**Examining Mothers' Mental Well-being Using the Subscales of the Edinburgh Postnatal Depression Scale**

by

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## ABSTRACT

Mothers who experience alterations in their mental well-being following childbirth are commonly labelled as having postnatal depression (PND); however, research suggests these alterations may also stem from feelings of anxiety or anhedonia. I re-examined data for 54 cases from a community-based sample of mothers who were labelled moderately depressed based on their total scores on the Edinburg Postnatal Depression Scale (EPDS). Using the EPDS subscales, analyses was conducted to determine if alterations in mental well-being reflected feelings of depression, anxiety, or anhedonia. Further analyses were conducted to examine how subscales scores were affected by mothers' perceptions of social support and their parity. Findings suggest mothers scored higher on the anxiety subscale than the depression subscale. Using the Social Provision Scale, mothers' mental well-being was affected by perceptions of reassurance of worth, opportunity of nurturance, and reliable alliances. Results suggest EPDS subscales offer a more detailed assessment of mothers' mental well-being.



*Keywords:* becoming a mother, postnatal, social support, parity, depression, anxiety, anhedonia

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## Chapter I: Introduction and Background

In Western societies becoming a mother can be a challenging process as women are typically expected to be the primary caregiver for the newborn. It is also commonly expected that women will continue to meet family and other commitments while taking on the demands and responsibilities of caring for their newborn. Attempting to satisfy the multiple demands associated with becoming a mother may impact the mental well-being of many women. During the first- or second-weeks following childbirth, it has been estimated that approximately 80% of mothers report having the "baby blues" which may involve feeling worried, unhappy, or fatigued (National Institute of Mental Health, n.d.). Such feelings are typically attributed to hormonal changes and resolve without intervention. However, for some mothers, the "baby blues" do not resolve and their mental well-being may further deteriorate. Other mothers may appear to be coping well shortly after childbirth but gradually experience a deterioration in their mental well-being. Such deteriorations in the mental well-being of mothers during the postnatal[1] period is commonly labelled as postnatal depression. Postnatal depression is defined as a mood disorder that begins after the baby is born and is commonly associated with feelings of extreme sadness, hopelessness, and overwhelming anxiety that interfere with daily activities including mothers' ability to care for the newborn, others, and self (National Institute of Mental Health, n.d.; O'Hara & Wisner, 2014). Interestingly, this

[1] Postnatal refers to topics related to both the mother and child (World Health Organization, 2010). In this document, postnatal period refers to the time after birth and up to 2 years following.

definition suggests the alteration in mental well-being may not be solely based on depressive symptoms but may also involve feelings of anxiety which can be debilitating in nature. In a recent survey involving 7,085 Canadian mothers who were between 5 and 13 months postnatal, Statistics Canada (2019) reported that 23% of respondents had feelings consistent with postnatal depression (PND; scores ≥ 7 as measured by 5-item version of Edinburgh Postnatal Depression Scale) or anxiety disorder (scores ≥ 3 for two questions from Generalized Anxiety Disorder scale). The estimated rates for Atlantic Canada ranged from 24% in New Brunswick to 31% in Nova Scotia. Despite these high rates, routine screening has not been implemented which may result in the under-identification of women who might benefit from early intervention.

During my 10 years working as a registered nurse in the areas of maternal-child and women's health, I frequently encountered mothers who exhibited signs and symptoms that suggested they may be experiencing an alteration in their mental well-being following the birth of their child. Further assessment of the mental status of some of these mothers involved having them complete the Edinburgh Postnatal Depression Scale (EPDS).

