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The Effects Of Postpartum Depression, Acculturative Stress, And Social Support On Mother-Infant Bonding Among U.s. Immigrant Women Of Arabic Descent

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THE EFFECTS OF POSTPARTUM DEPRESSION, ACCULTURATIVE STRESS, AND SOCIAL SUPPORT ON MOTHER-INFANT BONDING AMONG U.S. IMMIGRANT WOMEN OF ARABIC DESCENT

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DEDICATION

To the memories and the soul of my parents, dear mother, Kadijah Mathkor, and dear father Mansor Mathkor, who ingrained in me the passion and love for learning from an early age and believed in my ability to be successful in the academic arena. You were gone but your beliefs in me has made this journey possible.

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CHAPTER 1 INTRODUCTION

Background and Significance

The transition to motherhood is one of the major developmental processes in the human experience (Brockington et al., 2001). The development of mother-infant bonding is considered a critical process in the postpartum period (Brockington, 2004|). Becoming a mother has its challenges and may not be a positive experience for all women (Harwood, McLean, & Durkin, 2007). Childbirth and the postpartum period often require extraordinary physical, psychological and emotional efforts as a woman transitions into a motherhood role, reestablishes relationships, and works to meet the demands of her infant and other family members (Fahey & Shenassa, 2013). The first year after birth is considered a time of heightened vulnerability to health problems especially mood disorders including postpartum depression (PPD) (Gauthier, Guay, Senecal, & Pierce, 2010). According to Brockington (2004|), new mothers are vulnerable to a whole spectrum of general psychiatric problems and reported that 10% to 25% of the mothers who have difficulty bonding with their infants are referred to psychiatrists. Evidence suggests the stressors of the postpartum period can lead to anxiety, fatigue, and decreased self-care which are linked with an increased risk of PPD (Fahey & Shenassa, 2013).

PPD, a serious and distressing mood disorder, is one of the most common complications of childbirth (Bina, 2008; Miller, 2002). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM V) does not recognize PPD as a separate diagnosis and defines it as major depressive episode(s) affecting women within four weeks of birth (American Psychiatric Association [APA], 2013; (Centers of Disease Control and Prevention [CDC], 2009). According to O'Hara & McCabe (2013), PPD can occur up to a year after the birth of a baby. In the United States, approximately 10%-20% of women are diagnosed with PPD every year (Centers of Disease

Control and Prevention [CDC], 2009). Significant risk factors for PPD include a history of depression prior to or during pregnancy, anxiety during pregnancy, experiencing stressful life events, low levels of social support or partner support, low socioeconomic status, and obstetric complications (Milgrom et al., 2008; Robertson, Grace, Wallington, & Stewart, 2004). Women with PPD who receive inadequate treatment are at greater risk of suffering chronic and recurrent depression throughout life which can be profoundly disabling (Patel et al., 2012). Untreated maternal depression is associated with serious morbidity for the mother, the infant, and the family system.

It is well-known that PPD is a significant public health concern, with wide-range negative consequences for women and their infants. According to Tronick and Reck (2009), PPD may negatively impact mothers, newborns, and mother-infant interactions such as disengagement and intrusiveness. Infants of a mother suffering from PPD tend to develop attachment insecurity and impaired emotional/cognitive development (Tronick & Reck, 2009). Mothers with PPD are less able to interpret and respond appropriately to infant signals, show more negative and less positive affect towards their infants, and are more intrusive in their interactions with their infants (Boyd, Zayas, & McKee, 2006). Infants of mothers diagnosed with PPD may have challenging temperaments including difficulty with sleeping, eating, and being content. In addition, the babies may be seen as more demanding and difficult to comfort, increasing the risk for unmet maternal expectations (Eastwood, Jalaludin, Kemp, Phung, & Barnett, 2012). Moreover, an extensive literature review reported that children of depressed mothers are at increased risk of behavioral, cognitive, and social impairments (O'Hara & McCabe, 2013).

Mother-infant bonding, described as the emotional tie of a mother to her infant that is initiated at birth and develops gradually, is characterized by positive feelings, emotional warmth,

affection, and maternal behaviors such as cuddling or smiling at the infant (Reck, Zietlow, Müller, & Dubber, 2016; Taylor, Atkins, Kumar, Adams, & Glover, 2005). The relationship between the mother and the infant is vital and has long been recognized as essential to infant growth and development (Ainsworth, 1979). Mothers meet important physical and psychological needs that provide protection for their infants (Ainsworth, 1979). A mother's ability to form a relationship with her infant is enhanced or altered by many factors, the most common risk factor that is associated with impaired mother-infant bonding is PPD (Reck et al., 2006). Moehler. Brunner, Wiebel, Reck, and Resch (2006) found PPD to be strongly associated with lower quality of maternal bonding to the infant. Women experiencing PPD show less positive interaction and responsiveness to facial expression, while infants expressed more irritability and a higher risk of developmental delays than infants of non-depressed mothers (O'Higgins, Roberts, Glover, & Taylor, 2013; Li, Liu, & Odouli,2009).

Arab Immigrants in United States

The Census Bureau data (2014-2015) reports that 42.4 million immigrants (both legal and illegal) now live in the U.S. (Camarota & Zeigler, 2016). The Center for Immigrational Studies (2002) stated that Middle Easterners are one of the fastest growing immigrant groups in America (Camarota & Zeigler, 2016). From 2010 to 2014, the largest percentage of immigrants living in the U.S. were from Saudi Arabia, Bangladesh, Iraq, Egypt, Pakistan, India, and Ethiopia (Camarota & Zeigler, 2016).

The term of "U.S. immigrants of Arabic descent" is used in the literature interchangeably with "Arab Americans" (Wrobel, Farrag, & Hymes, 2009). The term of "Arab Americans" defined by the Arab American Institute (AAI) as those who immigrated or descended from one of the 22 Arabic speaking countries (AAI, 2018). Arab Americans are a diverse community of immigrants

and the descendants of immigrants, who have come from throughout the Arab State League that is located in the Middle East and North Africa (MENA) including Egypt, Syria, Lebanon, Jordan, Iraq, Palestine, Yemen, Bahrain, United Arab Emirates, Saudi Arabia, Kuwait, Oman, Qatar, the Comoros Islands, Djibouti, Somalia, Sudan, Tunisia, Algeria, Libya, Morocco, and Mauritania (AAI, 2018). Although they are from different countries and diverse communities, practice different religions, have a range of educational background and political affiliation, U.S. immigrants of Arabic descent share the same language, culture, and sense of history. The AAI (2018) reported the recent estimation of people living in U.S. from Arabic descent is 3.7 million and the majority of Arab Americans have ancestral ties to Lebanon, Syria, Palestine, Egypt and Iraq. Arab Americans are found in every state, but more than two thirds of them are concentrated in 10 states, one third of the total live in California, Michigan, and New York, (AAI, 2018). The state of Michigan has the second largest Arabic population in the U.S. with 223,075 individuals (AAI, 2018).

In the U.S, an immigrant is the foreign-born or alien individual with no U.S citizenship at birth. Immigration may be considered a voluntary or involuntary relocation (Wrobel et al., 2009). Voluntary immigrants refer to those individuals who leave their homeland by choice in search for educational or occupational opportunities, while involuntary immigrants refer to those who did not have the choice in the decision to leave their country of origin such as refugees and asylum seekers (Wrobel et al., 2009). 'Immigrant women' is a term used differently by various authors, however, in this study the term of "U.S. immigrant women of Arabic descent" will be used to refer to women of Arabic descent who immigrated to the U.S voluntarily or involuntarily.

Research on immigrant women suggests these populations have higher rates of PPD than non-immigrant women. A systematic review and meta-analysis reported that about 20% of

immigrant women around the world experience postpartum depressive symptoms in the first year following childbirth (Falah-Hassani, KShiri, Vigod, & Dennis, 2015). Moreover, the prevalence of these symptoms among immigrant women was between 1.5 and 2-fold higher compared to non-immigrant women (Falah-Hassani et al., 2015). In the U.S., the PPD prevalence among immigrant women was reported at 43%-60% in the immigrant Hispanic population (Heilemann, Frutos, Lee, & Kury, 2004; Lucero, Beckstrand, Callister, & Birkhead, 2012; Shellman, Beckstrand, Callister, Luthy, & 2013) and 28% among Asian Indian women (Goyal, Murphy, & Cohen, 2006). The only study to date on PPD and U.S. immigrant women of Arabic descent, found that 25.2% of women represented high risk for PPD (*n=115)* (Alhasanat-Khalil et al.,2019). Although immigrant women of different ethnic groups also suffer from PPD, information on Arabic women living in the U.S. is almost nonexistent. The reason for the paucity of studies on PPD in women of Arabic descent is likely due to lack of clarity on how they are classified in the US Census data. Arab American women are classified as 'White' (U.S. Census Bureau, 2010), which makes it difficult to distinguish findings about Arabs. The reported prevalence of PPD among Arabic women in the Middle East, however, has been studied, and ranges from 19% to 25% (Badr, 2018; Safadi, Abushaikha, & Ahmad, 2016).

Acculturative Stress

Acculturation is defined as the process of learning to adapt and adjust to the norms such as values, beliefs, behaviors when interacting with another cultural group (Berry, 1997). Acculturative stress, on the other hand, is a more specific concept than acculturation and refers to the stress reaction in response to life events as immigration, which leads negative emotional status such as anxiety and depression (Berry, 1997; Williams& Berry, 1991). Immigrant women of Arab descent may be more vulnerable to acculturative stress during the postpartum period. Much of the

literature has focused on acculturation of various ethnic groups without addressing acculturative stress specifically or confusing the terms (Amer & Hovey, 2007; Hovey, 2000).

Immigration is a very stressful experience that has tremendous influence on emotional health (Gagnon, & Tuck, 2004). Immigrant women face multiple challenges such as migration status, race and ethnicity, and language and cultural differences that may compromise their mental health (Fung, & Dennis, 2010). Many of these stressors are especially compounded in the vulnerable postpartum period, resulting in PPD for immigrant women (Fung, & Dennis, 2010)

Social Support

Social support is one of most important factors in predicting the health and well-being of individuals. According to Cohen and Wills (1985), social support plays a significant role in maintaining well-being and managing stress during stressful life events and major life transitions. While these stressful events may negatively affect physical and psychological health, social support has been found to have beneficial effects on mental and physical health (Rodriguez & Cohen,1998).

According to Beck (2002) social support consists of receiving two types of support, instrumental and emotional. Instrumental support includes babysitting and helping with household chores. Emotional support includes expressing empathy, love, trust, caring, listening and presence (Morelli, Lee, Arnn, & Zaki 2015). When the mother recognizes that she is not receiving the amount of support she expects from husband/partner, family, or friends, the lack of support occurs (Beck, 2002). Lack of social support is a well-documented predictor for PPD (Beck, 2001; Robertson et al., 2004). Strong social support leads to lower levels of PPD (Reid & Taylor, 2015) and higher quality of mother-infant interactions (Trivette, Dunst, & Hamby, 2010).

Significance Statement

The transition from “woman” to “mother” is a significant life event and can be extremely stressful when merged with the transition from ‘local’ to ‘immigrant’ (Barclay and Kent 1998). Immigrant women have higher rates of PPD compared with women in their native countries (Danaci, Dinc, Deveci, Sen & Icelli, 2002; Dankner, Goldberg, Fisch & Crum, 2000). Among the general population, PPD is strongly associated with lower quality mother-infant bonding. Social support can play a central role in lowering the levels of PPD, and may contribute to higher quality of mother-infant bonding. Moreover, limited data suggests that acculturative stress is found to be related to an increased PPD among immigrant women. However, limited research exists examining the predictors of mother-infant bonding among U.S. immigrant women of Arabic descent. Additionally, no published research has examined the relationships of PPD, acculturative stress, social support and mother-infant bonding among U.S. immigrant women of Arabic descent.

Purpose Statement

Given the lack of research in this area, the purpose of this study is to examine the relationships between PPD, acculturative stress, social support, and mother-infant bonding among U.S. immigrant women of Arabic descent. The specific aims are as follows:

Aim 1: Examine the relationships of PPD, social support, and acculturative stress on mother-infant bonding among U.S. immigrant women of Arabic descent.

Hypothesis 1.a. There is a negative relationship among PPD and mother-infant bonding.

Hypothesis 1.b. Increased levels of social support will increase mother-infant bonding.

Hypothesis 1.c. Higher levels of acculturative stress are related to poor mother-infant bonding

Aim 2: Examine if acculturative stress mediates the associations between PPD and mother-infant bonding among U.S. immigrant women of Arabic descent.

Hypothesis 2: Acculturative stress mediates the associations between PPD and mother-infant bonding.

Aim 3: Examine if social support moderates the associations between PPD and mother- infant bonding among U.S. immigrant women of Arabic descent.

Hypothesis 3: Social support moderates the associations between PPD and mother-infant bonding.

Knowledge gained from this study is expected to increase understanding of the relationships among these variables and to potentially reduce the incidence of PPD and improve the quality of the relationship between a mother and her infant among U.S. immigrant women of Arabic descent. Interventions developed as a result of this study may contribute to increased well-being of the mother, infant, and family system among this population.

CHAPTER 2 THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Theoretical Framework

The Roy Adaptation Model (RAM) is the theoretical framework that used to guide this study (Roy, 2009). RAM was developed in the 1960s by Sr. Calista Roy as a framework for nursing practice, research, and education. The model was developed based on the assumptions of adaptation and the scientific foundation of this model came from the work of Helson and Von Bertalanffy (Fawcett & DeSanto-Madeya, 2013; Roy, 2009). The model allows researchers to understand and explain people's adaptation within their life situation and to develop and test interventions and other strategies to enhance positive life pattern (Fawcett & DeSanto-Madeya, 2013). RAM has been used to guide interdisciplinary education, knowledge development, practice, and research, for over the past 50 years (Roy, 2011). Moreover, RAM's concepts provide various approaches for researchers to advance consolidated knowledge of the health of people as individuals and groups (Fawcett & DeSanto-Madeya, 2013).

Adaptation occurs when people respond positively to environmental changes, and it is the process and outcome of individuals and groups who use conscious awareness, self-reflection, and choice to create human and environmental integration (Roy, 2009). According to Roy (2009), adaptation refers to "the process and outcome whereby thinking and feeling people, as individuals or in groups, use conscious awareness and choice to create human and environmental integration" (p. 26). RAM is focused on the changes that occur in the human adaptive system and the environment. The central task of the human system when faced environmental stimuli is maintaining the integrity of the system. The goal of nursing is to promote adaptation, which will contribute the health, quality of life, and coping (Fawcett & DeSanto-Madeya, 2013). Adaptation is realized when a human adaptive system responds to stimuli through the coping process.

