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Exploring the Effects of Psychosocial Factors and Relationships to Postpartum Depression Symptoms Among Iranian Immigrant Women Living in Canada: A Cross-Sectional Study

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EXPLORING THE EFFECTS OF PSYCHOSOCIAL FACTORS AND RELATONSHIPS TO POSTPARTUM DEPRESSION SYMPTOMS AMONG IRANIAN IMMIGRANT WOMEN LIVING IN CANADA: A CROSS-SECTIONAL STUDY

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By

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ABSTRACT

EXPLORING THE EFFECTS OF PSYCHOSOCIAL FACTORS AND RELATONSHIPS TO POSTPARTUM DEPRESSION SYMPTOMS AMONG IRANIAN IMMIGRANT WOMEN LIVING IN CANADA: A CROSS-SECTIONAL STUDY

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Introduction: Immigrant women's health garners attention as migration creates changes in social networks and parenting needs. The effect of psychosocial factors, such as maternal self-efficacy, measured by ability to manage parenting responsibilities, social support and cultural postpartum practices on postpartum depression symptoms are not well known in Canadian immigrant women. **Methodology:** A cross-sectional descriptive survey design guided by Bandura's Reciprocal Determinism was used to explore the relationships between psychosocial factors including: maternal self-efficacy, social support, cultural postpartum practices; and symptoms of postpartum depression (PPD) among recent Iranian immigrant women living in Canada. **Results:** A total of 114 participants completed the survey. Two-thirds of the respondents screened for symptoms of PPD; there was a significant effect with maternal self-efficacy ($p<.001$), social support ($p=.001$), maternal age ($p=.001$), parity ($p=.009$) and years residing in Canada ($p<.001$),

but not with cultural postpartum practices (p=.281). A moderating effect of social support was found on the relationship with maternal self-efficacy and symptoms of PPD (p=.004). **Discussion:** Younger, first-time Iranian immigrant mothers who arrived recently in Canada were more likely to experience symptoms of PPD. Social support is a crucial component to maternal self-efficacy and finding ways to assist Iranian immigrant women in Canada to help alleviate their symptoms of PPD is needed.

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DEDICATION

I would like to dedicate this dissertation to two very important people who have inspired me to conduct this research. First to my friend and colleague Farideh, you inspired me to do this study by reminding me of my public health practice with Iranian refugee and immigrant postpartum women. Thank you for your guidance and encouragement. I am grateful for your support, patience, humility and your brilliant statistical justifications. Second, I want to dedicate this dissertation study to my Polish immigrant mother. I grew up as a witness to your mental health struggles. I was able to realize your dream by becoming a nurse. Mom, you inspired me to advocate for women who lost their voice. I love you mom and I miss you. This for you.

Thank you to my husband Larry. Your tough love, mixed with reassurance and patience led me through the most challenging aspects of my doctoral journey. A special thank you to my brother, sister-in-law Sarah and niece Nadia. Your support kept me going. Sarah you're such a great mom and inspired me to complete my PhD.

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Lastly, I would like to acknowledge the Faculty of Health, York University for the Minor Research Grant for funding this study.

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LIST OF ABBREVIATIONS

PPD= Postpartum Depression

WHO= World Health Organization

PI= Principal Investigator

VPN= Virtual Protective Network

IRB= Institutional Review Board

MR= Multiple Linear Regression

PMP-SE= Parental Maternal Perceived Self-Efficacy

MSPSS= Multidimensional Scale of Perceived Social Support

EPDS= Edinburgh Postnatal Depression Scale

ICPP= Iranian Cultural Postpartum Practices

WHO= World Health Organization

A Cross-Sectional Study Exploring Psychosocial Factors on Postpartum Depression Symptoms in Iranian Immigrant Women Living in Canada

Specific Aims

Women of childbearing age make up approximately half of the 1.8 million new immigrants who arrived in Canada within the last five years. 60 thousand Iranian immigrants, the fourth largest group, called the Greater Toronto Area their home (Canada, 2017; Dastjerdi, 2012). Immigrant mental health has garnered attention by the difficulties experienced during their settlement and migration experiences (Dennis et al., 2017; O'Mahony et al., 2013; WHO, 2018). Immigration can be considered a social determinant of health as the migration experience can impact mental health and even more so in women (Delara, 2016). Recent immigrant women have a twofold risk of developing postpartum depression (PPD) symptoms as compared to Canadian born women (Dennis et al., 2017). Risk factors include low income, social isolation, language barriers, inability to practice postpartum cultural practices and inadequate access to health care needs (Dennis et al., 2017; Higginbottom et al., 2014; Khanlou et al., 2017; O'Mahony, 2012; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Parenting confidence in samples of non-immigrant women contributed to symptoms of depression and unresolved depression further eroded parenting confidence (Takacs et al., 2019). Studies focused on PPD symptoms in immigrant women have focused on prevalence and experience, however, parenting confidence experienced by Iranian immigrant women in Canada is not known.

Psychosocial factors include maternal self-efficacy, social support and cultural considerations and how these contribute to PPD symptoms in immigrant women were

studied previously as separate entities. Maternal self-efficacy, defined as parenting confidence and the capacity to provide infant care has been influenced by the amount of social support accessed by a new mother (Teti & Gelfand, 1991). One Iranian study established a connection in perceived social supports with maternal confidence in first time mothers (Mirghafourvand & Bagherinia, 2018). Evidence suggests lack of social support is a main factor in the experience of immigrant women with PPD symptoms (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Variable levels of support and experiences of insecure immigration status may cause women to hesitate utilizing outside sources of support from fear of persecution (Guruge & Collins, 2008). Furthermore, adapting to a new country's cultural norms creates struggles in adjustment may lead to difficulties in meeting parenting demands (Dennis et al., 2017; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Maintaining cultural rituals after migration served as a predictor in immigrant mental health (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Migration stress, length of residency, language barriers, immigration status and access to health care along with perceptions of low support are associated with PPD symptoms, (Alhansanat et al., 2017; Alhasanat & Fry-McComish, 2015; Berry & Hou, 2016; Dennis et al., 2017; Fung & Dennis, 2010; George et al., 2015; Guruge et al., 2015), however, the role of maternal self-efficacy in Iranian immigrant women is undefined.

The study proposed is a cross sectional descriptive survey design using a theoretical framework to explore the relationships concerning psychosocial factors, maternal self-efficacy, perceived social support, traditional postpartum cultural practices and sociodemographic factors in the presence or absence of PPD symptoms among Iranian immigrant women living in Canada. The specific aims of the study are to

investigate recent Iranian immigrant women living in Canada. **Aim 1** is to determine the association between maternal self-efficacy and the presence or absence of PPD symptoms. **Aim 2** is to determine the association between social support and the presence or absence of PPD symptoms. **Aim 3** is to determine the association between postpartum cultural practices and the presence or absence of PPD symptoms. **Aim 4** is to determine the association between maternal self-efficacy, perceived social support and postpartum practices, socio-demographic factors and the presence or absence of PPD symptoms.

The purpose of this study is to understand psychosocial factors of maternal self-efficacy, perceived social support and cultural considerations among recent Iranian immigrant women experiencing alterations in mood during the postpartum period; effectiveness in mothering their baby and the type and quality of support needed which has not explored (Saad, 2019; Watson et al., 2019). Immigrant childbearing women are frequent consumers of the Canadian health care system during the perinatal period and are likely to access a nurse during routine postpartum care (Ganann et al., 2016; Khanlou et al., 2017). Yet, Iranian immigrants may be reluctant to disclose mental health challenges to their health care providers (Dastjerdi, 2012). This reluctance stems from building trust with their healthcare provider and the fear of broken confidentiality in part by the concerns about exposure within the relatively small Iranian community in the Greater Toronto (Dastjerdi, 2012). Assessing for PPD symptoms, perceived levels of social support, maternal self-efficacy and ability to practice cultural rituals in recent Iranian immigrant women will inform community mental health promotion and nursing practice.

Significance

Postpartum Depression Symptoms among Iranian Immigrant Women in Canada

Recently, the WHO (2018) classified migration as a social determinant of health. Global migration patterns are shifting as population groups flee civil and political instability in search of economic security and peace. Immigrant women's mental health requires urgent attention as migration creates changes in social networks, employment opportunities and cultural adjustment. Childbearing women specifically face additional stressors in meeting caregiving demands and are at greater risk of developing PPD symptoms (Beck, 1993). PPD is considered both a psychosocial and a biological illness characterized by emotional responses of sadness, anxiety and loss of joy in the mothering role during the postpartum period in addition to the physiologic changes which may impact mood in approximately 12% of immigrant women (Daoud et al., 2019). Furthermore, Canadian ethnic minority immigrant women are known to experience greater risk factors for PPD and are twice as likely to develop symptoms compared to Canadian European immigrant women and Canadian born women (Daoud et al., 2019; Falah-Hassani et al., 2015; Higginbottom et al., 2014). It is important to note immigrant women are screened for symptoms of PPD rather than diagnosed with the disorder.

Psychosocial Factors in Postpartum Depression

Social Support and Postpartum Depression

Psychosocial factors related to PPD symptoms include the perceptions of social support, cultural integration and feelings of connectedness (Dennis, 2014). The geographical separation of supportive networks is linked with PPD symptoms and is reported more frequently by immigrant women who increase their reliance on their spouse for emotional support (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo

et al., 2015; Shafiei et al., 2015). Women tend to rely on female family members to assist in cultural childrearing practices, however socially isolated immigrant women struggle to accomplish these, contributing to cultural maladjustment and loss of identity (Jin et al., 2016; Russo et al., 2015). Access to community resources, including heath care services, cultural community groups or parenting programs may increase the perception of social support. Lack of knowledge to these community means are reported by immigrant women with PPD symptoms (Mohammad et al., 2018; Morrow et al., 2008; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Perceived support from health care providers determined whether immigrant women would seek help for depression symptoms. Self-stigma and marginalization often prohibit these women from seeking further help (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Social isolation, or lack of access to supportive networks impact immigrant women's mental health, particularly during the postpartum period (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012).

Maternal Self-Efficacy

Self-Efficacy Theory is derived from Social Cognitive Theory, which focuses on a system in which individuals control thoughts beliefs, emotions and actions (Bandura, 1986; Pajares, 1997). Self-efficacy is described as a personal belief in the ability to manage competence and mastery of tasks, measured in confidence interpreted as results in actions and under periods of stress, demonstrate coping skills needed to fulfill health focused goals (Bandura, 1977; Bandura, 2004; Pajares, 1997). Maternal self-efficacy, mother's parenting confidence, is defined as abilities in infant caregiving or meeting parenting demands of caring for an infant (Leahy-Warren et al., 2012; Wittkowski, Garrett, et al., 2017). Maternal self-efficacy is a broad concept, studied primarily as the

ability to complete caregiving tasks, including the ability to breastfeed successfully. A study found non-immigrant first time mothers who were depressed were less likely to respond intuitively to their infant's needs including the ability to console infant crying (Leahy-Warren et al., 2012; Wittkowski, Garrett, et al., 2017). Low maternal self-efficacy was noted in immigrant women who experienced difficulty breastfeeding their infant exclusively, articulated as being overwhelmed with childrearing responsibilities (Shafiei et al., 2015). Immigrant mothers who experience high parenting stress described their fears of being a failure at parenting their infant, difficulties in adjusting to the maternal role and experiencing poor coping skills, all of which can be interpreted as maternal self-efficacy (Park & Moon, 2011). Most recently, breastfeeding self-efficacy was explored with Canadian immigrant postpartum women (Dennis et al., 2019), yet a more comprehensive understanding of parenting confidence is warranted, particularly in women with PPD symptoms.

Environmental Influence on Maternal Self-Efficacy

The influence of environment on behavioral outcomes are described by Bandura (1978) as Reciprocal Determinism; the interpretation of the results of individuals actions is informed by the environment and their self-beliefs. Reciprocal Determinism includes three domains of personal factors, 1) personal wellbeing provides a strong sense of personal capability, 2) behaviors influences actions made and 3) the environment creates the interaction between personal and behavior domains (Bandura, 1978). Self-efficacy is influenced by social and cultural contexts consisting of beliefs and capabilities individuals feel they have, but when faced with stress, find difficulty in attaining their health needs (Bandura, 1977; Bandura, 2004). Immigrant women with a strong maternal

role identity and ability to practice cultural postpartum traditions have a higher likelihood of maintaining healthy behaviors (King et al., 2019; Spector, 2002; Urindwanayo, 2018; Watson et al., 2019).

The cultural context of mental health needs is multifaceted. The HEALTH Traditions Model, a framework defined by the mind, body and spirit and a sense of harmony within the environment (Spector, 2002). The perception of health is dependent on cultural, family and community factors and the ability to practice beliefs and practices through culture rituals to maintain, protect or restore health (Spector, 2002). Certain cultural groups may express mental health as somatic symptoms, postpartum pain for instance or may deny symptoms of depression all together as a result of cultural stigma (Guruge et al., 2015; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Spector, 2002). The proposed study will examine the relationships of psychosocial factors including maternal self-efficacy, perceived social support, socioeconomic status, and cultural practices in Iranian women who experience PPD symptoms.

Cultural Factors in Postpartum Depression Symptoms

Isolated immigrant women reported greater dissatisfaction when the loss of cultural identity was felt, resulting in difficulties in meeting their parenting expectations (Chen et al., 2012; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). The ability to perform postpartum cultural practices, such as the observing the 40 day ritual, where postpartum women are restricted of leaving the home in the first 40 days postpartum, emphasis on recovery by periods of rest and cultural foods, breastfeeding with assistance from extended family members (Bina, 2008; O'Mahony et al., 2012). Those who were at risk for developing PPD symptoms reported frustration when health care providers

impeded their ability to practice cultural rituals postpartum (Ganann et al., 2019; Ganann et al., 2016). Immigrant women who sought help for PPD and articulated their symptoms as physical complaints or enduring pain were met with barriers, as mood disturbances were missed by health care providers (Ganann et al., 2016; O'Mahony et al., 2013).

Immigrant women who reported lower PPD symptoms were connected in their community (Chen et al., 2013; O'Mahony & Donnelly, 2010). Cultural experiences include the transition to new cultural norms, preferences in postpartum practices, access to health care and other community-based supports may play role in maternal mental health (Ganann et al., 2019).

Postpartum Iranian Immigrant Women Living in Canada

In general, immigrant women face greater difficulties, language barriers, lack of timely access to health care and low perceived social support which contribute to mental health issues and health disparities (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Iranian immigrants are family-oriented, but embrace both hierarchal and patriarchal traditions (Jannati & Allen, 2018). Reports of divergent cultural style in childrearing cause conflict within families, particularly when adjusting cultural postpartum practices after immigration (Shishehgar et al., 2015; Tummala-Narra & Kaschak, 2013). Additionally, Iranian immigrants were found to be reluctant to seek counselling and prefer to discuss their emotional concerns with family members (Lipson, 1992). Maternal self-efficacy in first time Iranian mothers was found to have a positive relationship with perceived social supports (Fathi et al., 2018; Mirghafourvand & Bagherinia, 2018), but this relationship is not known among Iranian immigrant women in Canada. Iranian postpartum women were solely studied in Iran (Mirghafourvand & Bagherinia, 2018).

Promoting Immigrant Maternal Mental Health in Community Nursing Practice

Immigrant postpartum women suffer from health disparities and addressing immigrant maternal mental health must start with examining psychosocial factors (George et al., 2015). Social determinants of health, socioeconomic status and perceived social support greatly impact maternal wellbeing. Immigrant women experiencing PPD symptoms tend to be mothers of older children who experience additional caregiving demands (Dennis et al., 2017). Moreover, immigrant women, specifically those settling in Canada, are less likely to be employed or suffer from underemployment, experience low income and rely on spousal support (Dennis et al., 2017; Ganann et al., 2019; Guruge et al., 2015). Perhaps first considering the presence of PPD symptoms in postpartum immigrant women using a psychosocial lens rather as a psychiatric condition can provide a greater understanding of parenting behaviors. Using a self-efficacy and cultural framework highlights reasons for personal beliefs, motivation and external influences on mental health (Whitehead, 2001). This is certainly a concern with Iranian immigrant women who experience self-stigma and denial in their own mental health needs (Dastjerdi, 2012). Discerning the impact of psychosocial factors, including maternal self-efficacy, social support and ability to practice cultural traditions during the postpartum period would inform future nursing practice by stressing the importance of linking community supports for PPD symptoms. Iranian immigrant women are subjected to stigma in regard to seeking health care for their mental health and experience low social support, low income and migration stress (Dastjerdi, 2012; Tummala-Narra & Kaschak, 2013). Iranian immigrant women in the postpartum period have not been directly studied in Canada, however previous research with Iranian immigrants indicates that they are

well educated, arrive to Canada from Iran with advanced degrees, but are underemployed and experience low income (Dastjerdi, 2012). Language barriers tend to restrict health seeking behaviors with this immigrant group, especially when seeking to address their mental health concerns, in addition to lack of knowledge of the Canadian health care system (Dastjerdi, 2012).

Innovation

The status quo as it relates to immigrant women with postpartum depression symptoms has involved identifying the prevalence, risk factors and access to mental health services globally (Alhasanat-Khalil et al., 2018; Dennis et al., 2016; Dennis et al., 2017; Falah-Hassani et al., 2015; Ganann et al., 2016; Khanlou et al., 2017; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Experiences with PPD symptoms identified links between low perceived social support and mood disturbances (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Insights on the role of social support and the experience of postpartum depression in immigrant women have been established, however, other psychosocial factors, cultural practice and maternal self-efficacy adds an additional layer not yet known.

