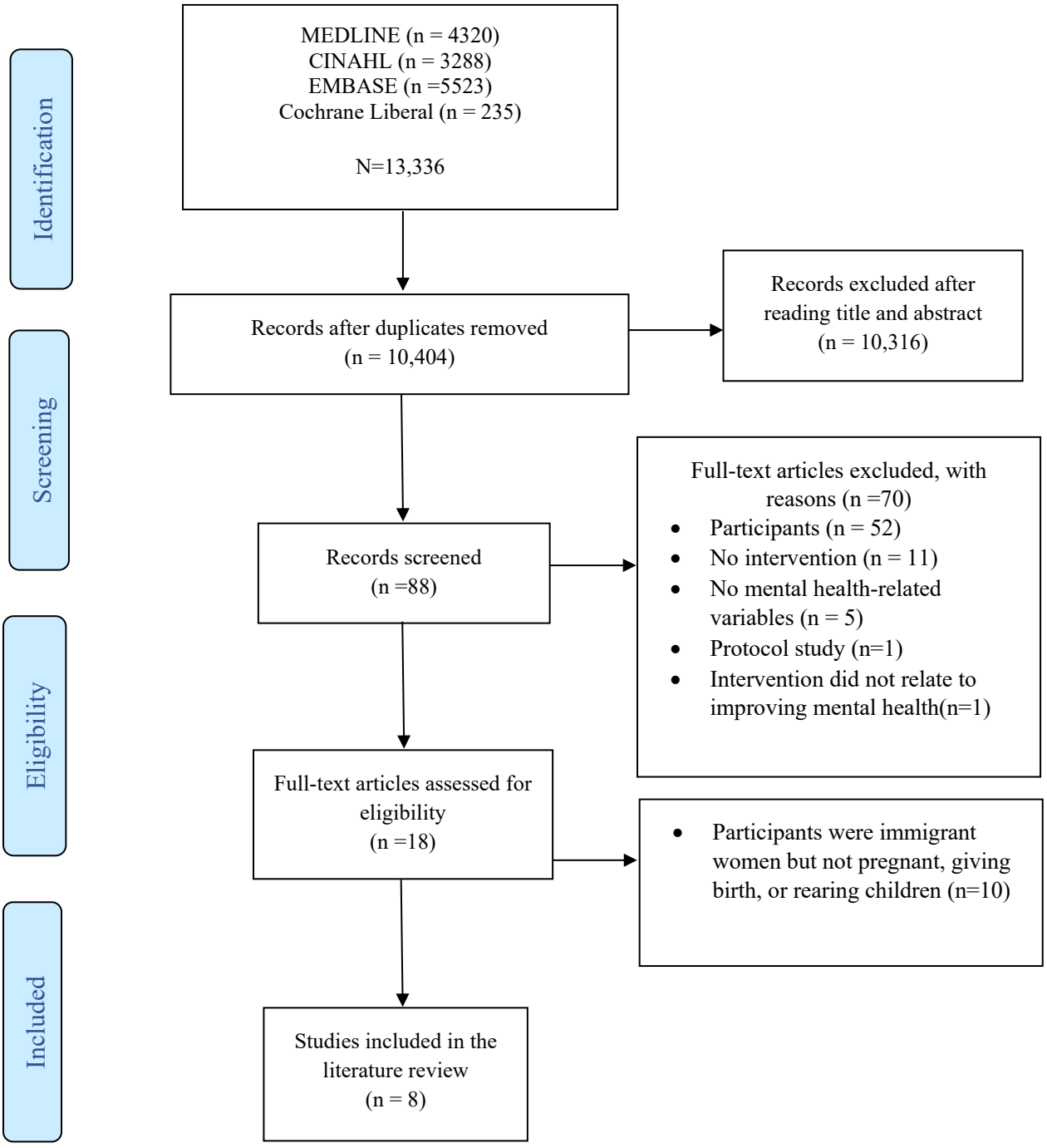



**Figure 2.1 The process of data search and selection following the PRISMA guidelines**

a pre-and post-test study design (Cowell et al., 2000); three had an initial quasi-experimental design with a single group pre-and post-test study design followed by a qualitative interview to appraise the participant's experiences and satisfaction with the intervention (Jin et al., 2020; Le et al., 2021; Ryan et al., 2018); and one had an initial qualitative interview followed by a random assignment experimental study design to collect both quantitative and qualitative data (Karasz et al., 2015).

The targeted populations of these studies included Spanish-speaking women (Cowell et al., 2000; Le et al., 2011; Le et al., 2021; Lutenbacher et al., 2018; Ryan et al., 2018), Turkish women (Hesselink et al., 2012), Chinese women (Jin et al., 2020), and Bangladeshi women (Karasz et al., 2015). Among these participants, three studies considered immigrant mothers (Cowell et al., 2000; Karasz et al., 2015; Ryan et al., 2018), one study examined women who were pregnant or up to 1 year postpartum (Le et al., 2021), and four studies recruited women during pregnancy and followed up with them until the postpartum period (Hesselink et al., 2012; Jin et al., 2020; Le et al., 2011; Lutenbacher et al., 2018). Participants were recruited from female infant and child services (Hesselink et al., 2012), public health services (Le et al., 2021), elementary schools (Cowell et al., 2000), community-based organisations (Karasz et al., 2015; Le et al., 2011; Ryan et al., 2018), hospital clinics (Jin et al., 2020; Le et al., 2011), and through flyers and announcements in areas with high volumes of immigrant customers (Lutenbacher et al., 2018). Seven studies reported ethical approval and/or obtained informed consent from study participants (Cowell et al., 2000; Hesselink et al., 2012; Jin et al., 2020; Karasz et al., 2015; Le et al., 2021; Lutenbacher et al., 2018; Ryan et al., 2018), and one study did not (Le et al., 2011).

## Table 2.2 Characteristics of selected studies

| Study | Purpose | Study design/ Participants/ Sample Size | Intervenor/ Setting | Interventions |
|---|---|---|---|---|
| Cowell et al. (2000) | To develop and test a Mexican American problem-solving home- and school-based school nursing intervention with Mexican immigrant families in the city of Chicago | **Mixed methods in 3 phases:**<br>**Phase 1.** Qualitative design (focus group),<br>● Mexican immigrant (Spanish-speaking) mothers,<br>● n =9<br>**Phase 2.** Instrument assessment<br>**Phase 3.** A quasi-experimental design with a single group pre- and post-test, Mexican immigrant mothers (n = 8) and their children (n = 17) | ● Bilingual Latina nurses<br>● Elementary school | ● **Home visits:** Using developed home visiting manual to guide the school nurse-mother interaction for eight visits over 8 weeks |
| Hesselink et al. (2012) | To evaluate an antenatal programme targeting multiple risk factors among Turkish women living in Amsterdam | ● A quasi-experimental design with a control group<br>● Turkish immigrant women from 3–5 months pregnant to 6 months postpartum<br>● n = 239 (EG = 89, CG = 94, lost = 56) | ● Trained Turkish community health workers in collaboration with midwives and physiotherapists<br>● The public health service | **For EG,**<br>● **Group classes:** Eight classes of 2 hours each before and after delivery<br>● **Individual contacts:** Two times of 2 hours each before delivery<br>● **Home visits**: Two times of 1 hour each after delivery<br>**For CG**, usual care |
| Jin et al. (2020) | To evaluate the effectiveness of a nursing intervention programme for Chinese women who gave birth in Japan to reduce cross-cultural stressors during the postpartum period and prevent postpartum depressive symptoms | ● Mixed methods with a single group pre- and post-test design<br>● Chinese women who were at least 30 weeks pregnant were included; they were followed through 1 month postpartum<br>● n = 38 | ● Chinese researcher in collaboration with a Japanese midwife<br>● The facility where participants were enrolled in prenatal care and pretending to give birth | ● **Maternity group classes:** Ninety minutes of maternity group education and distribution of a Chinese-language pamphlet to provide information on postpartum life<br>● **Conversation cards:** To help participants obtain assistance from nurses during their hospitalisation after delivery<br>● **Social-network groups:** A social-network group based on an online chat tool for each group to obtain peer support by communicating |
| Karasz et al. (2015) | To describe the development and a preliminary pilot evaluation of the intervention for Bangladeshi immigrant women in Bronx | **Mixed methods in 2 phases:**<br>**Phase 1.** Qualitative design (group discussion),<br>● Bangladeshi immigrant women,<br>● n = 16<br>**Phase 2.** Pilot study with a random assignment control group using quantitative and qualitative approaches,<br>● Bangladeshi immigrant women experiencing symptoms of tension/depression with at least three children<br>● n = 53 (EG = 32, CG = 21) | ● Peer health workers<br>● Phase 1 in a medical clinic; Phase 2 in a community-based organization | **For EG,**<br>● **Group sessions:** Twelve sessions twice a month, 2 hours in a private meeting space, with contents including psychological skills, social network, and financial asset building<br>**For CG**, no intervention |

EG, experimental group; CG, control group; RCTs, randomised controlled trial

**Table 2.2 Cont.**

| Study | Purpose | Study design/ Participants/ Sample Size | Intervenor/ Setting | Interventions |
|---|---|---|---|---|
| Le et al. (2011) | To evaluate the efficacy of a cognitive-behavioural intervention to prevent perinatal depression in high-risk Latina immigrant women in Washington, DC | ● RCTs<br>● Latina immigrant (Spanish-speaking) women with a high risk for depression who were at least 24 weeks pregnant; they were followed through 1 year postpartum<br>● n = 217 (EG = 73, CG = 77, lost = 67) | ● Trained bilingual or/and bicultural research staff<br>● A community-based health centre and a hospital clinic | **For EG,**<br>● **Group sessions:** Eight meetings held weekly for 2 hours of cognitive-behavioural intervention psychoeducation during pregnancy<br>● **Individual booster sessions:** Three times during postpartum<br>**For CG,** usual care |
| Le et al. (2021) | To evaluate the effectiveness of cognitive-behavioural intervention to prevent perinatal depression in low-income Latina immigrant pregnant women in Washington, DC | **Mixed methods in 2 phases:**<br>**Phase 1**. Single group pre- and post-test study design,<br>● Latina immigrant (Spanish-speaking) women who were pregnant or up to 1 year postpartum,<br>● n = 86<br>**Phase 2.** Qualitative interview,<br>● Randomly selected subsample from phase 1,<br>● n = 26 | ● Trained bilingual and bicultural research staff and mental health professionals<br>● The women, infants, and children's services sites | ● **Group sessions:** Self-selected to attend six weekly classes of 'mothers and babies' course' consistent with a cognitive-behavioural and attachment theory and adapted to the contextual factors |
| Lutenbacher et al. (2018) | To test the efficacy of the home visit programme in a sample of Hispanic immigrant women in Tennessee | ● RCTs<br>● Hispanic immigrant (Spanish-speaking) women at least 26 weeks pregnant who were followed through 6 months postpartum<br>● n = 188 (EG = 91, CG = 87, lost = 10) | ● Trained peer mentors<br>● A high volume of Hispanic customers (e.g., clinics, markets, apartment complexes, churches) | **For EG,**<br>● **Home visits:** pregnancy through 6 months of age, c. 1 hour each<br>**For CG,** minimal education materials |
| Ryan et al. (2018) | To assess the feasibility and potential efficacy of a mindfulness intervention to improve mental health among Latina immigrant women in Seattle, Washington | ● Mixed methods with a single group pre- and post-test study design<br>● Latina immigrant (Spanish-speaking) women born outside of the USA with at least one child<br>● n=24 | ● Spanish-speaking mindfulness and yoga instructor<br>● A community-based organisation | ● **Mindfulness group classes:** Five sessions held weekly in 2-hour classes |

EG, experimental group; CG, control group; RCTs, randomised controlled trial

### 2.5.3 Types of interventions and main outcomes

The types of interventions reported included home visits (Cowell et al., 2000; Hesselink et al., 2012; Lutenbacher et al., 2018), group classes (Hesselink et al., 2012; Jin et al., 2020; Karasz et al., 2015; Le et al., 2011; Le et al., 2021; Ryan et al., 2018), individual contact (Hesselink et al., 2012; Le et al., 2011), providing conversation cards (Jin et al., 2020), and providing social network groups (Jin et al., 2020). Group classes ranged from one 90-minute class to twelve 2-hour meetings over a 6-month period, including cognitive-behavioural psychoeducation (Le et al., 2011), a mothers and babies' course (Le et al., 2021), antenatal education (Hesselink et al., 2012), maternity information provision (Jin et al., 2020), mindfulness and yoga instruction (Ryan et al., 2018), and financial asset building (Karasz et al., 2015). Three of the studies used multiple interventions (Hesselink et al., 2012; Jin et al., 2020; Le et al., 2011). All interventions were conducted by bilingual or bicultural intervenors, including school nurses (Cowell et al., 2000), health workers (Hesselink et al., 2012; Karasz et al., 2015), researchers (Jin et al., 2020; Le et al., 2011; Le et al., 2021), mental health professionals (Le et al., 2021), peer mentors (Lutenbacher et al., 2018), and mindfulness and yoga instructors (Ryan et al., 2018). Table 2.3 summarises the measures and main outcomes.