According to RAM, coping process as it applies to individuals is categorized in two subsystems which are the cognator and regulator. The cognator subsystem is a major coping process involving four cognitive-emotive channels: perceptual and information processing, learning, judgment, and emotion. The regulator subsystem is a basic type of adaptive process that responds automatically through neural, chemical, and endocrine coping channels (Fawcett & DeSanto-Madeya, 2013; Roy, 2009). In response to these coping process subsystems or mechanisms, adaptive behaviors can be observed in four adaptation modes include physiological mode, self-concept mode, role function mode, and interdependence mode (Fawcett & DeSanto-Madeya, 2013). The physiological mode is associated with physical maintenance of the basic needs and of the integrity of the adaptive system such as oxygenation, nutrition, elimination, activity and rest, protection, senses, fluid, electrolyte, and acid-base balance, neurological function, and endocrine function. The self-concept mode is addressing the composite of beliefs and feelings that individual hold about oneself including physical self and personal self, such as body image, body sensation, self-consistency, self-ideal and the moral-ethical-spiritual self. This mode is associated with the adoption of behaviors that may or may not be healthy such as anxiety or depression (Ospina Romero, Muñoz de Rodríguez, & Ruiz de Cárdenas, 2012). The role-function mode basic need is social integrity, which focus on the roles that an individual has in society (Fawcett & DeSanto-Madeya, 2013). The interdependence mode focuses on the establishing and maintaining interactions with others such as social support as giving and receiving of love, respect, and value and feeling secure. Within this mode, there are two specific relationships for the individual including significant others and social system. These four adaptive modes are categorized as adaptive responses or ineffective responses. Adaptive responses refer to those behaviors that

promote the integrity of the human system and appropriately meet the goal of adaptation whereas ineffective responses are unable to meet this goal (Fawcett & DeSanto-Madeya, 2013).

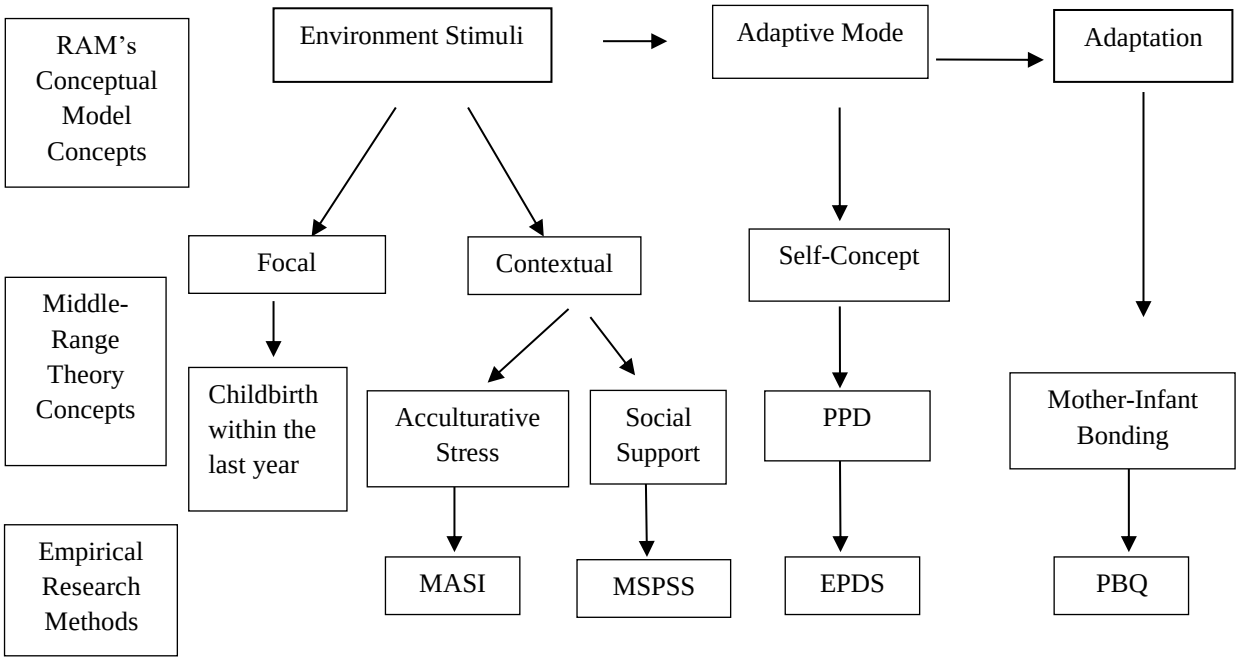
The key concepts of RAM consist of four components: human being, environment, health and nursing (Roy, 2009). RAM identified human beings and groups as a holistic, adaptive system that continuously interacts with the environment. The environment is represented by RAM as internal and external stimuli that include all conditions, circumstances, and influences that surround and affect the development and behavior of the human adaptive systems. The changing environment stimulates the human being to make positive or negative adaptive responses. Any environmental change, positive or negative, demands increased energy to adapt to the situation. Environmental stimuli have three dimensions: focal, contextual, and residual (Fawcett & DeSanto-Madeya, 2013; Roy, 2009). Focal stimuli are the stimuli that individuals immediate confront and to which they are most concerned. Contextual stimuli are all other factors that can affect focal stimuli which will influence how the human system response to the focal stimulus. Residual stimuli are all other environmental factors with effect on the focal stimuli (current situation) that are not clear (Fawcett & DeSanto-Madeya, 2013; Roy, 2009). Such stimuli are not easy to identify, and it may not be recognized by the observer or even by the human adaptive system. These three types of stimuli can place stress on the coping capacities and provoke the coping mechanisms that is the control process of the human adaptive system as mentioned above.

Moreover, according to Roy, a person's health described as a reflection of the interaction with the environment or adaptation. RAM states that health is a unidimensional concept that is described as a state and process of being and becoming integrated and whole human being that reflects this interaction (Fawcett & DeSanto-Madeya, 2013). On the other hand, Roy represents nursing as science and art that focus on the individual as a total being who responds to

environmental stimuli. RAM defines nursing as a health care profession that focuses on human life processes and pattern to promote health. In RAM, the goal of nursing is the promotion of adaptation for human beings in each of four adaptive modes in health and illness and to enhance the person's interaction with environment, contributing to health, and quality of life (Fawcett & DeSanto-Madeya, 2013).

Application of the RAM to the Study

Figure 1 *Pictorial Representation of the Substruct*



MASI= The Multidimensional Acculturative Stress Inventory, MSPSS: The Multidimensional Scale of Perceived Social Support, EPDS= Edinburgh Postnatal Depression Scale, PBQ= Postpartum Bonding Questionnaire.

As can be seen in Figure 1, the model concepts of RAM utilized in this study include the focal and contextual environmental stimuli, self-concept as an adaptive mode, and adaptation. In the present study, the main concepts were acculturative stress, social support, PPD, and mother-infant bonding. The focal stimulus is childbirth and the contextual stimuli is acculturative stress

and social support and will be measured using the Multidimensional Acculturative Stress Inventory (MASI) and the Multidimensional Scale of Perceived Social support (MSPSS), respectively. PPD is considered a self-concept adaptive mode that will be measured using Edinburgh Postnatal Depression Scale (EPSD). Finally, adaptation which is mother-infant bonding will be measured using the Postpartum Bonding Questionnaire (PBQ).

Figure 2 *Concepts Map Represents the Direction of the Relationships.*

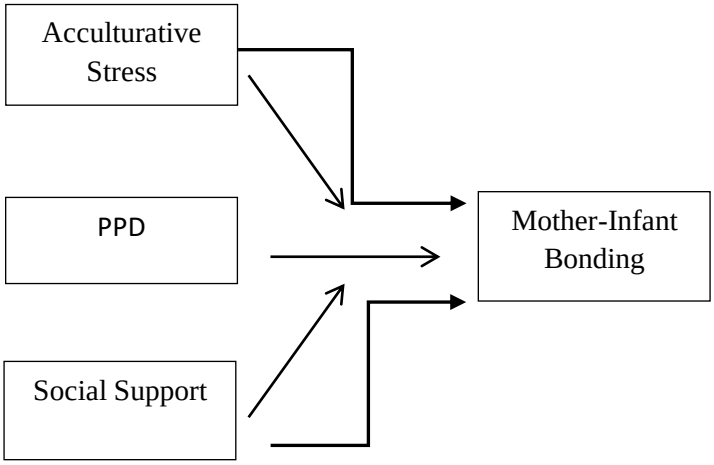


Figure 2 represents the main concepts in this study and the proposed relationships among these concepts. According to the literature, acculturative stress has been found to be associated with PPD and may increase the PPD symptoms among immigrant women (Alhasanat-Khalil et al.,2019; D'Anna- Hernandez, Aleman, & Flores, 2015; Zeiders, Umana-Taylor, Updegraff, & Jahromi, 2014). Moreover, acculturative stress may play a role as a mediating factor on the association between PPD and mother-infant bonding. In the literature review, research supports the central role that social support can play in lowering the levels of PPD and may contribute to higher quality of mother-infant bonding, moreover, social support may moderate the relationship among PPD and mother-infant bonding. Finally, mother-infant bonding is the outcome of the relationships of acculturative stress, social support, and PPD.

Review of the Literature

The postpartum period and transition to motherhood signify essential changes including hormonal, physical, and life-style changes and is considered a stressful time for many women (Mares, Newman, & Warren, 2011). Childbirth is a complex life event with rapid biological, social and emotional transitions, which can provoke significant effects on women's physical and mental health (Brockington, 2004). This period is a time of vulnerability for both the mother and her infant. Mother-infant bonding is a critical process that initially starts in early infancy throughout the postpartum year, and may continue throughout childhood (Kinsey & Hupcey, 2013). The bonding process is affected by many factors and has its consequences for both mother and infant. Therefore, this section provides a literature review regarding the impact of PPD, acculturative stress, social support on the mother-infant bonding among immigrant women of Arabic descent.

Postpartum Depression

Beck (2002) described PPD "as a dangerous thief that robs mothers of the love and happiness they expected to feel toward their newborn babies'' (p. 453). PPD is a significant worldwide public health problem with significant effects on the mother, infant, and family (Almond, 2009). PPD can occur 1-12 months postpartum and is considered the most common complication of childbirth (Miller, 2002; O'Hara & McCabe, 2013). The World Health Organization [WHO] reports that 13% of postpartum women worldwide have experienced depression, and 19.8% in developing countries. In the U.S., approximately 10%-20% of women experience PPD every year (Centers of Disease Control and Prevention [CDC], 2009). At an urban maternity hospital in U.S., Wisner et al., (2013) screened 10,000 postpartum women and reported that nearly 14% of new mothers may screen positive for PPD. African-American and Hispanic women more commonly reported postpartum depressive symptoms 43.9% and 46.8%,

respectively than white women (31.3%, $P < .001$) (Howell, Mora, Horowitz, & Leventhal, 2005; Huang, Wong, Ronzio, & Stella, 2007). In the Middle East among Arabic women, Badr (2018) and Safadi et al. (2016) reported that the prevalence of PPD ranged from 19% to 25%.

Various risk factors for PPD have been identified in the literature. According to Beck's meta-analyses conducted in the US among general population, thirteen significant risk factors for developing PPD were identified including prenatal depression, child care stress, life stress, lack of social support, prenatal anxiety, marital satisfaction, history of previous depression, infant temperament, maternity blues, low self-esteem, low socioeconomic status, marital status, and unwanted/unplanned pregnancy (Beck, 2002). Moreover, as a part of longitudinal study in Canada, Dennis, Janssen, and Singer (2004) confirmed Beck's identified risk factors and reported an additional risk factor for PPD, immigration within the last 5 years.

PPD Symptoms and Consequences

According to the National Institute of Mental Health (NIMH, 2018), mothers with postpartum depression experience feelings of extreme sadness, anxiety, restlessness, helplessness, guilt and exhaustion that may make it difficult for them to complete daily care activities for themselves or for others. PPD is associated with increased levels of negative emotionality, which affects the bonding of mother and her infant (O'Hara & McCabe, 2013). PPD dysregulates maternal cognitive and affective function and in turn interferes with the mother's ability to recognize and interpret her infant's cues accurately and sensitively (Field, 2010; Horowitz, Murphy, Gregory, & Wojcik, 2011). O'Higgins, Roberts, Glover & Taylor (2013) reports that women suffering from PPD are at risk for failing to attach themselves to their infants and show less positive interaction with their infants. Furthermore, infants of depressed mothers are at greater

risk for less interaction and responsiveness to facial expression, more irritability and higher risk of growth restriction than infants of non-depressed mothers (Li, Liu, & Odouli, 2009; Marcus, 2008).

Researchers have attributed the long-term effects of PPD including behavior problems, cognitive delays, and physical health problems in children (O'Hara & McCabe, 2013). PPD has been associated with poorer language and IQ development in children from early childhood to adolescence (Avan, Richter, Ramchandani, Norris & Stein, 2010; O'Hara & McCabe, 2013). Children of mothers who have experienced PPD had negative effects on child growth as well as significantly higher rates of gastrointestinal infections and lower respiratory tract infections (O'Hara & McCabe, 2013). Moreover, mothers with PPD are less likely to engage in positive caretaking behaviors such as sustained breastfeeding, attending regular well-child visits. As research demonstrates, PPD is a devastating condition that can lead to serious morbidity for the mother, the infant, and the family system.

Immigrant Women of Arabic Descent and PPD

Immigration is an enormously stressful experience that may have a significant impact on the emotional health of immigrants (Collins, Zimmerman, & Howard 2011). Regardless of the reason for immigration, immigrant women may face multiple challenges such as migration status, race and ethnicity, language and cultural differences that may compromise their mental health (Fung & Dennis, 2010). Immigrant women may have difficulties in coping with leaving family and friends, adapting to a new culture and value systems, and feeling insecure of an uncertain future (Collins et al., 2011). Language difficulties and discrimination may result in social marginalization (Collins et al., 2011). Many of these stressors are especially compounded in the vulnerable postpartum period, resulting in increased risk of PPD for immigrant women (Fung, & Dennis, 2010).

Research on immigrant women suggests that this population at high risk of PPD compared with women in their countries of origin (Danaci et al., 2002; Dankner et al., 2000; Glasser et al., 1998). The increased incidence of PPD symptoms in immigrants' women has been reported in Canada, Australia, Taiwan, and U.S. Among Canadians studies of immigrant women, immigrant women are two to three times at risk for PPD than their Canadian-born counterparts (Kirmayer et al., 2011) and the prevalence of PPD ranged from 11.2% to 37% (Alhasanat & Fry-McComish, 2015). Canadian immigrant women (35.1 %) scored higher for PPD than Canadian-born women (8.1 %) and had lower social support than Canadian-born women (Stewart, Gagnon, Saucier, Wahoush, & Dougherty, 2008). In Australia, the prevalence of PPD among immigrant women ranged from 7.7%-35% (Falah-Hassani et al., 2015; Small, Lumley, & Yelland, 2003), and in Taiwan 24%-41% (Chen, Tai, Wu, Chiang, & Chien, 2012; Chen, Hwang, Tai, & Chien, 2013). Among U.S. immigrant Hispanic women and U.S. immigrant Asian Indian women the prevalence of PPD ranged from 54%-60% and 28%, respectively (Goyal et al., 2006; Heilemann et al., 2004; Shellman et al., 2014).The only study to date on PPD and U.S. immigrant women of Arabic descent, found that 25.2% of women were at increased risk for PPD (*n=115)* (Alhasanat-Khalil et al., 2019) These international studies demonstrate that immigration is a significant factor in the development of PPD worldwide.