By contrast, the proposed study is innovative as it moves away from the status quo by using a framework that describes relationships between perceived social support, maternal self-efficacy and cultural traditions in a specific ethnic group of depressed postpartum immigrant women not widely studied in Canada. The proposed study's participant recruitment and methodology through remote means via an online Iranian mother's group on a popular social media site modernizes the means of conducting research compared to the predominantly traditional in person contact.

Approach

Preliminary Study

The principal investigator (PI) conducted a small qualitive inquiry to understand the perception of health and health seeking behaviors of recent postpartum immigrant women which informed the aims of this proposed study. The primary research question: 'What is the process recent immigrant women in Canada use to keep healthy during the postpartum period? The study used a grounded theory design (Strauss and Corbin, 1990), and a method of data collection from observations, field notes and face to face semi-structured interviews. Four recent immigrant Israeli women were recruited with assistance from a gatekeeper, using a purposive sampling method. The PI conducted the data analysis using a theoretical analytic approach by an open and selective coding method; field notes, memos and interview transcripts underwent a constant comparative method for theoretical themes (Strauss and Corbin, 1990), resulting in eight axial codes and five categories which determined the theoretical assumption. The small number of participants and restricted ability to sample theoretically limited data saturation.

The four participants, aged between 29 to 42 years, were married and mothers to an infant under one year of age, born in Israel, arrived in Canada an average of twelve months prior and were living in the Greater Toronto Area. The findings revealed the process participants took to seek health was very complex since they had a preconceived notion of being healthy. The access to health information was dependent on whether they had access to a primary health care provider, however, participants primarily resorted to using online searches to address their health concerns. Participants who identified having

social support became more familiar with Canadian life, which eased their difficulties in understanding social norms and adjustment to the colder weather conditions.

The mini-study informed the need for further examination of immigrant women's perceptions of support and achieving good health while adjusting to life with a new baby in Canada. The richness of the data collected identified a resiliency among the participants, and hints of maternal self-efficacy in reporting how they accessed health information and health focus. For the short time frame allotted for the mini-study the online recruitment through social media was faster than anticipated and participant engagement was high. The gatekeeper, an active member of a local Facebook Israeli mother's group was instrumental in promoting the mini-study by posting the flyer on the group's main page; she also identified interested participants and facilitated contact with the PI. Thus, recruitment is being planned similarly with the proposed study.

Participants revealed they did not feel healthy, experienced stress related to immigration and focused their efforts on their baby's wellbeing. The semi-structured interviews did not focus on mental health specifically, however participants disclosed periods of feeling overwhelmed, fatigued and worried about their own wellbeing during the postpartum period. The mini-study results identified the need to further explore the relationships with depression symptoms, social support and perception of parenting abilities in postpartum immigrant women.

Research Design

The proposed descriptive cross-sectional correlation design will investigate relationships among psychosocial factors, perceived social support, maternal self-efficacy, traditional postpartum cultural practices and sociodemographic variables in

presence of and without symptoms of PPD. The inclusion criteria includes postpartum women who live in the Greater Toronto Area, can read and understand English, over the age of 18, were born in Iran, who are mothers of infants under one year of age and have immigrated to Canada in the past five years as defined as a recent immigrant by Statistics Canada (Canada, 2017). Participants will complete a self-administered questionnaire electronically to report their perceptions of social support, maternal self-efficacy, traditional cultural practices, sociodemographic variables and presence of PPD symptoms once consent has been established. Signed consents will be obtained online on the Qualtrics survey platform.

The study's theoretical framework is based on the foundations of Bandura (1978) Reciprocal Determinism, describing personal, behavioral and environmental factors in relationship to PPD symptoms. Personal factors are a form of a cognitive beliefs and perceptions (Bandura, 1978) is determined as presence or absence of PPD symptoms, behavioral as sources of motivation and traits within the individual (Bandura, 1978) described as maternal self-efficacy and environmental creates the interaction between personal and behavioral factors by perceived social support, traditional cultural practices and socioeconomic status. The interaction between environment and behavior is influenced by the individual in a reciprocal direction (Bandura, 1978). Figure 3.1 provides an explanation which describes the relationships between psychosocial variables, maternal self-efficacy, social support, cultural practices and socioeconomic status with PPD symptoms as adapted from Reciprocal Determinism (Bandura, 1978).

Setting and Sample

Participant recruitment is aimed at a Facebook group geared to Iranian mothers living in the Greater Toronto Area, in the province of Ontario in Canada, where majority of Iranian immigrants have settled to this geographical area (Canada, 2017). The group is comprised of over 2000 members and a gatekeeper associated with a Facebook mother's group geared to Iranian immigrant women has agreed to assist in the promotion of the proposed study. In consultation with the gatekeeper, there are a large number of immigrant women who are mothers to young infants in this group seeking information through Facebook posts who would meet the inclusion criteria. A secondary source, the Telegram messenger application contains a popular channel for Iranian Mothers in Toronto group containing an unspecified number of mothers will also be considered for recruitment, as the gatekeeper is also a member if the primary recruitment strategy falls short.

The population enrolled for this study will include immigrant postpartum women who belong to the Facebook group geared to Iranian mothers in the Greater Toronto Area. The inclusion criteria include women over the age of 18 years, born in Iran, lived in Canada less than five years, able to read and understand English, live in the Greater Toronto Area and delivered a baby in the previous 12 months is considered as the postpartum period.

Recruitment and Consent

The PI will inform the gatekeeper of the study's purpose and develop a recruitment flyer in English for the gatekeeper to post on the main Facebook page. The flyer will contain information about the study's purpose and PI contact information. The gatekeeper will direct the interested participants to the PI, by email, phone or text to discuss the details of the study and to determine eligibility. The PI will screen for eligible

participants during the initial contact and obtain their contact information. The written consent Qualtrics link sent by email. If requested, participants will receive a video link describing the study by the PI in a video format for their reference.

During the consent process, participants will be informed their involvement is voluntary, confidential and that they have the right to withdraw without prejudice. Participants will be directed to complete the online consent with an electronic signature by clicking on the check box to agree to participate in the proposed study, typing their full legal name and entering the date in the designated boxes. The participant will be instructed to click submit to complete the consent form before commencing the survey and without the consent, the participant will be unable to access the survey. Participants will receive a confirmation email with an attached copy of their consent form, reminded of the PI's contact information and their right to withdraw from the study. Participants will be provided information for referral to mental health supports if participants identify an emotional difficulty after survey completion.

Access to the electronic survey results will be password protected and only accessed by the PI, with additional security firewalls on the computer's operating system and on a Virtual Protected Network (VPN) platform. Downloaded data will be saved on a password encrypted external hard drive, stored in a secure locked location accessed exclusively by the PI. Participants will have the option to decline further participation by a quit survey option embedded into the survey itself. If the participant prefers an alternate survey format, a PDF copy will be emailed, or a paper version with a self-addressed stamped envelope will be sent by regular mail. The PI will ensure participants understand the study procedures, benefits, risks and time required to complete the survey during the

consent process. Participants will be informed confidentiality and privacy will not be guaranteed when participating over the internet, the electronic survey is delivered by a third party and personal electronic information, including the IP address, may be obtained without their knowledge or consent and will not be used by the PI for the purpose of the study.

Data Collection

Participants will be asked at the start of the survey to complete a socio-demographic form developed by the PI to collect information on participant's age, income, educational attainment, years living in Canada. Participants will then complete four self-reporting questionnaires imbedded into the electronic survey maternal self-efficacy, perceived social support, Iranian cultural customs and ritual practices and presence of PPD symptoms. The completed electronic surveys will be reviewed by the PI, results downloaded onto a secure external hard drive in an electronic folder with the corresponding participant's non-identifying number. Participants are anticipated to require one half hour to review the study information video and consent. One hour is anticipated to complete the survey questions during the participant's own time. Participants will be emailed an $30 gift card electronically by email once the PI confirms survey completion.

Participants will be provided a 80-item electronic survey consisting of 11 sociodemographic questions, 20 maternal self-efficacy questions, 12 questions for perceived social support, 27 questions on Iranian cultural customs and rituals practices and 10 questions inquiring about the presence of postpartum depression symptoms.

Variables/Instruments

Socio-demographic data. The participant socio-demographic information collected aligns with traditional methods to protect health through body, mind and spirit outlined in the HEALTH Traditions Model (Spector, 2002). The socio-demographic information sought is the participant's age, income, educational attainment, and years living in Canada.

Iranian cultural postpartum practices. Iranian cultural postpartum practices will be measured using a 27-item questionnaire developed by Abdollahi et al. (2016) based on four categories; 1) general, Question #2 "people helped for free with the care of her other children" 2) maternal, Question #7 "avoiding bad news because this will affect the milk supply" 3) nutritional Question #20 " avoiding eating spicy food because these will give wind to the baby" and 4) neonatal practices Question #25 "wrapping or binding the baby to avoid the cold state for 10 days", rated by a yes (1)/no (0) response, scores ranging from 0-27 with higher scores denoting more cultural customs and rituals practiced. The questionnaire was developed for a longitudinal study in Iran to determine the relationship with postpartum mental health and cultural practices (Abdollahi et al., 2016). The original questionnaire is in Farsi, but a translated English version is available. The inter-rater reliability was measured using a test-retest method with a sample of 60 women, over a two-week interval at eight weeks postpartum, with the Cohen's kappa of 0.60 (Abdollahi et al., 2016). The general category asks about visiting family members, support for older children, the maternal category inquires if mothers observe the 40 day rest after birth, nutritional practice eating traditional foods and avoidance of spicy foods and the neonatal category baby massage and swaddling (Abdollahi et al., 2016). The

questionnaire was used for the first time in Iran and not tested in immigrant Iranian women in Canada. The questionnaire will be used in its entirety.

Maternal self-efficacy. Mothers will be asked to complete the Perceived Maternal Parental Self Efficacy Scale (PMP-SE) (Barnes & Adamson-Macedo, 2007) a 20-item self-reported questionnaire based on four subscales; 1) caretaking procedures, 2) perceptions of eliciting positive infant response behaviors, such as soothing, 3) reading cues and 4) situational beliefs about parenting abilities, scores range from 20-80. The higher the score, the mother demonstrates higher self-efficacy in their parenting abilities. The scale was initially developed in a study with mothers of hospitalized pre-term infants and was based on a previous study by Teti and Gelfand (1991) who determined maternal self-efficacy was a mediating factor in depressed postpartum women (Barnes & Adamson-Macedo, 2007). A modified version of the maternal self-efficacy scale was tested with first-time Iranian mothers among Irish first-time mothers who experienced postpartum depression symptoms (Fathi et al., 2018; Leahy-Warren et al., 2012). The reported Cronbach's alpha was 0.79 in the Iranian study and 0.91when tested with Irish first time depressed mothers (Fathi et al., 2018; Leahy-Warren et al., 2012). Example items include #3 "I can tell when my baby is sick", #7 "I believe that my baby and I have a good interaction with each other" #13 "I am good at understanding what my baby wants" and #20 "I can show affection to my baby". Both Leahy-Warren et al. (2012) and Fathi et al. (2018) suggest a positive relationship with maternal self-efficacy and perceived social support in postpartum women. The PI will use the original English version of the *PMP-SE* (Barnes & Adamson-Macedo, 2007) in its entirety for the proposed study.

Perceived social support. The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988) is a 12-item Likert self-report scale, inquiring about the subjective nature of social support and the perceived support from family, friends and other sources of social support, ranging in scores from 12 to 84 (Khandan, Riazi, Amir Ali Akbari, et al., 2018). The higher the score, the higher the perception of support. The MSPSS is divided into subscales namely family, friends and significant other, including questions #3 "My family really tries to help me", #4 "I get the emotional support I need from my family", #7 "I can count on my friends when things go wrong" and #8 "I can talk about my problems to my family". The perceived levels of emotional support were measured by the MSPSS in several cross-sectional studies, in 115 Arabic depressed immigrant postpartum women in the U.S. reporting a Cronbach's alpha of 0.84 with the Arabic version (Alhasanat-Khalil et al., 2018) and using a an Iranian translated version with 260 first time mothers with an alpha of 0.84 (Khandan, Riazi, Amir Ali Akbari, et al., 2018). The PI intends to use the English version of the MSPSS (Zimet et al., 1988) in its entirety in the proposed study.

Postpartum Depression Symptoms. The Edinburgh Post Natal Depression Scale (EPDS) is a 10-item questionnaire developed by Cox et al. (1987) to determine respondents mood and emotional state in the past seven days. Responses are based on a scale of 0-3, increasing in severity of feelings with a total maximum score of 30. There is variability when to screen women for PPD as Cox et al. (1987) designed the EPDS at six weeks postpartum, many have studied in the early period and up to one year postpartum. The standard cut off score is 12 risk for PPD (Cox et al., 1987), however studies with immigrant women score confirmed the acceptable cut off for presence of PPD symptoms

at 12 (Dennis et al., 2017; Zubaran et al., 2010). A previous study found the best cut off score was 12/13 for a Dari/Persian translated version of the EPDS (Montazeri et al., 2007; Shafiei et al., 2015). The EPDS is the most widely used tool to measure PPD symptoms globally, translated in multiple languages and has proven reliable for use in studies with immigrant postpartum women (Alhasanat-Khalil et al., 2018; Cox et al., 1987; Dennis et al., 2017). In previous studies, the MSPSS has a Cronbach's alpha of 0.84 tested on Arabic immigrant women in the U.S. and the EPDS Cronbach's alpha determined to be 0.80 with Canadian immigrant women (Daoud et al., 2019).The PI will use the original English version of the EPDS in the proposed study.

Power and Sample Size

The proposed study's sample size of approximately 80 participants was determined by the G*Power 31.1.9.2 software (Faul et al., 2009) by a statistical power of 0.80, significance level of 0.05 and a medium effect size of 0.30 based on recruitment from the Iranian mothers Facebook group site. The proposed study will be estimating the relationships between the variables, a minimum of effect size in determining statistical significance using Pearson's r is 0.2, considered a small effect (Sullivan & Feinn, 2012).

Data Analysis

Organization and management of collected data. After completed surveys have been obtained, each participant will be assigned a non-identifying number. An Excel spreadsheet will function as the codebook to populate each survey question by category and specific content, i.e. socio-demographic and traditional cultural practice questions, maternal self-efficacy, perceived social support and postpartum depression symptoms. Scores will be entered under the corresponding participant's assigned non-identifying

number. Raw data will be verified by the PI with codebook data to check for scoring and data entry errors to confirm accuracy.

The Excel data set will be imported into SPSS (IBM, 2018). Data will be recoded to transform variables, as the analysis is looking at relationships between the variables. To address the violation of normality or constant variance transforming data by taking the log, the square root or the reciprocal of the independent and /or dependent variables. Additionally, the PI will re-examine for coding errors by comparing raw variable data with recoded variables. The PI will review the data for missing values, extreme responses, known as outliers and erroneous values, due to miscoding.

Examination of key variables

Dependent (outcome) variable. The main dependent variable is the score obtained from the EPDS, the presence of PPD symptoms will be treated as a continuous variable as in previous Canadian studies with immigrant women (Dennis et al., 2017; Ganann et al., 2016). A score of 12 or more represents presence of symptoms but not considered a definitive diagnosis of PPD. Only a physician conducting a psychiatric interview can make this diagnosis (Alhasanat-Khalil et al., 2018; Cox et al., 1987; Dennis et al., 2017).

Independent (predictor) variables. The independent variables, maternal self-efficacy scores from the PMP-SE, social support scores from the MSPSS, the Iranian cultural postpartum practices scores and socio-demographic data including age of the participant, number of children, age of infant and number of years in Canada are considered as continuous variables.

Descriptive statistics. Univariate descriptive statistics will be conducted by examining the means, medians, standard deviations for continuous variables and the frequency and percentage for categorical variables.

Internal consistency and measurement validity. Cronbach's alpha coefficients for the PMP-SE, MSPSS and the EPDS will be determined to assess for internal reliability. An a priori Exploratory Factor Analysis (EFA) will be conducted on the PMP-SE for construct validity and to determine similarities within and between questionnaire items since the PMP-SE has not been tested for immigrant women.

Plan for exploring relationships with multiple linear regression analysis. Data analysis will be conducted using SPSS version 25 (IBM, 2018), at the significance level of a two-tailed alpha at 0.05. To determine the relationships between the EPDS score and the identified independent variables, multiple linear regression (MR) will be conducted to fit the model. Parameters of the model will be estimated by the ordinary least squares' method (Field, 2018). The main assumption of MR is that the relationship between the EPDS scores and the PMP-SE scores, the MSPSS scores, the cultural practices scores and the socio-demographic scores should be linear. The EPDS score is a continuous dependent variable and the residuals of each independent variable are normally distributed with a zero mean and a constant variance. In addition, the model assumes there is no multicollinearity, observations from each of the independent variables must be separate and have no relationship with each other. However, slight multicollinearity may occur due to the nature of the variables used in the analysis (Field, 2018). The model also assumes homoscedasticity, the variance of error is similar across all independent

variables will be examined by a scatterplot of the standardized predicted value of the dependent variable against standardized residuals (Field, 2018).

Using a stepwise model, the relationships between the independent variables will be explored. First, adding the maternal self-efficacy variable with the PMP-SE scores in order to explore the effect on the EPDS scores. Secondly, adding the social support variable with the MSPSS scores to explore the effect on the EPDS scores. Thirdly, adding the cultural practices scores to explore the effect with the EPDS scores and then adding all of the PMP-SE scores, MSPSS scores, cultural practices scores and the EPDS scores with the socio-demographic scores. The specific aims of this proposed study are: **Aim 1** will first explore the association between maternal self-efficacy using the PMP-SE scores and the EPDS scores. **Aim 2** will explore the association between perceived social support with the MSPSS scores and the EPDS scores. **Aim 3** will explore the association between Iranian traditional cultural practices scores and the EPDS scores. **Aim 4** will lastly explore the relationships between PMP-SE scores, MSPSS scores, Iranian cultural postpartum practices scores and the EPDS scores adjusted for socio-demographic factors.