#### 2.5.3.1 Home visit programme

Two studies only performed interventions through home visits. The 8-week intervention by Cowell et al. (2000) developed a home visit manual to guide school nurses to provide support (e.g., affective support, health information, decisional control, and professional competency) based on problem-solving for immigrant mothers. In this study, the mothers' mental health and depression significantly improved. Lutenbacher et al. (2018) trained peer mentors to perform home visit interventions beginning before the 26th week of pregnancy and following through to 6 months postpartum to provide

## Table 2.3 Measures and main outcomes

| Study | Variables | Scales | Main outcomes |
|---|---|---|---|
| Cowell et al. (2000) | • Women's mental health | • Hopkins Symptom Checklist | • Significantly improved |
| | • Women's family function | • Feetham Family Function Survey | • Increased but no significance |
| | • Children's depression | • Child Depression Inventory | • Significantly improved |
| | • Children's health perception | • Child Health Self-concept | • Improved but no significance |
| | • Children's self-esteem | • Global Self-worth | • Improved but no significance |
| Hesselink et al. (2012) | • Depression | • Epidemiological Studies Depression Scale | • No significant effect |
| | • Parent-child attachment | • Seven statements | • No significant effect |
| | • Smoking | • Six questions answered using yes or no | • Significant effect on smoking knowledge during pregnancy ($p < 0.01$) |
| | • Infant care | • Four questions on a 3-point scale | • Significant effect on the intention to engage in sudden infant death syndrome prevention behaviour ($p < 0.01$) |
| Jin et al. (2020) | • Stress | • State-trait Anxiety Inventory | • No significant difference |
| | • Depression | • Edinburgh Postnatal Depression Scale | • No significant difference |
| | • Social support | • Social Support Scale | • Not mentioned |
| | • Cognitive appraisal, coping, stress, social support, and participant's evaluation | • Interview | • All participants showed positive cognitive appraisals |
| Karasz et al. (2015) | • Depression | • Patient Health Questionnaire-9 | • EG decreased ($p < 0.001$). After the intervention, EG was lower than CG ($p = 0.02$) |
| | • Indigenous distress | • South Asian Tension Scale | • EG decreased ($p = 0.004$). After the intervention, EG was lower than CG ($p = 0.005$) |
| | • Asset acquisition | | • Participants saved an average of 10 dollars per week |
| | • Perceptions and experiences of the programme | • Interview | • Helped with loneliness |
| Le et al. (2011) | • Depression | • Beck Depression Inventory, Second Edition | • Reduced depression during pregnancy but not during the postpartum period |
| Le et al. (2021) | • Depression | • Postpartum Depression Screen Scale, Short Form | • No significant differences |
| | • Psychopathology | • Interview based on the World Health Organization World Mental Health Composite International Diagnostic Interview | • None of the participants met diagnostic criteria for major depressive disorder at the final data collection time point |
| | • Participant's experiences with this intervention | • Interview | • No differences between intervention completers and non-completers |
| Lutenbacher et al. (2018) | • Parenting stress | • Parenting Stress Index-Short Form | • After the intervention, EG was significantly lower than CG |
| | • Depression | • Edinburgh Postnatal Depression Scale | • EG showed a significantly greater decrease than CG |
| | • Mother's confidence to breastfeed an infant | • Breastfeeding Self-efficacy Scale-Short Form | • EG significantly increased |
| | • The quality and quantity of stimulation and support available to a child in the home environment | • Home observation for measurement of the environment-infant-toddler | • EG showed a significantly higher level than CG |
| Ryan et al. (2018) | • Depression | • Patient Health Questionnaire-9 | • Decreased but no significance |
| | • Anxiety | • Generalized Anxiety Disorders-7 | • Decreased but no significance |
| | • Parenting stress | • Parental Stress Scale | • No changes |
| | • Perceived stress | • Perceived Stress Scale | • Decreased but no significance |
| | • Mindful awareness | • Mindfulness Attention Awareness Scale | • Decreased ($p < 0.1$) |
| | • Participant satisfaction | • Interview | • High satisfaction |

EG, experimental group; CG, control group.

peer support, such as listening to maternal concerns, providing maternal and child-rearing related education, and providing links to needed medical and social services. Depression and parenting stress significantly improved, and mothers' confidence in their breastfed infants significantly increased.

#### 2.5.3.2 Asset-building mental health intervention

Karasz et al. (2015) developed a 26-week asset-building mental health intervention by conducting group classes to help low-income immigrant women improve their psychological skills, strengthen their social networks, and build financial assets. After the intervention, symptoms of depression and tension significantly improved, and the participants recognised that the intervention helped their loneliness and helped them to save money.

#### 2.5.3.3 Cognitive-behavioural intervention

Two studies used cognitive-behavioural interventions to prevent perinatal depression. Le et al. (2011) conducted an RCT of an 8-week cognitive-behavioural intervention for low-income immigrant women to prevent perinatal depression, which included group classes and individual contacts. Compared with a control group who received usual care, the intervention group's depressive symptoms were reduced during pregnancy, but not during the postpartum period. Another study (Le et al., 2021) performed a 6-week mothers and babies cognitive-behavioural therapy course for immigrant women with a high risk of depression, and collected both qualitative and quantitative data. Although the results did not show a significant statistical effect on depression prevention, participants who completed the whole intervention displayed greater knowledge of the cognitive-behavioural therapy techniques, such as mood tracking and engaging in pleasant activities.

#### 2.5.3.4 Nursing intervention

Jin et al. (2020) conducted a nursing intervention for women at least 30 weeks pregnant who were followed through 1 month postpartum by a nursing researcher in collaboration with midwives using multiple approaches including maternity group classes, conversation cards, and social network groups. All participants showed positive cognitive appraisals, but no significant outcomes were reported for preventing postpartum depression and reducing stress.

#### 2.5.3.5 Perinatal education intervention

Hesselink et al. (2012) performed a perinatal education intervention in which health workers collaborated with midwives using a quasi-experimental design with multiple approaches including group classes, individual contacts, and home visits. The perinatal education intervention, which was conducted with women who were 3–5 months pregnant to 6 months postpartum, showed a significant effect on smoking knowledge during pregnancy and infant care but did not improve depression and parent-child attachment.

#### 2.5.3.6 Mindfulness intervention

Ryan et al. (2018) conducted a mindfulness intervention, which consisted of 5 weeks of group classes for immigrant mothers. The intervention significantly increased women's coping skills and self-care behaviours, but did not significantly affect depression, anxiety, parenting stress, or perceived stress.

### 2.5.4 Main themes of qualitative outcomes from mixed-method studies

Three main themes were identified from the qualitative outcomes of mixed-method studies: addressing problems to develop an intervention, participants' evaluation of an intervention, and exploring the source of mental health problems.

#### 2.5.4.1 Addressing problems to develop an intervention

Two studies conducted initial group interviews to develop an intervention (Cowell et al., 2000; Karasz et al., 2015). The main reported problems were different living environments and lifestyles, lack of legal status, different child-rearing methods, health safety concerns (domestic violence, abuse, alcohol and drug use, and gang violence), financial problems, and lack of support (Cowell et al., 2000; Karasz et al., 2015). Cowell (2000) reported that immigrant mothers preferred home visits than group classes and requested that services should include family members.

#### 2.5.4.2 Participants' evaluation of an intervention

Four studies performed interviews after an intervention to collect the participants' appraisals (Jin et al., 2020; Karasz et al., 2015; Le et al., 2021; Ryan et al., 2018). All of these studies reported positive feedback from participants, including high satisfaction with intervention contents and experience, help with mental health problems, increased mental health awareness, recognised social support, and improved problem-solving capabilities (Jin et al., 2020; Karasz et al., 2015; Le et al., 2021; Ryan et al., 2018). Two studies reported negative feedback, such as long programme periods and long group sessions (Karasz et al., 2015), and intervention contents did not entirely support participants' expectations (Jin et al., 2020).

#### 2.5.4.3 Exploring the source of mental health problems

Through a post-intervention interview, Jin et al. (2020) explored two sources of stress. The major source of stress was maternity stressors, such as a lack of social support from family during childbirth and child-rearing, relationship conflict with family members, and neonatal health problems. Minor sources of stress comprised cross-cultural stressors including emotional distance between family members with a different cultural background and language problems.

### 2.5.5 The role played by nursing

Three studies mentioned interventions conducted by nurses or health workers in collaboration with midwives. These interventions were highly effective in improving mental health (Cowell et al., 2000), knowledge of smoking and infant care (Hesselink et al., 2012), and positive cognitive appraisals (Jin et al., 2020). Nurses and midwives played essential roles in educating and counselling immigrant women about mental health issues.

### 2.5.6 Quality appraisal results

The outcomes of the appraisal of all selected articles are shown in Table 2.4. Based on the quality appraisal process proposed by Hong et al. (2018a), The studies of Hesselink et al. (2012) and Lutenbacher et al. (2018) were classified as having a high-quality level, and the others were considered of moderate quality. The main deficiencies concerned studies using mixed methods, which did not adequately interpret the integration of qualitative and quantitative components and did not individually appraise the quality of the qualitative and quantitative components.

**Table 2.4 MMAT critical appraisal of included studies**

| Studies | Qualitative randomised controlled trials | Qualitative non-randomised | Mixed methods | C1 | C2 | C3 | C4 | C5 | MMAT scores |
|---|---|---|---|---|---|---|---|---|---|
| Cowell et al. (2000) | | | ✓ | Y | Y | | Y | | 60% |
| Hesselink et al. (2012) | | ✓ | | Y | Y | Y | Y | Y | 100% |
| Le et al. (2011) | ✓ | | | Y | Y | | | Y | 60% |
| Karasz et al. (2015) | | | ✓ | | Y | | Y | | 40% |
| Ryan et al. (2018) | | | ✓ | | Y | | Y | | 40% |
| Lutenbacher et al. (2018) | ✓ | | | Y | Y | Y | Y | Y | 100% |
| Jin et al. (2020) | | | ✓ | Y | Y | | Y | | 60% |
| Le et al. (2021) | | | ✓ | | Y | Y | Y | | 60% |

**Note**: Each of the criteria above is scored as 'yes', 'no', or 'cannot tell'; each 'yes' response resulted in an increment of 20%. Scores needed to be at least 40% for the study to be included. High quality: scores from 80% to 100%; Moderate quality: scores from 40% to 60%; Low quality: scores less than 40%.

## 2.6 Discussion

There are few interventions for improving immigrant women's mental health, especially for those in the stages of pregnancy, childbirth, or early child-rearing. Meanwhile, the existing interventions have shown no explicit significant effects. Thus, there is a lack of effective nursing interventions to improve immigrant women's mental health. The current study is the most recent systematic review to target the effectiveness of interventions for improving the mental health of immigrant women in the perinatal period. To date, only a recent scoping review (Playfair et al., 2017) and a relatively old literature review (O'Mahony & Donnelly, 2010) were conducted on the subject. The current study addresses this gap in knowledge by assessing the efficiency of the interventions reported in extant literature.

Among the included studies, various mental health-related variables were evaluated, such as depression, parenting stress, anxiety, and social support. Previous studies (Ganann et al., 2020; Hung et al., 2012; Luo & Sato, 2021a; Lee et al., 2014) also used these variables to measure immigrant women's mental health status. However, few studies have examined acculturative stress as a mental health problem among immigrant women (Kim, 2018; Luo & Sato, 2021a). Most existing interventions did not improve mental health-related variables significantly. However, home visits helped immigrant women improve two mental health-related variables: depressive symptoms and parenting stress. Future interventions should explore methods of improving a broad range of mental health-related variables, such as acculturative stress, anxiety, mental health, and social support. Besides, home visit programmes as a healthcare improvement service play an essential role in addressing and preventing maternal depression (Tandon et al., 2020). Although there is insufficient evidence to recommend a home visit programme, home visits should be considered as an effective and

appropriate approach to enrol immigrant women in mental healthcare plans. Meanwhile, Fujiwara et al. (2012) found an association between the frequency of home visits and reduction in parenting stress; that is, the greater the number of visits, the lesser the stress. Therefore, future home visit programmes should consider the frequency of visits.

Postpartum depressive symptoms are a major psychological disorder that affects immigrant women's mental health (Alhasanat & Fry-McComish, 2015). In this review, seven of the eight studies evaluated depression variables to assess the efficacy of the interventions. Depressive symptoms were only significantly improved by an asset-building mental health intervention (Karasz et al., 2015) and a home visit programme (Lutenbacher et al., 2018). This accords with a literature review (Alhasanat & Fry-McComish, 2015), which indicated that socioeconomic status is a risk factor associated with the development of depression in immigrant women, and confirms a comprehensive systematic review (Munns et al., 2016) that reported peer-led home visiting to be important for parenting support. However, most interventions did not show a significant effect on depression, including antenatal education programmes (Hesselink et al., 2012), nursing interventions (Jin et al., 2020), cognitive-behavioural interventions (Le et al., 2011; Le et al., 2021), and mindfulness interventions (Ryan et al., 2018). O'Mahony and Clark (2018) mentioned that health public policy and practices affected postpartum health in immigrant women. Thus, depressive symptoms as a variable should not be ignored in future studies that evaluate the effect of mental health promotion interventions among immigrant women.