**The Edinburgh Postnatal Depression Scale**

The EPDS was developed by Cox, Holden, and Sagovsky in 1987 to measure the severity of depressive symptoms experienced by mothers. Cox (2019) emphasizes the EPDS should not be used as a diagnostic test but rather as a tool to screen for symptoms suggestive of an alteration in mothers' mental well-being. The scale consists of 10-items which are answered on a 4-point rating scale (scored 0 to 3) to measure the frequency of the symptom experience during the last 7 days. Responses to the items are summed to

create a total score which can range from 0 to 30 with higher scores indicating greater severity of depressive symptoms. It has been reported that the scale can be completed in approximately 2 to 5 minutes (Cox et al., 1987; Drake et al., 2014; Gibson et al., 2009) and has a reading level at or below Grade 6 (Cox et al., 2014). The EPDS has been translated into over 60 languages and has been used extensively in research and clinical practice both nationally and internationally (Cox, 2019; Cox et al., 2014). A search of the Cumulative Index of Nursing and Allied Health Literature (CINAHL) database using the keyword "Edinburgh Postnatal Depression Scale" yielded 2,287 citations (search completed September 10, 2019). Considerable research has been conducted to demonstrate the reliability and validity of the EPDS. Kernot et al. (2015) examined the stability of total scores with a sample of 118 community participants who were less than 1 year post delivery. They reported a 2-day test-retest reliability of .92 suggesting a high degree of correlation between the two measures. Items of the EPDS have also exhibited an acceptable degree of internal consistency with Cronbach alphas ranging from .79 to .88 when the scale is completed using a pen and paper format or online (Bassi et al., 2017; Leahy-Warren et al., 2011). Investigation of the validity of the EPDS have tended to focus on the sensitivity, specificity, and predictive ability of various cut-off scores to screen for minor or major depression rather than focusing on the total score (See systematic review Gibson et al., 2009). However in a study involving 309 women with unsettled infants up to 12 months of age, Phillips et al. (2009) examined the concurrent validity by comparing total scores on the EPDS with scores on the Beck Depression Inventory II (BDI-II) and found a strong positive correlation (Pearson correlation coefficient $r = .72$).

Although Cox describes the EPDS as a unidimensional scale (Cox et al., 1987; 2014), others have examined the factor structure of the EPDS. Based on their examination of 31 studies dating from 1992 to 2015, Coates et al. (2017) concluded that findings regarding the factor structure of the EPDS were inconclusive. Coates et al. (2017) proceeded to conduct a secondary analysis of data from a population-based study involving over 11,000 mothers who completed the EPDS at least once prenatally (at 18 or 32 weeks gestation) and again postnatally (at 8 weeks or 8 months). Using exploratory factor analysis followed by confirmatory factor analysis, Coates et al. (2017) provided further evidence to support a three-factor solution with four items loading on a factor that they labelled depression, another four items loading on a factor labelled anxiety, and the remaining two items forming a factor labelled anhedonia (i.e., inability to feel pleasure). Two of the three factors demonstrated acceptable internal consistency with Cronbach alphas greater than .70 (alpha for anhedonia was not reported).

Examining the factors (subscales) formed by the items of the EPDS may provide a more comprehensive understanding of the alteration in mothers' mental well-being. It is important to differentiate depression, anxiety, and anhedonia because the treatment plan should be tailored to address the specific symptom experience.

**Social Support as a Protective Barrier**

Although Western society depicts becoming a mother as a happy and pleasurable experience, becoming a mother can evoke negative emotions such as loneliness, self-doubt, and loss (Jones et al., 2014; Staneva et al., 2015). Research suggests that social support may act as a protective barrier against negative emotions for mothers during the postnatal period because the physical or emotional assistance offered by others fosters a

sense of belonging and feelings of being cared for (Canadian Mental Health Association, 2018; Fahey & Shenassa, 2013; Milgrom et al., 2019; Negron et al., 2013; Razurel & Kaiser, 2015). Perceived support is the mothers' expectations of having resources available to help with meeting the demands of caring for their newborn while actual support is the mothers' report that those resources were received (Razurel & Kaiser, 2015). It has been suggested that mothers' perceptions of available support can be as influential for their sense of mental well-being as the support actually received (Fahey & Shenassa, 2013). Social support can be further categorized into structural (source) and functional (type) dimensions of support (Leahy-Warren et al., 2011). Sources of support are typically examined in terms of formal (e.g., health care professionals) or informal (e.g., spouse, family, friends) networks. Fellmeth et al. (2017) identified the most common types of support as instrumental, emotional, and informational. Mothers may require different types of social support during the postnatal period. Some mothers may require more instrumental support in terms of having someone who can help with the 'hands on' care of the newborn or completion of household chores. Other mothers may need emotional support that provides reassurance, affirmation, or encouragement to help improve confidence in their mothering behaviors. While others may benefit from informational support which may include advice or guidance about how to perform or complete tasks when caring for their newborn (Fahey & Shenassa, 2013). Mothers who perceive inadequacies in the social support available to them may be at risk for experiencing alterations in their mental well-being.