Anticipated barriers and challenges. Recruitment may potentially pose a challenge as PI will be relying on the gatekeeper to promote and advertise the study flyer. The PI will communicate with the gatekeeper regularly to discuss solutions to any recruitment difficulties. Problems may occur with survey response rates related to uncompleted surveys or slow response rates. The $30 incentive may affect the generalizability due to selection bias. There is a risk of drop off if participants haven't completed the online consent and survey. To remedy these issues, the PI will send bi-weekly email or telephone communication to remind participants to compete the survey.

Participants will be encouraged to respond truthfully and without distraction to the best of their ability.

Study limitations. Restricting participant recruitment to a specific cultural mother's group on popular social media platform in the largest city in the province of Ontario may not be characteristic of other cultural postpartum immigrant women's responses or living in other geographical areas in Canada or around the world. Despite the study focusing on Iranian immigrant postpartum women's experiences, it may not represent all Iranian immigrant mother's perceptions. Maternal self-efficacy, the perception of social support and presence of PPD symptoms will not necessarily capture the cultural context as the questionnaires do not reflect individual experiences. Convenience sampling may be perceived as a limitation in cross sectional study; however, this method is appropriate to recruit immigrant mothers who are underrepresented in quantitative research.

Protection of human subjects. All consent forms and data will be kept confidential and in a safe and secure environment only accessed by the PI by using a protected password and a Virtual Privacy Network (VPN). The data will be kept in an encrypted file and destroyed three years after the completion of the study. Data analysis will be conducted by the PI with the assistance of a paid statistician in a secure location using de-identified data downloaded onto an external hard drive protected by a password and secured in a locked location. The statistician will sign a confidentiality agreement prior to the start of the study.

Consent forms with identifying participant information will be stored securely on an encrypted external hard drive and hard copies will be stored in a separate locked

cabinet, located in the PI's locked office location. Institutional Ethics Approval and Institutional Review Board (IRB) of all study procedures and materials will be obtained prior to data collection as per York University's Human Participants Review Committee protocol and Duquesne University IRB protocol. Interested participants will be referred to the PI by the identified gatekeeper and the PI will not directly recruit participants from Facebook. If the participant expresses their wishes to withdraw, the request will be honored, and the collected data will not be used in the study. If a participant EPDS scores 12 and higher and conveys emotional difficulty including suicidality and depressed mood during and after completion the survey, she will be referred to their primary health care physician and to the professional mental health ConnexOntario Helpline.

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Social Support, Maternal Self-Efficacy and Acculturation Experience in Immigrant Women with Postpartum Depression Symptoms: An Integrative Review

Abstract

Relationships between social support, maternal self-efficacy and acculturation experience are not well understood in immigrant women experiencing symptoms of postpartum depression (PPD). Current evidence suggests perceptions of low levels of social support, immigration status and length of residency contribute to risk factors in developing PPD in this population. An integrative review was conducted to synthesize the literature on the perception of social support, maternal self-efficacy and acculturation experience among immigrant postpartum women with symptoms of depression. Twelve peer-reviewed articles were included-five quantitative and four qualitative studies, two meta-analyses and one mixed methods study. Feelings of connectedness, parenting capability and factors in the acculturative process were themes associated with symptoms of PPD. Persons working with this population should be sensitive to the needs of immigrant women with symptoms of depression who are marginalized by encouraging cultural postpartum ritual practice, access to a supportive network and referrals to community parenting resources.

Keywords

Self-efficacy, social support, acculturation, immigrant women, postpartum depression

Introduction

Postpartum depression (PPD) has garnered much attention as a disorder associated with poor maternal attachment and emotional distress in women in the first year after birth (Beck, 1993; Beck, 1998; Field, 2010). PPD is both a psychosocial and a biological illness characterized by emotional responses of sadness, anxiety and loss of joy in the mothering role, presenting itself in physiological changes during pregnancy and childbirth (Field, 2010; Stewart et al., 2003). Much of the research in PPD has sought to understand the effects and experiences of vulnerable childbearing women, with immigrant women being the focus globally for the last two decades. Immigrant women have a two-fold occurrence of PPD as compared to non-immigrant mothers and risk factors are imbedded in the lack of social determinants of health such as limited availability of social support (Dennis et al., 2017).

Immigrant women with PPD were primarily studied in regions with high rates of immigration including North America, Europe, Asia and Australia. Immigrant women were found to be at risk for low social support and difficulties accessing routine health care, experience parenting stress and challenges with settlement adjustment after arrival (Collins et al., 2011; Dennis et al., 2017). Immigrant women with symptoms of PPD were more likely to develop symptoms with recent settlement, have low levels of perceived social support and experience marital conflict and acculturation difficulties (Falah-Hassani et al., 2015; Fung & Dennis, 2010). In addition, postpartum immigrant women are more likely to be mothers of older children and lack social support. The mothering role and the acculturation experience in immigrant women with PPD is not well known and needs further exploration (Miszkurka, 2010). A recent preliminary study with Syrian

refugee women identified two thirds of participants experienced symptoms of depression and/or anxiety discovered social support was a protective factor from symptoms of PPD (Ahmed et al., 2017). The role of extended family members and friends in looking after the older children and taking care of the housework contributed to their positive mental health (Ahmed et al., 2017). Likewise, social support is considered an integral part of postpartum recovery as reported in an Australian study with Cambodian immigrant women who identified that they lacked this support from female extended family members who remained in their home country (Hoban & Liamputtong, 2013). Immigrant women reported financial barriers and difficulties with visa sponsorship requirements which affected their mental wellbeing (Hoban & Liamputtong, 2013).

Immigrant women may have differing perceptions or experiences of motherhood and childbearing practices before settling in their host country (Barclay & Kent, 1998). Motherhood is a developmental milestone, which is celebrated as a joyous event, often by practicing cultural rituals that symbolize the welcoming of a new family member with extended family and friends (Barclay & Kent, 1998). For example, a common ritual shared across cultures involves elder female family members nurturing over the postpartum woman for an extended period of time in order to allow recovery after childbirth (Alhansanat et al., 2017; Barclay & Kent, 1998; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Immigrant women often leave behind their extended family and communities and are faced with altered expectations when giving birth in a host country (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). They may experience unfamiliar procedures, face challenges with language barriers, rely on nurses as birthing coaches and face postpartum recovery without an established social network (Alhansanat et al., 2017;

Barclay & Kent, 1998). Social support is pivotal in the postpartum period as these practices contribute to health maintenance and well-being, including practices that focus on mother's needs and assistance in infant caregiving (Dennis, 2003; Higginbottom et al., 2014; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Social support is defined by informational, functional and emotional sources. (Cohen & Wills, 1985; Nahas et al., 1999). Health care professionals (HCP) or individuals with knowledge of resources to engage with women during their greatest time of need in the postpartum period offer informational support (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). The social network consists of the number of confidants a woman may trust during the postpartum period, described as functional sources of support (Dennis, 2003; Guruge & Collins, 2008). For instance, a significant positive relationship has been found between informal functional support and maternal self-efficacy at 6 weeks postpartum among Iranian postpartum women (Fathi et al., 2018).

Social Support Theory suggests perceived social support buffers individuals from stress and facilitates individual coping mechanisms thus proximity of social networks alleviates tension and creates feelings of belongingness (Lakey & Cohen, 2000; O'Mahony & Donnelly, 2010). Current evidence suggests lack of social support is a main factor in the experience of immigrant women with PPD and the social isolation experience is well documented, however, the type and quality of support needed to reduce depressive symptoms is not well understood (Saad, 2019).

Maternal self-efficacy, the ability to organize and accomplish tasks involving the parenting role is grounded in Bandura's (1997) Self-Efficacy Theory (Leahy-Warren & McCarthy, 2011). Maternal self-efficacy is understood as the capabilities of executing

parenting tasks, establishing parenting ability in addition to gauging parenting satisfaction (Leahy-Warren & McCarthy, 2011). Teti and Gelfand (1991) define maternal self-efficacy as abilities to enforce healthy behaviors and manage illness along with maternal self-confidence. Maternal self-efficacy can be further delineated by the capacity of completing task specific mothering activities, for instance breastfeeding, or by mothering behaviors such as attending to infant cues (Leahy-Warren & McCarthy, 2011). The ability to fulfill the mothering roles and the belief of how well they fulfill these roles demonstrates parenting confidence (Vance & Brandon, 2017).

Maternal self-efficacy was found to be a mediator between social support and parenting confidence in women with symptoms of PPD, particularly infants with a difficult temperament (Teti & Gelfand, 1991). Low maternal self-efficacy was also associated with low maternal competence and depressive symptoms (Teti & Gelfand, 1991). Furthermore, maternal self-efficacy is an indicator of role transition emphasizing parenting beliefs, responsibilities and duties to fulfil mothering roles and moderate social support (Leahy-Warren & McCarthy, 2011), yet for immigrants the acculturation experience complicates parenting expectations (Jannati & Allen, 2018).

The acculturation experience is the differing ways of relating to the overall larger host society as compared to one's natal cultural identity (Berry, 2003). Berry's (Berry & Hou, 2016) Canadian study addressed acculturation strategies in four areas: assimilation, integration, separation and marginalization, each describing beliefs and behaviors of immigrants adjusting to living in a host country. The acculturation process is dependent on circumstances which ease the transition involving the method of immigration, the ability to earn income, length of residence, availability of social networks and the overall

perception of belonging (Berry & Hou, 2016). How well one acculturates depends on circumstances or decision-making abilities to assimilate within the host society (32). For this reason, stress may occur due to cultural pressures to integrate with the new host society, adapting to learning the host language, altering food preferences and dress as well as challenges associated with psychosocial needs, low income and perceived lack of social support (Berry & Hou, 2016). Furthermore, immigrants who experience discrimination are subjected to marginalization and may prefer to separate rather than integrate (Sam & Berry, 2010). Thus, acculturation is a multifactorial process which can be increasingly challenging to understand, particularly in immigrant women with PPD symptoms. It is only recently that risk factors in immigrant women's mental health, including the effects of acculturative stress on mental health, their health care experiences, length of residence, language barriers and immigration status have been explored (Alhansanat et al., 2017; Alhasanat & Fry-McComish, 2015; Berry & Hou, 2016; Dennis et al., 2017; Fung & Dennis, 2010; George et al., 2015; Guruge et al., 2015). This connection between acculturation experiences, including acculturative stress on immigrant mothers' parenting abilities, accessibility of social support and mental health require further analysis.

Purpose and Specific Aim

The purpose of this integrative review is to establish a more comprehensive understanding of the relationships between social support, maternal self-efficacy and acculturation experience in immigrant women with symptoms of PPD. Past empirical and theoretical sources of literature were to inform future research. The primary aims of this review are 1) to explore whether social support, maternal self-efficacy and acculturation

experience are factors associated with symptoms of PPD, and 2) search for evidence of relationships between these variables among immigrant women experiencing symptoms of PPD.

Methods

Literature Search

The Whittemore and Knafl (2005) integrative review methodology was used to explore the state of the health, psychology, nursing and social science literature using the variables of social support, maternal self-efficacy and acculturation experience in immigrant women with symptoms of PPD. The five stage method includes problem identification, description of the search strategy, type of data evaluation tools used, how data analysis was preformed and presentation of findings and limitations of the studies selected in the integrative review (Whittemore & Knafl, 2005). The search was conducted under the expert guidance of experienced health librarians using Medline R, CINAHL, Embase, PsycINFO, Sociological Abstracts and Web of Science databases. The following search terms postpartum depression, immigrants, social support, self-efficacy and acculturation were used. Terms were further accessed through the database specific controlled vocabulary features (Table 1). No date limiters were set, however, the inclusion criteria focused on 1) original research, review articles and conceptual analyses written in English, 2) articles published in peer reviewed journals with the primary samples consisting of immigrant postpartum women identified with PPD or symptoms of PPD and 3) specific aims focused on experiences with social support, maternal self-efficacy and acculturation published in any country. Additional hand searches using the ancestry approach search technique were conducted to capture any missed references.

Excluded pieces of literature comprised of literature were not published in peer reviewed journals or included samples with prenatal women, comparators with non-immigrants or an emphasis on PPD prevalence or risk factors. The search yielded 522 publications with an end result of 12 peer reviewed articles–five quantitative, one mixed methods study, four qualitative studies and two meta-analyses. A total of 37 duplicates were removed. We used inclusion criteria to remove an additional 276 papers; 210 papers underwent full text screening, of which 198 were excluded. The identified ineligible papers did not have immigrant postpartum women in their sample, or the selected variables were not ascertained (Figure 1).

Data Evaluation

The studies and meta-analyses were appraised by the primary author for methodological quality using the critical appraisal checklists for qualitative and quantitative cohort studies, cross-sectional and case study design from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) and the Mixed Methods Appraisal (MMAT) Version 2018 (Hong et al., 2018). The selected tools were reviewed by the National Collaboration Centre for Methods and Tools (NCCMT) and evaluated to be appropriate in a public health context. Additionally, quality scores were assigned for theoretical rigor data relevance using Whittemore and Knafl's two point scale (Whittemore & Knafl, 2005). A score of 1 indicated the article was of low quality, denoted by a weak research methodology or limited amount of evidence in data results, and high quality were given a score of 2 with evidence of design rigor and strong data results connected to the overall aims (Whittemore & Knafl, 2005); see Table 2 for study quality ratings.

Data Analysis

Data were analyzed ensuring the integrative review's purpose using the constant comparison method (Glaser, 1965; Glaser, 2008), involving an iterative process by extracting data into categories and aiding in the development of themes and relationships (Whittemore & Knafl, 2005). Each study's purpose, sample and setting, research design, major outcome variables, measurement methods, summary of findings and limitations were structured into the data matrix table (Table 2). This process provided a visual pattern and relationships in categories of the included studies. Patterns were summarized and themes were synthesized by the primary author to further clarify the variables explored; results were compared with the original papers for verification.

Results

The search strategy resulted in five quantitative and four qualitative single studies, two meta-analyses and one mixed methods study, all were found to have a global reach from Australia (Nahas et al., 1999; Russo et al., 2015; Shafiei et al., 2015), United States (Alhasanat-Khalil et al., 2018; Tobin et al., 2018), Canada (Morrow et al., 2008; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012), East Asia (Chen et al., 2013; Choi et al., 2012; Park & Moon, 2011), the Middle East (Mohammad et al., 2018) and the United Kingdom (Wittkowski, Patel, et al., 2017). Results generated a limited number of high-quality papers, largely pertaining to problematic sampling methods of when immigrant women were studied during the postpartum period. The selected qualitative studies and meta-analyses did not clearly define the time when the data was collected, as symptoms of PPD may develop as early as two weeks postpartum and symptoms may last three years (Vliegen et al., 2014); however, one ethnographic study did clearly define

symptoms of PPD experienced retroactively in the last five years (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Each study provided multiple aims, but generally explored relationships with settlement, social support and PPD in immigrant women (Alhasanat-Khalil et al., 2018; Mohammad et al., 2018; Morrow et al., 2008; Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015; Tobin et al., 2018), acculturative stress and social support (Alhasanat-Khalil et al., 2018; Morrow et al., 2008) and acculturation experiences (Chen et al., 2013; Park & Moon, 2011; Wittkowski, Patel, et al., 2017). One study's main emphasis measured maternal self-efficacy and postpartum depression by comparing native and immigrant mothers in Korea (Choi et al., 2012), and another Korean study examined the effects of parenting stress on PPD in immigrant women (Park & Moon, 2011). Out of the selected 12 peer reviewed articles, only two defined a theoretical framework to their methodology using Leininger's Theory of Cultural Care Diversity and Universality (Nahas et al., 1999) and Kleinman's Exploratory Model (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012), with the majority describing conceptual frameworks imbedded in psychosocial and feminist paradigms (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015).

Sample sizes varied depending on the methodology with the smallest sample of 18 participants in an ethnographic study (Morrow et al., 2008) and the largest sample of 365 women in a cross-sectional design (Mohammad et al., 2018). All identified participants were postpartum immigrant women between the ages of 18-45 years; however, the ethnicities and ages of participants varied. Homogenous ethnic minority groups of immigrant women studied were of Syrian, Afghani, Vietnamese, Chinese and

Punjabi descent (Choi et al., 2012; Mohammad et al., 2018; Morrow et al., 2008; Nahas et al., 1999; Russo et al., 2015; Shafiei et al., 2015) but several studied were of heterogenous immigrant groups of women not pertaining to a specific geographical area or cultural group (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Shafiei et al., 2015; Tobin et al., 2018; Wittkowski, Patel, et al., 2017). Approximately half of the selected studies did not identify that participants were mothers of older children (Alhasanat-Khalil et al., 2018; Choi et al., 2012; Mohammad et al., 2018; Morrow et al., 2008; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Tobin et al., 2018; Wittkowski, Patel, et al., 2017), but the remaining studies identified samples of approximately 50% primiparas (Chen et al., 2013; Choi et al., 2012; Nahas et al., 1999; Park & Moon, 2011; Russo et al., 2015). All studies had similar inclusion criteria, requiring participants to have delivered an infant in the host country studied and identified or experienced symptoms of PPD.