This review could not include many interventions, even though their target population was immigrant women, because the studies using these interventions did not explicitly mention pregnancy, childbirth, or child-rearing. One such study used a mental health improvement guidebook to provide a personal contact service by trained

gatekeepers (Choi, 2017). Another intervention developed a psychological adaptation improvement programme based on cognitive-behavioural therapy to offer group sessions by mental health nursing professionals (Won et al., 2014). Both interventions demonstrated significant improvements in mental health, depression, mental health literacy, acculturative stress, and self-esteem, but the targeted populations represented various cultural backgrounds. Among the two studies that were based on cognitive-behavioural therapy focusing on immigrant women with the same cultural background (Le et al., 2011; Le et al., 2021), only one showed a minor effect on reducing depression during pregnancy but not during the postpartum period (Le et al., 2011). This may be because a high proportion of women who experience pregnancy, childbirth, and child-rearing experience psychological disorders, which lead them to experience more difficulties in improving mental health as compared with other women.

All included studies targeting participants who had the same cultural background and were conducted using bicultural or bilingual interventions. A previous study reported that the language barrier was especially difficult for immigrant women to cope with and strongly affected their mental health (De Moissac & Bowen, 2019). However, language barriers were considered and addressed by healthcare workers, members of social support networks, and researchers. Although multicultural populations pose a significant challenge to nurses in providing individualised and holistic care and support, culturally competent nursing care helps ensure the target population's satisfaction and positive outcomes (Maier-Lorentz, 2008). Besides, one of the studies included in the review was an RCT which did not report the ethics review process (Le et al., 2011). Human subjects research should present robust and clear ethical discussions in the future (Bruno & Haar, 2020).

Most of the studies reviewed used a mixed methods design but were not

assessed as being of high-quality. However, the majority of immigrant women who participated in these studies reported positive feedback and high satisfaction with the interventions (Jin et al., 2020; Karasz et al., 2015; Le et al., 2021; Ryan et al., 2018). There were deficiencies in the reports of mixed methods research, which is nevertheless a useful research methodology for helping nurses and healthcare providers gain insight into clinical practice (Bressan et al., 2017). The results of this review suggest that future studies could consider using robust mixed-method designs to identify the targeted population's needs, design effective interventions, and test their effectiveness.

This systematic review had several limitations that must be considered. The included studies were only published in English, which may have introduced language bias. The included studies were also largely from the United States, which may affect the generalisability of the results. Moreover, several of the included studies were limited by the use of small sample sizes, which might have influenced their quality.

Nurses and midwives play an important role in conducting practices for improving the mental health of women during the stages of pregnancy, childbirth, and child-rearing. This review provides evidence for public health nurses and midwives to select appropriate and effective approaches and strategies for providing mental health care to immigrant women, such as home visits. Regarding the studies reviewed herein, interventions were administered by different personnel, most of whom were research staff. This systematic review suggests that future studies consider all possible providers of future clinical interventions for immigrant women in the perinatal period.

## 2.7 Conclusions

Most existing interventions were conducted through group education to reduce

immigrant women's depression symptoms, but there were few explicit significant effects. Home visits may be an effective approach for conducting interventions to improve immigrant women's mental health. There is a lack of effective nursing interventions to improve immigrant women's mental health. More work is needed to understand and investigate the factors relevant to implementing a practical and effective mental health promotion intervention among immigrant women. Future studies should develop effective interventions that first consider the needs of the targeted immigrant women.

## 2.8 Chapter summary

This chapter has depicted a systematic review to identify and analyze the effectiveness of interventions for improving immigrant women's mental health. Depression as a significant variable has been emphasized to evaluate the effect of mental health promotion among immigrant women. Thus, depression will be evaluated to test the effect of the intervention. Besides, instead of a mixed-methods design, a qualitative study design will be initially conducted to identify the target population's needs in the following chapter.

# Chapter III Promotion of parenting and mental health needs among Chinese women living in Japan: A qualitative study

## 3.1 Abstract

Chinese women raising children in Japan tend to experience high parenting stress and poor mental well-being. However, their specific parenting and mental health promotion needs remain unknown. This study aimed to explore the parenting and mental health promotion needs of Chinese women living in Japan and provide recommendations to guide interventions. Semi-structured in-depth interviews were conducted. Participants included 15 women aged 28–39 years who were pregnant or rearing a child younger than six years old. Thematic analysis was performed for data analysis. More than half of the participants experienced mental health problems, such as depressive symptoms and child-rearing stress. Four themes relating to their needs were identified: concrete support, information provision, caring and understanding, and social network building. Information provision and social network building should be emphasized as practical social support mechanisms to improve these women's mental health. Furthermore, a mental health promotion intervention should be developed to address this vulnerable population's needs. Healthcare providers and public health workers should help improve the social support systems of Chinese women in Japan to prevent mental health problems. Potential transcultural education can, arguably, help healthcare providers better understand transcultural care.

## 3.2 Introduction

Previous study found a high prevalence of postpartum depression in Chinese immigrant women (Chen et al., 2019). Immigrant Chinese new mothers in Japan are likely to exhibit a high risk of postpartum depression, general stress, and cross-cultural stress (Jin et al., 2016). Moreover, Chinese women living in Japan with preschool-aged children reported high parenting-related stress and expressed a desire for childcare support (You & Emori, 2010). Furthermore, a survey on the general population of immigrant Chinese women in Japan indicated that high coronavirus disease 2019 (COVID-19) concerns were related to poor mental health (Luo & Sato, 2021b). Therefore, improving this vulnerable population's mental health—especially during the emergency pandemic period—is necessary.

Few studies have been conducted on improving the mental health of Chinese immigrant women in Japan. A systematic review including 36 studies reported that immigrant perinatal women in Japan experienced varied physical, psychological, social, and economic problems and recommended social support to resolve them (Kita et al., 2015). However, only one study in this review included multiracial women such as Chinese women (Ogasawara, 2004). Additionally, some surveys that were administered in Japan for Chinese mothers with children of varying ages revealed that Chinese mothers exhibited parenting stress and loneliness, and lacked social support (Luo & Sato, 2021a; Wakimizu & Wang, 2022; Li et al., 2019). Furthermore, Jin et al. (2020) developed a nursing intervention to prevent postpartum depression among Chinese immigrant women in Japan, but no significant results were reported. Therefore, the specific needs of these women regarding parenting and mental health promotion should be identified to provide effective social support for this specific population and improve their mental health. This study addressed the research question, 'What are the parenting

and mental health needs of Chinese women living in Japan?'.

Qualitative research is a useful methodology that helps health and nursing science researchers understand the concerns of participants, guide emerging theories, and describe social support's health impact (Gray & Grove, 2020). Thus, qualitative study design was considered the ideal methodology to explore our aims.

## 3.3 Aims

This study aimed to explore parenting and mental health promotion needs and to provide development recommendations for an intervention promoting the mental health of Chinese women living in Japan.

## 3.4 Methods

A qualitative descriptive research design was employed to demonstrate the needs of Chinese immigrant women in Japan regarding their experience of parenting and mental health (Sandelowski, 2000; Sandelowski, 2010). This study conducted semi-structured interviews to guide participants on pertinent topics while providing the necessary flexibility to investigate new data (Gray & Grove, 2020).

### 3.4.1 Participants and recruitment

This study used the convenience sampling technique. Participants were recruited from various online groups using WeChat, a Chinese multi-purpose messaging social media platform developed by Tencent. Online groups of Chinese people living in Japan include consumer groups, second-hand goods exchange groups, and associations of Chinese students. Thereafter, snowball sampling was used to recruit more participants. The recruitment of study participants was stopped after attaining data

saturation. Approximately 90% of codes emerged after 12 interviews in a qualitative study (Guest et al., 2006). Women who met the inclusion criteria were recruited. The inclusion criteria were as follows: (1) Chinese women aged over 20 years; (2) experience of pregnancy or of having reared at least one child under the age of six years in Japan; (3) willingness to be interviewed; (4) ability to speak, read, and understand Mandarin Chinese; and (5) no diagnosed mental disorders or intellectual disabilities.

### 3.4.2 Data collection

The interview guide (see Table 3.1) was designed following a literature review and a previous study that indicated the mediating effect of parenting stress between social support and mental health among Chinese women living in Japan—based on the health effect of social support methodology (Luo & Sato, 2021a; Norbeck, 1987; Norbeck & Tilden, 1988). Thus, data collection included questions related to (1) demographic factors; (2) pregnancy, childbirth, and the child rearing experience; (3) mental health; and (4) an extended, open-ended question to explore more related experiences that the participants would like to narrate.

Before conducting the interviews, all participants read the informed consent form, expressed their willingness to be interviewed, and provided the required information. Participants could quit the interviews at any time without providing a reason for the same, and all relevant data would be withdrawn. Per the participants' convenience, interviews were conducted either face-to-face or online via Zoom. Face-to-face interviews were conducted in private areas, such as the interview room of the affiliated institution or the participant's home. Interviews were conducted in Mandarin Chinese from October to November 2021. Data were collected by the author, who is a Chinese woman living in Japan, a native speaker of Mandarin, and a nursing researcher with experience in conducting child-rearing salons, focus group discussions, and in-

depth interviews among foreign women living in Japan. Interviews lasted 25–60 min and were audio-recorded with the participants' permission. After the interviews, each participant received a gift card valued at 20 USD. To protect the participants' privacy, all collected data were coded with numbers (such as ID1, ID2, etc.) and stored using a password after personal information had been removed.

**Table 3.1 Interview guide card**

| Topics | Prompts |
|---|---|
| Demographic factors | Age, number of children, duration of residence, employment status, annual household income, education background, residential status, family structure, Japanese proficiency, nationality of spouse |
| Pregnancy, childbirth, and child-rearing experience | • Please tell me about your experience of pregnancy, childbirth, and child rearing in Japan.<br>• What kind of difficulties did you experience during pregnancy, childbirth, and child rearing in Japan?<br>• What caused these difficulties?<br>• How did you overcome these difficulties?<br>• What kind of support did you receive or wished to receive when going through these difficulties? |
| Mental health experience | • What do you think about the term 'mental health problem'?<br>• Did you experience any mental health problems during pregnancy, childbirth, and child rearing in Japan?<br>• What caused these mental health problems?<br>• How did you address these mental health problems?<br>• What kind of support did you receive or wished to receive when experiencing these mental health problems? |
| An extended question | • If you have any other experiences that you would like to share, please feel free to do so. |

### 3.4.3 Data analysis

The collected data were analysed using NVivo 12.0 software. Data were analyzed using the thematic analysis method (Braun & Clarke, 2006). To guarantee the trustworthiness of this study, credibility, transferability, dependability, and confirmability were considered (Korstjens & Moser, 2018). First, each recording was

transcribed, read, and reread in Mandarin Chinese by a native speaker. Second, initial codes were created and reviewed. Eighty-one initial codes were generated. The next level of analysis included reviewing the codes and translating them into English. The process of code generation and translation were independently conducted by two Chinese-English bilingual researchers in the field of medical or nursing sciences. If any differences or disagreements arose, a third researcher assisted in deciding. The translated data were further checked by an English native speaker. In this step, the variety of the initial codes was carefully kept to generate higher-level sub-themes. Initial codes with the same essence were categorised and refined into sub-themes and themes. The coding technique and process of generated themes and sub-themes were reviewed, discussed, and named by all the research team members.

### 3.4.4 Ethical consideration

This study was approved by the Ethics Review Committee of Faculty of Health Sciences, Hokkaido University (approval number: 21-57). Both oral and written informed consent was obtained from each participant before performed data collection.

## 3.5 Results

Seventeen women were approached; two were excluded as they did not meet the inclusion criteria and did not complete the interviews. Finally, 15 participants were interviewed and analyzed. Among the 15 participants, 10 were recruited from various online groups, and 5 were recruited using the snowball sampling method.

### 3.5.1 Participants' demographic factors

Table 3.2 presents the participants' demographic factors. Participants' mean age was 32.7 (SD = 3.0), ranging from 28 to 39 years. The mean length of residence duration was 7.8 (SD = 4.4) years. Roughly half (8) of the participants had two children,

9 were employed, 8 had a middle level of annual household income, and 8 had a graduate school educational background. Further, 6 had non-work permit residence status, 13 lived in a nuclear family structure, 9 had a middle or low level of Japanese proficiency, and 14 were married to a Chinese man.

**Table 3.2 Demographic factors of participants in the qualitative study (*n* = 15)**

| Demographic Factors | Categories | Number (%) |
|---|---|---|
| Age (years) | 28–34 | 10 (66.7%) |
| | 35–39 | 5 (33.3%) |
| Number of children | 1 | 7 (46.7%) |
| | 2 | 8 (53.3%) |
| Duration of residence (years) | <5 | 3 (20%) |
| | 5–10 | 8 (53.3%) |
| | >10 | 4 (26.7%) |
| Employment status | Employed | 9 (60%) |
| | Unemployed | 6 (40%) |
| Annual household income (USD) | <30,000 | 4 (26.7%) |
| | 30,000–70,000 | 8 (53.3%) |
| | >70,000 | 3 (20%) |
| Educational background | Junior college | 2 (13.3%) |
| | University | 5 (33.3%) |
| | Graduate school | 8 (53.3%) |
| Residence status | Work permit [1] | 5 (33.3%) |
| | Non-work permit [2] | 6 (40%) |
| | Family permit [3] | 4 (26.7%) |
| Family structure | Nuclear family | 13 (86.7%) |
| | Extended family | 2 (13.3%) |
| Japanese proficiency | High | 6 (40%) |
| | Middle | 4 (26.7) |
| | Low | 5 (33.3%) |
| Nationality of spouse | Chinese | 14 (93.3%) |
| | Japanese | 1 (6.7%) |

[1] Work permit includes medical services, engineer/specialist in humanities/international services, and highly skilled professional; [2] Non-Work permit includes student and family stays; [3] Family permit includes permanent resident and spouse of permanent resident.