## Purpose of Study

The purpose of my thesis research was to examine the potential utility of the EPDS subscales. I re-examined data from a one-group, repeated measures study investigating the effect of telephone-based peer support on the mental well-being of mothers between 4 and 24 months following delivery who were labelled as moderately depressed (Letourneau et al., 2015). I examined the subscales of the EPDS to determine if the alterations in the mental well-being of these mothers reflect feelings of depression, or of anxiety or anhedonia. Analyses were conducted to examine if scores on these subscales were affected by the mothers' perceptions of social support and their parity at the time of enrollment into the study. Findings from this investigation offer additional insight into the mental well-being of mothers during the postnatal period and how health care professionals could better assist women throughout the process of becoming a mother.

# Chapter II: Review of the Literature

## Theoretical Framework

The theoretical framework that guided the development of this research study is Mercer's Theory of Becoming a Mother (Mercer, 2004). Mercer describes becoming a mother not as one-major event but as a process that occurs over time. How mothers adapt, function, and cope in this new role is dependent on a variety of maternal, infant, and environmental factors (Mercer, 1981, 2004). An environmental factor that has been identified as playing a key role in the ongoing well-being of mothers during the postnatal period is social support. In this chapter, I review research exploring the effects of mothers' perception of social support on their mental well-being, specifically looking at symptoms of depression, anxiety, and anhedonia, during the postnatal period.

## Search Strategy

To retrieve relevant research a search of the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database was conducted between May and June 2020 using a combination of keywords and subject headings. The three key concepts for my research study are postnatal, mental well-being, and social support. A keyword search was conducted using synonyms and alternate spellings for each concept. Truncation was used to retrieve variations of the ending of a word (e.g., well*) and phrases were enclosed in quotation marks (e.g., "social support"). Next the CINAHL database was searched for relevant subject headings for each key concept. The keyword and subject heading searches for each key concept were then combined using the Boolean operator "OR". Finally, the searches for each key concept were combined using the Boolean operator "AND" (Refer to Table 1).