Various tools were used to measure the concepts of interest for this review. All of the selected quantitative papers determined symptoms of PPD using translated versions of the Edinburgh Post Natal Depression Scale (EPDS) for the sample of participants studied (Cox et al., 1987). Two studies utilized tools to measure social support, the Multi-Dimensional Scale of Perceived Social Support (MSPSS) (Alhasanat-Khalil et al., 2018; Chen et al., 2013) and the Maternity Social Support Scale (MSSS) tools to measure social support (Mohammad et al., 2018) and to describe the relationship with PPD symptoms. Parenting self-efficacy was measured using a translated Vietnamese version of the Parenting Expectation Survey (PES) (Reece, 1992) in (Choi et al., 2012) comparative study. The Parenting Stress Index (PSI) (Abidin, 1990) was used to gauge levels of the parent’s and child’s emotional relationship and associated behaviors (Park & Moon,

2011). A translated Arabic version of the Multi-Dimensional Acculturative Stress Inventory (MASI) (Rodriguez et al., 2002) compared with the EPDS was used to measure acculturative stress (Alhasanat-Khalil et al., 2018). The qualitative studies explored experiences with social support and parenting satisfaction, while acculturation was collected as a demographic variable by length of residence and immigration status (Morrow et al., 2008; Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Overall, three themes emerged from the analysis of the selected studies in this integrative review–perceptions of connectedness, parenting capability and factors in the acculturation process.

Emerging Themes from the Literature

Perceptions of Connectedness

Perceptions of connectedness primarily explored perceived social support, social isolation, kinship and supportive needs in relation to symptoms of PPD in immigrant women. The most reported source of perceived connectedness was emotional, described as the presence of extended family, friends, a partner or spouse (Mohammad et al., 2018; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Park & Moon, 2011). Emotional sources of support were identified as support from social networks including family and friends, available in their home country but not after settlement (Morrow et al., 2008). Lack of connectedness with a social network, absence of perceived sources of support and ability to reach out to another in times of stress were missing (Morrow et al., 2008). Emotional support was found to be negatively correlated with symptoms of PPD (r= -0.49, p<0.0001*)* among Arabic immigrant women in the U.S. (Alhasanat-Khalil et al.,

2018) and in Syrian refugees living in Jordan (r= -0.44, p<0.01) (Mohammad et al., 2018).

Functional support was considered as practical help with caregiving and household chores, and informational sources were dependence on health care provider's support and access to community groups, which both can also serve as a form of emotional support (Mohammad et al., 2018; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). In the selected studies interview data described the perception of social support, however Park and Moon (2011) found no relationship between social support and symptoms of depression in immigrant women in their study. Absence of extended family and separation from social support networks were related to PPD, yet higher reported symptoms of PPD were noted from participants who described increased reliance on their spouse for emotional support (Mohammad et al., 2018; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015). However, reported marital discord was caused by high levels of spousal reliance as husbands were not prepared to provide emotional or functional support, specifically when these expectations were not congruent with cultural norms (Chen et al., 2013; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Tobin et al., 2018). Moreover, intergenerational conflict presented as disagreements with mothers-in-law which further increased spousal tension and stress (Chen et al., 2013; Morrow et al., 2008; Shafiei et al., 2015; Tobin et al., 2018).

Informational support was described as sources consisting of HCPs, including nurses, physicians and counselors, as well as laypersons, elder community members and extended female family members who could help immigrant postpartum women with information on how to access to health care needs, and guidance on parenting (Morrow et

al., 2008; Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015). The role of informational support was not explicitly addressed in the selected papers, however, lack of trust with health care providers prevented postpartum immigrant women from disclosing their symptoms in fear of being perceived as a bad mother, decreasing the perception of support (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Shafiei et al., 2015). Many immigrant women do not seek emotional help from HCPs due to cultural differences and fear of stigma (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Furthermore, immigrant women described being let down by their HCP during periods of emotional distress by not having the opportunity to discuss their health needs, not willing to help or their feelings minimized and reported discrimination (Nahas et al., 1999). Reports of limited knowledge of resources pertaining to health and parenting information for immigrant women who suffer from symptoms of PPD posed a challenge to increase feelings of isolation and health inequities (Russo et al., 2015). Therefore, immigrant women found greater comfort in expressing their emotions with their social networks without fear of persecution (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015).

Immigrant women who are parents of older children described positive emotional wellbeing during the postpartum period due to the incorporation of religious and spiritual practices and being connected with the local community compared to the pre-migration experience (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015). Immigrant women with multiple children described difficulties with managing parenting tasks alone without extended family members' support (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015). For

immigrant women in an Australian study extended immigrant women's family members were considered part of health maintenance through the sharing of childrearing experiences and giving maternal advice (Nahas et al., 1999). Once the advice or help was missing, immigrant women disclosed feelings of insecurity and decreased parenting confidence especially when they received contradictory information from HCP (Nahas et al., 1999). Furthermore, access to community resources, such as parenting programs can be perceived as informative sources of support; though immigrant women with symptoms of PPD may feel marginalized by lack of awareness of available community resources which may impact the perception of social support (Morrow et al., 2008; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). The overall results indicate that loss of emotional and functional support predisposed women to symptoms of PPD (Morrow et al., 2008; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012).

Parenting Capability

Parenting capability refers to a woman's knowledge of her ability to parent and her ability to cope with the parental caregiving responsibilities as defined by maternal self-efficacy (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Park & Moon, 2011). Immigrant women reported conflict in their parenting capabilities when information provided by their HCP contradicted their cultural beliefs (Nahas et al., 1999). Immigrant women may hear conflicting health information, for example breastfeeding, from their HCP differs from the information their family members provided (Nahas et al., 1999). While breastfeeding success contributes to maternal satisfaction in meeting their infant care needs, difficulties in successful exclusive breastfeeding was interpreted as low maternal self-efficacy in some immigrant women (Nahas et al., 1999; Park & Moon,

2011; Shafiei et al., 2015). Participants described being overwhelmed and distressed with breastfeeding due to inexperience (Shafiei et al., 2015), fear of being labelled a bad mother, juggling parenting responsibilities and keeping silent on their parenting stressors (Park & Moon, 2011), feeling stressed by prioritizing their baby's feeding needs over their own resulted in emotional distress and sadness (Nahas et al., 1999; Wittkowski, Patel, et al., 2017). Immigrant women who had a strong identity to their role as a mother related their sense of purpose expressed their confidence in caring for their infant and felt less depressed (Nahas et al., 1999). However, immigrant women who reported difficulties in soothing their infant experienced a fear of failure in their parental capabilities (Nahas et al., 1999; Park & Moon, 2011; Shafiei et al., 2015; Wittkowski, Patel, et al., 2017).

Coping with caregiving responsibilities was described in the literature as meeting their infant's needs and the role as a mother to keep their child and family healthy (Nahas et al., 1999). Immigrant mothers of older children voiced difficulties in juggling competing parenting demands, resulting in low maternal self-efficacy (Nahas et al., 1999; Russo et al., 2015). For example, immigrant women discussed the hardship or inability to cope with a new baby as juggling multiple responsibilities as mother and wife as well as expectations of extended family members (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Park and Moon (2011) further learnt that immigrant women in Korea experienced caregiving difficulties related to fulfilling the nurturing responsibilities to their infants which added to their parenting stress (Park & Moon, 2011). Although Park and Moon (2011) found that parenting stress was connected to PPD symptoms ($r^2 = 0.427, p < 0.001$), they did not define its characteristics. (Shafiei et al., 2015) study of immigrant women in Australia described parental stress by participants'

concerns of feeling overwhelmed as a first-time mother, their breastfeeding worries and concerns about their baby's health. Also, immigrant women with low mood had problems in meeting caregiving expectations which could impact their parenting capabilities and confidence especially in first time mothers (Chen et al., 2013; Shafiei et al., 2015).

Factors in the Acculturation Process

The acculturation process for immigrant postpartum women consisted of acculturative stress, assimilation and the acculturation experience. Inversely, an arduous acculturation process challenged by language barriers, underemployment and isolation resulted in disconnectedness with the host value system can increase symptoms of depression (Alhasanat-Khalil et al., 2018; Tobin et al., 2018). During the move immigrant postpartum women may experience acculturative stress, as they try to accept the host country's societal values, assimilation of new information while at the same time trying to practice traditional postpartum cultural rituals (Russo et al., 2015; Wittkowski, Patel, et al., 2017). Acculturative stress was described as feeling overwhelmed with transitioning to the host country and leaving family behind; worries about insecure immigration status were positively correlated with PPD symptoms in one United States study with Arabic immigrant postpartum women (r=0.27, p<0.01) (Alhasanat-Khalil et al., 2018). The added acculturation and acceptance in their new-found country can have a negative impact on immigrant women's mental health (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Furthermore, acculturative stress and settlement adjustment are not well understood. Other sources of stress were magnified when spouses were unsuccessful in securing employment and were faced with financial pressures or ineligibility to seek employment from insecure immigration status (Morrow et al., 2008; Wittkowski, Patel, et

al., 2017). For instance, immigrant women in Korea who favored mainstream values experienced less depression symptoms when social supports were present (Chen et al., 2013). Differences in cultural values and perspectives and a breakdown in communication with a HCP result in barriers in seeking health for their mental health (Morrow et al., 2008).

Throughout the acculturation process, immigrant women have to assimilate and adapt to the culture in the host country. Assimilation is defined as the adaption to the dominant culture; a process for immigrant women took to assimilate as feelings of connectedness within the larger society while at the same time adjusting from the old way of life to the new (Morrow et al., 2008; Nahas et al., 1999). Immigrant women who had the opportunity to practice their cultural postpartum period rituals integrated and women who engaged themselves in the community were motivated to adjust social attitudes and accepted mainstream ideals reported lower symptoms of PPD (Chen et al., 2013). New immigrant mothers who experienced a negative acculturation experience attempted to seek ways to adhere to their postpartum cultural but were met with disapproving HCPs, a small supportive network, increased marital dissatisfaction and feelings of sadness when unable to hold onto their cultural identity (Wittkowski, Patel, et al., 2017). Review findings suggest cultural postpartum practices are fundamental to mental health in immigrant women, and perhaps more importantly are used to pass their culture down with their foreign-born infants (Nahas et al., 1999; Russo et al., 2015; Shafiei et al., 2015).

Discussion

The aims of this integrative review were to explore whether social support, maternal self-efficacy and acculturation experience were factors associated with PPD symptoms and to search for evidence of relationships between these factors among immigrant women. The three themes yielded from this analysis– perceptions of connectedness, parenting capability and factors in the acculturative process–generated a psychosocial perspective in understanding immigrant women's experiences with PPD symptoms (Wittkowski, Patel, et al., 2017). Perceptions of connectedness were identified as sources of access to emotional support including spouse and extended family, links with community members and an HCP as informational resources; perceived lack of these contributed to the presence of PPD symptoms (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Lack of social support is perceived as not receiving the emotional or functional support sought during this time frame (Lakey & Cohen, 2000). Parenting capability was understood as the ability to cope with parenting responsibilities whereas maternal self-efficacy was determined by confidence in the maternal role and asking for help with caregiving when needed (Chen et al., 2013). Factors in the acculturative process determined whether immigrant women felt accepted in their host country and the ability to practice traditional postpartum rituals without restriction (Nahas et al., 1999; Russo et al., 2015). The relationship between maternal self-efficacy and acculturation was associated with PPD symptoms in this population by the perceived lack of social support (Alhasanat-Khalil et al., 2018). Social support was determined to be a mediating factor in the acculturation experience and parenting stress (Alhasanat-Khalil et al., 2018; Park & Moon, 2011) as well as a protective factor in depressed postpartum immigrant women (Alhasanat-Khalil et al., 2018). Results suggest immigrant women who are

socially isolated and wish to practice postpartum cultural rituals relied on female family members for postpartum support (Nahas et al., 1999). Low perception of these supports contributed to poor acculturative adjustment (Alhasanat-Khalil et al., 2018; Tobin et al., 2018). Immigrant women are subjected to significant amounts of stress from multiple responsibilities, the parental role and geographical transitions affect their mental health and overall wellbeing (Alhasanat-Khalil et al., 2018). In addition, immigrant women with PPD symptoms and who are also mothers to older children are not explicitly identified in the studies selected. It is important to note parenting multiple children has added caregiving responsibilities and understanding the supportive needs of these mothers when experiencing PPD symptoms is paramount. However, the type of support needed by immigrant women in general warrants further exploration as well (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012).

Evidence of a relationship between maternal self-efficacy and PPD in immigrant women was difficult to determine from the results. Maternal self-efficacy was found to be negatively correlated with PPD symptoms primarily in non-immigrant postpartum women, but there was no evidence of low maternal self-efficacy in immigrant Vietnamese women residing in Korea, for example (Choi et al., 2012). Maternal self-efficacy was a crucial component in maternal mental health and infant attachment in a European study with non-immigrant women (Leahy-Warren & McCarthy, 2011). Determining its influence can inform the capabilities immigrant postpartum women possess or lack in meeting parenting demands (Leahy-Warren & McCarthy, 2011; Wittkowski, Patel, et al., 2017). Bandura (1986) proposed individual self-efficacy elicits positive coping behaviors and decreases reaction to stress. Seeking health information

motivated immigrant women to meet their infant's developmental and emotional needs. Community parenting programs or information obtained from health care providers during routine medical appointments served as tools for maintaining baby's health (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Park & Moon, 2011; Russo et al., 2015).

Further understanding of how maternal self-efficacy, explicitly role adjustment and parenting self-confidence, contributes to depressive symptoms in postpartum immigrant women is worth pursuing (Choi et al., 2012; Wittkowski, Patel, et al., 2017). The association with maternal self-efficacy and perceived levels of social support was not determined by simply measuring parenting expectations or stress (Choi et al., 2012; Park & Moon, 2011), but by parenting capabilities, including the capability to respond to infant's cues and support their infant's growth and development. Access to childcare through community or key female support networks provided time for the immigrant mother to care for her own needs, including her emotional wellbeing for brief intervals (Russo et al., 2015).

The presence of PPD symptoms did not account for parenting expectations or role adjustment in immigrant women, however role adjustment was found to improve as the infant got older in Vietnamese immigrant first time mothers living in Taiwan (Choi et al., 2012). A recent Canadian study measured maternal self-efficacy by exclusive breastfeeding practices among Chinese immigrant postpartum women and Canadian born women of Chinese ancestry. Results predicted that recent immigrant women, living in Canada less than five years, are less likely to exclusively breastfeed their infants at one month as compared to nonrecent immigrant women or Canadian born women (Dennis et

al., 2019). The authors suggested that recent immigrant women may have decreased access to breastfeeding supports including an HCP who specializes in breastfeeding. In addition, recent immigrant women may be adhering to cultural feeding practices including supplementation and early introduction of complementary foods (Dennis et al., 2019). The analysis of PPD symptoms was not explicitly included in this study, and an understanding of parenting capabilities, like breastfeeding practices, is needed.

In this review, acculturation experiences were related to traditional postpartum practices, language barrier and immigration status (Morrow et al., 2008; Nahas et al., 1999; Wittkowski, Patel, et al., 2017). Certainly, immigration status influences the acculturation experience by immigrant women, asylum seekers and refugees do not have similar migration experiences as compared to immigrant women who have permanent residency (Wittkowski, Patel, et al., 2017). Asylum seekers and refugee postpartum women resist seeking support from an HCP for their PPD symptoms due to fear of deportation or discrimination (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Inquiring about the migration experience will provide clues to how immigrant postpartum women acculturate and the factors which assimilation into the host society or preservation of cultural identity is maintained. Immigrant postpartum women experienced marginalization by systemic racial discrimination and cultural stereotypes as a result of their traditional cultural postpartum practices (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). For example, immigrant women reported HCPs denying the practice of postpartum cultural rituals (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). In addition, language and cultural barriers further isolate women with perceived disconnectedness from mainstream society. The fear of stigma and label of being an

incompetent mother prevents immigrant women seeking care for their PPD symptoms (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Tobin et al., 2018).

Implications for Research, Practice and Policy

This review demonstrated the need to address postpartum immigrant women's experiences when they migrate to a new country. Migration is recognized as a social determinant of health (WHO, 2018) and with the predominant movement of people by immigration around the world, the implications of immigrant maternal health is now reaching globally. Western nations should have immigration policies in place that provide on-time limited travel visas which allow for extended family members to come to provide sources of emotional and functional support and familiarity of practicing postpartum cultural rituals (Ahmed et al., 2008; Morrow et al., 2008; Nahas et al., 1999). This may not only alleviate the psychological distress that comes with the birth experience and having a new baby but being in a new country far from customs of home and a supportive network (Alhasanat-Khalil et al., 2018; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; WHO, 2018). The need to establish a supportive network requires additional evaluation of current community programs directed at immigrant postpartum women. Encouraging immigrant women to make community connections by searching local mothering groups on social media and virtual platforms as well as establishing links to culturally specific organizations may be helpful. Furthermore, the focus of perceived support on kinship may mean more than the mere presence of extended family members because the quality and type of support preferred by immigrant postpartum women is largely unknown.

Seeking mental health care services for PPD symptoms may further stigmatize immigrant women. Emotional distress in immigrant women is associated with unpredictable levels of support and depending on immigration status, women may reject offers of outside sources of support from fear of persecution (Guruge & Collins, 2008; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Emotional distress requires mental health care and support, however less likely accessed by immigrant women and requires further study (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Mental health care should also address psychosocial distress including the effects of perceived low social support and language barriers (17). Health care providers, including nurses and community workers, can promote culturally inclusive postpartum care by providing space for immigrant women to rely on their cultural traditions, introducing peer support and educating immigrant women to watch for PPD symptoms as suggested in previous studies with non-immigrant women (Dennis, 2003). Furthermore, successful integration is closely linked with a multiculturalist policy as it promotes cultural maintenance by bonding with one's own cultural group (Sam & Berry, 2010). Integrative behaviors increase wellbeing and life satisfaction by promoting positive mental health, and marginalized experiences are categorized as the poorest level of wellbeing (Berry & Hou, 2016). The current state of the literature is focused on prevalence and risk of PPD in immigrant women. Screening practices are popular methods of identifying women for symptoms of PPD, however these are not definite diagnoses of PPD. More accurate assessment methods involving the psychiatric interview are required to understand the complexity of emotional distress in immigrant postpartum women (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Furthermore, identifying the psychosocial issues among

perceived social support, maternal self-efficacy and the acculturation experience may contribute to developing community-level interventions suited for nurses, settlement workers and other front-line health care providers working with this population.