### 3.5.2 Participants' parenting and mental health promotion needs

We identified four themes regarding the participants' parenting and mental health needs: concrete support, information provision, caring and understanding, and social network building. Table 3.3 presents the 4 themes and 15 sub-themes.

**Table 3.3 Parenting and mental health promotion needs (*n* = 15)**

| Theme | Sub-Theme (*n*, %) |
|---|---|
| Concrete support | • Perinatal care support (15, 100%)<br>• Language support (8, 53.3%)<br>• Childcare support (15, 100%)<br>• Housework support (5, 33.3%)<br>• Everyday living support (4, 26.7%) |
| Information provision | • Child rearing information and knowledge (11, 73.3%)<br>• Familiarity with Japanese medication, education, and policy (8, 53.3%)<br>• General life information (4, 26.7%) |
| Caring and understanding | • Husband's support (14, 93.3%)<br>• Communicate with someone (10, 66.7%)<br>• Various methods to cope with negative emotions (73.3%)<br>• Advice from mental health specialists (3, 20%) |
| Social networking building | • Overcome social isolation (4, 26.7%)<br>• Child rearing communication group (10, 66.7%),<br>• Strong community ties (9, 60.0%) |

#### 3.5.2.1 Concrete support

Participants reported both negative and positive experiences during their pregnancy, childbirth, and child rearing. All the participants who had positive parenting and mental health experiences obtained sufficient instrumental support. Providing sufficient concrete support for Chinese women living in Japan would effectively

prevent or alleviate the effects of negative parenting and mental health experiences. The study addressed the concrete support that the participants desired, including perinatal care support, childcare support, and language support.

Despite being in Japan, more than two-thirds of the participants practised 'Zuoyuezi'. 'Zuoyuezi' is a traditional Chinese month-long postpartum care ritual, which refers to the postpartum 'sitting month' period in Chinese. It encompasses several aspects, including house confinement for a month, support from husbands, parents, or in-laws, and strict rules for perinatal behaviours such as specific diets and no hair washing. To help them during the postpartum period, their parents from China often visited them in Japan to provide support.

*ID 7: I received the care of 'Zuoyuezi' after giving birth . . . The tradition was performed based on my parents' experience.*

*ID 10: After I gave birth to my first child, there was no COVID-19, and my mum came to Japan to help me perform 'Zuoyuezi'.*

However, the COVID-19 outbreak prevented Chinese women living in Japan from obtaining support from their families in China. Some participants, therefore, relied on support from their friends or used a postnatal care service.

*ID 2: My family could not come to Japan because of COVID-19 . . . At first, I wanted to return to China, but the long quarantine period and expensive cost made me give up . . . I was anxious. Because my family is more experienced in taking care of postnatal care . . . Finally, I used a postnatal care service, but I could only use it for one week.*

*ID 10: There were two Chinese pregnant women in my community when I had my second child. Our delivery dates were close, so we helped each other after giving birth to help the care of Zuoyuezi . . . Because of*

*COVID-19, none of our family members could come to Japan.*

Some participants experienced parenting-related stress because of the difficulty in balancing child rearing and work, study, or daily life. Childcare and housework support from their family allowed them private time to balance child rearing and daily life.

*ID 9: Sometimes, I do not have time to eat lunch because I have to look after my kid . . . It would be nice to have someone to help me, so I can have time to go to the toilet or take a bath . . . Taking care of a child without help does not leave me with enough time.*

*ID 3: It is best to have a family member come over to Japan to help with cooking or share the housework. Now that I live with my mother-in-law, she helps me a lot, and I feel relaxed.*

Participants with a low level of Japanese proficiency usually needed language support from their husbands or friends. The Chinese medical interpretation group was mentioned as particularly helpful during pregnancy, birth, and child rearing.

*ID 9: I came to Japan with no Japanese language skills, so the [main] difficulty in the whole process of childbirth and child rearing was the language barrier.*

*ID 7: The difficulty is that every time I go for a maternity check-up, I have to ask my husband to take time off work to accompany me because I do not speak Japanese.*

*ID 1: I think it is important that I contact the Chinese medical interpretation group. They were helpful. They helped me to go to the health centre to get a mother and child handbook, apply for subsidies, and to make appointments for maternity check-ups. They continued to*

*help me for the next two years.*

One participant experienced difficulty renting a house because she was a pregnant foreign woman. Thus, essential life support should be provided for this population to improve their daily life in Japan.

> *D 1: A stressor for me during my pregnancy was renting a house. I lived in the university's dormitory. I was told I could not live in the dormitory if I had a baby. I was anxious and stressed. I had a terrible experience finding a place to live . . . Because I was not good at Japanese and was a pregnant foreigner, there was no suitable place to live . . . Many landlords did not want to rent to pregnant foreign women like me. I did not feel very good at the time.*

#### 3.5.2.2 Information provision

Almost all the participants experienced a difficult period during which they lacked sufficient information, especially when they were newcomers in Japan, had a low level of Japanese proficiency, or had no local family and friends. Most participants mentioned that they lacked child-rearing knowledge and wanted to obtain related information conveniently, such as information on vaccinations, weaning, and caring for a sick baby.

> *ID 6: I am interested in how to make myself better at child rearing. Knowledge of child rearing is what I need most because that will affect my mood… The first is about baby vaccinations. I feel my baby needs a lot of vaccinations, and my baby will probably be back in China in a few months. I would like to know how the baby vaccination systems differ in China and Japan. The other is about the baby's food, such as how to wean her from breast milk or balance breast milk and complementary*

*food. I would also like to know what to do if my baby is unwell, such as experiencing flatulence, hiccups, fever, and vomiting. If it is severe, which hospital should I go to? These are the things I am worried about.*

*ID 10: When I had my first child, I did not have many friends, so I had fewer sources of information.*

*ID 11: I faced different concerns at different ages. It would be nice to have an online communication website, which includes various sections with diverse knowledge. Mothers like me can get the information conveniently.*

Some participants indicated that they had trouble because of the differences between the Chinese and Japanese medical and educational systems or because they did not know about Japan's welfare policy for pregnant women. Therefore, necessary information to help foreign women become familiar with Japanese medical and educational policies should be provided.

*ID 5: If there was one thing that made me feel a little uncomfortable, it would be that the test terms of maternity check-ups in Japan are different from those in China… I found that in Japan, they do not perform Down's syndrome screening tests, even in women aged over 35 years. The doctor would not even talk to us about it… My husband and I asked the doctor to screen for Down's syndrome, even if we had to pay for it ourselves.*

*ID 14: It was difficult when my child entered kindergarten because there was no one to ask about the preparations and admission procedure.*

*ID 4: I became pregnant after leaving my last job. Because I had worked at my new company for less than a year and received an unemployment subsidy at my previous company, I could not receive a childcare subsidy*

*now… If I could get my childcare subsidy back, I would be willing to pay back double the unemployment subsidy.*

Some participants mentioned that if they had known some of the information earlier, they might have had an easier time raising their children in Japan. Thus, general information support is necessary, especially for newcomers.

*ID 1: After living in Japan for a long time, I knew that there were some online groups for Chinese speakers in Japan where one could buy second-hand furniture or find people to move house. If I had known this earlier, it would have been helpful.*

#### 3.5.2.3 Caring and understanding

Almost all the participants mentioned that they experienced a difficult emotional period after giving birth and during child rearing. More than half the participants had severe mental health problems during postpartum and child rearing, including depressive symptoms, loneliness, anxiety, and parenting stress. Caring and understanding from their husband were crucial, especially for first-time mothers. Insufficient support and a lack of comprehension of mental health issues from their husbands considerably affected the participants' psychological well-being.

*ID 8: I had postnatal depressive symptoms… I would look at my children and want to cry… Because of the family conflict between my mother-in-law and me, my husband supported his mother unconditionally… I raised our children alone; my husband did not help much, and my mother-in-law did not help either… I was depressed and even suicidal when I had my first child.*

*ID 13: When I had my first child, I had severe depressive symptoms. I thought about bad things and could not perceive the value of life… It*

*was because of pressure, partly from my mother and partly from my husband, that he was not good enough.*

Some participants actively communicated with people around them because communication alleviated their negative emotions, such as loneliness. The main individuals for the participants to communicate with were usually their mothers and other Chinese mothers living in Japan.

*ID 4: Luckily, I have a few Chinese mothers around me who can communicate and help me to relieve my stress because we can spill the beans to each other.*

*ID 12: I felt very lonely when I had my first child because my husband had to work. I always take my kid to the park and talk to other mums… In winter, I would take my kid to the supermarket or store because I wanted to find someone to talk to me.*

Most participants stated that to cope with negative emotions, they used different methods, such as shopping, doing housework, eating sweets, reading books, spending money, earning money, and exercising. Additionally, some of them desired to obtain advice from a mental health specialist.

*ID 12: I feel like what I need is psychological guidance. When I faced mental health problems … I needed someone to help me solve them or unblock them.*

#### 3.5.2.4 Social network building

Several participants took care of their children by themselves, which led them to experience extreme social isolation. Therefore, helping Chinese women build a social network in Japan is vital to overcome social isolation.

*ID 11: From a psychologically perspective, for example, if I encounter*

*any problems or something happens, there is no one around to talk to, except my husband. My relatives, parents, and close girlfriends are not in Japan, which may lead to my psychological anxiety.*

More than half of the participants wished for someone with whom they could share their parenting experiences and build a long-term connection, especially other mothers who were raising same-aged children. Helping Chinese women build a social network, such as by organising a child-rearing communication group, would help them attain greater parenting experience and adapt to life in Japan.

*ID 6: I think, for example, a seminar … we can have a chance to talk to other mothers, to make friends, have a place to talk, and share [our thoughts] with each other… Because sometimes, for pregnant women, it is difficult to move around and communicate with the outside world, but they still need to talk or communicate… If possible, it is good to have this kind of organisation.*

*ID 11: I hope there was a group around me, for example, using LINE or WeChat, where I could easily ask at any time, and then someone would share her experience. That would be better.*

Some participants mentioned that they wanted to maintain a strong connection with the community from which they could conveniently receive childcare support and desired greater attention from the authorities.

*ID 15: I would like to see more child-rearing seminars in my community, so that I can always ask questions when my children are growing up.*

*ID 4: I hope the ward office will hold events for childcare mothers. I am not quite sure if there was one before COVID-19… I also hope that the Japanese government will pay more attention to us foreigners; [it is] not*

*that I want more benefits, but I hope there will be more attention.*

## 3.6 Discussion

This study explored the parenting and mental health promotion needs of Chinese women living in Japan to provide evidence supporting their child-rearing experience. It highlights the importance of social support, especially their husbands', in preventing mental health problems and alleviating stress. These findings suggest that an effective intervention on mental health promotion should be developed for Chinese women living in Japan. Social support from the neighbourhood or community should be provided to immigrant and resettled women during periods such as the COVID-19 pandemic.

Potential overlapping exists in some quotes pertaining to the themes, such as a quote expressed building a social network simultaneously to obtain necessary information. The function of quotes is to provide evidence for the sub-themes or themes, illustrate a concrete example, and present participants' thoughts and feelings (Sandelowski, 1994). It is common and acceptable in qualitative research for a quote to fit into multiple themes, indicating a connection between them (Braun & Clarke, 2006). This intrinsic connection could inspire health providers and policymakers when it comes to providing support or making decisions.

The participants in this study reported considerable mental health problems during pregnancy, childbirth, and child rearing, such as postpartum depression, anxiety, parenting stress, and loneliness. These mental health problems were also previously found among Chinese women living in Japan (Luo & Sato, 2021a; Wakimizu & Wang, 2022; Li et al., 2019). The study found that receiving support from their husband was the most important factor related to women's perinatal mental health. Childcare support

from family members was another essential factor in preventing or reducing Chinese women's child-rearing stress and postpartum depression. In China, mothers and mothers-in-law are important providers of child rearing and postpartum care support. They also generally share the responsibility of rearing grandchildren to reduce their children's parenting burden (Mori et al., 2012). This concurs with this study's findings. However, the relationship between women and their family members, especially their mothers-in-law, plays an essential role in relation to psychological well-being (Qi et al., 2022).

'Zuoyuezi' is a postpartum care tradition that is highly valued by Chinese women to recover their physical and mental health and prevent future diseases (Liu et al., 2015). Most participants in this study adhered to this tradition. To practice 'Zuoyuezi', obtaining the support of an experienced person, such as a mother or mother-in-law, is necessary. However, the COVID-19 outbreak made it difficult to obtain family support (Luo & Sato, 2021b). Thus, providing postpartum care for Chinese women living in Japan is essential to help them get through the most challenging postpartum period, such as by extending the available period of postpartum care services.