Alhasanat and Fry-McComish (2015) found that lack of social support is a main risk factor for PPD among immigrant women and Arab women in their country of origin. Alhasanat and Fry-McComish (2015) also reported similarities of PPD risk factors to those classified by Beck including lack of social support, stress life events, marital satisfaction, and low family income and socioeconomic status. Moreover, Alhasanat and Fry-McComish (2015) identified additional risk factors in the literature among immigrant and Arab women that may contribute to PPD including

immigration stress, intimate partner violence, and limited access to health care services. O'Mahony and Donnelly (2007) identified difficulty adapting to the host culture as an additional risk factor for PPD in this population.

Acculturative Stress

Acculturation refers to the process of behavioral and psychological changes that occurs when an individual attempt to adjust and adapt to a new culture (Sam & Berry,1995). Acculturative stress refers to a specific type of stress and emotional reactions provoked by specific life events and circumstances such as immigration (Sam & Berry,1995). The challenges associated with acculturated stress may lead to lower emotional and mental health status particularly anxiety and depression, feeling insecure, and identity confusion (Sam & Berry,1995). Acculturative stress is defined in the literature as the level of psychosocial strain experienced by immigrants in response to the stressors associated with immigration and may occur throughout their adaptative process to a new life in a new country (Arbona, et al., 2010; Hovey, 2000).

Regarding the relationship of acculturation level and PPD, there is no general consensus among researchers (Alhasanat & Giurgescu, 2017; Hovey, 2000). Sumner, Wong, Schetter, Myers, and Rodriguez (2012) described an association between higher level of acculturation and higher level of postpartum depressive symptoms, while Valentine, Rodriguez, Lapeyrouse, and Zhang (2011) did not find this association. Moreover, some researchers may have confused the concept of acculturation with that of acculturative stress (Hovey, 2000). In the literature, most of the studies have examined the relationships of acculturation and PPD and mainly these studies were among Hispanic immigrant women in the U.S. (D'Anna-Hernandez et sl., 2015; Preciado & D'Anna-Hernandez, 2016). One research study examined the association between acculturation, PPD, and mother-infant bonding among 38 Eritrean asylum seekers in Israel, who were up to 6

months postpartum (Nakash, Nagar, & Lurie, 2016). Their findings showed a high PPD rate among this vulnerable population and suggests that acculturation may play a significant role in the development of mother-infant bonding.

However, in spite of increasing number of immigrants of Arabic descent in the U.S., there are only five studies that revealed the influence of acculturative stress on PPD. Moreover, the association between acculturative stress, PPD, and mother-infant bonding, and the influence of acculturative stress on the relationship of PPD and mother-infant bonding among women of this minority group has not been explored. Results of these studies showed that during the pregnancy and postpartum periods, acculturative stress was positively related to depressive symptoms among Mexican-American women (D'Anna- Hernandez et al., 2015; Zeiders et al., 2014). Alhasanat-Khalil et al. (2019), examined the relationships between acculturative stress, acculturation and PPD symptoms among 115 U.S. immigrant women of Arabic descent. Alhasanat-Khalil et al. (2019) found that higher levels of acculturative stress were related to higher levels of PPD symptoms. Furthermore, acculturative stress predicted PPD symptoms among U.S. immigrant women of Arabic descent, whereas acculturation was not a significant predictor for PPD symptoms. However, the literature regarding the relationship between acculturative stress, PPD, and mother-infant bonding among U.S. immigrant women of Arabic descent is essentially lacking. No published studies were identified that examined the relationships among acculturative stress and mother-infant bonding. In addition, there are no research studies have reported the relationships among acculturative stress, PPD, and mother-infant bonding among U.S. immigrant women of Arabic descent.

Social Support

Social support is an essential factor in predicting the health and well-being of individuals managing stressful life events (Clark, 2005; Cohen & Wills, 1985). In the past several decades, researchers have shown great interest in the phenomenon of social support, and how it relates to health. After reviewing the importance of social relationships for health, Cassell (1976) and Cobb (1976) viewed social support/social relationships as a potential buffer of the life stressors on the individual and emphasized the significance of social support processes (e.g., that one is cared for and loved) in coping and adaptation (Cassell, 1976; Cobb, 1976). Studies indicate that people with spouses, friends, and family member who provide psychological and tangible resources are in better health than those with low social support contacts (Cohen & Wills, 1985). The role of social support as a determinant of health is studied in different diseases and conditions. House, Landis, and Umberson (1988) stated that those with low level of social support have higher morbidity and mortality rate. When social support occurs, it can reduce the probability of illness, help in speed recovery, and reduce the risk of mortality from serious disease (House et al., 1988). In addition, social support has been associated with mental health outcomes and effectively reduces psychological distress such as depression and anxiety during the time of stress (Cohen & Wills, 1985; House et al., 1988). Conversely, during stressful times, the lack of social support may contribute to psychological distress, especially for people with high needs for social support who are unable to obtain it (Sorkin, Rook, & Lu, 2002).

Social support is considered as a key factor that facilitates the transition to motherhood and is demonstrated to be significantly associated with maternal role development (Leahy-Warren, McCarthy, & Corcoran, 2011). When the mother recognizes that she is not receiving the amount of support she expected from husband/partner, family, or friend, the lack of support occurs (Beck,

2002). There are two ways (models) explaining how social support may affect physical and psychological health (Cohen & Wills 1985; Rodriguez & Cohen, 1998). First, is the stress buffering model; social support moderates and protects or buffers the harmful effects of stress on mental health and well-being and this occurs when individuals are exposed to stress (Rodriguez & Cohen,1998). Second, the main or direct effect model, proposes that social support enhances wellbeing and has a positive direct effect on mental and physical health irrespective of individual's stress level (Rodriguez & Cohen,1998).

Lack of social support has been well documented as a predictor for PPD (Beck, 2001; Dennis, Heaman, & Vigod, 2012; Ganann, Sword, Thabane, Newbold, & Black, 2015; Lee & Hung, 2015; Robertson et al., 2004; Valentine, Rodriguez, Lapeyrouse, & Zhang, 2011; Verreault et al., 2014; Youn & Jeong, 2013). Xie, He, Koszycki, Walker, and Wen (2009), studied the level of social support during both the prenatal and postnatal periods and found that postnatal social support is a more potent predictor of risk for PPD than prenatal support. Research among racial and ethnic minorities indicates social support is a protective factor of maternal stress (Dennis et al., 2009; Dennis et al., 2004). Studies have examined various types of support and have shown that partner support and emotional support of the partner had a major influence on lowering maternal stress during the postpartum year (Dennis & Ross, 2006; Meadows, 2011; Sampson, Villarreal, & Padilla, 2015). Among African American and Latino mothers, there was a strong correlation between less perceived social support and higher levels of depression (Huang, Costeines, Kaufman, and Ayala, 2014). During the postpartum period, women experience several psychological stressors (Cheng & Pickler, 2009; Gjerdingen, Froberg, & Fontaine, 1991) and social support has been found to have a substantial impact in coping with these stressors, in addition to decreasing the incidence of PPD (Negron, Martin, Almog, Balbierz, & Howell, 2013).

Immigration stress related to separation from family members during the vulnerable postpartum period may result in PPD for immigrant women (Erickson & Al-Timimi, 2001; Fung & Dennis, 2010). In the Arabic culture, a rest after childbirth for 40 days is a typical family support and protective practice (Nahas & Amasheh, 1999). Traditionally, in these 40 days, family members stay with the mother taking care of her, of the new baby, the house, and other children. The new mother is expected to rest and take care of her newborn (Nahas & Amasheh, 1999). Arabic women face many challenges that make them vulnerable for PPD including the social isolation and loneliness they may experience when they immigrate with their husbands (Nahas & Amasheh, 1999). In the postpartum period, immigrant women without family support, may feel deprived of their traditional practice of 40 days of recovery and may experience a higher risk of depressive symptoms (Nahas & Amasheh, 1999). Alhasanat and Fry-McComish (2015), reported that lack of social support was found as a reliable essential risk factor for PPD among immigrant women and Arabic women in the Middle East. A recent study conducted among U.S. immigrant women of Arabic descent reported that social support predicted PPD symptoms (Alhasanat-Khalil et al., 2019).

The beneficial effects of social support on mother-infant bonding have been reported in many studies. Falceto, Giugliani, and Fernandes (2012) reported that the strong mother's social system and network was an important factor to achieve optimal mother-infant bonding. Figueiredo, Costa, Pacheco, and Pais (2009) found that mothers with more stable and supportive relationships with the partner were closer with their infants with more positive interaction. Moreover, a meta-analysis showed that the mother's parenting behavior is positively correlated with the emotional and marital support she receives (Andresen & Telleen, 1992). Therefore, social support is considered as a critical factor in promoting and protecting optimal mother-infant

bonding. These findings support that postpartum immigrant women are at higher risk for PPD, and that social support is associated with PPD and mother-infant bonding. Limited research exists on the relationship of social support and maternal infant bonding among U.S. immigrant women of Arab descent.

Mother-Infant Bonding

Bonding is a complex phenomenon that occurs between the mother and her infant during a specific period. The term "bonding" has been used as a synonym for attachment, risks confusion with infant-mother bonding, which is a totally different phenomenon (Altaweli & Roberts, 2010; Kinsey & Hupcey, 2013). The theory of mother-infant bonding was first described by Klaus and Kennell as a sensitive period that refer to the first hours and days after birth (Altaweli & Roberts, 2010). Klaus and Kennell (1976) stated that an immediate close contact between mother and her new baby will provoke a positive bond and lead to achieve the optimal infant's developmental outcomes. Madrid, Skolek, and Shapiro (2006) defined mother-bonding as "an intense emotional tie between mother and infant during pregnancy and continuous after birth" (p. 271). Taylor, Atkins, Kumar, Adams, and Glover (2005) used the term "bonding" to describe how the mother feels towards her infant. According to Taylor et at. (2005), mother-infant bonding refers to the unique emotional tie characterized by positive feelings, emotional warmth, and affection towards the child; it differs from attachment, which includes the infant's behavior towards the mother (Taylor et al. 2005).

Mother-infant bonding is a critical factor in the process of the infant's development. When bonding is successfully achieved, the strong healthy relationship between mother and her infant will develop, which promotes the infant's growth and development as well as helps to form a positive self-concept for the child later in life (Brockington, 2004; Kinsey & Hupcey, 2013).

Several studies identified that maternal bonding starts to develop during pregnancy and suggest that maternal bonding in pregnancy predicts maternal bonding in the postpartum period (Rossen et al., 2016; Van Bussel, Spitz, & Demyttenaere, 2010). In mothers who show a delay in the development of maternal bonding, serious negative effects on infants such as neglect or impulses to harm the infant can result (Brockington, 2004; Kinsey & Hupcey, 2013). A mother's ability to form a relationship with her infant is enhanced or altered by many factors, the most common risk factor that associated with impaired mother-infant bonding is PPD (Reck et al., 2006), whereas, social support and early contact have been described as factors to enhance the bonding between mothers and their infants (Altaweli & Roberts, 2010; Johnson, 2013). Although the establishment of a strong mother-infant bond can lead to more positive parenting behaviors and enhanced infant's cognitive and neurobehavioral development, the failure to establish this relationship can lead to serious long-term effects affecting the child's development (Brockington et al., 2001).

Risk Factors for Impaired Mother-Infant Bonding

While some mothers develop a healthy relationship with their infants successfully, some may have difficulty with the process. During the early interaction between mother and her infant, there are factors can negatively alter the process and their relationship. The risk factors most frequently linked with disturbed bonding include factors of the mother, the baby, the pregnancy, the postpartum and the social environment (Edwards, Phillips, Esterman, Buisman-Pijlman, & Gordon, 2017).

An examination of the literature of mother-infant bonding in U.S., revealed ten studies that described risk and protective factors and the consequences of mother-infant bonding. Most of the studies focused on, the risk factors related to PPD (Seng et al., 2013), posttraumatic stress disorder (Muzik et al., 2013; Seng et al., 2013), child birth experience (Soet, Brack, & DiIorio, 2003), infant

sleep difficulties and maternal mood (Hairston et al., 2011), history of miscarriage (Kinsey, Baptiste-Roberts, Zhu, & Kjerulff, 2014), and maternal history of childhood abuse and neglect (Muzik et al., 2013; Seng et al., 2013). The sample in these studies included white 57.4%-85%, African American 7.2%-30%, Hispanic 2%-5.5%, other women 0%-3.8. Despite the majority of the sample described as white, the sample remained diverse (Hairston et al., 2011; Kim et al., 2011; Kinsey et al., 2014; Muzik et al., 2013; Seng et al., 2013). The risk factors of mother-infant bonding that were identified by this literature review are grouped into two categories, (1) psychological and mental illnesses, and (2) maternal and infant factors.

Psychological and Mental Illnesses

Maternal mental health is of vital importance and plays a critical role on mother-infant bonding. Mothers with a history of psychological problems compared to those without showed more difficulties in bonding to their infant (Figueiredo et al., 2009; Seng et al., 2013). There are three major mental health issues that have been found in the literature as risk factors for impaired mother-infant bonding including depression, anxiety, and post-traumatic stress disorder (PTSD). Depression is correlated with poor bonding during pregnancy and the postpartum period (Rossen et al., 2016). Depressed mothers are frequently defined as being passive, withdrawn, unresponsive, or intrusive (Field, 2010). According to O'Higgins et al. (2013), women experiencing depression postpartum are at risk for failing to attach themselves to their infants and show less positive interaction with their infants. Mothers with PPD are more likely to have negative emotions and less likely to respond to their infants' needs (O'Hara & McCabe, 2013). Studies have reported that antenatal depression (Müller, Teismann, Havemann, Michalak, & Seehagen, 2013; Kokubu, Okano, & Sugiyama, 2012; Rossen et al., 2016), and increased paternal depressive symptoms are associated with disturbed mother-infant bonding (Kerstis et al., 2016; Falceto et al., 2012).

Anxiety has shown to have adverse impact on the relationship between mother and her infant (Edhborg, Nasreen, & Kabir, 2011). Several studies reported that increased postpartum anxiety (Dubber, Reck, Müller, & Gawlik, 2015; Edhborg et al., 2011; Gunning, Waugh, Robertson, & Holmes 2011; Figueiredo & Costa, 2009) and increased anxiety symptoms during antenatal period (Dubber et al., 2015; Kokubu et al., 2012) negatively affects mother-infant bonding.

PTSD has been described as another risk factor for impaired mother-infant bonding. Muzik et al. (2013) and Seng et al. (2013) reported that mothers who were diagnosed with PTSD were more likely to have inadequate mother-infant bonding. In addition to mental health issues, one study mentioned other high-risk mothers, and indicated that the mothers who have experienced physical, emotional, or sexual abuse or physical or emotional neglect have lower bonding in the postpartum period (Muzik et al., 2013). This study will focus on the relationship between PPD and maternal-infant bonding.