Limitations

Although a comprehensive literature search was conducted, a limited amount of high-quality evidence was found. Additionally, the literature appraisal was conducted by a single reviewer in consultation with a group review. The sample populations were small in number, and findings were subject to bias from self-reporting. The scope of the review did not have date limiters and included studies which were published over twenty years ago. The selected articles remained in the review as they provided valuable participants' experiences. The variety of methodological approaches provided unique perspectives, however, sample and measurement variability limited generalizability, and the review fails to contribute to any conclusive connections with the variables examined. While the qualitative data provides context to personal experiences, these are difficult to apply across multiple immigrant cultural groups found in countries with a high proportion of immigrants in their population. Additionally, the operationalization of maternal self-efficacy in the selected literature varied and did not encompass the more practical aspects of parenting behaviors in immigrant mothers. Previous history of depressive symptoms was not included as a confounding factor of this review; however, the focus of this review was to be better understand the relationships of social support, self-efficacy, and acculturation with the presence of PPD symptoms. Connections between other factors including immigration status, income and education, antenatal depression, and experiences of previous depression by participants were not consistently studied in the

literature. Immigrant women are often reluctant and fearful to discuss their past mental health with their healthcare providers, experience lack of trust, and factors in migration may pose challenges in navigating the health care system (Nahas et al., 1999; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Russo et al., 2015). Four of the selected papers mentioned previous history of depression in their introduction (Nahas et al., 1999; Russo et al., 2015; Tobin et al., 2018; Wittkowski, Patel, et al., 2017), however, none measured history of depression directly. Navigating work with this population is approached carefully due to stigma, lack of trust, family beliefs, and keeping emotional health private, which might be a factor in the lack of measurement of pre-existing depression.(Morrow et al., 2008; Wittkowski, Patel, et al., 2017).

Conclusion

Themes related to immigrant women with PPD symptoms included the perceptions of connectedness, parenting capability and factors in the acculturation process. This integrative review did not provide a definitive answer to our secondary aim, to determine the relationships between social support, maternal self-efficacy and acculturation experience in postpartum immigrant women with depression. However, a lack of social support is related to women developing PPD symptoms, and attention is needed toward providing the necessary support for immigrant women's mental health and the health of their infant offspring needs. The selected literature uncovered some of the complex needs of immigrant women who are depressed. The specific type of social support needed requires additional investigation, further exploring the dynamics of perceived connectedness. The three themes identified provide a starting point for research to support the needs of immigrant women with PPD symptoms. Additional study is

needed to determine the impact of parenting confidence and capability when giving birth as an immigrant in a foreign country for the first time. This review also indicates ways to mitigate acculturation challenges and promote cultural practices during the postpartum period is an area of literature which needs further development.

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Table 2.1 Integrative Review Search Strategy

Postpartum Depression	Immigrant	Social support	Self-efficacy	Acculturation experience	Postpartum	Depression	Postpartum
MeSH	MeSH	MeSH	MeSH	MeSH	MeSH	MeSH	MeSH
Depression, Postpartum/	"Emigrants and Immigrants"/	Social Support/ or Socialization/	Self-Efficacy/	Acculturation/	Postpartum Period/ or Puerperal Disorders/ or Puerperium/	Depression/ or Depressive Disorder	Postpartum period/ or puerperium/
KW	KW	KW	KW	KW	KW	KW	KW
PPD post natal depression postnatal depression postpartum depressive symptoms	asylum-seek* emigra* immigr* migrant* refugee*	support, social social support social support system systems, social support psychosocial support system support, psychological psychological social network	efficacy, self self efficacy self concept confidence, self concept, self esteem, self perception, self self perception self-perception parenting child rearing	acculturation assimilation, cultural cultural assimilation socialization settlement accult*	childbirth or child-birth or parturition or post-nat* or postnat* or post-part* or postpart* or puerper*	Sadness Downcast mood Unhappiness Sad*	Period, postpartum Postpartum Postpartum women Women, postpartum Puerperium Parturition pp

Figure 2.1

PRISMA Flow Diagram (used with permission)

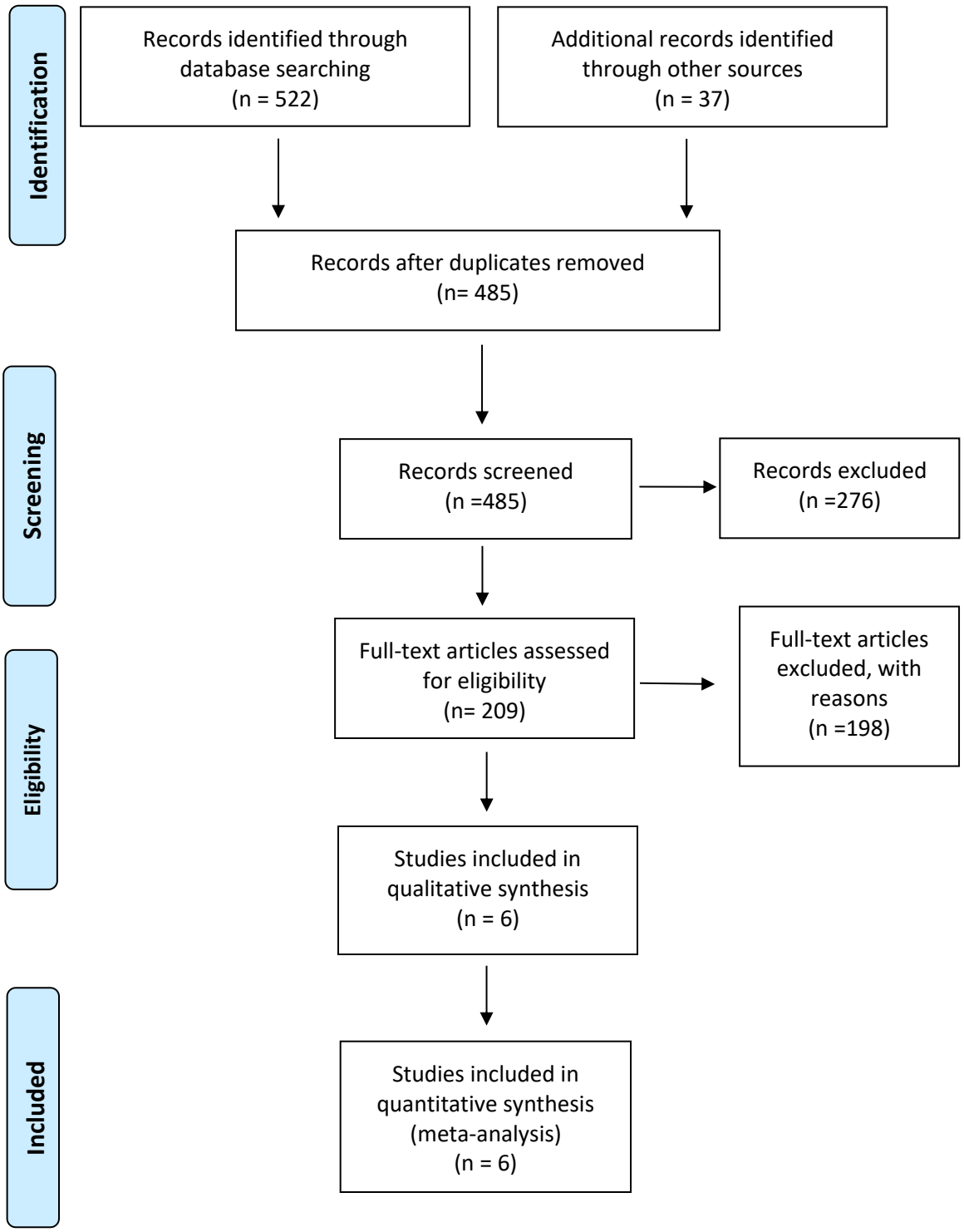

Table 2: Data Extraction Table

Author, year, country	Purpose	Sample And Setting	Major outcome variable(s), Measurement tools	Design	Major findings	Limitations	Study Quality Rating
1. Alhasanat-Khalil, D., Fry-McComish, J., Dayton, C., Benkert, R., Yarandi, H. & Giurgescu, C. (2018). United States	Examines the relationships among acculturative stress, social support and PPD symptoms. The secondary aim examines whether social support moderates the associations between acculturative stress and PPD symptoms among U.S. immigrant women of Arabic descent.	N=115 Inclusion: 1-12 months postpartum, had a live birth, between the ages of 18-45 years, born outside of the U.S, arrived after the age of 14 years and speaks and reads English or Arabic.	**Acculturative stress** using the Multi-Dimensional Acculturative Stress Inventory (MASI) **Social Support** Multidimensional Scale of Perceived Social Support (MSPSS) **Postpartum Depression** Edinburgh Post Natal Depression Scale (EPDS)	Cross-sectional design	**Results:** Acculturative stress was negatively correlated with social support (r=−0.34, p<.01) and positively correlated with PPD symptoms (r= 0.27, p< .01). Social support was negatively correlated with PPD symptoms (r=−0.49, p< .0001). Social support influenced PPD symptoms (β=−0.32, t=−2.51, p=.014). No effect on acculturative stress and social support on PPD symptoms.	**Limitations**: Depressive symptoms measured one-time and were self-reported. Cofounding factors, including sample recruited from a cohesive Arabic community in central Michigan may have influenced the relationships with variables studied. Length of residency was not documented.	2
2. Chen, H-H., Hwang, F-M., Tai, C-J. & Chien, L-Y. (2013). Taiwan	Examines the relationships among social support, acculturation and PPD symptoms among marriage-	N= 226 at 1 month postpartum N=203 at 6 months postpartum	**Acculturation:** Length of residence in Taiwan, ability to speak Chinese, social assimilation and social attitude	Cohort study design	**Results:** Immigrant women resided in Taiwan < 36 months, EPDS score ≥10 was 24.1% at 1 month postpartum and 12.3% at 6 months	**Limitations:** Study focused on the methodology of structural equation modelling (SEM) to examine the	2

	based immigrant mothers in Taiwan.	(137 Chinese immigrant women, 66 Vietnamese immigrant women) Inclusion: immigrant women giving birth in one of the 5 districts of Taipei City, registered at one of the 5 health centers aged 18 years or older.	were rated, higher scores, greater acceptance into mainstream society **Social support:** tool developed by authors **Postpartum Depression:** Edinburgh Post Natal Depression Scale (EPDS)		postpartum. social support at 1 month postpartum was directly and positively associated with social attitude (*path coefficient*=0.19, $p<$ 0.05); depression at 1 month postpartum was directly and negatively associated with social attitude (*path coefficient*=-0.18, $p<0.05$); social attitude moderated the relationship between depression at 1 month and social support at 6 months postpartum, where a positive social attitude decreased the negative effect of depression at 1 month postpartum on social support at 6 months postpartum (*path coefficient*=-0.17, $p<0.05$).	interrelationships among acculturation, social support and depression. An unclear analysis of the descriptors for the relationships among variables studied. Generalizability is a concern with a specific group of immigrant women who spoke the official language and shared similar cultural practices (Chinese).	
3. Choi, S.Y., Kim, E.J., Ryu, E., Chang, K.O., Park, M.N. (2012). Korea	To compare postpartum depression and parental self-efficacy between Vietnamese immigrant women	N=72 Korean mothers N=69 Vietnamese immigrant mothers, part of a larger	**Parental Self-Efficacy:** Parenting Expectations Survey (PES)	Comparative Study	**Results:** Mean EPDS score for immigrant women 11.1, (t=-3.466, p=0.001) higher than native Korean mothers and parental self-efficacy was	**Limitations:** PES was not tested on mothers longer than 1 month postpartum, unclear of the	1

	and native Korean women	longitudinal study at 4 points in the postpartum year: 1-4, 5-8 and/or 9-12 months	**Postpartum Depression**: EPDS		higher in native Korean mothers (t=5.607, p<0.001). PPD negatively correlated with self-efficacy in Korean mothers but not in immigrant Vietnamese women. .	tool's features on self-efficacy.	
4. Mohammad, K.I., Awad, D.A., Creedy, D.K. & Gamble, J. (2018). Jordan	To investigate the prevalence of PPD symptoms among Syrian refugee women in Jordan and associated risk factors.	N=365. Inclusion: Syrian refugee women, who were 6-8 weeks postpartum, between 18-45 years, able to read and speak Arabic. Recruited in 4 maternal and child health centers located in Ramtha City and Jerash City, Jordan and were living in refugee camps.	**Social support**: Measured the social factors identified as family support, social network, relationship and perception of support from husband using the Maternity Social Support Scale (MSSS) **Postpartum Depression**: EPDS	Cross-sectional study design	**Results:** EDPS mean score for this sample was 12.6 (*SD*= 3.3, *range* = 6–23). One hundred and eighty-one women (49.6%) had EPDS scores greater than 12, indicating probable PPD. The MSSS mean score for this sample was 16.3 (*SD*= 2.94, *range*= 8–24). 78.6% had low support scores, and 21.4% reported medium support. None of the participants reported adequate support. Income and length of residence in Jordan were negatively correlated with PPD scores.	**Limitations:** Study design only measured depression at one point of time and was difficult to explain the temporal relationships among variables.	2

5. Morrow, M., Smith, J.E., Lai, Y.& Jaswal, S. (2008). Canada	To understand immigrant women's own stories about their experiences of depression and what they identify as contributing factors in first generation South Asian and Chinese women living in Vancouver, BC.	N=18 immigrant women (7 Mandarin speaking, 8 Cantonese and 1 Punjabi speaking) and one second generation immigrant woman interviewed. Women recruited from BC Reproductive Services and interviewed in 3 identified languages	Understanding immigrant women's experiences with postpartum depression.	Ethnographic qualitative study design	**Themes:** **PPD Experience:** Physical symptoms, and mental and emotional distress, suicidal ideation and fear of harm of baby; perceived emotional issues not a medical one. **Psychosocial Distress:** Migration experience, suffering from lower socioeconomic status, have lack of an established social network, lack partner support and are isolated from extended family. Gender and role conflict, unfamiliar standards and pressures of being a mother in Canada with Western ideals, and pressure to have male offspring. Difficulty with disclosing feelings of sadness with health care providers.	**Limitations:** Unclear methodology, and small sample size. Unclear definition of postpartum period, risk of recall bias and limited discussion of cultural context in relation to PPD symptoms.	1
6. Nahas, V. & Amasheh, N. (1999). Australia	The purpose was to discover, describe and explain care meanings and expressions of PPD	N= 22 women; 9 key informants and 13 general informants. Inclusion:	Understanding the cultural context and meanings of PPD	Ethnonursing method utilizing Leininger's	**Themes:** **Care means carrying and fulfilling traditional gender role as mother and**	**Limitations:** Generalizability to the general immigrant population in	2

	among Jordanian immigrant women living in Sydney, Australia.	Women who have been diagnosed with PPD, a Jordanian immigrant and knowledgeable about the Jordanian Muslim culture. Interviews conducted in English and Arabic.		Sunrise Model.	**wif**e through coping mechanisms, not complaining, knowing how to care for the baby, fear of failure, feelings of guilty and having strong religious beliefs. **Strong family support and kinship ties;** respect for extended family members including mother in law, seeking advice from family, feeling lonely and husband's support. Preserving childbearing traditions and customs consist of maintaining 40-day observation postpartum, naming the baby on the 7th day and strong religious beliefs by adhering to Muslim faith.	Australia and similar countries with high immigration rates.	
7. O'Mahony, J.M., Donnelly, T.T., Bouchal, S.R. & Este, D. (2012). Canada	Explored how the contextual factors interact with race, gender, and class to affect ways in which immigrant and refugee women seek help and manage their PPD.	N=30 immigrant and refugee women (8 were refugee, 22 immigrants), diverse ethnic backgrounds; Central and South America, China,	Kleinman's explanatory model was used to examine the interactions of immigrant and refugee women, their families and social sup-	Critical ethnonursing method	**Themes:** **Formal Support:** Unfamiliar with resources for mental health **Additional HCP supports**: Mental health service limitations	**Limitations:** Participants were not studied during the postpartum period, the inclusion criteria consisted of positive EPDS criteria for PPD	1