In 2006, the Japanese Ministry of Internal Affairs and Communication developed a Multicultural Coexistence Promotion Plan to help foreign residents adapt to life in Japan (Ministry of Internal Affairs and Communications, 2006). However, 49% of the local governments had not implemented the plan as of April 2022 (Ministry of Internal Affairs and Communications, 2022). Meanwhile, previous studies have reported that despite having been offered support, foreign women in Japan continue to experience difficulties associated with child-rearing and acculturation (Kita et al., 2015; Luo & Sato, 2020). Therefore, healthcare providers should consider a practical

approach to increase the utilisation of health care services among immigrant women, such as examining mental health treatment differences by country of origin (Straiton et al., 2016). A possible transcultural education of healthcare providers can also be considered to help providers understand postpartum traditions and facilitate women in following their customs. For example, 'Zuoyuezi' can be aided via offering home visits to help women who choose to spend their first postpartum month at home. Home visits might be an effective intervention approach to improve immigrant women's mental health (Luo, Ebina et al., 2022). Furthermore, a more understanding and knowledgeable crew of healthcare professionals might help the mother feel more connected to them and the healthcare system in Japan.

Immigrant and resettled women rearing children in a new environment not only experience stress from the process of childcare but also face challenges in building new lives (Meadows et al., 2001). Immigrants in a strange environment lack essential information resources; obtaining reliable health information and accessing health services becomes a significant social issue (Mason et al., 2021). Therefore, information barriers should be addressed practically to help them adapt to general life and child rearing in Japan. Making information convenient to obtain and easy to understand is essential. A previous study reported that low Japanese proficiency limited the communication of immigrant women in Japan with health providers, thereby reinforcing their loneliness (Igarashi et al., 2013). Based on the study participants' responses, the study recommends providing online information and material in immigrant women's native language in future studies. This will ensure that perinatal health-related information is linguistically accessible and culturally inclusive (Chedid et al., 2018).

Making friends, especially with women from the same cultural background, is

a practical way for immigrant women to adapt to life in a different environment by sharing their experiences and enhancing their sense of belonging. For immigrant women, a sense of belonging might decrease their loneliness and homesickness and protect their mental health (Straiton et al., 2017). Thus, helping immigrant women build a social network within their community is necessary. Establishing close connections will assist immigrant women to access community services and resources (Neufeld, et al., 2002). Community ties have played an essential role in assisting immigrant women, especially during the COVID-19 pandemic. These findings imply that social support providers, healthcare providers, and public health workers should help immigrant and resettlement women strengthen their connection with the community and neighbourhood to ensure that they do not lack social support during challenging periods such as the current COVID-19 pandemic. Internet-based intervention played a significant role in preventing mental health issues in various populations during COVID-19 (Mahoney et al., 2021; Serlachius et al., 2021). Thus, this study recommends developing an Internet-based intervention to help Chinese women in Japan obtain information conveniently and efficiently. The findings also recommend provide an available approach to assist them in building a community tie even during an extraordinary period, such as online child-rearing salons.

This qualitative study has several limitations that must be considered. First, the sample size was small, which may affect the generalizability of the results. Additionally, the participants were recruited using convenience and snowballing sampling, and primary recruitment was only conducted using WeChat, which might have introduced technological bias. Moreover, due to COVID-19, the author could not interview all the participants in person. The different interview methods might have influenced the quality of the data collected. Finally, the qualitative study design limits the

generalizability of the findings. However, the participants' experiences and considerations were explored in depth.

## 3.7 Conclusions

This study explored the needs of Chinese women living in Japan concerning parenting and mental health problems to provide evidence for developing practical interventions to improve their mental well-being. More than half of the participants experienced mental health problems during postpartum and child rearing, such as depressive symptoms and parenting stress. Four themes regarding their needs were identified: concrete support, information provision, caring and understanding, and social network building. Support from the neighbourhood and community is essential for participants, particularly during the COVID-19 pandemic. Based on these findings, an effective mental health promotion intervention should be developed for Chinese women living in Japan. Additionally, a possible transcultural education could be considered to help healthcare providers understand transcultural care when they interact with immigrants.

## 3.8 Chapter summary

This chapter has described a qualitative study to explore parenting and mental health promotion needs and provide evidence for the intervention. Information provision and social network building have been emphasized as practical social support mechanisms to improve the mental health of Chinese women living in Japan. Considering the situation of COVID-19, Internet-based tools and materials as a practical and convenient approach are recommended to develop the mental health promotion intervention in the next chapter.

# Chapter IV Effects of the mental health promotion intervention among Chinese women living in Japan: A quasi-experimental study

## 4.1 Abstract

Owing to a lack of social support, child-rearing Chinese women in Japan experience poor mental health, such as depression and parenting stress. Effective interventions to improve the mental health of these women are lacking. This study aimed to develop an Internet-based mental health promotion intervention for this subsection of the population and to evaluate the effectiveness of the intervention. This study used a quasi-experimental pre- and post-intervention testing design whereby the results of the intervention group were compared against a control group. Seventy-three child-rearing women were recruited from online groups of Chinese residents in Japan. The Internet-based intervention involved the participants utilising an information provision application and attending online parenting workshops. The intervention group participated in the online workshops once a week for six weeks and accessed the application, whereas the control group did not. The outcome measures included mental health distress, depression, social support, and parenting stress. Data were collected during the period February to April 2022. Data analysis was performed using repeated-measures analysis of variance. The intervention group showed a significant improvement in mental health distress and a decrease in depression compared with the control group. There were no significant differences in social support and parenting stress between the groups. The Internet-based mental health promotion intervention was highly appraised by the participants in the intervention group. This intervention

can be applied to foreign women with multicultural backgrounds in a variety of settings to improve their psychological well-being.

## 4.2 Introduction

Mental health problems among immigrant women have been observed in countries with high immigration rates (Almutairi et al., 2022; Guruge et al., 2015). With increasing immigrant populations in Japan, the Multicultural Coexistence Promotion Plan was developed by the Japanese Ministry of Internal Affairs and Communication in 2006. The aim of this Plan is to track the development of a multicultural coexistence in Japan and to assist people from different cultural backgrounds who are living in Japan to live together happily as members of a communal society (Ministry of Internal Affairs and Communications, 2006). This Plan was updated in 2020 to include communication support, life support, support for raising awareness, social support for social participation, and the promotion of regional revitalization and a response to globalization (Ministry of Internal Affairs and Communications, 2020). However, as of April 2022, the Plan had only been implemented by 51% of the local government departments (Ministry of Internal Affairs and Communications, 2022). Consequently, immigrant women in Japan still lack adequate and effective social support mechanisms and encounter mental distress and social isolation (Kita et al., 2015).

As a result of the difficulties associated with pregnancy, childbirth, and child-rearing, Chinese women in Japan are prone to experiencing significant mental health problems, such as postpartum depression and parenting stress (You & Emori, 2010; Jin et al., 2016). Furthermore, a survey reported that high COVID-19 concerns were linked to poor mental health in Chinese women residing in Japan (Luo & Sato, 2021b). However, even though several studies have identified that Chinese women who are pregnant, have given birth, or are raising children in Japan exhibit high levels of

parenting stress, loneliness, and a lack of social support (Wakimizu & Wang, 2022), only one nursing intervention has been developed to prevent postpartum depression among these vulnerable women (Jin et al., 2020). In addition, the results of structural equation modelling have shown that social support reduces parenting stress and positively affects mental health among Chinese women in Japan (Luo & Sato, 2021a). Thus, it is necessary to provide the appropriate social support to assist Chinese women living in Japan to improve their mental health and overall quality of life.

A previous qualitative study has identified the child-rearing and mental health promotion needs of Chinese women in Japan as concrete support, information provision, caring and understanding, and social network building. This study proposed that providing practical information and helping these women build community ties would allow for the development of social support (Luo, Sato, et al., 2022). Internet-based tools and materials have been recommended to provide informational support and interactive talks for immigrant women (Lee et al., 2013) and Internet-based mental health services have been suggested to improve the well-being of the immigrant population (Liem et al., 2021). Several Internet- and mobile-based interventions have been conducted to reduce the burden of mental disorders among immigrant populations in various countries (Spanhel et al., 2021). During the COVID-19 pandemic, Internet-based interventions played an essential role in maintaining individuals' mental health and well-being in various populations (Mahoney et al., 2021; Okorie et al., 2022; Serlachius et al., 2021). In addition, Internet-based interventions have been recognized as a possible approach to reducing stress, anxiety, and depression in prenatal women (Bright et al., 2019). Among immigrant Chinese women, Internet-based information resources have been widely desired (Gong & Bharj, 2022), and an Internet-based education program has been verified to increase their social support and decrease

parenting stress (Song et al., 2022). However, Internet-based interventions to improve the mental health of immigrant women living in Japan are still lacking. Thus, the author has developed an Internet-based mental health promotion intervention based on the parenting and mental health needs of Chinese women in Japan to provide practical information and assist them to build social networks.

## 4.3 Aims

This study aims to evaluate the effects of an Internet-based mental health promotion intervention on the mental health distress, depression, social support, and parenting stress among Chinese women living in Japan.

## 4.4 Methods

### 4.4.1 Design

The study design was a quasi-experimental pre-test-post-test design with a control group. This study was registered in the UMIN Clinical Trials Registry under registration number UMIN000046260. This study was reported according to the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) statement (Caetano, 2004)

This mental health intervention was developed based on the qualitative study in chapter III, which suggested providing informational support and assisting social network building for Chinese women living in Japan to improve their mental health. Information provision includes the provision of information relating to child-rearing, Japanese medication, education, and child-rearing policy, as well as general life information. Social network building includes overcoming social isolation, joining child-rearing communication groups, and creating strong community ties. Thus, to meet

the needs of target population, this program comprised two components: developing and using a smartphone application to provide information and conducting online parenting workshops. The intervention was performed during the period February to April 2022.

First, to provide the necessary and accurate information, the author developed a smartphone application. This smartphone application was named ‘Love for mom’ (http://loveformom.online/), and iOS and Android versions were made available. The ‘Love for mom’ application includes six types of content, which comprises overviews of parenting in Japan and information relating to child-rearing, vaccinations, childcare services, social support services, and children’s development. Figure 4.1 shows the loading page and homepage of ‘Love for mom’ application.

The author translated and revised all published information in this application and provided them in Chinese. All original information in this application was published and provided by various government institutions and Non-profit Organizations, including Cabinet Office, Ministry of Health, Labour and Welfare, City of Sapporo, Bureau of Social Welfare and Publish Health in Tokyo, Japan Pediatric Society, Sapporo International Communication Plaza Foundation, Kanagawa International Foundation, Researching and Supporting Multi-Cultural Healthcare Services, Research group for promoting the Early Childhood Development of children with foreign roots in Japan, Council of Local Authorities for International Relations.

Second, to build the women’s social network, online parenting workshops were conducted using Zoom Meeting, a proprietary videotelephony software developed by Zoom Video Communication. Meanwhile, to allow the women to communicate conveniently, an online parenting group was created on WeChat that included all participants in the intervention group. We conducted the parenting workshops twice a


a. Loading page b. Homepage

**Figure 4.1 Display of the 'Love for Mom' application**

week for six weeks and these workshops lasted between 70 and 90 minutes. They took place in the evening on weekdays and during the daytime on weekends. The participants chose which day they would like to attend during the week according to what was convenient for them and committed to attending at least once a week. Before each week, the research staff announced the opening time in advance for the WeChat group. The parenting workshops had three main focuses: introducing the use of the 'Love for mom'

application, parenting skills, and social network building. Each workshop was structured similarly with a combination of icebreakers, an introduction to the 'Love for mom' application, parenting experience sharing, and time for free discussion. Table 4.1 presents the content of a typical workshop. Each week's workshop shared the same contents of the introduction to the 'Love for mom' application and then included different parenting experiences and discussions. A psychological expert in children's development and education of children, who is also Chinese mother living in Japan, and a bilingual nursing researcher with experience in conducting parenting workshops and focus group discussions, attended each workshop to answer the participants questions and to ensure that the workshops ran smoothly. Each session was video recorded and after each workshop took place all content regarding parenting difficulties and experiences as well as the free discussions were recorded and organized into a readable file that was sent to the WeChat group for participants to review at their convenience. All workshops were facilitated by Chinese individuals. After completing the post-intervention questionnaire, each participant in the intervention and control group received a gift card to the value of 20 USD.

**Table 4.1 A typical parenting workshop**

| Time (min) | Contents |
|---|---|
| 5 | Icebreaker |
| 15 | Introduction to using the 'Love for mom' application |
| 40 | Parenting experience sharing |
| 10–30 | Free discussion |

### 4.4.2 Instruments with validity and reliability

Both the pre-intervention test and the post-intervention test measured demographic information and the variables of mental health distress, depression, social support, and parenting stress. Additionally, assessments of the mental health promotion

intervention were added to the post-intervention test for participants in the intervention group. Mental health distress and depression were adopted as the primary outcomes, and social support and parenting stress were considered as secondary outcomes.

#### 4.4.2.1 Mental health distress

Mental health distress was evaluated using the 12-item General Health Questionnaire (GHQ-12) developed by Goldberg and Williams (1991). The GHQ-12, a self-administered questionnaire, was designed to detect persons at risk of developing common, non-psychotic mental health issues associated with depression, anxiety, somatic symptoms, and social dysfunction (Vanheule & Bogaerts, 2005). The Chinese version of the GHQ-12 has been extensively used, and its reliability and validity are considered good (Li et al., 2009; Liang et al., 2016). GHQ-12 has two types of calculating, including the bio-modal (0-0-1-1) and Likert scoring methods (0-1-2-3) (Montazeri et al., 2003). This study utilised the four-point Likert scale scoring method with 0 = *not at all*, 1 = *no more than usual*, 2 = *rather more than usual*, and 3 = *much more than usual*. Total scores ranged from 0 to 36, with a higher score indicating more severe mental health distress. Scores over the cut-off point of 12 could be recognized as having a risk of mental health distress (Goldberg et al., 1997). Cronbach's alpha of the GHQ-12 in this study was 0.854.