Maternal and Infant Factors

The educational level of the mother related to bonding was explored in three studies. One study reported that a lower level of education was negatively associated with mother-infant bonding (Figueiredo et al., 2009), whereas the other two studies found higher level of education were negatively associated with mother-infant bonding (Dubber et al., 2015; Kinsey et al., 2014). The study by Figueiredo et al. (2009) also showed that unemployed mothers presented lower mother-infant bonding than employed mothers (Figueiredo et al., 2009). Moreover, the mothers with poor social network, lack of support, and unmarried significantly reported disturbed bonding with their infant (Falceto et al., 2012; Figueiredo et al., 2009; Kinsey et al., 2014).

One study reported that women's negative attitude towards unwanted or unplanned pregnancy was correlated with bonding failure (Kokubu et al., 2012). Other studies have been found that a mother's lack of emotional intelligence postnatally, negative perception of difficult infant temperament, and unproductive ruminative thinking were all linked with increased incidence of bonding problems (Gunning et al., 2011; Hairston, Solnik-Menilo, Deviri Handelzalts 2016; Müller et al., 2013). In addition, the history of miscarriage, difficulty in labor involving severe pain and mode of delivery (vaginal versus caesarean section) were investigated as potential risk factors for impaired mother-infant bonding (Johnson, 2013; Kinsey et al., 2014). Johnson (2013) found that mothers with these factors had less interaction and engagement with their infant in the postpartum period, while Kinsey et al., (2014) reports that these factors had no effect on mother-infant bonding.

A study found that during and after childbirth, complications may contribute to the disruption of mother-infant bonding. Mothers of infants with neonatal problems such as prematurity and physical pathology demonstrated decreased mother-infant bonding compared to mothers of healthy infant (Bienfait et al., 2011; Figueiredo et al., 2009; Kinsey et al., 2014). Another risk factor is sex of the child, which showed a direct relationship with mother-infant bonding. Studies reported that women who had giving birth to a girl showed decrease mother-infant bonding compared to a boy (Edhborg et al., 2011; Figueiredo et al., 2009). Moreover, infant sleep difficulties, bed-sharing with the infant, and lack of pacifier use were negatively associated with mother-infant bonding (Hairston et al., 2016; Kim et al., 2011; Mitchell, Hutchison, Thompson, & Wouldes, 2015)

Mother-Infant Bonding Protective Factors

Few studies provided results of protective factors for increased optimal mother-infant bonding. As previously mentioned, the emotional mother-infant relationship is formed prenatally. Research has shown prenatal bonding is associated with postnatal bonding and high levels of bonding towards the unborn baby will promote high levels of mother-infant bonding (Rossen et al., 2016; Van Bussel et al., 2010).

Another factor is breastfeeding, which facilitates greater maternal response and emotional bonding. Research has shown that the closeness between breastfeeding mothers and their infants were greatly increased when compared to bottle-feeding mothers (Altaweli & Roberts, 2010; Kim et al., 2011).Breastfeeding can enhance the mother infant relationship by demonstrating positive maternal behaviors, such as touching, gazing, cuddling, smiling, and skin-to-skin interaction that has been shown to benefit the infants by encouraging positive infant responses and behaviors (Altaweli & Roberts, 2010; Kim et al., 2011). Furthermore, maternal emotional components such as positive early attitude of the mother, maternal education, and mother's realistic expectations of the parenting role may help to encourage optimal bonding (Dubber et al., 2015; Edhborg et al., 2011; Figueiredo et al., 2009; Wittkowski, Wieck, & Mann, 2007).

Another pertinent protective factor is social support. Transition to motherhood is a stressful life event and the satisfaction of perceived social support was found to buffer against the stress associated with birth (Cohen & Wills, 1985). In the postpartum period, maternal social environment and support may be related to the ability of a mother to develop a strong relationship with her infant (Brockington, 2004). Regarding the mother-infant bonding, the beneficial effects of social support have been reported in many studies. According to Falceto et al. (2012), the mother's social system and network was an important factor to achieve the optimal mother-infant

bonding. A meta-analysis of 66 studies evaluated the association between social support and maternal behavior and attitude of the mother on a homogenous sample population of white, middle-class, married mothers of young children without physical or mental disabilities (Andresen & Telleen, 1992). This meta-analysis demonstrated that the mother's parenting behavior is positively correlated with the emotional and marital support she receives (Andresen & Telleen, 1992). Mothers with more stable relationships, supportive intimate and positive relationships with the partner, as well as mothers with a secure attachment style are usually closer with more positive interaction with their infants (Figueiredo et al., 2009). Therefore, social support is considered a significant factor in promoting and protecting the optimal mother-infant bonding experience. Examination of the literature revealed that in order to enhance maternal-infant bonding, health-care providers should attempt to promote not only physical proximity of mother and newborn, but also a positive emotional state of the mother at birth.

Consequences of Mother-Infant Bonding

Bonding is an important process and its significance lies in the consequences that occur with optimal and poor mother-infant bonding. According to Altaweli and Roberts (2010) and Bienfait et al. (2011), strong maternal-infant bonding facilitates the improvement of mother’s parenting behaviors and skills, and it is also essential to the infant's psycho-affective, physical, and development such as cognitive, emotional, social and neurobehavioral (Bienfait et al., 2011; Kinsey & Hupcey, 2013). Neuro-psycho- biological studies have found early bonding and interaction also impacts the growth and organization of the maturing brain, eventually affecting both physiological and psychological development (Mantymaa et al., 2003). According to World Health Organization (WHO, 2004), positive and stable early relationship between the mother and her child have been found to be associated with better social adjustment and protection from

psychopathology in long-term studies of child outcomes. There is an evidence also reported that having an early positive mother-infant bonding helps in reducing the impact of adverse factors on child development (Davis & Sandman, 2010). Besides the advantage of mother-infant bonding on the survival, health and development of the infant, it is also considered as the foundation for the infant's later attachments and forms a basis for the child's sense of self (Madrid et al., 2006).

In addition, social emotional growth theories have suggested that the early relationship between infant and caregiver shapes the individual's adaptation throughout life (Feldman, 2010). Several studies have reported an association between aspects of mother-infant relationship with competence and adaptation in the middle childhood (Feldman, 2010). During adolescence, the adaptation played a significant role in the transition from childhood to adult life, particularly academic and social competence, is thought to develop on the foundation of the mother-infant relationship and predict well-being and adjustment in adult life (Feldman, 2010).

According to Mantymaa et al. (2003), the perception of stressful situations in the infants is highly dependent on the relationship with their caregiver and the child's vulnerability to stressful conditions and experiences increased by constant poor mother infant interaction. Impairment of mother-infant bonding can lead to negative consequences on the psychosocial well-being and cause serious long-term effects on the relationship between the mother and her infant and on the child development (Brockington et al., 2001). Maternal consequences of poor bonding include lack of maternal feelings, irritability, hostility, and rejection of the infant, and in cases of severely altered bonding, the baby may be expose to maternal aggression, which may progress to avoidance, neglect, abuse, child maltreatment and in extreme cases to infanticide (Brockington, 2004; Kinsey & Hupcey, 2013). Poor mother-infant relationship negatively affects the infant's cognitive, language, socio-emotional development and social adaptation, physical health, cerebral functional

and biological development, personal relationships and interaction, child's temperament and stress regulation, moreover, it may condition their social interactions and the development of psychopathology in childhood and adolescence (Feldman, 2010; Mantymaa et al., 2003; Johnson, 2013).

The effect of the quality of early mother-infant bonding and interaction on the cognitive, socio-emotional, behavioral, and physical development of the child has mostly been studied in connection with PPD.

Cognitive and Behavioral Development. Intervention studies reported that mother-infant relationship, mother's sensitivity and mother's adjustment to her infant evidenced to be the most effective in improving of the child's cognitive development, or in promoting behavioral features linked with cognitive abilities, such as exploration (Mantymaa, 2006). PPD had negative effect on mother-infant relationship and on caregiving, it is also frequently had been found to be linked to impaired child's cognitive performance (O'Hara & McCabe, 2013). Insensitivity and unresponsiveness of the mother, poor interaction and high levels of distress associated with PPD may affect the child's intellectual development and predicts poorer language and IQ development in children throughout childhood and adolescence (O'Hara & McCabe, 2013; Leigh, Nievar, & Nathans, 2011; Parfitt, Pike, Ayers, 2014).

The importance of mother-infant relationship on socio-emotional development of the child was studied and the results have been shown an association between the mother-infant relationship and the child behavioral outcomes including internalizing and externalizing psychopathology, and negative and positive emotionality (Mantymaa, 2006; O'Hara, & McCabe, 2013). Impaired maternal-infant bonding was found to be related to problems with externalizing behaviors at 18 months of age (Hairston et al., 2011). In addition, PPD, which is frequently accompanied by

disturbances in the mother-infant relationship was found to have an association with behavioral problems from early childhood to adolescence (Mantymaa, 2006; O'hara, & McCabe, 2013). The severity and chronicity of maternal depressive symptoms predicted future child behavioral problems (O'hara, & McCabe, 2013), and the quality of early mother-infant bonding predicts the behavioral problems in early childhood (Esser et al., 1993; Mantymaa, 2006). Therefore, mother-infant bonding may be associated with child's behavior and emotional development.

Physical Health. The caregivers are the primary gatekeepers of children's health. Physical health and mother-infant relationships have been found to be related. In psychosomatic research, psychological stress has been shown to be associated with physical diseases such as infections and asthma in school aged children and adults (Yatsenko, Pizano, & Nikolaidis, 2016). Asthma is the U.S.'s most prevalent chronic pediatric condition, affecting over 6.8 million children (Yatsenko et al., 2016). A variety of risk factors have been suggested to contribute to asthma's problems, prevalence one of them was the weak relationship with the mother (Yatsenko et al., 2016). Madrid et al. (2006) found that the treatment of maternal-child bonding disorders resulted in elimination of asthma symptoms. Furthermore, mothers with PPD have difficulty in relating and engaging in positive caretaking behaviors such as breastfeeding and attending regular well-child visits (O'Hara & McCabe, 2013). Because of the mother's maladaptive caretaking behaviors, the physical health of the infant and child may be affected (O'Hara & McCabe, 2013). In infants of mothers who have experienced PPD and decreased/limited mother-infant bonding during first six months postpartum, researchers found higher rates of gastrointestinal infections, lower respiratory tract infections, and poorer child cardiovascular functioning, moreover, it can influence child growth (O'Hara & McCabe, 2013). These findings highlight the importance of early identification and treatment of PPD and the consequences of inadequate mother-infant bonding and interactions.

Gap in Knowledge

To date there are limited focus on the research among immigrant women of Arabic decent related to acculturative stress social support, PPD, and mother-infant bonding. The findings from this literature review suggests that immigrant women are at higher risk for PPD, impaired mother-infant bonding is associated with PPD, acculturative stress may play a role in predicting PPD, and social support plays a role in predicting PPD and promoting mother-infant bonding. However, research on PPD and mother-infant bonding among U.S. immigrant women of Arabic descent is non-existent. No published studies have been found that explore the relationship among acculturative stress, social support, PPD and mother-infant bonding. Therefore, it's imperative to study the relationships among these variables among U.S. immigrant women of Arabic descent.

CHAPTER 3 METHODOLOGY

The purpose of this study was to examine the relationships between PPD, acculturative stress, social support, and mother-infant bonding among U.S. immigrant women of Arabic descent. This chapter discussed the research method for this study including a description of the study design, sample and setting, measures, data collection procedures, and data analysis.

Study Design

This study utilized a non-experimental, cross-sectional, correlational, descriptive design to examine the relationships of PPD, acculturative stress, social support and mother-infant bonding. Acculturative stress was examined to determine if it mediates the association between PPD and mother-infant bonding, and social support was examined to determine if it moderates the association between PPD and mother-infant bonding among U.S. immigrant women of Arabic descent. This design is appropriate when the aims of the study are to demonstrate the existence of relationships, not demonstrate causality.

Sample Size

Based on a formulation of 80% power, a critical effect size of 0.15 (R^2 = 0.13), six predictors (PPD, social support, acculturative stress, education, annual household income, and length of residence in the U.S.), and an alpha level of 0.05, a sample of n = 95 U.S immigrant women of Arabic descent was deemed sufficient to address the study aims. The G*power computer software (Version 3) was used to calculate the required sample size (Faul, Erdfelder, Lang, & Buchner, 2009). Therefore, a convenience sample of 95 postpartum U.S. immigrant women of Arabic descent was enrolled in this study.

Inclusion and Exclusion Criteria. The inclusion criteria in this study consisted a target population of U.S. immigrant women of Arabic descent who are 1 to 12 months postpartum. The

participants also required to be 18 years of age or older, and to be able to speak and read either Arabic or English language. Exclusion criteria include history of mental disorder (not including prior PPD), taking any psychiatric medications, as well as having a potentially terminal diagnosis such as HIV or cancer.

Setting

The participants were recruited from an obstetrics and gynecology clinic and the Arabic Community Center for Economic and Social Services - Women, Infant, and Children program (ACCESS-WIC). These two sites serve a large population of women of Arabic descent and are in a city with many Arab residents. In the obstetrics and gynecology clinic, women receive care during their pregnancy and in the first six weeks postpartum in the clinic. The Women, Infants and Children (WIC) nutrition program provides women and their families a healthy start in life. In partnership with the U.S. Department of Agriculture and the Michigan Department of Community Health, the program offers supplemental food, nutrition counseling and program referrals. The staff in the WIC office include one registered dietitian and manager, three nutritionists, five clerk/technicians and one breastfeeding peer counselor. WIC services are provided to low-annual income pregnant, postpartum, and breastfeeding women as well as their children up to age 5. Postpartum women are scheduled to visit the WIC office at one month, three months, six months, nine months, and 12 months post-birth to see the nutritionist.

Measures

Participants completed five instruments including: (1) the Edinburgh Postnatal Depression Scale (EPDS), (2) the Multidimensional Acculturative Stress Inventory (MASI), (3) the Multidimensional Scale of Perceived Social Support (MSPSS), (4) the Postpartum Bonding Questionnaire (PBQ), and (5) a sociodemographic tool developed by the investigator.

The Edinburgh Postnatal Depression scale (EPDS). The EPDS is used to screen women for depressive symptoms in the postpartum period (Cox, Holden, & Sagovsky, 1987). The EPDS is a self-report tool that has been found to be highly acceptable by postpartum women and is the most widely used screening tool for PPD (Boyd, Le, & Somberg, 2005; Cox et al., 1987). The EPDS is very clear, written at the third-grade reading level, and short, can be completed in five minutes (Cox et al., 1987).

The EPDS is a 10-item self-report questionnaire assessing the common symptoms of depression in the past seven days (Cox et al., 1987). These 10 items included ten symptoms of depression such as inability to laugh, inability to look forward to things, blaming oneself, anxious or worried, fear or panic, inability to cope, difficulty sleeping, sad or miserable, crying, and thoughts of harming oneself (Cox et al., 1987). Each item followed by four responses, which are in a Likert scale format ranging from zero (no symptom) to three (sever symptom), with a possible final score ranging between 0-30 after adding the scores for each of the ten items. Items (3, 5, 6, 7, 8, 9, 10) must to be reverse scored, with the top response scored as a three and the bottom response as zero (Cox et al., 1987). The final score represents the level of postpartum depression symptomatology. A score of 10 or less represent no symptoms of depression, and a score of 13 or more suggests a significant probability of PPD (Cox et al., 1987).