		Middle East and South Asia. Recruited from mental health service providers and community organizations. Inclusion: non-European immigrant women, living in Canada less than 10 years, EPDS score over 10 within the past 10 years, aged 18 years and older.	port networks, and their access to health care		**Support groups**: Community support groups were not always helpful or not a fit for participant needs **Telephone support:** Mixed reviews on its efficacy **Health care relationship**: Perception of support from hcp was mixed **Informational support**: Support from family friends; lack of social relationships and feeling connected or absence of family members felt vulnerable, especially if experiencing family conflict. **Partner support:** Identified lack of understanding of PPD and felt not supported.	symptoms in the last 5 years, risk of recall bias. Participants were unlikely to be in the postpartum period at time of recruitment.	
8. Park, O.I. & Moon, H. (2011). Korea	Identified levels of parenting stress, depression and family support of immigrant women and to investigate the moderating effect of family support on the relationship between parenting	N=86 immigrant women registered in multicultural family support centers in South Jeolla province in Korea; immigrants consisted of sponsored	Investigated the level of pa-renting stress, family support and depression of immigrant women. To understand the moderating effect of family support on parenting	Quantitative descriptive study	**Results:** The relationship between depression and parenting stress was positive (r=.43, p<.01) and there was no relationship with family support. Level of depression and parenting stress	**Limitations**: Unclear study design. Ages of participants' children were not identified, assumed postpartum period with the use of the	1

	stress and depression of immigrant women.	immigrants by marriage from the Philippines, Vietnam and China, arrived minimum 2 years previously. Inclusion criteria not identified.	stress and depression. Depression measured with EPDS, a modified version of Parenting Stress Index was used to measure parenting stress and the 12 items from United Nations Development Project		together is moderated by the degree of family support. No statistical significance with association between family support and depression. Perception of support was high.	EPDS. The separate groups of immigrant women were not discussed in the results.	
9. Russo, A., Lewis, B., Joyce, A., Crockett, B. & Luchters, S. (2015). Australia	To explore the experiences of Afghan women throughout pregnancy, birth and into the early stages of motherhood, and gain insight into the aspects of the experience as it impacts emotional wellbeing.	N=38 Purposive sampling of Afghani born women living in Greater Dandenong and Casey, Australia, who arrived in 7 years prior. Inclusion criteria Majority were refugees.	Interview questions were extrapolated from the following themes: experiences of being pregnant and giving birth, transition to motherhood, wellbeing and emotions, challenges and supports, relationships comparing Afghanistan with Australia.	Qualitative study design using focus groups and semi-structured interviews	**Results:** **Experiences within formal maternity health care settings:** Health care providers were perceived as a form of emotional support, conflicted with health care providers advice and beliefs and advice from family. The challenges women identified are the reluctance to discuss emotional distress with hcp and found it inappropriate to discuss emotional health. **Experiences within the context of**	**Limitations** Unclear study design, methodology included large focus groups and missing data from who did not participate. Missing sociodemographic factors.	1

					relationships, home and community: High level of support in Afghanistan contributed to emotional wellbeing for new mothers, adhere to cultural traditions such as the 40-day rest period and celebrations surrounding the birth of a baby in the community; women in Australia felt desertion and loneliness; but even more so when relying on emotional support from husband, leading to marital conflict. Participants described the challenges with negotiating Afghani cultural practices during the postpartum period and conflicted with health care services in Australia.		
10. Shafiei, T., Small, R. & McLachlan, H. (2015). Australia	To explore and describe the immigrant Afghani women's emotional well-being and experiences of depression after	N=39. Recruited from 4 antenatal clinics, postpartum units in Melbourne. Telephone interview	Depression measured with EPDS Semi-structured interviews	Mixed Methods Design	**Results:** 31% scored above 13 on EPDS at 4 months, indicating PPD symptoms, and 41% reported at the semi-structured feelings of sadness.	**Limitations:** Unclear study design and limited generalizability focusing on specifically	2

	having a baby and use of health services in the first few months postpartum in Melbourne, Australia.	conducted 4 months postpartum and interviewed between 9-15 month postpartum.			Themes: felling alone and lack of social support, being overwhelmed, and relying on seeking help from health professionals, reluctant to seek help. Emotional problems centered on social context including loss of social support, marital conflicts and immigration status concerns.	Afghani women living in Australia.	
11. Tobin, C. L., Di Napoli, P. & Beck, C.T. (2018). United States	The purpose was to meta-synthesize qualitative research of PPD in immigrant women, create an understanding of their experiences and how they coped including exploring the barriers and experiences for effective care.	N=13 studies found in the CINAHL, MEDLINE, PsycINFO, Social Science Citation Index and PubMed databases. Inclusion criteria included participants who are refugees and/or immigrant women, experiencing PPD, qualitative study conducted in English, between 2004 and 2014	Concepts identified: PPD experience, cultural conceptualizations and barriers to help seeking	Meta-analysis using Noblit and Hare's (1988) approach for conducting a systematic review for qualitative research.	**Results:** Perception of PPD is largely culturally influenced, and fearful of stigma or not appropriate for discussion with health care providers or conflict with family member or cultural expectations. Social support played a role in resilience or coping abilities, speaking with family members and those who sought help faced barriers in accessing health care services or found ways to cope by accessing resources.	**Limitations:** Results based on 167 participants, limited generalizability and risk of subjective recall bias.	2

12. Wittkowski, A., Patel, S. & Fox, J.R. (2017). United Kingdom	The aim was to appraise and assimilate qualitative findings of PPD in immigrant mothers	N=16 qualitative studies in Web of Science, CINAHL, MEDLINE, PsycINFO, PubMed and Embase databases. Inclusion criteria included qualitative research with immigrant postpartum women conducted in English, published between January 1990-March 2014.	PPD experiences	Meta-synthesis using Noblit and Hare's (1988) method	**Results:** Migration factors, Cultural influences and consequences were the overarching themes. Migration factors included participants discussions of feeling alone, experiencing relationship conflict and financial, housing and immigration concerns. The cultural influences consisted of upholding gender roles, adherence to childbirth rituals and cultural beliefs and values, which led to a psychosocial understanding of PPD, the barriers to access mental health care and identifying coping strategies.	**Limitations:** Included the definition of immigrant-second generation or extended length of settlement, and most of participants are not generalizable.	2

Exploring the Effects of Psychosocial Factors and Relationships to Postpartum Depression Symptoms Among Iranian Immigrant Women Living in Canada: A Cross-Sectional Study

Abstract

Introduction: Canadian immigrant postpartum women experience changes in social networks and parenting needs. The effect of maternal self-efficacy, ability to manage parenting responsibilities, social support and cultural postpartum practices on postpartum depression (PPD) symptoms are not well known. **Methodology:** A cross-sectional survey explored the relationships between maternal self-efficacy, social support, cultural postpartum practices and symptoms of PPD among recent Iranian immigrant women living in Canada. **Results:** A total of 114 surveys were completed. Two-thirds experienced symptoms of PPD; a significant effect on maternal self-efficacy and social support was found; none with Iranian postpartum cultural practices. Social support was found to moderate the relationship with maternal self-efficacy and symptoms of PPD. **Discussion:** Younger, first-time and recent Iranian immigrant mothers were more likely to experience symptoms of PPD. Social support is a crucial component to maternal self-efficacy; more information to understand Canadian Iranian immigrant women's supportive networks and virtual access to mental health care is required.

Keywords: Postpartum Depression; Psychosocial Factors; Social Support; Maternal Self-Efficacy; Iranian immigrant women; Iranian Cultural Postpartum Practices; Canada

Exploring the Effects of Psychosocial Factors and Relationships to Postpartum Depression Symptoms Among Iranian Immigrant Women Living in Canada: A Cross-Sectional Study

Maternal mental health is public health concern by the World Health Organization (WHO) is identified as a significant health risk impacting both mother and child (WHO, 2023). Postpartum depression (PPD) is a well-known phenomenon impacting the mental health of childbearing women. In a recent National Survey on Maternal Health, an average 23% of Canadian mothers reported symptoms of PPD (Canada, 2019). Women with PPD experience low mood, somatic complaints, parenting difficulties and in more severe cases suicidal ideation (Dol et al., 2021; Saad, 2019). In addition, risk factors include low socioeconomic status, lack of social supports, history of a mood disorder and having been born outside of Canada (Falah-Hassani et al., 2015).

Immigrant mental health is a relevant population health concern with known challenges in resettlement and acculturation among migrants worldwide (PAHO, 2018). Canada welcomed 1.3 million new immigrants during the 2016 to 2021 census period, one in four Canadians are immigrants, the highest proportion of immigrants amongst the G7 nations (Canada, 2022). Iranian immigrants have represented a large proportion of newcomers in the past ten years, 100,000 settled in a major metropolitan city in central Canada and have a considerable presence (Canada, 2022). The migration experience can impact women's mental health as many face social, financial and structural barriers (Delara, 2016). Immigrant women were identified to have a twofold risk of developing PPD symptoms as compared to Canadian born women; newly settled and refugee women reported having the greatest risk (Dennis et al., 2017; Falah-Hassani et al., 2015).

Additionally, immigrant mothers with low income, migration stress and low social supports face risk in developing PPD symptoms (Alhasanat-Khalil et al., 2018; Dennis et al., 2017). Lack of social support during the postpartum period is the most commonly reported concern of immigrant women with PPD symptoms (Dennis et al., 2017; Falah-Hassani et al., 2015; Ganann et al., 2016; Kassam, 2019; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Saad, 2019; Stirling Cameron et al., 2022). Immigrant women, who migrated in the past five years (Canada, 2022), are more likely to experience low income, language barriers, inadequate access to health care services and social isolation (Dennis et al., 2017; Higginbottom et al., 2014; Khanlou et al., 2017; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Stirling Cameron et al., 2022).

Absence of social support may lower coping responses in immigrant women during the postpartum period (Ganann et al., 2016). Separation from extended family members, limited spousal caregiving involvement and unfamiliarity of community resources are reported in previous studies (Daoud et al., 2019; Dennis et al., 2017; Ganann et al., 2016; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Sword et al., 2006). During the stress of migration, maternal adjustment may lead immigrant women to have increased feelings of sadness, and feelings of social isolation (Ganann et al., 2016). Acculturation difficulties strain the transition to motherhood mainly when the new mother lacks social support or access to a supportive network, resulting in unhealthy coping behaviors and possibly symptoms of PPD (Dennis et al., 2017; Falah-Hassani et al., 2015; Fung & Dennis, 2010; Ganann et al., 2016; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). In addition, the stress of migration and maternal adjustment may cause immigrant women to have increased feelings of sadness and marginalization if

socially isolated (Ganann et al., 2016). Previous studies identified that immigrant women would benefit from a network of supports during transition into a new environment and motherhood (Ganann et al., 2016; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012).

Background and Rationale

To understand the phenomenon of PPD in immigrant women, studies have relied on establishing incidence and prevalence, risk factors, experiences of PPD, and the role of social support in immigrant postpartum women's mental health (Ahmed et al., 2017; Beck, 2022; Collins et al., 2011; Daoud et al., 2019; Falah-Hassani et al., 2016; Shafiei et al., 2015; Stirling Cameron et al., 2022; Zlotnick et al., 2022). A literature review was conducted exploring keywords "postpartum depression" "immigrant women", social support, self-efficacy and acculturation (Gola et al., in preparation). The literature review found studies contained psychosocial factors, involving maternal self-efficacy, the role of migration, cultural practice and relationships in the presence of PPD symptoms (Boruszak-Kiziukiewicz & Kmita, 2020; Samdan et al., 2022).

Maternal self-efficacy, the ability to organize and accomplish parenting tasks, is grounded in Bandura's (1997) Self-Efficacy Theory (Leahy-Warren & McCarthy, 2011). Maternal self-efficacy is a behavioral response to soothe infant distress by the self-belief of the ability to respond to infant needs by caregiving tasks (Leahy-Warren et al., 2012; Leerkes & Crockenberg, 2002; Wittkowski, Garrett, et al., 2017). Caregiving tasks measuring maternal self-efficacy include responding to a crying infant, reading cues or the ability to feed and breastfeeding successfully (Leahy-Warren & McCarthy, 2011; Samdan et al., 2022; Teti & Gelfand, 1991). A study with depressed non-immigrant first time mothers found that mothers were less likely to respond intuitively to their infant's

needs, the ability to console infant crying (Leahy-Warren et al., 2012; Wittkowski, Garrett, et al., 2017). Low maternal self-efficacy was found in immigrant women in Australia who experienced difficulty breastfeeding their infant exclusively, and described being overwhelmed with childrearing responsibilities (Shafiei et al., 2015). In a Singapore study with immigrant women, participants scored low maternal parental self-efficacy on newborn caregiving tasks, including breastfeeding, soothing and responding to infant needs (Shorey et al., 2014). In an Iranian study with non-immigrant mothers, high maternal self-efficacy and high infant care scores were found in mothers who were less depressed compared to depressed mothers who reported to be socially isolated and lacked the ability to practice self-care (Fathi et al., 2018). Characteristics of maternal self-efficacy, such as breastfeeding self-efficacy, were explored with Canadian immigrant postpartum women (Dennis et al., 2019), however, a more comprehensive understanding of how immigrant women experiencing PPD symptoms are meeting parenting responsibilities is warranted.

Having access to a social network creates feelings of belonging (Lakey & Cohen, 2000; O'Mahony & Donnelly, 2010). Limited access to social support networks were connected with the absence of extended family and friends reported by Canadian immigrant women (Ahmed et al., 2008; Ganann et al., 2016; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). Immigrant women were more likely to be parents of older children and were less likely to have functional sources of support, such as child care in comparison to non-immigrant women (Dennis et al., 2017; Falah-Hassani et al., 2015; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). One of earliest documented ethnographic studies recognized social support networks were primarily connected to

Middle Eastern immigrant women's physical and emotional wellbeing (Nahas et al., 1999). Family is a strong source of social support for immigrant women and the absence of family was a challenging experience for women experiencing symptoms of PPD (O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). In addition, correlation between PPD and social support (r=0.44) was found in a study of Syrian immigrants living in Jordan (Mohammad et al., 2018). Social isolation, or lack of access to supportive networks are well known to affect immigrant postpartum women's emotional health (Beck, 2022; Dennis et al., 2017; Dol et al., 2021; Ganann et al., 2016; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012; Saad, 2019) however it is unclear if Iranian immigrant women experience these as well.

Practicing cultural traditions during the postpartum period is a rite of passage for many immigrant women (Dela Cruz et al., 2023; Morrow et al., 2008; Nahas et al., 1999; O'Mahony et al., 2013; Tobin et al., 2018). Often cultural traditions include leaning on elder female family members, friends and community to assist informal support for the new mother; caregiving of the infant, assisting in household tasks and a source of parenting encouragement (Morrow et al., 2008; Nahas et al., 1999). The acculturation experience is the differing ways of relating to the migrated society as compared to one's natal cultural identity (Berry, 2003). Acculturation is a multifactorial process which can be increasingly challenging to understand (Berry & Hou, 2016), particularly in immigrant women with PPD symptoms. Risk factors in immigrant women's mental health, including the effects of acculturative stress on mental health, their health care experiences, length of residence, language barriers and immigration status have been explored (Alhasanat & Fry-McComish, 2015; Alhasanat-Khalil et al., 2018; Berry &

Hou, 2016; Dennis et al., 2017; Fung & Dennis, 2010; George et al., 2015; Guruge et al., 2015). Mothers who experienced significantly high levels of acculturative stress in a study of immigrant Arab couples in the United States reported symptoms of PPD (Khalil et al., 2022), and acculturative stress was associated with PPD in an earlier study with Arab immigrant women (Alhasanat-Khalil et al., 2018). In a US study with Southeast and East Asian immigrant women, traditional gender roles were maintained and cultural traditions were modified for feasibility; income and maternity leave allowance impacted cultural practices (Vo, 2021). Additionally, a study on Canadian immigrant women's experiences with postpartum depression reported PPD was not an illness new mothers faced due to the care provided in their cultural traditions and language (Stirling Cameron et al., 2022). Canadian immigrant women's experiences with PPD have been studied, however Iranian immigrant women's experiences were not explicitly investigated.

This connection between acculturation experiences, acculturative stress, accessibility of social support, maternal self-efficacy and their mental health requires further analysis. Investigating maternal self-efficacy includes understanding the needs of a new immigrant mother, the low levels of support and unfamiliarity of health resources (Dennis et al., 2017). The role of maternal self-efficacy, social support and postpartum cultural practices are not well understood in immigrant women with PPD.

This study explored the relationships concerning psychosocial factors including: maternal self-efficacy, perceived social support, traditional postpartum cultural practices and sociodemographic characteristics in the symptoms of PPD among Iranian immigrant women living in Canada. The specific aims of the study are to investigate 1) the relationship between perceived maternal self-efficacy, perceived social support and

Iranian cultural postpartum practices and symptoms of PPD; 2) the association of perceived maternal self-efficacy, perceived social support, Iranian cultural postpartum practices, participant's age, years in Canada and number of children and the symptoms of PPD; and 3) whether perceived social support has a moderating effect on the association between maternal self-efficacy and symptoms of PPD.

Theoretical Framework

To understand the relationships between psychosocial factors and symptoms of PPD, Bandura's (1978) Reciprocal Determinism theoretical framework was used to guide the empirical inquiry. Bandura (1978) suggested personal factors, identified as individual beliefs and behavioral factors, are influenced by social environmental factors. The triadic interaction between personal, behavioral and environmental factors is influenced in a reciprocal direction (Bandura, 1978). In this study, personal factors understood as cognitive beliefs and perceptions were measured as symptoms of PPD; behavioral factors described as sources of individual motivation were evaluated as maternal self-efficacy and Iranian cultural postpartum practices and the environmental factor that creates the interaction between personal and behavioral factors was measured by socio-demographics and perceived social support (Figure 1). The framework theorizes Iranian immigrant postpartum women's environmental and behavioral experiences are influenced by their personal beliefs suggesting a reciprocal feedback related to the perception of social support, years living in Canada, maternal age and parity, related to perceived maternal self-efficacy and associated with the experience of symptoms of PPD. This hypothesis suggests low levels of perceived social support influences the level of

maternal self-efficacy found in Iranian immigrant postpartum women who experience symptoms of PPD.