#### 4.4.2.2 Depression

Depression was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D) developed by Radloff (1977). The Chinese version of the CES-D has been used to assess depression in different Chinese populations (Ma 2018; Niu et al., 2021), including immigrant Chinese women (Li & Hicks, 2010), and has shown good reliability and validity (Cheung & Bagley, 1998). The CES-D is one of the most widely used self-reporting scales to evaluate depressive symptoms and consists of

20 items. Each item is scored from 0 = *rarely or none of the time* to 3 = *most or all of the time*. Total scores ranged from 0 to 60, with a higher score indicating a more severe level of depression. A CES-D score above the cut-off point of 16 indicates a risk of depression (Radloff, 1977). Cronbach's alpha of the CES-D in this study was 0.867.

#### 4.4.2.3 Social support

Social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet et al. (1988). The scale was revised for use among the Chinese population by Jiang (2001), and the reliability and validity of the Chinese version of the MSPSS was found to be good in a previous study (Nie et al., 2020). The assessment tool consists of 12 items, each of which are scored on a seven-point Likert scale ranging from 1 = *very strongly disagree* to 7 = *very strongly agree*. The participants' scores were computed by adding the item scores, with higher scores indicating higher levels of perceived social support. The Cronbach's alpha for this study sample was 0.910.

#### 4.4.2.4 Parenting stress

The Child-rearing Stress Scale (CRSS) used a childcare stress scale for immigrant mothers residing in Japan developed by Shimizu and Masuda (2001). The Chinese version of the CRSS was translated by You and Emori (2010), and its reliability and validity were found to be good in a previous study on Chinese immigrant women in Japan (Luo & Sato, 2021a). It consists of 40 items comprising 10 subscales, with each item scored from 1 = *strongly disagree* to 4 = *strongly agree*. The total score is the sum of the scores, with a higher score indicating a higher level of parenting stress. The Cronbach's alpha coefficient for the CRSS in this study was 0.934.

#### 4.4.2.5 Demographic factors

Demographic data were collected, including age, employment status, number of

children, use of childcare facilities, duration of residence in Japan, planned length of stay in Japan, level of education, status of residence, family structure, annual household income, nationality of spouse, and proficiency in Japanese language.

#### 4.4.2.6 Assessment for the mental health promotion program

The author developed several sets of items to be used for participants in the intervention group so that they could assess the quality of the application and parenting workshops. The measured content included satisfaction, usability, convenience, the functionality of the 'Love for mom' application, as well as 'desiring the parenting workshops will continue'. Each item was scored from 1 = *strongly disagree* to 5 = *strongly agree*, with a higher score indicating a higher level of satisfaction.

### 4.4.3 Sampling and recruitment

The participants were recruited from various online groups of Chinese residents in Japan using WeChat, a Chinese multipurpose messaging social media platform developed by Tencent. Online groups included second-hand goods groups, Chinese restaurant consumer groups, Chinese product shops, and associations of Chinese students. Snowball sampling was used to recruit more participants.

#### 4.4.3.1 Inclusion and exclusion criteria

Participants who met the inclusion criteria were enrolled in this study. The inclusion criteria were as follows: The participants had to be (1) Chinese women living in Japan; (2) pregnant or rearing at least one child under the age of six years old; (3) able to speak, read, and understand Mandarin Chinese. The exclusion criteria were as follows: The respondents were to be excluded if they (1) were unable to read the materials and utilise electronic equipment, and (2) had intellectual disabilities.

#### 4.4.3.2 Sample size and power

The sample size of this study was calculated using G*Power. For an effect size

of 0.25, a power of 0.95, and a repeated-measures analysis of variance (ANOVA), a total of 36 participants were necessary. Therefore, at least 18 participants were included in each of the groups.

Figure 4.2 shows a flowchart of recruitment process and how the participants were assigned to the two groups. Of the 80 women who were approached, 73 were recruited as seven women did not meet the inclusion criteria. Recruited participants were then assigned to one of two groups depending on their answers to the two initial questions. The first question was, 'can you download and use the "Love for mom" application on your mobile phone?' The second question was, 'can you attend the online parenting workshops once a week for six weeks?' Only participants who answered 'yes' to both questions were assigned to the intervention group, and the remaining participants were assigned to the control group. Thirty-eight women were assigned to the intervention group and 35 to the control group. Finally, a total number of 64 women completed both the pre- and post-test portions of the study and the data obtained from these questionnaires were analysed (intervention: 32, control group: 32). Seven participants could not be contacted, and two participants in the intervention group did not complete the workshop intervention and dropped out.

### 4.4.4 Quality appraisal of data abstraction

The outcomes were measured pre- and post-intervention using electronic questionnaires. All participants were allocated reference numbers to be used instead of their names when completing the questionnaires. All questionnaires were created and distributed using an Internet-based survey platform called Wenjuanxing, a popular Chinese online survey service platform. All measurements were performed using the Chinese versions of the abovementioned scales.

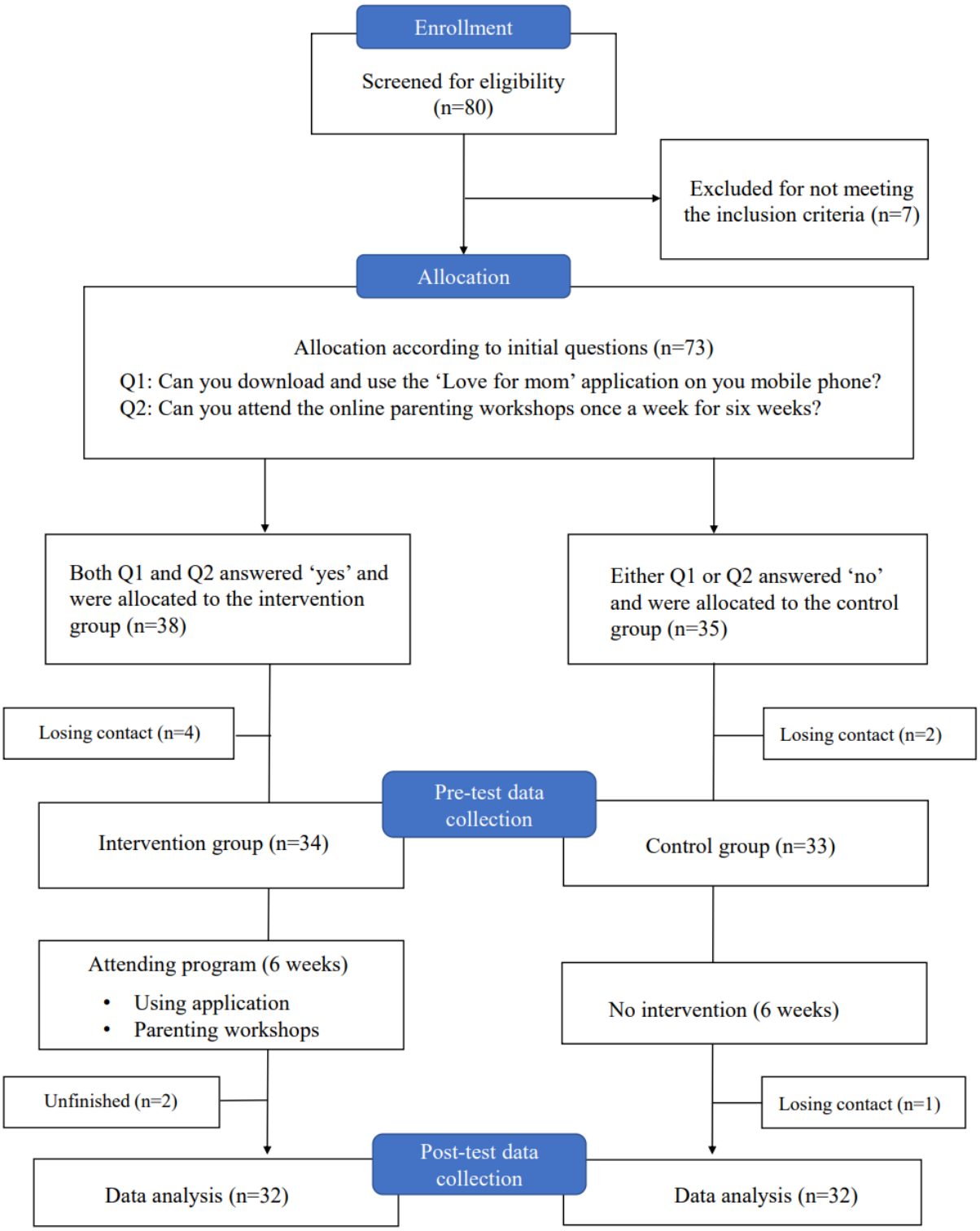



**Figure 4.2 Flow chart of participants recruitment and assignment**

### 4.4.5 Data analysis

Data analysis was conducted using IBM SPSS Statistics version 26.0 (IBM, New York, NY, USA). Participants' demographic characteristics were summarized using descriptive statistics. The distribution of continuous variables was assessed using the Shapiro-Wilk normality test. Homogeneity tests were performed using independent t-tests in continuous variable and chi-square tests in nominal variables. If significant differences in the variables of demographic characteristics between the intervention and control group were found, these variables would be included as control variables in the effect analysis. The effect of the intervention was tested using two-way repeated measures ANOVA after the assumptions of normality and sphericity were met. Group (intervention group or control group) and time (pre-intervention or post-intervention testing) were set as factors, and group-by-time interactions were examined. A simple main effect was observed if a significant group-by-time interaction was found. The effect sizes calculated using the partial eta-squared values for small, medium, and large effects were 0.009, 0.058, and 0.137, respectively (Cohen, 1988).

The appraisal for the Internet-based mental health intervention by the intervention group were summarized using descriptive statistics. To provide recommendations for improving the intervention, the relationships between the appraisal scores and demographic factors of the intervention group were further explored. The Mann–Whitney U test and Kruskal–Wallis test were used to evaluate significant differences in the non-parametric data. The results were presented as 95% confidence intervals.

### 4.4.6 Ethical consideration

This study was approved by the ethical review committee of the Faculty of Health Sciences, Hokkaido University (approval number 21-64). Before commencing

with the study, all participants provided both oral and written informed consent. Since all participants were allocated identifying numbers instead of using their names when completing the questionnaires, their anonymity was ensured.

## 4.5 Results

### 4.5.1 Sociodemographic characteristics

The participants' demographic factors and homogeneity test results for the intervention and control groups are shown in Table 4.2. The mean ages of the intervention and control groups were 33.56 (±3.64) and 34.16 (±3.59) years, respectively. Most participants were in their 30s, used childcare's facilities, were married to a Chinese husband, and had a nuclear family structure. More than half of the participants were employed, had one child, planned to stay in Japan for more than 10 years, had an unlimited work permit status, an annual household income of between 30,000 and 70,000 USD, and a high level of Japanese language proficiency. Approximately half of the participants had an undergraduate level of education. In the intervention group, the largest proportion of participants had lived in Japan for less than 10 years, whereas in the control group, the highest number had lived in Japan for more than 10 years.

The results of the homogeneity test showed no demographic differences between the intervention and control groups. In addition, there was no statistically significant difference in the GHQ-12, CES-D, MSPSS, and CRSS scores at the pre-intervention testing stage (Table 4.3).