**Table 1**

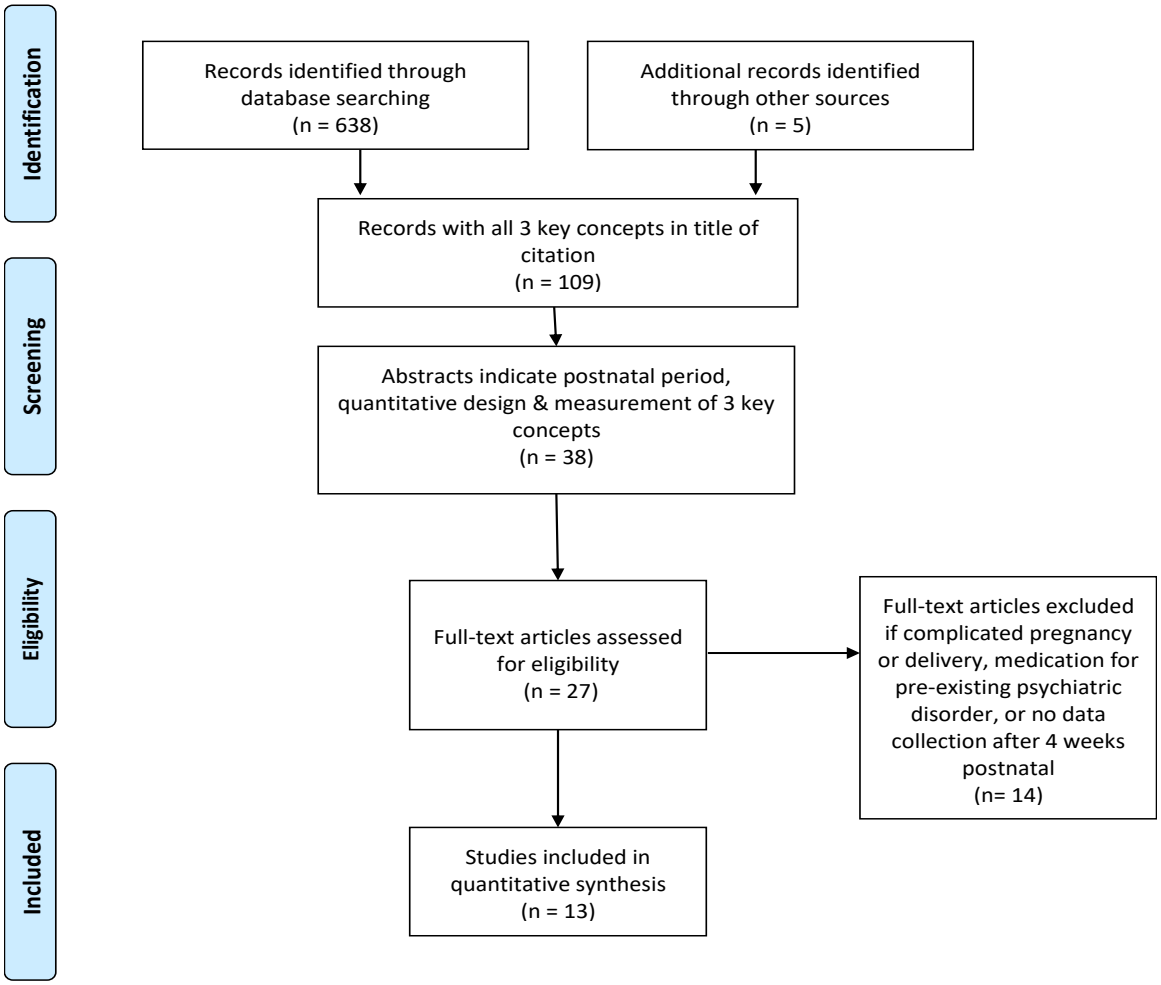
*Key Words and Subject Headings Searched in the CINAHL Database*

| Key Concepts | | |
|---|---|---|
| Postpartum | Mental Well-being | Social Support |
| Synonyms, Alternate Spellings, & Truncations | | |
| *postnatal, postpartum, perinatal, puerperal,* and "*after birth"* | *"psychological well*", "mental well*", "psychological health",* and *"mental health"* | *"social support", psychosocial, "social network"* |
| Subject Heading | | |
| *Postnatal Period* | *Psychological Well-being* | *Support, psychosocial* |

A total of 638 citations were retrieved. The titles of the retrieved citations were examined and only those that included terms for postnatal, social support, and mental well-being measured by either depression, anxiety, or anhedonia were retained. Retrieved materials were also limited to those written in English. During the development of this research study, only citations for quantitative research studies were examined. Studies involving the implementation of a social support intervention were examined to see if measures of social support and depression/anxiety/anhedonia were collected prior to the intervention however no studies were found. Studies were excluded if data collection only occurred in the prenatal period or within 4 weeks following the birth of the infant. Studies were also excluded if the sample was limited to mothers

taking medication for a psychiatric disorder (e.g., Schizophrenia, bipolar) or mothers who experienced complications during pregnancy or childbirth. Nine quantitative studies and five systematic reviews were retained. To determine if any relevant primary studies were overlooked in the search strategy, the reference list of the systematic reviews were examined. Four additional studies were identified. In total, 13 quantitative studies were retained for synthesis (see Table 2).