Study Methods

Study Design, Setting and Sampling

This study was a cross-sectional descriptive survey design using an electronic survey format on Qualtrics ™ (Qualtrics, 2023) to investigate relationships among the psychosocial factors including: perceived social support, maternal self-efficacy, traditional postpartum cultural practices and sociodemographic variables with symptoms of PPD. The inclusion criteria include postpartum Iranian women who live in Canada, can read and understand English, are over the age of 18, were born in Iran, and have an infant under one year of age. The data collection procedures followed study approval granted by Duquesne University Institutional Board, and York University, Faculty of Health's Minor Research Grant funded the study, approval was granted by the Ethics Committee at York University. From the periods of June 2021 to September 2021 and December 2021 until April 2022, participants were recruited from private group networks specifically for Iranian mothers listed on two social media platforms in a metropolitan city located in a Central Canadian province. The private groups consisted of approximately 2200 members. The group's moderators posted electronic study flyers to their message boards. Potential participants were vetted by the moderators and the principal investigator screened interested women for inclusion criteria. Eligible participants were emailed a link to the electronic consent on the Qualtrics™ online survey platform. Once completed consents were received, participants received a Qualtrics ™ generated individualized invitation to complete the survey. Survey

instructions provided information on how to access local mental health services for participants who scored to be at risk for symptoms of PPD and options to stop the survey. Participants who completed the electronic self-administered questionnaire received a separate email with a $30 e-gift card for compensation. Data verification protocols were maintained throughout data collection.

Measurements

The electronic self-administered 80-item survey was completed in English on the Qualtrics ™ platform reported on participants' perceptions of social support, maternal self-efficacy, Iranian postpartum cultural practices, sociodemographic variables and PPD symptoms.

Demographics. Participants responded to 11 items self-identifying their age, marital status, level of educational attainment, income, employment status, ages and number of children, how many people and who resided in their household, immigration status and years living in Canada. Previous studies focused on risk factors for postpartum depression among immigrant women, including low income and low perception of support and collected similar demographic data (Dennis et al., 2017; Falah-Hassani et al., 2016).

Postpartum Depression Symptoms. The Edinburgh Postnatal Screening Scale (EPDS) is the most widely researched and utilized screening tool to assess symptoms of postpartum depression. It has been adapted by many local and federal health service organizations globally with endorsement from the World Health Organization (WHO) (Society, 2011). The tool was designed as a self-reporting tool that was easy to use and facilitated screening practices by health care providers who were not necessarily rooted in

clinical psychiatric practice (Cox et al., 1987). The original 10-item tool instructs the respondent to underline their answer by rating, 'No, not at all', 'No, not very often', 'Yes, most of the time' or 'Yes all of the time' in the past seven days. The cut off score of 12 out of 30 indicates the presence of depressive symptoms (Cox et al., 1987). Most studies involving immigrant women measure symptoms of PPD using the EPDS, including recent Canadian studies involving immigrant women (Daoud et al., 2019; Dennis et al., 2017; Ganann et al., 2016), in addition to studies with Iranian mothers (Khandan, Riazi, Amir Ali Akbari, et al., 2018; Mazhari & Nakhaee, 2007). The EPDS has a high reliability, as the Cronbach's alpha coefficient in a Canadian study with immigrant women was 0.87 (Ganann et al., 2016) identical to the original psychometric study by Cox et al. (1987). For this study, the original English EPDS version was used.

Maternal self-efficacy. Barnes and Adamson-Macedo (2007) developed the Parental Maternal Perceived Self-Efficacy scale (PMP-SE), a 20-item Likert self-reported questionnaire based on four subscales; 1) caretaking procedures, 2) perceptions of eliciting positive infant response behaviors, such as soothing, 3) reading infant cues, and 4) situational beliefs about parenting abilities. Total scores range from 20-80, the higher the participant score, the higher perceived maternal self-efficacy, with subscale scores identifying specific areas of concern (Barnes & Adamson-Macedo, 2007; Pitetti et al., 2016). No score ranges were identified. The scale was initially developed in a study with mothers of hospitalized pre-term infants based on a previous study by Teti and Gelfand (1991) who determined maternal self-efficacy was a mediating factor in depressed postpartum women (Barnes & Adamson-Macedo, 2007). A modified version of the PMP-SE was first studied with first time Irish mothers and later in first-time Iranian mothers

(Fathi et al., 2018; Leahy-Warren et al., 2012). The reported Cronbach's alpha was 0.91 when tested with Irish first time depressed mothers (Leahy-Warren et al., 2012) and 0.79 in the Iranian study (Fathi et al., 2018). Example items include #3 "I can tell when my baby is sick" #7 "I believe that my baby and I have a good interaction with each other" #13 "I am good at understanding what my baby wants" and #20 "I can show affection to my baby." Both Leahy-Warren et al. (2012) and Fathi et al. (2018) suggest a positive relationship with maternal self-efficacy and perceived social support in postpartum women. The original English version of the PMP-SE (Barnes & Adamson-Macedo, 2007) was used in this study.

Perceived social support. The Multidimensional Scale of Perceived Social Support (MSPSS) by Zimet et al. (1988) is a 12-item Likert self-report scale (very strongly disagree=1 to very strongly agree=7), inquiring about the subjective nature of social support including perceptions of support received from family, friends and other sources of social support, ranging in scores from 12 to 84 (Khandan, Riazi, Amir Ali Akbari, et al., 2018). Scores are distributed into ranges, 12-35 low perceived social support, 36-60 moderate levels of support and 61-84 rated as higher levels of support (Zimet et al., 1988). The MSPSS rates family, friends and significant other for perception of social support, including questions #3 "My family really tries to help me" #4 "I get the emotional support I need from my family" #7 "I can count on my friends when things go wrong" and #8 "I can talk about my problems to my family". The MPSS was studied for its psychometric properties with immigrant Arab women and the MPSS-AW had a Cronbach's alpha of 0.74 (Aroian et al., 2010), but it has not been psychometrically tested with Iranian postpartum women; the only published Cronbach's alpha was a study

with a population of Iranian patients recovering from Myocardial Infarction (Bagherian-Sararoudi et al., 2013). The English version of the *MSPSS* (Zimet et al., 1988) was used in its entirety in this study.

Iranian Cultural Postpartum Practices (ICPP). The 27-item questionnaire was developed for a longitudinal study in Iran to determine the relationship with postpartum mental health and cultural practices (Abdollahi et al., 2016). The scale contains questions inquiring about family and support; cultural practices including if mothers observe the 40 day rest period after birth, traditional dietary restrictions including avoidance of spicy foods and infant care practices such as massage and swaddling practices. The questionnaire is rated by a yes (1)/no (0) response, with scores ranging from 0-27 (Abdollahi et al., 2016). Scores ranging 0-12 were rated as a low level of postpartum cultural practices, 13-16 a medium level, and above 16 as high level (Abdollahi et al., 2016). The inter-rater reliability was measured using a test-retest method with a sample of 60 women, over a two-week interval at eight weeks postpartum, with the Cohen's kappa of 0.60 (Abdollahi et al., 2016). The original questionnaire is in Farsi, but a translated English version provided by the author was used in this study.

Data Analysis

Data from the completed questionnaires were entered into Statistical Package for Social Sciences (SPSS) version 27 and questionnaire scores were calculated (IBM, 2021). The number of children were dichotomized to participants with one child or more than one child to estimate the effect of one child on PPD compared to more than one child. The symptoms of PPD was considered as both a continuous and a binary outcome. For

the latter, EPDS scores of 12 or above were used to identify symptoms of PPD, the studied threshold score for immigrant women (Daoud et al., 2019).

For the first aim, descriptive statistics were generated using medians and inter-quartile ranges (IQR, 25th percentile, 75th percentile) for continuous variables and frequencies and percentages for categorical variables. Differences in PPD symptoms were evaluated using Chi-Square or Fisher's exact tests for categorical and Mann–Whitney U test for continuous independent variables. Secondly, a bivariate regression analysis was conducted to determine the relationship between symptoms of PPD and for each outcome, perceived maternal self-efficacy, social support, Iranian Cultural Postpartum Practices (ICPP) and participant's age, income, years in Canada and number of children.

In order to identify possible predictors of the quantitative variable PPD symptoms in aim two, an analysis was conducted for each outcome (continuous or dichotomized EPDS) in two steps. First, a multivariate regression model was performed using psychosocial factors, Iranian Cultural Postpartum Practices, participant's age, income, years in Canada and number of children in the family (Ahmed et al., 2017; Dennis et al., 2017; Ganann et al., 2016; O'Mahony, Donnelly, Raffin Bouchal, et al., 2012). In the next step for aim three, an interaction term of self-efficacy and social support was added to the multivariable model to explore if the effect of self-efficacy on the EPDS depends upon the levels of social support (Leahy-Warren & McCarthy, 2011; Zlotnick et al., 2022).

Similar to the linear multivariate regression models, two logistic regression models were used to investigate the odds ratios for presence of symptoms of PPD

(EPDS>= 12) related to the perceived social support, perceived maternal self-efficacy, Iranian cultural postpartum practices and socio-demographic variables.

Results

Sample Descriptions

A total of 114 mothers were eligible among 116 participants who had completed the survey, the two ineligible women had reported their infants were over the age of one; 112 (98%) resided in Central Canada near the metropolitan city and 2 (2%) resided in Western Canada. The socio-demographic characteristics of all participants are presented in Table 1. Rates of missing data were less than 10 percent of the total completed surveys.

The age of the studied mothers ranged between 21 and 46, with a median (IQR) of 36 (32, 39) years. The majority of mothers had completed a bachelor's degree or higher 81 (73%), were married 96 (85.7%), were on maternity leave 30 (27.8%), had only one child 76 (66.7%) and had an income 54 (48.6%) less than $30K. The median (IQR) of years being in Canada was 5 (4, 7) years.

The median (IQR) of EPDS scores was 15 (9, 18) with more than half of mothers 67 (59.0%) rated the presence of symptoms of PPD. In terms of perceived self-efficacy, the median (IQR) score was 59 (55, 65). The median (IQR) score of perceived social support was 52 (44, 62), suggesting a moderate view of support. The median (IQR) of Iranian Cultural Postpartum Practices was 9 (7, 10) indicating a low level of postpartum cultural practices. In our sample, most of mothers reported low level of postpartum cultural practices 9 (89.2%).

Women who scored 12 or above on EPDS scored significantly lower on the median of maternal self-efficacy (56.5 vs 60.0, p<0.001) and perceived social support (50.0 vs 60.0, p<0.001) compared to those who scored less than 12. Scores for Iranian Postpartum Cultural Practices did not differ significantly between the two groups (Table 1).

Psychosocial Factors Related to Postpartum Depression Symptoms

A significant linear regression model (F (6, 100) = 8.75, $R^2_{adj} = 31\%$, $p<.001$) indicated that maternal self-efficacy, perceived social support, Iranian Cultural Postpartum Practices, maternal age, number of children and years in Canada explained 31% of the variation in the EPDS scores. The results indicated that Iranian immigrant mothers with high scores of PMP-SE, perceived maternal self-efficacy, (β = -.14, 95% C.I: -.26, -.01, p=.031) and high scores of MSPSS, perceived social support (β = -.19, 95% C.I: -.27, -.10, p<.001) had significantly lower EPDS scores. In contrast, mothers who reported higher Iranian Postpartum Cultural Practices scores had higher EPDS scores suggesting the more cultural postpartum traditions were practiced, the more likely to experience symptoms of PPD, but this effect was not significant (β = .14, 95% C.I: -.12, .39, p=.281). Older mothers, over the age of 36 years, who lived in Canada longer were less likely to score higher on the EPDS, but this effect was not significant (Table 2).

Results from the first logistic regression model indicated that strong self-efficacy (OR=.94, 95% C.I (.88, .99), p=.043) and social support (OR=.94, 95% C.I (.90, .99), p=.012) significantly reduced the odds of the presence of symptoms of PPD. Older mothers who immigrated earlier to Canada were also less likely to have symptoms of PPD, although these effects were nonsignificant (Table 3).

Moderating Effect of Social Support on Maternal Self-Efficacy

A moderated multivariable logistic regression analysis was also used to examine the moderator effect of perceived social support scores on the relationship between perceived maternal self-efficacy and EPDS scores. There was a significant interaction effect between perceived social support and perceived self-efficacy (β= .01, 95% C.I: .01, .02, p=.004). More importantly, the interaction term added 5% to the explained variation in the EPDS (F (7, 99) = 9.35, $R^2_{adj} = 36\%$, $p<.001$) compared to the previous model without the interaction effect. (Table 4).

Figure 2 depicts this interaction effect, using simple slopes analysis in a model with only self-efficacy and social support as predictors. Regression lines at three levels of the moderator social support low, medium and high social support were plotted (Figure 2). At low level of social support, self-efficacy predicted a decreasing EPDS score more substantially with the slope of -.45 while the impact of self-efficacy on EPDS was much smaller in the medium social support level with the slope of -.28 and no effect with high perceived scores of social support.

Finally, results from the moderated logistic regression showed a significant moderation effect (OR=1.01, 95% C.I. (1.002, 1.02), p=.015) suggesting that perceived maternal self-efficacy has a slightly different relationship to the symptoms of PPD, depending on the level of perceived social support (Table 5).

Reliability

In this study, the internal consistency of the EPDS, measured by the Cronbach's alpha coefficient was found to be 0.91, indicating a satisfactory reliability consistent in previous studies with immigrant women (Dennis et al., 2017; Ganann et al., 2016). The

reliability Cronbach's coefficient alpha for both PMP-SE and MSPSS was 0.94, consistent with other studies on depressed mothers (Alhasanat-Khalil et al., 2018; Jiramanee et al., 2022; Kahya & Uluc, 2021; Leahy-Warren et al., 2012). Also, the Iranian Postpartum Cultural Practices measured an acceptable alpha of 0.71 with this immigrant sample (Abdollahi et al., 2016).

Discussion

This novel Canadian study with Iranian immigrant mothers sought to explore the relationships between sociodemographic characteristics, perceived maternal self-efficacy, perceived social support and Iranian cultural postpartum practices with symptoms of PPD as well as the moderating effect of perceived social support on maternal self-efficacy and prediction of symptoms of PPD. Data collection occurred in 2021 and 2022 during the COVID-19 pandemic, a time period associated with social isolation. A large proportion of this sample were found to have symptoms of PPD. Previous studies with non-immigrant first-time mothers experiencing low maternal self-efficacy found high levels of women experiencing PPD (Choi et al., 2012; Dol et al., 2021; Hennegan et al., 2015; Leahy-Warren & McCarthy, 2011). There was no significance in number of years residing in Canada or immigration status, similar to results in a previous Canadian study (Dennis et al., 2017). Furthermore, a positive association was found between perceived maternal parental self-efficacy and perceived social support in women who had symptoms of PPD. Inversely, from the moderating effect of social support and the effect of the relationships with maternal self-efficacy with PPD symptoms was much greater in women who had reported low social support; they reported being less effective in their ability to carry out parenting tasks. No evidence of a relationship between the Iranian

Cultural Postpartum Practices and symptoms of PPD was found. These results revealed that postpartum cultural practices are not utilized among Iranian immigrant mothers in Canada, perhaps related to generational differences.

The use of the PMP-SE scale to explore maternal self-efficacy with Iranian immigrant postpartum women in Canada was unique; participants who scored low maternal self-efficacy and had symptoms of PPD were younger, first time mothers with low reported income as compared to mothers who did who not experience PPD symptoms. Since participant recruitment was conducted during the COVID-19 pandemic, the results were consistent with several studies reporting mothers experienced low maternal self-efficacy, a result of the physical distancing restrictions required to limit the spread of community infection (Chen et al., 2022; Xue et al., 2021).

Low perceived social support, a known risk factor for symptoms of PPD, was found in studies with immigrant women and has been described as a lack of supportive networks (Alhansanat et al., 2017) and limited access to social support (Chen et al., 2016; Daoud et al., 2019; Ganann et al., 2016; Leahy-Warren et al., 2012; Saad, 2019; Wittkowski, Patel, et al., 2017; Zlotnick et al., 2022). Social support is defined as a resource for immigrant women with PPD (Kassam, 2019). Studies with Iranian postpartum women acknowledged low social support is a known risk factor (Fathi et al., 2018; Khandan, Riazi, Akbari, et al., 2018; Mirghafourvand & Bagherinia, 2018; Vaezi et al., 2019). Beck's Grounded Theory on postpartum depression, *Teetering on the Edge* (Beck, 2022), was updated to include the role of social support in PPD with immigrant women, identifying that the separation from vital female extended family members, and consequently negatively impacted the amount of support new immigrant mothers

received. Relationships with family members are vital sources of emotional support. However, there were Iranian immigrant mothers who reported high perceived levels of social support and maternal self-efficacy and no symptoms of PPD. A possible contributing factor to the emotional wellbeing of Iranian immigrant women and their maternal self-efficacy is the role of community and social engagement (Fathi et al., 2018).

Maternal self-efficacy's relationship with PPD was not straightforward and was dependent on perceived social support. Social support bolsters maternal self-efficacy, particularly when sources of helpful support, extended family members providing hands on assistance with caregiving tasks reduced the caregiving burden (Leerkes & Crockenberg, 2002). The Iranian immigrant women in this study who rated low levels of social support had lower rates of maternal self-efficacy and predictably experienced PPD symptoms, likely were affected by social isolation, separation from family and a lack of practical sources of support, likely from the restrictions imposed during the COVID-19 pandemic (Zlotnick et al., 2022).