**Table 4.2 Homogeneity test for descriptive characteristics of participants**

| Variables | Total (n=64) n (%) | IG (n=32) n (%) | CG (n=32) n (%) | t / x² | p |
|---|---|---|---|---|---|
| **Age (years)** | | | | | |
| M (SD) | 33.86 (3.60) | 33.56 (3.64) | 34.16 (3.59) | 0.657 | 0.514 |
| 20–29 | 7 (10.94) | 4 (12.50) | 3 (9.38) | 1.494 | 0.669 |
| 30–39 | 50 (78.13) | 26 (81.25) | 24 (75.00) | | |
| 40–49 | 7 (10.94) | 2 (6.25) | 5 (15.63) | | |
| **Employment status** | | | | | |
| Employed | 38 (59.38) | 17 (53.13) | 21 (65.63) | 1.036 | 0.309 |
| Unemployed | 26 (40.63) | 15 (46.88) | 11 (34.38) | | |
| **Number of children** | | | | | |
| 1 | 34 (53.13) | 17 (53.13) | 17 (53.13) | 0.000 | 1.000 |
| ≥2 | 30 (46.88) | 15 (46.88) | 15 (46.88) | | |
| **Use of childcare facilities** | | | | | |
| Yes | 48 (75.00) | 24 (75.00) | 24 (75.00) | 0.000 | 1.000 |
| No | 16 (25.00) | 8 (25.00) | 8 (25.00) | | |
| **Duration of residence (years)** | | | | | |
| <10 | 33 (50.00) | 18 (56.25) | 14 (43.75) | 1.000 | 0.317 |
| ≥10 | 33 (50.00) | 14 (43.75) | 18 (56.25) | | |
| **Planned length of stay (years)** | | | | | |
| <10 | 19 (29.69) | 11 (34.38) | 8 (25.00) | 0.674 | 0.412 |
| ≥10 | 45 (70.31) | 21 (65.63) | 24 (75.00) | | |
| **Education background** | | | | | |
| High school or others | 12 (18.75) | 4 (12.50) | 8 (25.00) | 1.648 | 0.439 |
| Undergraduate school | 30 (46.88) | 16 (50.00) | 14 (43.75) | | |
| Graduate school | 22 (34.38) | 12 (37.50) | 10 (31.25) | | |
| **Status of residence** | | | | | |
| Unlimited work permit [1] | 39 (60.94) | 19 (59.38) | 20 (62.50) | 0.402 | 0.818 |
| Limited work permit [2] | 11 (17.19) | 5 (15.63) | 6 (18.75) | | |
| Non-work permit [3] | 14 (21.88) | 8 (25.00) | 6 (18.75) | | |
| **Family structure** | | | | | |
| Nuclear family | 55 (85.94) | 27 (84.38) | 28 (87.50) | 1.219 | 0.500 |
| Extended family | 9 (14.06) | 5 (15.63) | 4 (12.50) | | |
| **Annual household income (USD)** | | | | | |
| <30,000 | 12 (18.75) | 8 (25.00) | 4 (12.50) | 2.679 | 0.262 |
| 30,000–70,000 | 33 (51.56) | 17 (53.13) | 16 (50.00) | | |
| >70,000 | 19 (29.69) | 7 (21.88) | 12 (37.50) | | |
| **Nationality of spouse** | | | | | |
| Chinese | 50 (78.13) | 27 (84.38) | 23 (71.88) | 3.112 | 0.213 |
| Japanese | 13 (20.31) | 4 (12.50) | 9 (28.13) | | |
| Others | 1(1.56) | 1 (3.13) | 0 (0.00) | | |
| **Japanese proficiency** | | | | | |
| Lower | 19 (29.69) | 11 (34.38) | 8 (25.00) | 0.674 | 0.412 |
| Upper | 45 (70.31) | 21 (65.63) | 24 (75.00) | | |

[1] Unlimited work permit: permanent resident, spouse or child of Japanese national, and spouse or child of permanent resident; [2] Limited work permit: researcher, medical services, engineer/specialist in humanities/international services, business manager, etc. [3] Non-work permit: student, dependent for family stays, cultural activities, etc. IG: intervention group; CG: control group; M: mean; SD: standard deviation.

**Table 4.3 Homogeneity test of study variables at pretest (n=64)**

| Variables | IG (n=32) M (SD) | CG(n=32) M (SD) | t | p |
|---|---|---|---|---|
| **GHQ-12** | 13.19 (4.17) | 10.69 (5.77) | 1.986 | 0.051 |
| **CES-D** | 15.44 (8.43) | 12.00 (7.05) | 1.769 | 0.082 |
| **MSPSS** | 67.38 (10.04) | 67.38 (8.02) | 0.000 | 1.000 |
| **CRSS** | 88.81 (17.42) | 86.81 (16.71) | 0.469 | 0.641 |

IG: intervention group; CG: control group; M: mean; SD: standard deviation; GHQ-12: 12-item General Health Questionnaire; CES-D: Center for Epidemiologic Studies Depression Scale; MSPSS: Multidimensional Scale of Perceived Social Support; CRSS: Child-rearing Stress Scale.

### 4.5.2 Effects of the intervention on mental health distress, depression, social support, and parenting stress

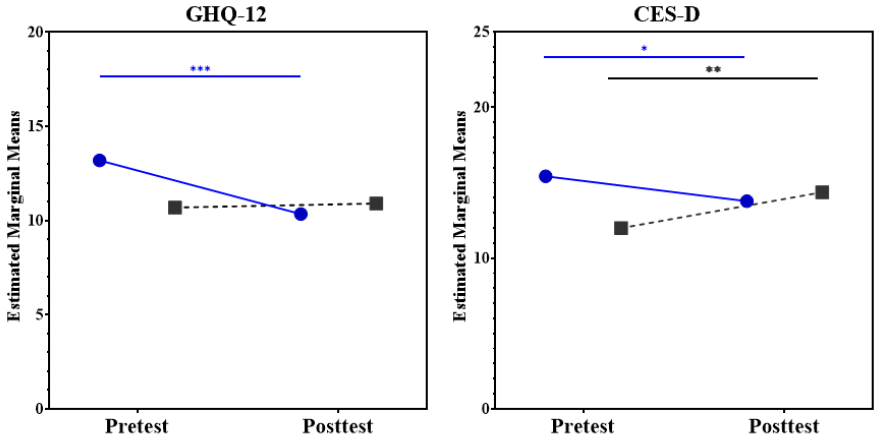
Table 4.4 demonstrates the effects of the intervention programme on social support, parenting stress, depression, and mental health distress. Regarding the primary outcome, the GHQ-12 scores of the intervention group decreased from 13.19 to 10.34, whereas those of the control group increased slightly from 10.69 to 10.91. The results show a significant main effect of time ($F = 7.020$, $p = 0.010$, $\eta^2 = 0.102$) and an interaction effect, indicating a statistically significant difference between the two groups ($F = 9.555$, $p = 0.003$, $\eta^2 = 0.134$). To further explain the interaction, a simple main effect test was conducted for the GHQ-12, and the simple main effects of time in the intervention group were significant ($F = 16.478$, $p < 0.001$, $\eta^2 = 0.210$; Figure 4.3). Meanwhile, the CES-D scores in the intervention group decreased from 15.44 to 13.78, whereas those of the control group increased from 12.00 to 14.38. There was a statistically significant group and time interaction effect in the CES-D ($F = 13.078$, $p = 0.001$, $\eta^2 = 0.174$). A simple main effect test was conducted for the CES-D, and the simple main effects of time in the intervention ($F = 4.415$, $p = 0.040$, $\eta^2 = 0.066$) and control groups ($F = 9.078$, $p = 0.004$, $\eta^2 = 0.128$) were significant (Figure 4.3).

Regarding the secondary outcome, there were no statistically significant effects on the total MSPSS scores ($F = 0.128$, $p = 0.722$, $\eta^2 = 0.002$) or CRSS scores ($F = 0.390$, $p = 0.535$, $\eta^2 = 0.006$).

**Table 4.4 Intervention effects on study variables (n=64)**

| | IG (n=32) | CG (n=32) | Effects | | | |
|---|---|---|---|---|---|---|
| **Variables** | **M (SD)** | **M (SD)** | **Source** | **F** | **p** | **$\eta^2$** |
| **GHQ-12** | | | | | | |
| Pretest | 13.19 (4.17) | 10.69 (5.77) | Time | 7.020 | 0.010 | 0.102 |
| Posttest | 10.34 (3.38) | 10.91 (5.23) | Group | 0.815 | 0.370 | 0.013 |
| | | | Time × Group | 9.555 | 0.003 | 0.134 |
| **CES-D** | | | | | | |
| Pretest | 15.44 (8.43) | 12.00 (7.05) | Time | 0.416 | 0.521 | 0.007 |
| Posttest | 13.78 (7.02) | 14.38 (8.48) | Group | 0.582 | 0.448 | 0.009 |
| | | | Time × Group | 13.078 | 0.001 | 0.174 |
| **MSPSS** | | | | | | |
| Pretest | 67.38 (10.04) | 67.38 (8.02) | Time | 1.074 | 0.304 | 0.017 |
| Posttest | 66.81 (8.77) | 66.22 (8.58) | Group | 0.021 | 0.886 | 0.000 |
| | | | Time × Group | 0.128 | 0.722 | 0.002 |
| **CRSS** | | | | | | |
| Pretest | 88.81 (17.42) | 86.81 (16.71) | Time | 0.007 | 0.935 | 0.000 |
| Posttest | 88.09 (19.05) | 87.75 (16.91) | Group | 0.079 | 0.780 | 0.001 |
| | | | Time × Group | 0.390 | 0.535 | 0.006 |

IG: intervention group; CG: control group; M: mean; SD: standard deviation; GHQ-12: 12-item General Health Questionnaire; CES-D: Center for Epidemiologic Studies Depression Scale; MSPSS: Multidimensional Scale of Perceived Social Support; CRSS: Child-rearing Stress Scale.




Note: ● intervention group; ■ control group; *: p<0.05; **: p<0.01; ***: p<0.001.
GHQ-12: 12-item General Health Questionnaire; CES-D: Center for Epidemiologic Studies Depression Scale

**Figure 4.3 Simple main effect tests on depression and mental health distress**

### 4.5.3 Assessment of the mental health intervention programme by the intervention group

The appraisal of the mental health intervention programme by the participants in the intervention group is shown in Table 4.5. The mean satisfaction, usability, convenience, and functionality scores for the 'Love for mom' application were 3.97, 3.78, 3.97, and 3.69, respectively. Meanwhile, the mean scores for satisfaction, usability, convenience, and 'desiring the parenting workshops will continue' were 4.31, 4.31, 4.25, and 4.38, respectively.

**Table 4.5 Appraisal for the mental health intervention by intervention group (n=32)**

| | M | SD | Min.−Max. |
|---|---|---|---|
| **Appraisal for the 'Love for mom' application** | | | |
| Satisfaction | 3.97 | 0.73 | 3−5 |
| Usability | 3.78 | 0.74 | 2−5 |
| Convenience | 3.97 | 0.68 | 3−5 |
| Functionality | 3.69 | 0.81 | 2−5 |
| **Appraisal for parenting workshops** | | | |
| Satisfaction | 4.31 | 0.85 | 2−5 |
| Usability | 4.31 | 0.77 | 3−5 |
| Convenience | 4.25 | 0.90 | 2−5 |
| Desiring the parenting workshop continue | 4.38 | 0.82 | 2−5 |

M: mean; SD: standard deviation; Min: minimum; Max: maximum.

According to the results of the relationships between the demographic factors of intervention group and the appraisal scores for application, significantly high scores were shown on satisfaction from women with low Japanese proficiency ($p = 0.042$) and unlimited or non-work permit status of residence ($p = 0.039$), usability from women with a planned length of stay in Japan above ten years ($p = 0.034$) and living with extended family ($p = 0.013$), and convenience from women with living with extended family ($p = 0.006$). There were no significant differences between the demographic factors of intervention group and the appraisal scores for online parenting workshops.

## 4.6 Discussion

There have been few effective interventions developed and implemented for improving immigrant women's mental health, especially with regards to pregnancy, childbirth, and child-rearing (Luo, Ebina, et al., 2022). This study introduced a six-week Internet-based mental health promotion intervention programme, including parenting workshops and an information provision application, for Chinese women in Japan. The results of the intervention group were compared with the control group that did not take part in the programme. After the intervention, the levels of mental health distress and depression improved in the intervention group compared with the control group. In addition, the intervention programme was highly appraised by the participants in the intervention group, especially the online parenting workshops.

According to the pretest results, the intervention group's mean scores of GHQ-12 were over the cut-point of 12, indicating that the participants were at risk of mental health distress before attending the intervention. These women chose to attend the intervention because they might realize they were experiencing worse mental health. Future studies could be considered to assess mental health literacy to evaluate participants' ability and knowledge to seek mental health information and the intervention effect on improving mental health literacy (Choi, 2017). Meanwhile, this study may be the first to develop an Internet-based mental health promotion intervention programme for immigrant women in Japan. Internet-based intervention programmes have been developed to improve mental health variables among various immigrant populations in other countries and have played an essential role in enhancing immigrants' health by decreasing depression-related stigma among immigrants in Australia (Kiropoulos & Bauer, 2011) and providing health information among Turkish migrants in Germany (Samkange-Zeeb et al., 2015). In addition, information provision

applications aimed at pregnant and child-rearing women are increasing globally, but the use rate of non-native-language-speaking women has been relatively low (Hughson et al., 2018). This Internet-based intervention programme utilised the participants' native language to avoid language issues and developed a practical information provision application and online parenting workshops, which resulted in improved mental health and decreased levels of depression symptoms in immigrant women.

Depression, as a critical mental health problem, has been documented in previous studies of immigrant women (O'Mahony & Donnelly, 2010; Playfair et al., 2017). At the pretest, the mean scores of CES-D in both the intervention and control groups did not go over the cut-point of 16, which might indicate the necessity of further monitoring of depressive symptoms. After the intervention, participants in the intervention group showed a decrease in depression, whereas those in the control group without any intervention showed a statistically significant increase in depression. This may be attributed to the existence of confounding variables due to the COVID-19 pandemic. The outbreak of COVID-19 not only had an influence on the economies around the globe, sending many into crisis, but also resulted in a high prevalence of depression and anxiety in Japan (Stickley et al., 2021). Another possible reason for the increase in depression symptoms could be due to the stress that is caused as a result of the cross-cultural environment (Jin et al., 2016). The author suggests that future studies should adopt a longitudinal design to observe the change in depressive symptoms among these women and to be able to provide evidence for policymakers and healthcare providers to strengthen the child-rearing or living environment.