The EPDS is representative of 86% sensitivity, 78% specificity, and positive predictive value of 73% using a cutoff point of 9/10 (Cox et al., 1987). The EPDS has many translated versions and has been validated in different languages and cultures including Arabic. The psychometric properties of the Arabic version of EPDS at cut-off point of 10 as having a sensitivity of 91 %, specificity as 84 % (Ghubash, Abou-Saleh, & Daradkeh, 1997). Another study reported that EPDS was reliable in a sample of U.S. immigrant women of Arabic descent (Cronbach α=

.81) (Alhasanat-Khalil et al.,2019). Therefore, it is recommended to use the cut-off score of 10 for the Arabic version to obtain more accurate results (Ghubash et al., 1997, Alhasanat-Khalil et al.,2019). The Cronbach's alpha internal consistency in this study was r = 0.83 indicated that EPDS had an adequate internal consistency reliability.

The Multidimensional Acculturative Stress Inventory (MASI). The MASI is used to assess acculturative stress (Rodriguez, Myers, Mira, Flores, & Garcia-Hernandez, 2002). This research tool was originally developed to assess acculturative stress among adult women and men of Mexican origin living in U.S. The MASI is a 36-item instrument and its principal-components factor analyses yielded four factors based on 25 items that measures the severity of acculturative stress: Spanish Competency Pressures (7 items) (e.g., "I feel uncomfortable being around people who speak only Spanish"), English Competency Pressures (7 items) (e.g., "I don't speak English or don't speak it well"), Pressure to Acculturate (7 items) (e.g., "It bothers me when people pressure me to assimilate to the American ways of doing things"), and Pressure Against Acculturation (4 items) (e.g., "People look down upon me if I practice American customs") (Rodriguez et al., 2002). Respondents rate measure items according to the perceived acculturative stress amount of experienced during the previous three months on a five-point Likert scale ranging from (1) *not at all stressful* to (5) *extremely stressful*. (Rodriguez et al., 2002). If an event had not been experienced at all during the past 3 months, participants were coded (0) (*does not apply*), whereas events that had been experienced but were not at all stressful were coded as (1) (Rodriguez et al., 2002). Total score can range from 0-180, higher MASI scores reflect greater acculturative stress (Rodriguez et al., 2002).

Tests of reliability suggest the MASI and its subscale were reliable and had a good internal consistency with respect to the overall scale (Cronbach's alpha ranging from .77 to .93) and

corresponding subscales: the English subsample (Cronbach's alpha ranging from.77 to.94), and the Spanish subsample (Cronbach's alpha ranging from.74 to.91) (Rodriguez et al., 2002). The validity of the MASI was established by Pearson's correlations, as well as with correlation coefficients that showed acceptable test–retest reliabilities for three of four subscales ranged from *r*=.53–.84. The only subscale that demonstrated a modest reliability (*r* =.53) was the Pressure to Acculturate subscale. Rodriguez et al. (2002) reported that the Pressure to Acculturate subscale significantly predicted greater psychological distress and lower well-being above and beyond sociodemographic variables.

The 25-item of the MASI was modified slightly in order to reflect Arabic culture and language (Wrobel et al., 2009). For example, in the statement "People look down on me if I practice Mexican/Latino customs" the word Arabic was substituted for "Mexican/Latino." Moreover, the original scale had some statements like "Because of my cultural background, I have a hard time fitting in with Whites," the word "Americans" was substituted for "Whites," as those of Arab decent are classified as white, and hence the word white may not necessarily reflect the cultural stressors experienced by Arabs (Wrobel et al., 2009). The MASI was translated into Arabic by a bi-lingual licensed psychologist with clinical experience with both English and Arabic speaking populations; and gave the Arabic version to a translator unfamiliar with the original English scale and translated back into English (Wrobel et al., 2009). Inconsistencies in meaning from the original English versions were evaluated by a professor of Arabic language, and revisions in the Arabic version were made in order to maintain the original meaning of the instrument (Wrobel et al., 2009).

In a sample of 200 community dwelling Arab Americans ages 60 to 92 years old, the modified Arabic MASI was used and the reliability analysis its items indicates that two of the four

original factors (subscales), the English Competency and Pressure to Acculturate subscales had adequate internal consistency reliabilities with Cronbach's alpha 0.84 and 0.80, respectively (Wrobel et al., 2009). The other two subscales, Pressure against Acculturation and Arabic Competency had low internal consistency reliabilities (alphas<0.50). These results suggest that there is little variation in scale responses for the sample of community dwelling Arab Americans (Wrobel et al., 2009). A composite score of the scale was also created by summing together the original 25 items in the four factors that reported by Rodriquez et al.2002, in which the total score of 25 items range from 0-125 (Wrobel et al., 2009). Higher scores indicate higher levels of acculturative stress. The coefficient Alpha for the composite of the 25-item MASI showed an adequate internal consistency reliability with Cronbach's alpha 0.85 (Wrobel et al., 2009).

Alhasanat-Khalil et al. (2019), utilized the Arabic and English versions of the MASI to assess acculturative stress among U.S. immigrant women of Arabic descent. Adequate internal consistency reliability was demonstrated in the 25-item MASI (Cronbach's alpha = .83), which required 10-15 minutes to complete (Alhasanat-Khalil et al.,2019). In this study, both Arabic and English versions of the 25-item MASI was used according to their language preference. The Cronbach's alpha in this study was r = .79, indicated that MASI had an acceptable internal consistency reliability.

The Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS is intended to measure the extent to which an individual perceives social support from three sources: Significant Others (SO) (Items 1, 2, 5, and 10), Family (FA) (Items 3, 4, 8, and 11) and Friends (FR) (Items 6, 7, 9, and 12) (Zimet, Dahlem, Zimet, & Farley, 1988). Items measuring support from a significant other refer to a "special person," which may be interpreted differently by respondents (Aroian, Templin, & Ramaswamy, 2010; Zimet et al., 1988). MSPSS is a brief, easy

to administer self-report questionnaire which contains twelve items rated on a seven-point Likert-type scale with scores ranging from ‘very strongly disagree’ (1) to ‘very strongly agree’ (7) (Zimet et al., 1988).

A measure of reliability in a sample of 275 adult men and women with Cronbach’s alpha for the total scale is .88, whereas the Cronbach’s alpha for each subscale is .91 for significant other, .87 for family, and .85 for friends (Zimet et al., 1988). The reported test-retest reliability with a 2-3-month interval for the significant other, family, and friends’ subscales are .72, .85, and .75 respectively. Test-retest reliability for the whole scale was .85. Therefore, the MSPSS demonstrate adequate internal, test-retest reliability, strong factorial validity and moderate construct validity (Zimet et al., 1988).

The MSPSS has proven to be psychometrically sound in diverse samples (including Arabs) and to have good internal reliability, test-retest reliability, and validity. Aroian et al. (2010) adapted and translated the MSPSS to be culturally appropriate to measure perceived social support among immigrant women of Arabic descent and was named MSPSS Arabic Women (MSPSS-AW) (Aroian et al., 2010). In MSPSS-AW, the wording of MSPSS items on two of the original three MSPSS subscales were modified (Aroian et al., 2010). Instead of measuring perceived adequacy of support from significant other, the MSPSS-AW measured perceived adequacy of support from husbands (Aroian et al., 2010). In the MSPSS-AW, regards to family scale, the husbands were separate from other family members. Since the term “special person” on the significant other subscale was originally intended to be interpreted as a particularly close relationship that could be of a romantic nature, asking about husbands instead of a special person is consistent with Arabic traditional culture (Aroian et al., 2010). Like the original MSPSS, the MSPSS-AW has 12 items with four items for each of the three sources (family, friends, and husband) of support. Aroian et

al. (2010), collapsed the 7-point rating scale to a 3-point rating scale, the rational for this collapsed was because Arabs are less likely to use middle response categories when presented with many options (Aroian et al., 2010). The 3-point Likert scale were coded as (1) disagree, (4) neutral, and (7) agree to sustain comparability with the original versions of the scale (Aroian et al., 2010).

Tests of reliability suggest that the three subscales were reliable and had a good to very good internal consistency, Cronbach's alpha for the Husband subscale was 0.89, for the Friends subscale was 0.80, and for the Family subscale was 0.73. The total MSPSS-AW (Cronbach's α = 0.74), which considered an acceptable internal reliability (Aroian et al., 2010). The correlations among the MSPSS-AW subscales were examined in order to support the concurrent and discriminant validity. The scores for the three subscales range from −.02 to .26, $p<.01$. Family subscale scores correlated significantly ($p< .01$) with both Friends factor scores ($r = .26$) and Husband subscale scores ($r = .15$). Friends subscale scores and Husband subscale scores were not significantly correlated ($r = -.02$). Alhasanat-Khalil et al. (2019), used both Arabic and English versions of the MSPSS-AW to measure the perceived social support in the postpartum period among U.S. immigrant women of Arabic descent with good internal consistency reliability (Cronbach's $\alpha = .75$). In this study, both Arabic and English versions of the MSPSS-AW was used according to their language preference. The Cronbach's alpha in this study was $r = .73$, indicated that MSPSS-AW had an acceptable internal consistency reliability.

Postpartum Bonding Questionnaire (PBQ). The PBQ is used to measure mother-infant bonding. The PBQ is the gold standard and most frequently cited tool in the bonding literature that assess for bonding. Brockington et al. (2001) developed the PBQ as a screening tool to detect problems in mother-infant bonding. PBQ is a self-report questionnaire with 25 statements that include six alternative responses rated from 0-5 (Brockington, Fraser, & Wilson, 2006). The

statements include positive responses such as “I enjoy playing with my baby’’ scored from zero “always” to 5 “never”, and negative responses, which scored from 5 “always” to zero “never”, such as ‘‘I am afraid of my baby’’ (Brockington et al., 2006). The PBQ contains 4 subscales or factors include general factor (impaired bonding), rejection & pathological anger, anxiety about the infant, and incipient abuse/risk abuse (Brockington et al., 2006).

The PBQ was compared to the psychiatric interview to assess bonding (Brockington et al., 2006). PBQ has been reported to have good validity (Brockington et al., 2006) and reliability (Wittkowski et al., 2007). The reliability coefficient of the tool was at α=0.76, which suggest an adequate internal consistency (Wittkowski et al., 2007). The internal consistency for scales 1, 2 and 3 were α=0.79, α=0.63, and α=0.63, respectively, and the alpha for scale 4 couldn’t be determined due to zero variance in the two items of the risk abuse scale and when omitted these items from the total PBQ scale, the internal consistency was α=0.77 (Wittkowski et al., 2007). The convergent and concurrent validity of the PBQ were supported (Wittkowski et al., 2007).

The PBQ has been translated to many languages and adapted by many cultures. In translating the tool, a 16-items tool was found more valid than the original 25-items; the four-subscales structure of the original English version were not confirmed, and nine items were eliminated for a single scale structure (Dubber et al., 2015; Reck et al., 2006). Because the first scale showed a markedly high eigenvalue, they constructed a shorter version with 16 PBQ items that had a single- factor structure. Each item followed by six responses ranging from zero to five, nine of the 16 items with negative responses are scored from 5 (always) to zero (never), while positive responses must to be reverse scored, with a possible final score ranging between 0-80, higher scores indicate impaired bonding (Badr, 2018).

The PBQ-16 has been validated with good internal consistency of Cronbach's alpha at 0.85 and 0.83 (Dubber et al., 2015; Reck et al., 2006). Recently, the abridged 16 items version of the PBQ was used to assess the mother-infant bonding among Arab population (Badr, 2018). The tool was translated to Arabic language by translated retranslated method, the Cronbach's alpha internal consistency was 0.79 (Badr, 2018). The PBQ-16 is the only self-report instrument that was translated to Arabic language to measure the bonding between the mother and her infant with good validity and reliability. Moreover, it has been proven to be useful in several clinical populations such as mothers suffering from depression or post-traumatic stress disorder (Garcia-Esteve et al., 2016). In this study, both Arabic and English versions of the PBQ-16 was used according to their language preference. The Cronbach's alpha in this study was r = .73, indicated that PBQ-16 had an adequate internal consistency reliability.

Demographic Data. Will be developed by principle investigator (PI) to obtain socio-demographic data. Items will be asked to women about their age, country of origin, length of residence, total annual household income, educational status, employment, marital status,, number of pregnancies, number of live children, last monthly period, estimated date of confinement, gestational age at birth, type of delivery, infant's weight at birth, infant's sex and any medical or obstetrical complications.

Data Collection Procedures

After obtaining the approval from Wayne State University Institutional Review Board (IRB) and from both collection sites, the study and the data collection process will be described to WIC and OB/GYN clinic staff. The study will be introduced to potential participants by the nutritionist at WIC and the nurse at the OB/GYN clinic during a routine postpartum visit. The PI will explain the study to each woman who has demonstrated interest in the study. If a woman is

willing to participate in the study, the PI will screen her for eligibility. When a woman meets the inclusion criteria and agrees to participate in the study, a pre-arranged private room will be used to ensure privacy and complete the inform consent and data collection processes. The approximate period for collecting the data in this study will be 3-4 months.

Arabic and English version of the questionnaires including EPDS, PBQ, MASI, MSPSS are available. The survey packet will be provided to the participants depending on their language preferences. The socio-demographic data tool is available in English language only, therefore PI will ask the questions of this tool as an interview with the women to get their responses in Arabic. The PI is fluent in both languages and able to clarify any questions. The survey will take 35 to 45 minutes to complete. Upon completing the questionnaires, each participant will receive a $20 gift card.

Protection of Human Subjects

In order to protect all women involved in this research study, approval from Wayne State University Institutional Review Board (IRB) was obtained. In addition, approval was obtained from collection sites, which were WIC-ACCESS and Obstetrics/Gynecology clinic, the letters of support were provided. The study was explained by the PI and the confidentiality and the privacy of each participant was maintained. Informed consent forms was available in both Arabic and English and provided according to each participant's preference. All information and data were treated as confidential. The consent forms with identifiable data on them were stored separately from the study questionnaire data and kept in a locked file cabinet in the PI's office and the PI only had access to it. Each participant's data were assigned to an identification number in ensure anonymity and stored in a second locked cabined in the PI's office. The participants were informed

that they have the right to withdraw from the study at any time during data collection. PI contact information were provided to each participant during the informed consent process.

Data Management and Analysis

The data were coded and analyzed utilizing the statistical software, International Business Machines Corporation (IBM) SPSS 25. Descriptive statistics including mean scores, standard deviations, and frequency distribution were used to analyze the sociodemographic data as well as the variables. Cronbach's alpha was used to assess the internal reliability of the instruments. To address hypotheses 1a, 1b, & 1c, Pearson's correlation analysis was used to determine the significance of the relationship among PPD, acculturative stress, social support, and mother-infant bonding. Moreover, backward stepwise multiple linear regression analyses utilized by using the independent variables of PPD, acculturative stress and social support along with sociodemographic data including (years of education, length of residence in the U.S., and total annual household income), to predict mother-infant bonding. For hypothesis 2, a series of linear models were used to identify the effect of PPD on acculturative stress, the effect of PPD on mother-infant bonding, and the effect of PPD and acculturative stress on mother-infant bonding. Significance of the regression coefficients for the acculturative stress in the first and third linear models suggest that acculturative stress serve as a mediator between PPD and mother-infant bonding. To identify the moderating impact of social support, for hypothesis 3, in relationship between PPD and mother-infant bonding, a new variable which showed the interaction between PPD and social support was created. Multiple regression equation was employed to evaluate the potential impact of PPD, social support and interaction between PPD and social support on mother-infant bonding. The result of the regression coefficient for the interaction variable suggests that social support is not significant moderator of PPD and mother-infant bonding.