Iranian cultural postpartum practices were not found to have an effect on symptoms of PPD, despite previously reported findings of isolated depressed immigrant women experienced difficulties in meeting their parenting expectations when feeling disconnected with their cultural identity (Chen et al., 2012; O'Mahony, Donnelly, Bouchal, et al., 2012). Possibly the Iranian cultural postpartum practices did not resonate with Iranian immigrant mothers living in Canada; the ability to perform postpartum cultural practices, such as the observing the 40 day ritual, where postpartum women are restricted of leaving the home in the first 40 days postpartum, emphasis on recovery by

periods of rest and cultural foods, breastfeeding with assistance from extended family members (Bina, 2008; O'Mahony et al., 2012) were likely not performed with low levels of perceived support. The experience of symptoms of PPD with this sample of mothers, however, confirmed the inequities of immigrant mental health. Recently, the WHO (2018) classified migration as a social determinant of health. Global migration patterns are shifting as population groups flee civil and political instability in search of economic security and peace. Immigrant women's mental health needs attention as their needs results from changes in social networks and cultural adjustment (Dela Cruz et al., 2023; Guruge et al., 2015). However, what is not adequately understood as a small number of respondents who scored higher levels of Iranian cultural postpartum practices had symptoms of PPD. The type of social support needed to buffer risk for symptoms of PPD, the influence of acculturation and/or migration experiences in immigrant women with PPD is not known.

Implications for Practice and Research

The aims of this inquiry were to understand the relationships between socio-demographic characteristics, maternal self-efficacy, perceived social support and Iranian cultural postpartum practices and the risk of developing symptoms of PPD in Iranian immigrant mothers living in Canada. Research involving Iranian immigrant women during the postpartum period has been underrepresented in Canada, however previous research with Iranian immigrants indicates a well-educated group with advanced degrees who experienced underemployment and low income (Dastjerdi, 2012). It has been established that approximately 20% of immigrant women in Canada will experience symptoms of this disorder (Falah-Hassani et al., 2016), however immigrant women are

less likely to access mental health services (Vigod et al., 2016). Long lasting effects of PPD on infant development include delays in developmental milestones, emotion dysregulation and behavioral problems (Beck, 1993; Beck, 1998). This study's findings provide evidence to further support that immigrant women continue to have higher rates of stress and symptoms of PPD (Dennis et al., 2017).

Related to practice, expanding screening practices for symptoms of PPD with immigrant Iranian women is needed, however, more importantly, referral to mental health care may be challenging for nurses. The stigma of PPD remains, and Iranian mothers may be reluctant to share their feelings outside of family members (Lipson, 1992), unlike the anonymity of the self-administered survey in this study provided a space for immigrant mothers to share their opinions. Mental health promotion strategies involving mothers to self-identify their symptoms of PPD with online screening and virtual referrals for mental health care, as has been done in Poland (Chrzan-Dętkoś & Walczak-Kozłowska, 2022). With a shift in health seeking information by virtual means, nurses can play a pivotal role in providing a virtual platform for immigrant mothers to self-identify and create links with mental health care.

Innovative virtual mental health interventions are needed to support immigrant women with symptoms of PPD. One Canadian study found the effectiveness of telephone-based interpersonal psychotherapy in reduction of PPD symptoms (Dennis et al., 2020), psychotherapy to depressed mothers via videoconferencing (Yang et al., 2019), and the use of mobile health technologies to link depressed mothers with virtual mental health providers (Novick et al., 2022). Our study's recruitment strategies support the belief immigrant postpartum women are very active in connecting on virtual

platforms, and social media networks and must be included in these mental health promotion strategies.

This study informs transcultural nursing practice, reminding nurses the utilization of cultural postpartum practices are not universally practiced and may not provide protective factors for symptoms of PPD (Evagorou et al., 2016). Furthermore, risk for developing symptoms of PPD may be manifested into other contexts including somatic complaints, and interpersonal relationship and marital difficulties (Dennis et al., 2017; Khanlou et al., 2017). Further exploration of the experience of maternal self-efficacy in immigrant women is needed, including the types of parenting information need for maternal self-efficacy. Considering what immigrant postpartum women need to rebuild their social networks should be included in future intervention research.

Strengths and Limitations

The novel use of the PMP-SE in Iranian immigrant women was a reliable measurement of maternal self-efficacy. The timing of participant recruitment likely contributed to the 100% participant response rate, conducted during Canada's second round of COVID-19 pandemic related restrictions. The uniqueness of Iranian immigrant women in this sample was likely the COVID-19 pandemic shifted their emotional health, resulting in health seeking information and social connecting patterns through virtual means suggested by a study with Polish mothers (Chrzan-Dętkoś & Walczak-Kozłowska, 2022). The strong reliability of the EPDS and the MSPSS were validated in studies with Iranian non-immigrant and Canadian immigrant mothers. The challenge for this research problem is how to contextualize complex psychosocial factors, such as perceived social support, when symptoms of PPD are considered a stigma in immigrant women (Bina,

2008; Higginbottom et al., 2014; O'Mahony et al., 2013) and perceptions by Iranian immigrant women are unclear. These effects of psychosocial factors on symptoms of PPD are intended to inform community mental health promotion and not necessarily maternal mental health. This study focused on Iranian immigrant postpartum women's experiences in a major city in Central Canada in a short period of time, during the COVID-19 pandemic when the stress of the pandemic may have been high (Lim et al., 2022; Sangsawang & Sangsawang, 2023). A recent Canadian study suggest more Canadian women accessed mental health care with their primary care providers during the first phase of the COVID-19 pandemic (Vigod et al., 2021). This sample of participants does not represent the perceptions of all Iranian immigrant mother's experiences. The convenience sampling was conducted non-randomly, targeting virtual groups with membership, representing Iranian mothers and may not be representative of Iranian immigrant women in Canada. The women who volunteered to participate for this study may have had a higher risk of symptoms of PPD, but due to the nature of cross-sectional analysis, the causal relationship cannot be determined. However, this method is appropriate to recruit immigrant mothers who are underrepresented in research.

Conclusion

This study's findings indicate maternal self-efficacy and social support was associated with symptoms of PPD in Iranian immigrant women in Canada. As in our study, a moderating effect of social support on the association between maternal self-efficacy effects and PPD symptoms was found previously in studies with non-immigrant postpartum women (Dol et al., 2021; Leahy-Warren et al., 2012). Unexpectedly, immigration status and cultural postpartum practices had no significant relationships with

symptoms of PPD Further exploration of Iranian immigrant women postpartum needs and their emotional health seeking behaviors, including access to parenting information and what types of support are beneficial, are warranted.

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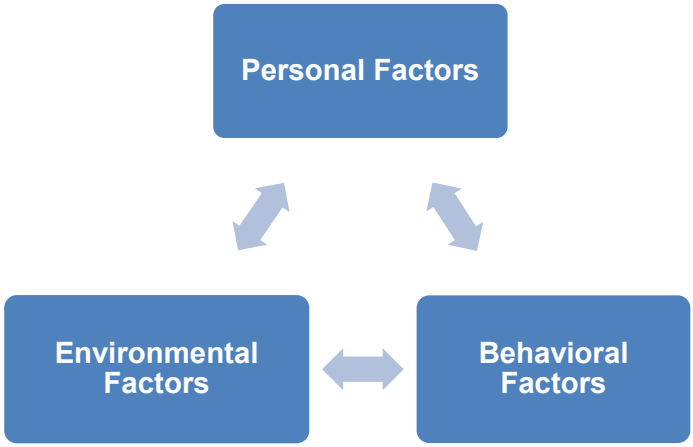

Figure 3.1. Bandura's (1978) Reciprocal Determinism

Table 3.1: Summary of Study Characteristics by Symptoms of PPD

Characteristics	Overall	Symptoms of postnatal depression		
	n (%)[1]	No (%)[2]	Yes (%)[2]	P-value[3]
	114	46 (40.7%)	67 (59.3%)	
PMP-SE, median(IQR)	59 (55, 65)	60 (58, 68.7)	56.5 (52, 60)	<.001
MSPSS, median(IQR)	52 (44, 62)	60(49, 67)	50 (43, 57)	<.001
ICPP, median(IQR)	9 (7, 10)	9 (7,10)	9 (7,11)	.882
Age, median(IQR)	36 (32, 39)	37.5 (35, 42)	36 (28, 38)	.004
Years living in Canada, median (IQR)	5 (4,7)	6 (4, 8)	4 (2, 6)	.003
N. of children				.015
One	76 (66.7)	25 (32.9)	51 (67.1)	
More than one	38 (33.3)	21 (56.8)	16 (43.2)	
Education				.047
No high school	7 (6.3)	1 (14.3)	6 (85.7)	
High school	10 (9.0)	2 (20.0)	8 (80.0)	
Postsecondary diploma	13 (11.7)	3 (23.1)	10 (76.9)	
Bachelors	46 (41.4)	17 (37.8)	28 (62.2)	
Masters	29 (26.1)	18 (62.1)	11 (37.9)	
Doctorate	6 (5.4)	3 (50.0)	3 (50.0)	
Annual income, CAD				.012
Less than $30K	54 (48.6)	14 (25.9)	40 (74.1)	
$30K–$59.9K	34 (30.6)	18 (52.9)	16 (47.1)	
$60K-$90K	16 (14.4)	10 (62.5)	6 (37.5)	
$90K+	7 (6.3)	3 (50.0)	3 (50.0)	
Marital status				.449
Married	96 (85.7)	41 (43.2)	54 (56.8)	
Divorced	4 (3.6)	0.0 (0.0)	4 (100.0)	
Widowed	3 (2.7)	1 (33.3)	2 (66.7)	
Single	9 (8.0)	4 (44.4)	5 (55.6)	
Employment				.570
Contract	13 (12.0)	5 (38.5)	8 (61.5)	
Self-employed	21 (19.4)	9 (45.0)	11 (55.0)	
Maternity leave	30 (27.8)	14 (46.7)	16 (53.3)	
Student	10 (9.3)	4 (40.0)	6 (60.0)	
Stay at home mother	18 (16.7)	7 (38.9)	11 (61.1)	
Unable to work/Unemployed	16 (14.8)	3 (18.7)	13 (81.3)	
Residency status				.085
Canadian citizen	42 (36.8)	23 (56.1)	18 (43.9)	
Permanent Resident	20 (17.5)	9 (45.0)	11 (55.0)	
Student visa	20 (17.5)	6 (30.0)	14 (70.0)	
Refugee	19 (16.7)	5 (26.3)	14 (73.7)	
Other	13 (11.4)	3 (23.1)	10 (76.9)	

Note. [1] Column percentages, [2] Row percentages, [3] Chi-squared tests (or Fisher's exact test where expected cell values were less than 5) for categorical and Mann–Whitney U test for continuous variables. Statistics are either n (%) for categorical variables or median (25th percentile, 75th percentile) for continuous variables. PMP-SE= Parental Maternal Perceived Self-Efficacy; MSPSS= Multidimensional Scale of Perceived Social Support; ICPP= Iranian Cultural Postpartum Practices; CAD= Canadian dollars

Table 3.2: Bivariate Regression Analysis Predicting PPD

Predictor	Coefficients		
	β	95% Confidence Interval	p-value
PMP-SE	-.28	-.41, -.16	<.001
MSPSS	-.25	-.32, -.17	<.001
ICPP	-.04	-.32, .25	.799
Mother's age (years)	-.30	-.47, -.12	.001
Number of children (one)	3.02	.78, 5.26	.009
Years living in Canada	-.60	-.93, -.28	<.001

Note: PMP-SE= Parental Maternal Perceived Self-Efficacy; MSPSS= Multidimensional Scale of Perceived Social Support; ICPP= Iranian Cultural Postpartum Practices.

Table 3.3: Multiple Regression Analysis Predicting PPD

Predictor	Coefficients		
	β	95% Confidence Interval	p-value
PMP-SE	-.14	-.26, -.01	.031
MSPSS	-.19	-.27, -.10	<.001
ICPP	.14	-.12, .39	.281
Mother's age (years)	-.09	-.26, .08	.285
Number of children (one)	.55	-1.48, 2.58	.590
Years being in Canada	-.15	-.48, .17	.354

F (6, 100) = 8.75, $R^2_{adj} = 31\%$, $p<.001$.

Note: PMP-SE= Parental Maternal Perceived Self-Efficacy; MSPSS= Multidimensional Scale of Perceived Social Support; ICPP= Iranian Cultural Postpartum Practices.

Table 3.4: Moderated Multivariate Regression Analysis Predicting PPD

Predictor	Coefficients		
	β	95% Confidence Interval	p-value
PMP-SE	-.86	-1.35, -.36	.001
MSPSS	-1.02	-1.58, -.46	<.001
Interaction:			
MSPSS × PMP-SE	.01	.01, .02	.004
ICPP	.15	-.09, .40	.219
Mother's age (years)	-.09	-.26, .08	.282
Number of children (one)	.25	-1.71, 2.22	.799
Years living in Canada	-.16	-.47, .16	.328

F (7, 99) = 9.35, $R^2_{adj} = 36\%$, $p<.001$.

Note: PMP-SE= Parental Maternal Perceived Self-Efficacy; MSPSS= Multidimensional Scale of Perceived Social Support; ICPP= Iranian Cultural Postpartum Practices.

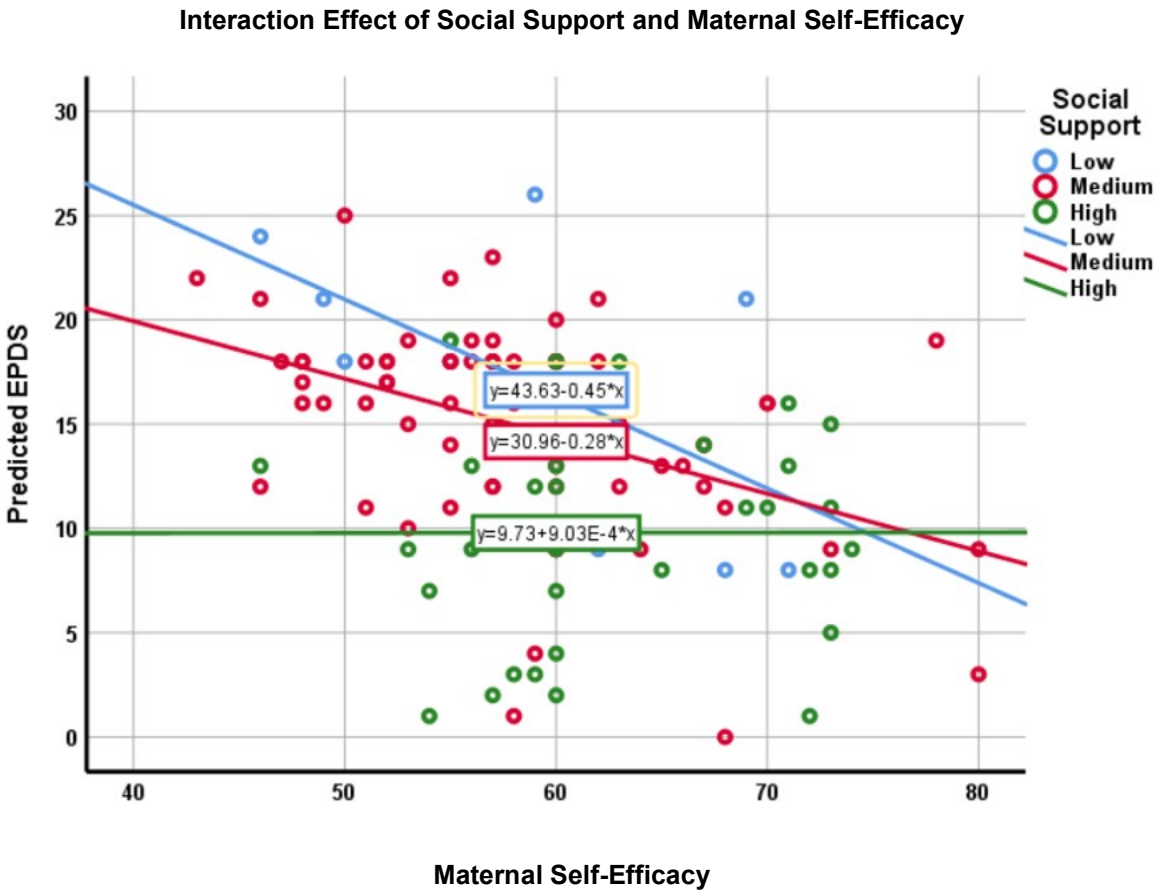

Figure 3.2: Moderating Effect of Social Support on the Relationship between Maternal Self-Efficacy and PPD

Table 3.5: Multivariate Logistic Regression Model for the Association between Psychosocial Factors and PPD

Predictor	Coefficients		
	OR	95% Confidence Interval	*p*-value
PMP-SE	.94	.88, .99	.043
MSPSS	.94	.90, .99	.012
ICPP	1.07	.95, 1.21	.266
Mother's age (years)	.94	.86, 1.02	.147
Number of children	1.34	.53, 3.42	.540
Years living in Canada	.98	.84, 1.14	.783

Note: PMP-SE= Parental Maternal Perceived Self-Efficacy; MSPSS= Multidimensional Scale of Perceived Social Support; ICPP= Iranian Cultural Postpartum Practices.

Table 3.6: Moderated Logistic regression analysis predicting PPD

Predictor	Coefficients		
	OR	95% Confidence Interval	*p*-value
PMP-SE	.59	.41, .87	.008
MSPSS	.56	.36, .86	.008
MSPSS × PMP-SE	1.01	1.002, 1.02	.015
ICPP	1.09	.96, 1.23	.199
Mother's age (years)	.93	.84, 1.01	.095
Number of children (one)	1.09	.41, 2.86	.864
Years living in Canada	.98	.84, 1.15	.844

Note: PMP-SE= Parental Maternal Perceived Self-Efficacy; MSPSS= Multidimensional Scale of Perceived Social Support; ICPP= Iranian Cultural Postpartum Practices.