Compared to the previous study conducted among Chinese women living in Japan before COVID-19 (Luo & Sato, 2021a), both the intervention and control groups showed high parenting stress and social support at the pretest. To the best of my

knowledge only one nursing intervention has been developed for Chinese women in Japan, and no significant intervention effects on social support, stress, and postpartum depression were reported (Jin et al., 2020). Our study provided similar results; the findings showing no effects on social support and parenting stress. Parenting stress and social support of mothers are associated with socioeconomic variation (Parkes et al., 2015), which may lead to change taking place more slowly. Thus, the intervention programme's long-term effect on social support and parenting stress should be assessed in the future. On the contrary, a recent study has shown that a mobile phone-based education intervention can reduce childcare stress and improve social support, but this study was conducted on immigrant Chinese women with newborn babies only (Song et al., 2022). The participants in our study included mothers of preschool children aged 0 to 6 years and were relatively diverse. Future studies could consider narrowing the study participants, such as mothers of children under 3 years old or mothers of children 3 to 6 years old, which may show more significant effects.

Future studies could also consider separately investigating the effects of the smartphone application and online parenting workshops. Firstly, the effective and target populations may be different. Women highly appraised the informational provision application with low Japanese proficiency, unlimited or non-work permit status of residence, a long-term planned length of stay in Japan, and living with extended family. Future evaluation for the smartphone application could specify these target populations. However, online parenting workshops obtained high appraisals from all types of participants, which could be more general practice for Chinese women living in Japan. Secondly, the optimally effective time points of smartphone applications and workshops may differ, requiring various intervention periods. A previous intervention study using an informational provision application for the immigrant population

reported effective results with an intervention period of two hours (Fernández-Gutiérrez et al., 2019), while workshops among immigrant women utilised a relatively long period and showed few effects (Luo, Ebina, et al., 2022).

This study has several limitations. First, the study used a quasi-experimental design in which the intervention and control groups were not assigned randomly, but rather as a result of the participants' convenience. Even though there were no significant differences in the baseline scores of mental health distress, depression, and parenting stress, the scores of the intervention group were higher than the control group. This may be due to the fact that the participants in the intervention group recognized the strained child-rearing environment or exhibited a high level of self-awareness of their mental health and this led them to participate in the intervention. Future studies should be conducted where the allocation of participants to the intervention and control groups is random to avoid this type of possible bias. Second, the small sample size may have limited the generalizability of the findings among immigrant Chinese women and immigrant women in Japan. Third, this study conducted tests at only two time points: pre- and post-intervention. There is the lack of a third or maintenance observation of all outcome measures, which assesses how stable treatment effects are across time. A third test would give more credence to any significant treatment effects found. Thus, the long-term effect with more than two repeated measures should be considered for future evaluation.

The relevance for future practice of this study was considered as follows. First, Internet-based interventions, including information provision applications and online parenting workshops, can help improve mental health distress and depression among immigrant Chinese women. Second, information communication technology can assist immigrant mothers to access accurate information quickly and conveniently. It can be

utilised to overcome language barriers to increase the efficiency of social support and healthcare providers. Third, Internet-based interventions may improve and maintain the psychological well-being of immigrant women with multicultural backgrounds during the COVID-19 pandemic and any future health crises.

## 4.7 Conclusions

The Internet-based mental health promotion intervention programme significantly improved depression and mental health distress among Chinese women in Japan, but did not affect social support and parenting stress. The participants in the intervention group highly appraised the mental health promotion programme, especially the online parenting workshops. The author suggest that informational provision applications and online parenting workshops could be utilised to assist immigrant women with multicultural backgrounds to attempt to improve their mental health status and their quality of life.

## 4.8 Chapter summary

This chapter has developed an Internet-based mental health promotion intervention that involved an information provision application and online parenting workshops and has conducted a quasi-experimental study to evaluate the effect of the intervention. Internet-based intervention as a possible approach has been recommended to maintain and improve the mental health of Chinese women living in Japan. The next chapter describes a summary of the work that the author has done and a discussion of the study's limitations and implications for future practice.

# Chapter V Discussion of the dissertation

## 5.1 Summary of the dissertation

The objective of this PhD dissertation was to develop a mental health promotion intervention and evaluate the effect of the intervention among Chinese women living in Japan. As a result, an Internet-based intervention was developed and significantly improved mental health distress and depression among Chinese women living in Japan. A clear process of how the Internet-based intervention to be developed is summarized as follows.

In preparation step, two cross-sectional studies were conducted to identify the mental health status before and after the COVID-19 pandemic outbreak. Meanwhile, a theoretical framework of significant variables was confirmed and proposed for mental health promotion among Chinese women living in Japan

In step one, a systematic review was performed to identify and analyze the effectiveness of previous interventions for improving the mental health of immigrant women and explore the role of nursing practice in these interventions. Depression as a significant variable was emphasized to evaluate the effect of mental health promotion among immigrant women. Besides, most studies reviewed used a mixed-methods design but were not assessed as being of high quality. Thus, instead of a mixed-methods design, the author initially adopted a qualitative study design to identify the target population's needs and then executed a quasi-experimental study design to test the developed intervention in the following phases.

In step two, a qualitative study was performed to explore parenting and mental health promotion needs and to provide development recommendations and evidence for

the mental health promotion intervention. Information provision and social network building were emphasized as practical social support mechanisms to improve the mental health of Chinese women living in Japan

In step three, considering the current situation of COVID-19 the Internet- based tools and materials as a usefulness and convenience approach was adopted to develop the mental health promotion intervention. Meanwhile, a quasi-experimental study was conducted to evaluated the effect of the Internet-based intervention. Consequently, the internet-based intervention significantly improved the mental health distress and depression, but no social support and parenting stress.

In the next step, the long-term effect with more than two repeated measures should be considered for future evaluation of the Internet-based intervention. Information provision applications like ‘Love for Mom’ should be considered to develop in muti-language to assist immigrant women with multicultural backgrounds

## 5.2 Limitations

Firstly, the primary recruitment was only conducted online and participants were recruited using convenience and snowballing sampling, which might have introduced technological bias. Secondly, the small sample size may have limited the generalizability of the findings among immigrant Chinese women and immigrant women in Japan. Thirdly, considering the high rate of dropout in the previous studies, the effect evaluation of intervention used a quasi-experimental design in which the intervention and control groups were not assigned randomly but by participants’ convenience. Future studies should be considered conducting random allocation of participants to avoid this kind of bias. Finally, the effect evaluation of intervention was tested at only two time points: pre- and post-intervention. There is the lack of a third or

maintenance observation of all outcome measures, which assesses how stable treatment effects are across time, giving more credence to any significant treatment effects found between just two observations. Thus, the long-term effect with more than two repeated measures should be considered for future evaluation.

## 5.3 Implications for future practice

First, this study highlights that nurses and midwives, and possibly other clinical healthcare providers, play an important role in conducting practices to improve immigrant women's mental health during the stages of pregnancy, childbirth, and child-rearing.

Second, few interventions are aimed at improving immigrant women's mental health, especially for those in the stages of pregnancy, childbirth, or early child-rearing. Furthermore, few of these existing interventions showed significant effects. Effective nursing interventions should be developed to improve immigrant women's mental health based on their multi-cultural background.

Third, as a useful research methodology, mixed-method research should be conducted in a more robust manner to identify immigrant women's needs, design effective interventions, and test the effectiveness of these interventions. Depression as a significant variable should be evaluated to assess the effectiveness of mental health promotion interventions among immigrant women.

Forth, social support providers, healthcare providers, and public health workers should help immigrant and resettlement women strengthen their connection with the community and neighbourhood to ensure that they do not lack social support during challenging periods such as the current COVID-19 pandemic.

Fifth, information communication technology should be used to help immigrant

women access and obtain accurate information quickly and conveniently. It can be utilised to overcome language barriers to increase the efficiency of social support and healthcare providers.

Sixth, during an emerging pandemic, Internet-based interventions are a possible approach to maintaining and improving immigrant women's mental health in multicultural backgrounds, not exclusively Chinese women and immigrant women in Japan.

## 5.4 Conclusions

The study developed an Internet-based mental health promotion intervention that involved an information provision application and online parenting workshops. The intervention significantly improved the depression and mental health distress of Chinese women living in Japan, but did not affect social support and parenting stress. The long-term effect of the Internet-based intervention with more than two repeated measures should be considered for future evaluation. The findings suggest that informational provision applications and online parenting workshops could be utilised to assist foreign women with multicultural backgrounds in attempting to improve their mental health status and quality of life. This study makes a significant contribution to the future practice of cross-cultural healthcare since Internet-based interventions to address immigrant women's mental health difficulties are lacking, even though access to the Internet is widely available.

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# List of Research Achievements

## 1. Scholarly journal articles

- **Luo Y**, Sato Y, Zhai T, Kagamiyama H, Ebina Y. Promotion of mental health and parenting needs among Chinese women in Japan: A qualitative study. International journal of environmental research and public health. 2022, 19(20), 13538.
- **Luo Y**, Ebina Y, Kagamiyama H, Sato Y. Interventions to improve immigrant women's mental health: A systematic review. Journal of clinical nursing. 2022, 00, 1–13.
- **Luo Y**, Sato Y. Health-related quality of life and risk factors among Chinese women in Japan following the COVID-19 outbreak. International journal of environmental research and public health. 2021, 18(16), 8745.
- **Luo Y**, Sato Y. Relationships of social support, stress, and health among immigrant Chinese women in Japan: A cross-sectional study using structural equation modeling. Healthcare. 2021, 9(3), 258.
- **羅云潔**，澤田佳香，佐藤洋子．中国語を母国語としている母親における健康に関連する QOL と知覚されたソーシャルサポートとの関連：横断研究．小児保健研究，2021；80(4)：527-537.
- **羅云潔**，佐藤洋子．在日外国人の育児に関する文献検討．日本小児看護学会，2020；20：59-64.

## 2. Proceedings and feature articles

- **Luo Y**, Sato Y. Changes in the Health-related Quality of Life of Chinese Women in Japan Following the COVID-19 Outbreak. Proceedings of the 3rd International Electronic Conference on Environmental Research and Public Health —Public Health Issues in the Context of the COVID-19 Pandemic, MDPI: Basel, Switzerland, January 2021.
- **羅云潔**，佐藤洋子.在日外国人の母親が感じている育児ストレス．子どもと家族のケア，2019；14(5)：39-44.

## 3. Conference presentations

- **Luo Y**, Sato Y, Kagamiyama H, Ebina Y. A systematic review of interventions to improve immigrant women's mental health. The 7th International Nursing Research Conference of World Academy of Nursing Science. Taipei (online), October 18-19, 2022.
- **Luo Y**, Ebina Y, Kagamiyama H, Sato Y. Promotion of parenting and mental health needs among Chinese immigrant women in Japan: a qualitative study. The 25th East Asian Forum for Nursing Scholars. Taipei (online), April 21-22, 2022.
- **Luo Y**, Sato Y, Yoko S. The impact of COVID-19 on health and social support among Chinese residents living in Japan: a cross-sectional study. The 41st Annual Conference of Japan Academy of Nursing Science. Virtual Congress, December 4-5, 2021.
- **Luo Y**, Sawada Y, Sato Y. The Mediating Effect of Parenting Stress between Social Support and Mental Health among Chinese Women in Japan. ICN Congress 2021 – Nursing Around the World. Virtual Congress, November 2-4, 2021.
- **Luo Y**, Kagamiyama H, Sato Y. Health Response to the COVID-19 Pandemic of Chinese International Students in Japan. The 5th FHS International Conference, Sapporo, September 17-18, 2021.
- **Luo Y**, Sato Y. The Relationship between Health-related Quality of Life and Perceived Social Support among Chinese Immigrant Mothers in Japan: A Cross-Sectional Study. The 24th East Asian Forum for Nursing Scholars, Virtual Congress, April 15-16, 2021.
- **Luo Y**, Aoyanagi M, Sato Y. The influence of social support on mental health among Chinese immigrant women in Japan. The 40th Annual Conference of Japan Academy of Nursing Science. Virtual Congress, December 12-13, 2020.
- **Luo Y**, Sawada Y, Sato Y. Child-rearing Stress, Acculturative Stress, and Quality of Life among Immigrant Chinese Women in Japan. The 23nd East Asian Forum for Nursing Scholars, Chiang Mai, January 10-11, 2020.
- **Luo Y**, Sawada Y, Sato Y. Population Dynamics of Chinese Residents in Japan from 2008 to 2017. The 4th FHS International Conference, Sapporo, July 5, 2019.

- **Luo Y**, Sato Y. Review of Literature on the Child-rearing Support for Foreigners in Japan. The 22nd East Asian Forum for Nursing Scholars, Singapore, January 17-18, 2019.
- **羅云潔**，澤田佳香，佐藤洋子．在日外国人母親の育児ストレスに関する文献検討．日本小児看護学会第 29 回学術集会, 札幌，2019 年 8 月 3-4 日.

## 4. Awards

- 令和 2 年 3 月 25 日，2019 年度北海道大学大学院保健科学院長賞
- 平成 30 年 7 月 19 日，平成 30 年度北海道大学大学院保健科学院大学院生合同シンポジウム優秀賞

## 5. Fundings

- The Hokkaido University DX Doctoral Fellowship funded by JST SPRING
  2021.10–2023.03
  Director, approved amount 992,200 JPY
- The Doctoral Program for World-leading Innovation and Smart Education (1801) from the Japan Society for the Promotion of Science (JSPS), funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT)
  2021.10–2023.03
  Director, approved amount 400,000 JPY