CHAPTER 4 RESULTS

In the following chapter, the results of this study are presented. Results include univariate analysis for all study variables, and Pearson correlation and multiple regression to answer each study hypothesis. All participants were included in the final analysis with no missing data.

Sample Characteristics

Sample characteristics for the U.S immigrant women of Arabic descent, N= 95 are listed in Table 1. Women ranged in age from 20-43 years (mean age = 30 years, SD = 5.0). The mothers were between 1-12 months postpartum (mean= 5.5 months, SD= 3.16). The average length of stay in the U. S. ranged from one to 31 years (mean = 10.19 years, SD= 7.18). The participant's mean age at the time of immigration to the United States was 19.6 years (SD= 9.18). The majority of participants immigrated from Yemen (56.8%), then Lebanon (14.7%), Iraq (13.7%), and Syria (11.6%). The average woman completed a high school education (mean=12 years, SD=3.5) with a range of 3 to 21 years of education. Eighty percent of the women preferred to be interviewed in Arabic. All of the women were married. Among the 95 women, 87 (91%) had an annual family income of <$40,000, 90.5% were not employed, all received WIC services, and 92.6% indicated having Medicaid as their primary medical insurance.

Pregnancy and Birth Outcomes

Nearly 97% of the women gave birth to a full-term infant, 82% birthed vaginally, and 60% had male infants. Greater than 74% of the pregnancies were planned,71% of the women were multigravida, 63% were not using contraceptives, and 52% chose formula as their method of infant feeding. One third of the study participants (33.7%) reported feeling depressed during their pregnancy, 27 of them (28.4%) reported depression as mild, with three participants (3.2%) reported their depressive feelings as severe. In addition, seven women (7.4%) reported feeling depressed

before this pregnancy. The health issues reported in this study before or during pregnancy were asthma (2.2%), diabetes (1.1%), and thyroid problems (1.1%).

Table 1

Descriptive Characteristics for Participants, Socio-demographic Data (n=95)

Variables	**Minimum**	**Maximum**	**Mean%**	**St. deviation**
Mother's age	20	43	30.80	5.02
Women's age when she came to the U.S.	1	39	19.62	9.18
Length of Stay in U.S. (year)	1	31	10.19	7.18
Level of education (years)	3	21	12.29	3.57
Working hours per week	13	40	26.33	8.48
			Frequency	Percent (%)
Preferred language		Arabic	76	80.0
		English	19	20.0
Country of origin		Yemen	54	56.8
		Lebanon	14	14.7
		Iraq	13	13.7
		Syria	11	11.6
		Jordan	2	2.1
		Tunisia	1	1.1
Immigration status		Immigrant	85	89.5
		Refugee	10	10.5
Marital status		Married	95	100.0
Employment		Yes, working	9	9.5

	No, at home	80	84.2
	No, student	6	6.3
	Full-time	2	2.2
	Part-time	7	7.4
Annual family income	<$20,000	52	54.7
	$20,000-$39,999	35	36.8
	$40,000-$59,999	7	7.4
	$60,000-$79,999	1	1.1
Financial contribution to income	Spouse	90	94.7
	Self	10	10.5
	Parent	3	3.2
Other source of income	WIC	95	100
	Food stamps	49	51.6
	SSI	1	1.1
Health insurance	Medicaid	88	92.6
	Private + Medicaid	4	4.2
	No insurance	2	2.1
	Medicare + Medicaid	1	1.1

Maternal medical and obstetric history

Variables	**Minimum**	**Maximum**	Mean%	St. deviation
Postpartum (months)	1	12	5.46	3.16
Number of pregnancies	1	9	3.08	1.85
Full-term pregnancies	0	8	2.61	1.67

Premature pregnancies	0	3	.13	.41
Miscarriages	0	3	.35	.77

		Frequency	percent (%)
Full-term birth (>37 weeks gestation)		92	96.8%
Type of birth	Vaginal	78	82.1
	Cesarean section	17	17.9
Infant's gender	Male	57	60
	Female	38	40
Infant feeding	Formula	50	52.6
	Both formula & breast	42	44.2
	Breastfeeding	3	3.2
Planned pregnancy	Yes	71	74.7
	No	24	25.3
Using contraceptive	No	63	66.3
	Yes	35	36.9
Feeling depressed during pregnancy	No	63	66.3
	Yes	32	33.7
Feeling depressed before this pregnancy	No	88	92.6
	Yes	7	7.4
Medical complications Asthma		2	2.1
Thyroid problem		1	1.1
Gestational diabetes		1	1.1

The mean values for the main variables in this study PPD, acculturative stress, social support, and mother-infant bonding are presented in Table 2. The mean score for PPD on EPDS was 6.54±4.52. An EPDS score ≥ 10 indicates a likely for depression screen; twenty four women (25.2%) in this study had scores ten and higher; the mean score for acculturative stress on MASI the mean score was 50.96±5.96; for social support on MSPSS the mean score was 2 8.19±4.46; and the total score for mother-infant bonding on PBQ was 13.40±6.98.

Table 2

Descriptive Statistic for PPD, Acculturative Stress, Social Support, and Mother-Infant Bonding

Variables (Instruments)	Range	Minimum	Maximum	Mean%	St. deviation
PPD (EPDS)	20	0	20	6.54	4.52
Acculturative Stress (MASI)	30	42	72	50.96	5.96
Social Support (MSPSS-AW)	16	20	36	28.19	4.46
Mother-Infant Bonding (PBQ)	29	0	29	13.40	6.98

Note. EPDS= Edinburgh Postnatal Depression Scale, MASI= Multidimensional Acculturative Stress Inventory, MSPSS-AW= Multidimensional Scale of Perceived Social Support for Arabic Women, PBQ= Postpartum Bonding Questionnaire.

Pearson r correlation coefficient were used to examine the relationships among sociodemographic variables including (years of education, annual household income, and length of residence in the U.S.) and PPD, acculturative stress, social support, mother-infant bonding. Years of education was significantly positively correlated with social support (r=.26, p= .011), with a significantly negative correlation with PPD (r= -.32, p= .002). Women with more years of education reported to have more social support, and less PPD symptoms. In addition, maternal age was significantly negatively correlated with social support (r= -.23, p= .023), indicating that older

women reported a lower level of social support. There was no significant correlation among years of education, annual household income, and length of residence and mother-infant bonding (see Table 3).

Table 3

Correlations among Years of Education, Annual Household Income, Length of Residence in the U.S and PPD; Acculturative Stress; Social Support; Mother-Infant Boding.

Variables		Years of Education	Annual House Income	Length of Residence in U.S.	Maternal Age
Acculturative Stress	Correlation	-.07	-.07	-.18	.17
	P	.484	.476	.075	.098
Social Support	Correlation	.26*	.19	.15	-.23*
	P	.011	.057	.144	.023
PPD	Correlation	-.32**	-.07	-.15	.19
	P	.002	.485	.142	.856
Mother-Infant Bonding	Correlation	-.15	-.02	-.17	.09
	P	.149	.860	.091	.377

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Analysis of Specific Study Aims

Aim 1. Examine the relationships of PPD, social support, and acculturative stress on mother-infant bonding among U.S. immigrant women of Arabic descent. Pearson r correlation coefficient analysis was used to test the hypotheses 1a, 1b, and 1c, and to determine the significance of the relationship among variables. The results are presented in Table 4.

Hypothesis 1.a. (Accepted) There was a negative relationship among PPD and mother-infant bonding. PPD was significantly correlated with mother-infant bonding, that is higher levels of PPD symptoms related to poor mother-infant bonding (r=.55, p= .000).

Hypothesis 1.b. (Accepted) Social support was significantly related to mother-infant bonding (r= -.29, p= .005).

Hypothesis 1.c. (Accepted) Higher levels of acculturative stress are related to poor mother-infant bonding. Analysis showed that acculturative stress was significantly correlated with mother-infant bonding, with higher levels of acculturative stress being related to poor mother-infant bonding (r=.37, p= .000).

Table 4

Relationships among PPD, Acculturative Stress, Social Support, and Mother-Infant Bonding

Variables		Acculturative Stress	Social Support	PPD	Mother-Infant Bonding
Acculturative Stress	Correlation	1	-.35**	.32**	.37**
	P	-	.001	.002	.000
Social Support	Correlation	-.36**	1	-.19	-.29**
	P	.001	-	.061	.005
PPD	Correlation	.32**	-.19	1	.55**
	P	.002	.061	-	.000
Mother-Infant Bonding	Correlation	.37**	-.29**	.55**	1
	P	.000	.005	.000	-

**. Correlation is significant at the 0.01 level (2-tailed).

Covariates

Furthermore, after controlling for the covariates of years of education, annual household income, and length of residence in the U.S. a stepwise multiple linear regression analysis was performed to identify if PPD, acculturative stress, social support were predictors of mother-infant bonding. This study found that PPD (β= .46, t= 5.33, p=.000) and acculturative stress (β= .22, t= 2.41, p=.018) predicted mother-infant bonding, but not social support. These two predictors explained 34% of the variance, R^2=.34, F= 23.65, p= .000 (see Table 5).

Table 5

Predictors of Mother-Infant Bonding

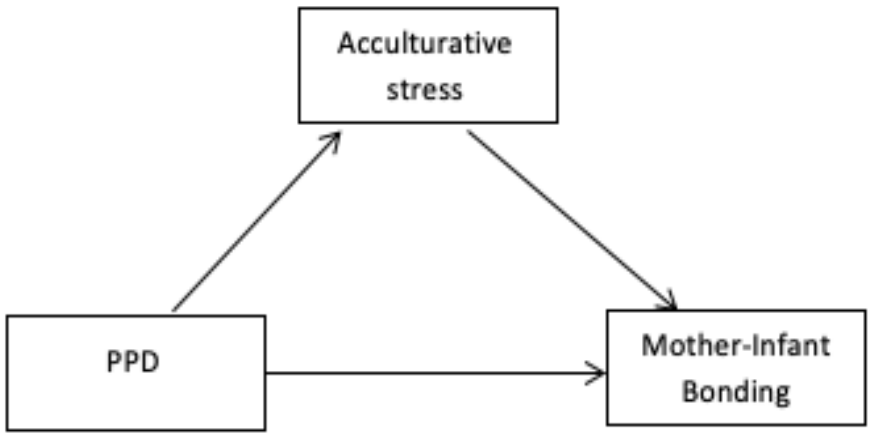
Variables	***β***	***t***	***P***
PPD	.46	5.33	.000
Acculturative Stress	.22	2.41	.018
Social Support	.03	-1.51	.133
Education	.03	.38	.706
Annual House Income	-.07	-.75	.454
Length of Residence in U.S.	.02	.24	814

R^2=.34, F= 23.65, p= .000.

Aim 2: Examine if acculturative stress mediates the associations between PPD and mother-infant bonding among U.S. immigrant women of Arabic descent (see Figure 3).

Figure3

Examine if Acculturative Stress Mediates the Associations between PPD and Mother-Infant Bonding



Hypothesis 2: Acculturative stress mediates the associations between PPD and mother-infant bonding. Multiple linear regression analyses were used to identify the effect of acculturative stress on the relationship between PPD and mother-infant bonding. A series of linear models were used to examine the relationship between (a) PPD and acculturative stress, (b) PPD and mother infant bonding, and (c) acculturative stress and PPD on mother-infant bonding. PPD was significantly associated with acculturative stress (β= .32, t= 3.27, p= .002). In addition, there was significant association between PPD and mother-infant bonding (β= .55t= 6.28, p= .000). When examining the relationships among acculturative stress, PPD, and mother-infant bonding, both PPD (β= 45, t= 5.33, p= .000), and acculturative stress were statistically significant (β= .22, t= -2.41, p= .018). Therefore, acculturative stress mediates PPD and mother-infant bonding. The model explained 34% of variance in mother-infant bonding (R^2=.34, F= 23.652, p= .000) (see Table 6).

Table 6

Mediation Effect of Acculturative stress on PPD and Mother-Infant bonding

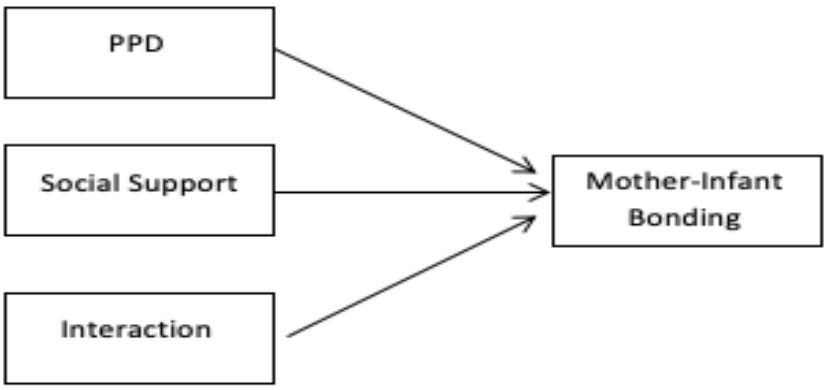
Variables	***β***	***t***	***P***
PPD	.45	5.33	.000
Acculturative Stress	.22	2.41	.018

R^2=.34, F= 23.65, p= .000

Aim 3: Examine if social support moderates the associations between PPD and mother- infant bonding among U.S. immigrant women of Arabic descent.

Figure 4

Examine if social support moderates the associations between PPD and mother- infant bonding



Hypothesis 3: Social support moderates the relationship between PPD and mother-infant bonding (see Figure 4). Multiple regression equation was conducted to test the interaction among social support, PPD and mother-infant bonding (Table 7). PPD, social support, and the interaction between PPD and social support were not statistically significant. Therefore, social support did not moderate PPD and mother-infant bonding

Table 7

Examining the Moderating Effect of Social Support on the Relationship between PPD and Mother-Infant Bonding.

Variables	***β***	***t***	***P***
PPD	.48	.83	.407
Social support	-.195	-1.23	.222
Interaction between PPD and social support	.03	.06	.953

R^2=.332, F= 15.052, p= .000

Summary

This chapter provide the results of the sample characteristics and each aim in this study and identified the relationships among the key variables. The findings of this study indicated that PPD, social support, and acculturative stress all were significantly correlated with mother-infant bonding. High levels of PPD symptoms and high levels of acculturative stress were related to poor mother-infant bonding, with social support being related to more optimal bonding. Acculturative stress significantly mediates the relationship between PPD and mother-infant bonding. Finally, the relationship between PPD and acculturative stress, PPD and mother infant bonding, and acculturative stress and PPD on mother-infant bonding was examined. The analysis showed that PPD was significantly associated with both acculturative stress, and mother-infant bonding. Then, the results showed that acculturative stress and PPD both were statistically significant with bonding; thus, the mediating effect of Acculturative stress was found to mediate PPD and mother-infant bonding. Social support was found not to moderate the relationship between PPD and mother-infant bonding.

CHAPTER 5 DISCUSSION

The purpose of this study was to examine the relationships between PPD, acculturative stress, social support, and mother-infant bonding among U.S. immigrant women of Arabic descent. In this chapter, the discussion of the research results is presented along with study's strengths, limitations, clinical implications, and recommendations for future research.

PPD and Mother-Infant Bonding

Limited research exists on the effects of PPD, acculturative stress, and social support on mother-infant bonding among U.S. immigrant women of Arabic descent. The results of this study found the prevalence of PPD to be 25.2 %, similar to the results reported by Alhasanat-Khalil et al. (2019). Badr (2018) and Safadi et al. (2016) found that the incidence of PPD among Arabic women in the Middle East ranged from 19% to 25%. In this study, we found that PPD was associated with and predicted mother-infant bonding. Women who had Edinburgh Postpartum Depression Scale scores of greater to or equal to ten, or had a higher score of postpartum Bonding Questionnaire, were at higher risk for PPD and poor mother-infant bonding. This result is consistent with previous studies conducted in Western populations (Brockington et al. 2001, Closa-Monasterolo et al., 2017; Dubber et al., 2015; Edhborg et al. 2011; Reck et al., 2006, Moehler et al., 2006). Similarly, Rossen et al. (2016), reported that PPD is correlated with poor bonding during the postpartum period; O'Hara & McCabe (2013), found that mothers with PPD are more likely to have negative emotions and less likely to respond to their infants' needs. However, inconsistent findings have been reported in terms of the relationship between PPD and mother-infant bonding among women of Arab descent. The only and recent study conducted in Lebanon among 150 postpartum Lebanese women reported that PPD was not associated with mother-infant bonding (Badr,2018). This inconsistency may be due to the differences in the EPDS

cutoff score. Badr (2018), used a cutoff score greater than 13 which made it difficult to compare the findings.

Social Support and Mother-Infant Bonding

Social support is considered as a key factor that facilitates the transition to motherhood, and is demonstrated to be significantly associated with maternal role development (Brockington, 2004, Leahy-Warren et al, 2011). Moreover, social support is recognized as an essential factor related to mother-infant bonding (Falceto et al.,2012). In this study, we examined the direct effect of social support on mother-infant bonding and if social support moderates the relationship between PPD and mother-infant bonding.

The findings of this study found that social support was related to mother-infant bonding. We found that mothers who reported higher levels of social support also reported lower levels of PBQ or optimal bonding between mothers and their infants. The beneficial effects of social support on mother-infant bonding have been reported in previous studies. Falceto et al. (2012) reported that a mother's social system and network was an important factor to achieve optimal mother-infant bonding. Another study found that mothers in more stable and supportive relationships found that their partners were closer to and interacted more with their infants. Furthermore, a meta-analysis of 66 studies revealed that the mother's behavior towards her infant was positively correlated with the social support she received (Andresen & Telleen, 1992).

Lower perceived social support was found to be related to poorer mother-infant bonding (Tester-Jones, O'Mahen, Watkins, & Karl, 2015). Similarly, lack of social support was found to be significantly associated with less optimal bonding among Arabs women in Lebanon (Bder, 2018). Furthermore, Bder (2018), reported that social support was one of the strongest predictors

associated with mother-infant bonding. The results of this study were consistent with previous studies that showed that social support is significantly related to positive mother-infant bonding.

In terms of a moderating effect, social support did not moderate the relationship between PPD and mother-infant bonding in this study. Nevertheless, there is limited research that has examined the moderating effect of social support on the association between PPD and mother-infant bonding. Several studies examined the main effect of social support on mother-infant bonding and PPD separately. We found that there was no statistically significant relationship between social support and PPD among our sample which is inconsistent with previous studies. Majority of the studies shown that lack of social support during the postpartum period was as predictor of PPD (Dennis et al., 2012; Ganann, Sword, Thabane, Newbold, & Black, 2015; Lee & Hung, 2015; Valentine, Rodriguez, Lapeyrouse, & Zhang, 2011; Verreault et al., 2014; Youn & Jeong, 2013).

Furthermore, Alhasanat and Fry-McComish (2015), reported that lack of social support was found to be an essential risk factor for PPD among immigrant women and Arabic women in the Middle East. Similarly, a recent study conducted among U.S. immigrant women of Arabic descent found that social support predicted PPD symptoms (Alhasanat-Khalil et al., 2019). However, this is the first study investigated the moderating effect of social support in the association between PPD and mother-infant bonding and our finding did not support the moderating effect of social support. In summary, the results of this study found that social support had a statistically significant effect on maternal-infant bonding but did not moderate this relationship.

Acculturative Stress and Mother-Infant Bonding

Acculturative stress is a specific type of stress that triggered by specific life events and challenges of adaptation to new culture (Sam & Berry,1995). In this study, we investigated the relationship between acculturative stress and mother-infant bonding. The results showed that acculturative stress was significantly correlated with mother-infant bonding. The higher the level of acculturative stress, the poorer the bonding between mothers and their infants. Prior studies have investigated the relationship between stress and mother-infant bonding but not on acculturative stress. Kinsey, Baptiste-Roberts, Zhu and Kjerulff (2014), reported that mother-infant bonding was negatively correlated with maternal stress. Similarly, Nordahl et al. (2020), found that stress such as parenting stress had a negative relationship on mother-infant bonding. More research on the relationship between acculturative stress and maternal-infant bonding is needed.

In addition, we examined the mediating effect of acculturative stress on the associations between PPD and mother-infant bonding. Previous studies investigated the association between PPD and acculturative stress among immigrant women. Alhasanat-Khalil et al. (2019), conducted a study among U.S. immigrant women of Arabic descent, and found that acculturative stress predicted PPD symptoms. Other studies conducted among Mexican women in U.S, reported an association between acculturative stress and depressive symptoms (D'Anna-Hernandez et sl., 2015; Preciado & D'Anna-Hernandez, 2016; Zeiders et al., 2015). No known studies have examined the association between acculturative stress and mother-infant bonding nor the mediating effect of acculturative stress on the relationship between PPD and mother-infant bonding. In this study, after using a series of liner regression, we found that PPD was significantly

related with both acculturative stress and mother-infant bonding. Therefore, acculturative stress mediates PPD and mother-infant bonding.

Demographic Variables and Mother-Infant Bonding

To our knowledge, no studies have investigated mother-infant bonding among immigrant women of Arab descent. Numerous studies, however, have examined the relationships among mother-infant bonding, level of education, and household income. In this study, we found that the years of education, annual household income, and the length of residence in the U.S. were not significantly associated with mother-infant bonding. These findings were consistent with two previous studies. Örün et al. (2013), reported that level of education and household income not significantly related to mother-infant bonding. Similarly, Falceto et al. (2012), reported that low education level and low income were not significantly associated with mother-infant bonding.

Contrary to our results, several studies reported an association between level of education and mother-infant bonding (Dubber et al., 2015; Figueiredo et al., 2009; Kinsey et al.,2014). Figueiredo et al. (2009) and Kinsey et al. (2014), revealed that women with lower level of education had poorer mother-infant bonding, whereas Dubber et al. (2015), revealed that women with higher level of education had poorer mother-infant bonding. Another study reported a significant association between household income and mother-infant bonding (Kinsey et al., 2014). Women reporting lower household incomes had higher PBQ scores which had poorer mother-infant bonding (Kinsey et al., 2014). The incongruent findings may be due to differences in cultural traditions, roles, and norms.

Although level of education, household income, and length of residence in U.S. did not affect mother-infant bonding, level of education was found to be positively correlated with social support and negatively correlation with PPD. Women with more years of education reported to

have more social support, and less PPD symptoms. Additionally, the variables that remained significant in predicting mother-infant bonding after controlling for the covariates of years of education, annual household income, and length of residence in the U.S. were PPD and acculturative stress.

Strengths and Limitations

Strengths

This study examined the relationships of PPD, acculturative stress, and social support on mother-infant bonding and the relationships between these variables among U.S. immigrant women of Arabic descent. There was no missing data in this study that allowed for full analysis of the data. Both Arabic and English versions of the survey instruments were used, which enhanced the recruitment process and allowed us to recruit both English and non-English speaking immigrant women. Researcher fluent in both Arabic and English language. Additionally, among our sample, the instruments PBQ, EPDS, MASI, and MSPSS-AW had good reliability coefficients of .73, .83, .79, and .73, respectively. Finally, it is worth highlighting that we were able to identify significant predictors of mother-infant bonding among this specific minority sample such as PPD and acculturative stress, which confirmed some and added some new findings to the literature and bring a new knowledge for Nursing.

Limitations

This study, however, has some limitations. This study used a cross-sectional design therefore, the direction of causality cannot be assumed, as data was collected at a single point in time. In this study mother-infant bonding was measured by using a self-report questionnaire. Although this instrument has been validated (Badr, 2018; Brockington, 2004) and the findings show consistency with both theory and past empirical research, observational methods are

recommended to confirm this pattern (Wysocki, 2015). Furthermore, for measuring the PPD we only used EPDS which is a screening tool, thus, diagnostic confirmation of PPD is needed. In terms of generalization, 98% of the women participated from one site (ACESS-WIC) in the city of Dearborn, MI. As this study was conducted in the city of Dearborn, which considered as the home to the largest concentration of Arab population, the findings cannot be generalized to all immigrant women of Arabic descent in the U.S

Implications for Practice

The results of this study suggest several implications for healthcare care professionals to help promote healthy mother-infant bonding. The results clearly indicate that PPD is a strong predictor of mother-infant bonding among Arab immigrant women, which supports the need to screen for depression minimally at the first prenatal visit and following birth (Alhasanat-Khalil et al., 2019; Netsi et al., 2018; Curry et al., 2019). Moreover, the study findings suggest that acculturative stress has an impact on mother infant bonding, as well as on the PPD symptoms among immigrant women of Arabic descent. The higher the level of acculturative the poorer the bonding and the higher the depression symptoms. This indicate that acculturative stress is an actual issue among Arab immigrant women in the postpartum period, which may compromise their mental health and may influence the quality of mother-infant bonding. Therefore, it is important for nurses and other healthcare providers to be aware of the life stressors including acculturative stress that may influence the mother-infant bonding among immigrant women.

The findings of this study support the theoretical based knowledge that the everyday life stresses that may mothers' experiences are significantly associated with mother-infant bonding. In addition to the screening for PPD, more research on the assessment of acculturative stress prenatally or after birth may provide additional knowledge on how this affects mother-infant

bonding among immigrant women. This will help to provide an intervention to promote maternal well-being, reduce stress, prevent depression, and develop a positive mother-infant bonding quality.

Culture is an important factor to generate and adapt a supportive environment needs for new mothers (Taylor et al., 2004). It is essential to understand the cultural differences, which help in understanding the stressor that may mothers facing in postpartum period that may affect their relationship with their infant. Arabic culture classified as Ethnokinship, in this culture the support by family networks are the primary focus of care for both mothers and newborns during the immediate and late postpartum periods, last for 40 days (Callister et al., 2010; Evagorou et al., 2016). Arabic woman experiences different life and face numerous challenges when she immigrates with her husband that make her vulnerable for depressive feelings alongside the social isolation and loneliness, which may affect the bonding with her infant (Nahas & Amasheh, 1999). Understanding the cultural differences is essential, therefore, more training on cultural competency and cultural humility should be provided for health care providers so that they may better understand the issues facing immigrant women of Arab descent living in the U.S.

In summary, the study reveals the using of PBQ was an effective tool to measure mother-infant bonding among Arab immigrant women. The PBQ can be an important instrument for the primary healthcare providers, as well as for community healthcare facilities (Brockington et al. 2001). A more complete understanding of the factors that influence mother-infant bonding can lead to better health outcomes for mothers and their infants.

Recommendations for Future Research

Future research studies are needed to expand the findings of this study. Mixed methods study design is recommended to explore the issue of mother-infant bonding among U.S. immigrant

women of Arabic descent. Longitudinal studies including larger sample of Arab immigrant women recruited from other cities than Dearborn. Longitudinal studies will allow to assess the changes of mother-infant bonding over the time, which could help to further our understanding and to capture the immediate effect of negative challenges that may Arab immigrant women face such as cultural differences, language barrier, separation from their family and friends which may lead to social isolation (Collins et al., 2011; Falah-Hassani et al., 2015) and its subsequent resolution. Additionally, besides self-report questionnaire, observational methods are recommended to be used in assessing the mother-infant bonding because they provide objective details of the relationship (Wysocki, 2015). Finally, more studies are needed to examine the factors that may influence mother-infant bonding among this population such as prenatal bonding, breastfeeding, maternal age, social support, and everyday life stressor (Altaweli & Roberts, 2010; Kim et al., 2011, Rossen et al., 2016; Van Bussel et al., 2010).

Conclusion

The purpose of this study was to examine the relationship between PPD, acculturative stress, social support and mother-infant bonding among U.S. immigrant women of Arabic descent. The findings of this study showed a statistically significant association between PPD, acculturative stress and mother-infant bonding, as well as social support and mother-infant bonding. PPD found to be a strong predictor of mother-infant bonding. Moreover, the results revealed that social support significantly related to mother-infant bonding, however, the moderating effect of social support on the relationship between PPD and mother-infant bonding was not significant. Furthermore, PPD found to be statistically significant predictor for mother-infant bonding and acculturative stress. Therefore, acculturative stress mediated the relationship between PPD and mother-infant bonding. Lastly, PPD and acculturative found to significant predictors on mother-

infant bonding after controlling for years of education, annual household income, and length of residence in the U.S., but not for social support. Further studies with larger samples in different settings are needed to provide validity to the results of this study and to provide a better understanding of the factors that might impact mother-infant bonding among immigrant women of Arab descent.

APPENDIX A
DEMOGRAPHIC DATA

1. What is your preferred language to communicate (please check)?

   ○ English ○ Arabic

2. What is your date of birth (mm/dd/yy):_____

3. What is your immigration status (please mark):

   ○ Immigrant ○ Refugee

4. At what age did you come to the Unites States?_____

5. What is your country of origin/ birth? _____

6. How long have you lived in the United States? Years:_____Months:_____

7. What is your marital status:

   ○ Single ○ Divorced ○ Separated
   ○ Married ○ Widowed

8. How many years of education do you have:_____

9. What is your highest level of education?

   ○ Less than High school
   ○ Technical/ vocational training
   ○ Graduated High School or GED
   ○ Some college
   ○ Associate degree
   ○ Bachelor degree
   ○ Graduate degree or higher

10. Are you currently working or temporarily laid off from a regular job?

    ○ Yes, working. If you currently work, about how many hours per week do you work?_____
    ○ Yes, temporary laid off
    ○ No, not working. If not working, are you?
      ○ At home
      ○ Student

- O Other (please specify) _____

11. Are you currently employed?

- O No. If not employed, please mark if you are
  - O house person
  - O in school
- O Yes. If yes please mark if you are employed
  - O full time
  - O part time

12. What is your annual family income?

- O < $20,000
- O $20,000- $39,999
- O $40,000- $59,999
- O $60,000- $79,999
- O $80,000- $99,999
- O > $100,000

13. Who makes the financial contribution to your household income (please mark all that apply)?:

- O Self
- O Father of baby
- O Live-in partner
- O Spouse
- O Your Father/Mother
- O Other (please specify relationship) _____

14. Are there other sources of income to your household?

- O Yes
- O No

15. If yes, what are other sources of income to your household (please mark all the apply)?

- O SSI
- O Welfare
- O Unemployment
- O Food Stamps
- O Alimony
- O WIC

- Other (please specify) _____
- There are no other sources of income to my household
- Who is the main financial provider(s) in your household (please check all that apply)? Self
- Partner (husband, fiance)
- Parent(s) (your mother or father, or both)
- Other (please specify) _____

16. What type of health insurance do you have?
    - Private or through employer
    - Private + Medicaid (to cover maternity)
    - Medicaid
    - Self-pay
    - Medicare
    - Medicare + Medicaid
    - Other (please specify) _____
    - Don't know, unsure
    - None

Please tell us about your previous pregnancies. Answer based on what scenarios apply to you.

17. H**ow many times** have you been pregnant? (Please include full term and premature births, miscarriages and elective terminations of pregnancy)_____
18. How many of your pregnancies were **Full Term** (delivered after 9 months or 37 weeks)_____
19. How many of your pregnancies were **Premature** (delivered before 9 months or 37 weeks)_____
20. How many of your pregnancies were **miscarriages or elective terminations** of pregnancy (less than 4 months or 20 weeks pregnant) Number of pregnancies:_____
21. How many living children do you have? _____
22. If the pregnancy with this baby was not your first pregnancy what is the **date of your last birth**? (enter as mm/dd/yyyy)_____
23. What is the date of your last infant's birth (mm/dd/yy)?_____
24. What type of birth did you have for your last baby?
    - Normal vaginal birth
    - Cesarean section

25. What is the infant's gender?

O Male O Female

26. Did you plan to become pregnant with this child?

O Yes O No

27. How are you feeding your baby?

O Formula

O Breastfeeding: For how long did you breastfeed him/ her? _____ months

O Both Formula and breastfeeding.

28. Are you using a contraceptive method (birth control)?

O Yes_____ O No

29. Did you feel depressed or sad during your last pregnancy?

O Yes O No

If yes, when and how long have you been feeling this way? _____

If yes, how mild or severe would you consider your depression? _____

30. Before this pregnancy, have you ever been depressed?

O Yes O No

If yes, when did you experience this depression? _____

If yes, have you been under a physician's care for this past depression? _____

If yes, did the physician prescribe any medication for your depression?

31. Did you have any medical conditions before or during the pregnancy (please check all that apply)?

O Yes. O No

If yes:

O Asthma or other problems with your lungs (please describe)

_____

O Hypertension or elevated blood pressure while not pregnant (please describe)

_____

O Thyroid problems (please describe) _____

- ○ Diabetes or high blood sugar levels while not pregnant (please describe) _____
- ○ Heart problems (please describe) _____
- ○ Kidney problems that was more than an infection of your urinary bladder (please describe) _____
- ○ Other conditions (please describe) _____

32. Did you have any mental or psychological conditions before or during the pregnancy (please check all that apply)?
    - ○ Major Depression (Please describe) _____
    - ○ Postpartum Depression (Please describe) _____
    - ○ Bipolar (Please describe) _____
    - ○ Substance abuse (Please describe) _____
    - ○ Schizophrenia (Please describe) _____
    - ○ Personality disorder (Please describe) _____
    - ○ Other conditions (please describe) _____

APPENDIX B
EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

In the past 7 days:

1. I have been able to laugh and see the funny side of things
   - As much as I always could
   - Not quite so much now
   - Definitely not so much now
   - Not at all

2. I have looked forward with enjoyment to things
   - As much as I ever did
   - Rather less than I used to
   - Definitely less than I used to
   - Hardly at all

*3 .I have blamed myself unnecessarily when things went wrong
   - Yes, most of the time
   - Yes, some of the time
   - Not very often
   - No, never

4. I have been anxious or worried for no good reason
   - No, not at all
   - Hardly ever
   - Yes, sometimes
   - Yes, very often

*5. I have felt scared or panicky for no very good reason
   - Yes, quite a lot
   - Yes, sometimes
   - No, not much
   - No, not at all

*6. Things have been getting on top of me
   - Yes, most of the time I haven't been able to cope at all
   - Yes, sometimes I haven't been coping as well as usual
   - No, most of the time I have coped quite well
   - No, have been coping as well as ever

*7. I have been so unhappy that I have had difficulty sleeping
   - Yes, most of the time
   - Yes, sometimes
   - Not very often
   - No, not at all

*8. I have felt sad or miserable
   - Yes, most of the time
   - Yes, quite often
   - Not very often
   - No, not at all

*9 I have been so unhappy that I have been crying
   - Yes, most of the time
   - Yes, quite often
   - Only occasionally
   - No, never

*10. The thought of harming myself has occurred to me
   - Yes, quite often
   - Sometimes
   - Hardly ever
   - Never

APPENDIX C
MULTIDIMENSIONAL ACCULTURATIVE STRESS INVENTORY (MASI)

Below is a list of situations that as an Arab-American you may have experienced. Read each item carefully and first decide whether or not you have experienced that situation during the past 3 months. If you have experienced the situation during the past 3 months, circle YES. Then circle the number that best represents HOW STRESSFUL the situation has been for you. If you have not experienced the situation during the past 3 months, circle NO, and go to the next item.

1. I have a hard time understanding others when they speak English. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #2.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

2. I have a hard time understanding others when they speak Arabic. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #3.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

3. I feel pressure to learn Arabic. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #4.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***

Stressful ***Stressful*** ***Stressful*** ***Stressful*** ***Stressful***

4. It bothers me that I speak English with an accent. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #5.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

5. Since I don't speak English well, people have treated me rudely or unfairly. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #6.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

6. I have been discriminated against because I have difficulty speaking English. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #7.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

7. I don't speak English or don't speak it well. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #8.

1	***2***	***3***	***4***	***5***

Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

8. I don't speak Arabic or don't speak it well. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #9.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

9. I feel pressure to learn English. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #10.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

10. I feel uncomfortable being around people who only speak English. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #11.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

11. I feel uncomfortable being around people who only speak Arabic. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #12.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

12. It bothers me when people assume that I speak Arabic. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #13.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

13. Since I don't speak Arabic well, people have treated me rudely or unfairly. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #14.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

14. I have been discriminated against because I have difficulty speaking Arabic. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #15.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

15. It bothers me when people pressure me to assimilate to the American ways of doing things.

YES NO

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #16.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

16. It bothers me when people don't respect my Arab values (e.g., family). ***YES NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #17.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

17. Because of my cultural background, I have a hard time fitting in with Americans. ***YES NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #18.

1	***2***	***3***	***4***	***5***
Not At All Stressful	***A Little Stressful***	***Somewhat Stressful***	***Very Stressful***	***Extremely Stressful***

18. I don't feel accepted by Americans. ***YES NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #19.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***

Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

19. I have had conflicts with others because I prefer American customs (e.g., celebrating Halloween, Thanksgiving) over Arab ones. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #20.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

20. People look down upon me if I practice Arab customs. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #21.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

21. People look down upon me if I practice American customs. ***YES*** ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #22.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

22. I feel uncomfortable when I have to choose between Arab and American ways of doing things.

YES ***NO***

If you answered YES, how stressful has this situation been during the past 3 months?

If you answered NO, go to #23.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

23. I feel uncomfortable because my family does not know American ways of doing things. ***YES NO***

If you answered YES, how stressful has this situation been <u>during the past 3 months</u>?

If you answered NO, go to #24.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

24. I feel uncomfortable when others expect me to know American ways of doing things. ***YES NO***

If you answered YES, how stressful has this situation been <u>during the past 3 months</u>?

If you answered NO, go to #25.

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stressful***

25. I feel uncomfortable when others expect me to know Arab ways of doing things. ***YES NO***

If you answered YES, how stressful has this situation been <u>during the past 3 months</u>?

1	***2***	***3***	***4***	***5***
Not At All	***A Little***	***Somewhat***	***Very***	***Extremely***
Stressful	***Stressful***	***Stressful***	***Stressful***	***Stress***

APPENDIX D
MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT (MSPSS) (MOTHER)

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the 1 if you disagree

Circle the 2 if you are neutral

Circle the 3 if you agree

	Disagree	Neutral	Agree
1. My husband is around when I am in need.	1	2	3
2. I can share my joys and sorrows with my husband.	1	2	3
3. My family (other than husband) really tries to help me.	1	2	3
4. I get the emotional help and support I need from my family (other than husband)	1	2	3
5. My husband is a real source of comfort to me.	1	2	3
6. My friends really try to help me.	1	2	3
7. I can count on my friends when things go wrong.	1	2	3
8. I can talk about my problems with my family (other than husband)	1	2	3
9. I have friends with whom I can share my joys and sorrows.	1	2	3
10. My husband cares about my feelings.	1	2	3
11. My family (other than husband) is willing to help me make decisions.	1	2	3
12. I can talk about my problems with my friends.	1	2	3

APPENDIX E
POSTPARTUM BONDING QUESTIONNAIRE

Please indicate how often the following are true for you. There are no 'right' or 'wrong' answers.

Choose the answer, which seems right in your recent experience.

Statment	Always	Very often	Quite often	Sometimes	Rarely	Never
1- I feel close to my baby?						
2- I wish the old days when I had no baby come back						
3- I feel distant from my baby						
4- I love to cuddle my baby						
7- My baby winds me up						
8- I love my baby to bits						
9- I feel happy when my baby smiles or laughs						
10- My baby irritates me						
11- I enjoy playing with my baby						
13- I feel as trapped as a mother						
14- I feel angry with my baby						
15- I resent my baby						
16- My baby is the most beautiful baby in the world						
19- My baby makes me anxious						
21- My baby annoys me						
25- My baby is easily comforted						

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ABSTRACT

THE EFFECTS OF POSTPARTUM DEPRESSION, ACCULTRATIVE STRESS, AND SOCIAL SUPPORT ON MOTHER-INFANT BONDING AMONG U.S. IMMIGRANT WOMEN OF ARABIC DESCENT

by

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Purpose and Background/Significance: The transition from "woman" to "mother" is a significant life event and can be extremely stressful when merged with the transition from 'local' to 'immigrant'. The development of mother-infant bonding is considered a critical process in the postpartum period. Immigrant women have higher rates of PPD compared with women in their native countries. Among the general population, PPD is strongly associated with lower quality mother-infant bonding. Social support can play a central role in lowering the levels of PPD, and may contribute to higher quality of mother-infant bonding. Moreover, limited data suggests that acculturative stress is found to be related to an increased PPD among immigrant women. However, no published studies have examined the predictors of mother-infant bonding among U.S. immigrant women of Arabic descent. Additionally, no published research has examined the relationships of PPD, acculturative stress, social support and mother-infant bonding among U.S. immigrant women of Arabic descent. Therefore, the purpose of this study was to examine the effect of PPD, acculturative stress, and social support on mother-infant bonding among U.S. immigrant women of Arabic descent.

Theoretical/ conceptual framework: This study was guided by Roy's Adaptation Model. The model concepts of RAM utilized in this study include the focal and contextual environmental stimuli, self-concept as an adaptive mode, and adaptation. In the present study, the main concepts were acculturative stress, social support, PPD, and mother-infant bonding. The focal stimulus is childbirth and the contextual stimuli is acculturative stress and social support. PPD is considered a self-concept adaptive mode. Finally, adaptation which is mother-infant bonding.

Method: This study utilized a non-experimental, cross-sectional, correlational, descriptive design. A convenience sample of 95 postpartum U.S. immigrant women of Arabic descent was enrolled in this study. Participants completed five instruments including: (1) the Edinburgh Postnatal Depression Scale (EPDS), (2) the Multidimensional Acculturative Stress Inventory (MASI), (3) the Multidimensional Scale of Perceived Social Support (MSPSS), (4) the Postpartum Bonding Questionnaire (PBQ), and (5) a sociodemographic tool developed by the investigator. The data were analyzed using correlational and multiple linear regression analyses.

Results: Women ranged in age from 20-43 years with mean age = 30 years and were between 1-12 months postpartum with mean 5.5 months postpartum. The average length of stay in the U. S. ranged from one to 31 years (mean = 10.19 years, SD= 7.18). The participant's mean age at the time of immigration to U.S was 19.6 years (SD= 9.18). The average woman completed a high school education (mean=12 years, SD=3.5). Eighty percent of the women preferred to be interviewed in Arabic, and (91%) had an annual family income of <$40,000, and 90.5% were not employed.

Aim 1: There was a negative relationship among PPD and mother-infant bonding. PPD was significantly correlated with mother-infant bonding, that is higher levels of PPD symptoms related to poor mother-infant bonding (r=.55, p= .000). Social support was significantly related to mother-

infant bonding (r= -.29, p= .005), and acculturative stress was significantly correlated with mother-infant bonding, with higher levels of acculturative stress being related to poor mother-infant bonding (r=.37, p= .000).

Aim 2: Multiple linear regression analyses were used to identify the effect of acculturative stress on the relationship between PPD and mother-infant bonding. A series of linear models were used to examine the relationship between (a) PPD and acculturative stress, (b) PPD and mother infant bonding, and (c) acculturative stress and PPD on mother-infant bonding. PPD was significantly associated with acculturative stress (β= .32, t= 3.27, p= .002), and significantly associated with mother-infant bonding (β= .55, t= 6.28, p= .000). When examining the relationships among acculturative stress, PPD, and mother-infant bonding, both PPD (β= 45, t= 5.33, p= .000), and acculturative stress were statistically significant (β= .22, t= -2.41, p= .018). Therefore, acculturative stress mediates PPD and mother-infant bonding.

Aim 3: Multiple regression equation was conducted to test the interaction between social support, PPD and mother-infant bonding. PPD, social support, and the interaction between PPD and social support were not statistically significant. Therefore, social support did not moderate PPD and mother-infant bonding

Conclusions: PPD, acculturative stress, and social support were associated with mother-infant bonding among U.S. immigrant women of Arabic descent. Social support did not moderate the association between PPD and mother-infant bonding, while acculturative stress mediated the association between PPD and mother-infant bonding. Future studies with larger samples in different settings are needed to provide validity to the results of this study and to provide a better understanding of the factors that might impact mother-infant bonding among immigrant women of Arab descent. Longitudinal studies and using observational methods are

recommended to be used in assessing the mother-infant bonding because they provide objective details of the relationship, as well as, using a diagnostic assessment for measuring PPD. Nurses and other health care providers should be aware of life stressors including acculturative stress that may influence the mother-infant bonding among U.S. immigrant women of Arabic descent. Therefore, is screening those women prenatally for acculturative stress, depression, and bonding are needed

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