**Figure 1**
*PRISMA Flow Diagram for Process of Citation Retrieval*



**Synthesis of Quantitative Research Studies**

The 13 retrieved citations included 11 articles, one thesis, and a dissertation. The years of publication ranged from 2001 to 2019 with six published within the last 10 years (Alhasanat-Khalil et al., 2018; Mohammad et al., 2019; Racine et al., 2019; Razurel & Kaiser, 2015; Razurel et al., 2017; Schwab-Reese et al., 2017). Five of the 13 studies were conducted in North America (Alhasanat-Khalil et al., 2018; Fan, 2007; Racine et al., 2019; Schwab-Reese et al., 2017; Surkan et al., 2006); however these studies exhibit ethnic diversity with the recruitment of not only Caucasian mothers but also those of Arabic, African American, Hispanic, or Chinese descent. The remaining eight studies were conducted in Jordan (Mohammad et al., 2019), China (Gao et al., 2009; Leung, 2001), Pakistan (Rahman et al., 2003), Turkey (Ege et al., 2008), Switzerland (Razurel & Kaiser, 2015; Razurel et al., 2017), and the Republic of Ireland (Leahy-Warren et al., 2011).

Of the 13 studies, seven were cross-sectional and six were longitudinal. Of the cross-sectional studies, three were descriptive (Ege et al., 2008; Gao et al., 2009; Mohammad et al., 2019), three were correlational (Alhasanat-Khalil et al., 2018; Leahy-Warren et al., 2011; Surkan et al., 2006), and one was comparative (Fan, 2007). The six longitudinal studies involved correlational analyses (Leung, 2001; Racine et al., 2019; Rahman et al., 2003; Razurel & Kaiser, 2015; Razurel et al., 2017; Schwab-Reese et al., 2017). Out of the thirteen studies, two of the studies involved the development of instruments to measure social support (Leahy-Warren et al., 2011; Razurel & Kaiser, 2015). The number of participants in the various studies ranged from 115 to 3,388 mothers (Median = 334). Participant recruitment primarily occurred in primary health

centers (n = 7; Alhasanat-Khalil et al., 2018; Ege et al., 2008; Fan, 2007; Gao et al., 2009; Mohammad et al., 2019; Racine et al., 2019; Surkan et al., 2006) or hospitals (n = 5; Leahy-Warren et al., 2011; Leung, 2001; Razurel & Kaiser, 2015; Razurel et al., 2017; Schwab-Reese et al., 2017). All studies involved urban locations except for the study conducted by Rahman et al. (2003) which specifically targeted mothers in rural communities. Five studies recruited only primiparous women (Fan, 2007; Gao et al., 2009; Leahy-Warren et al., 2011; Razurel & Kaiser, 2015; Razurel et al., 2017) with the remaining eight studies recruiting both primiparous and multiparous mothers. No study solely recruited multiparous mothers. No study specifically recruited mothers with symptoms of depression, anxiety, or anhedonia.

Considerable variability is evident in the data collection period for the studies. Three of the cross-sectional studies only recruited mothers during the early postnatal period: 6 weeks (Leahy-Warren et al., 2011) and 6 to 8 weeks postnatal (Gao et al., 2009; Mohammad et al., 2019). The remaining cross-sectional studies recruited mothers for up to 2 years following the birth of their newborn. For example, Surkan et al. (2006) recruited mothers from 6 to 96 weeks. Only one longitudinal study collected data from mothers solely in the postnatal period (Schwab-Reese et al., 2017). The remaining five longitudinal studies recruited mothers prenatally and followed them during the postnatal period. For example, Racine et al. (2019) recruited mothers earlier than 25 weeks prenatally and followed them up to 48 weeks postnatally.

The mental well-being of mothers during the postnatal period was measured in different ways in the various studies. Eight of the thirteen studies examined only depressive symptoms (Alhasanat-Khalil et al., 2018; Ege et al., 2008; Fan, 2007; Gao et

al., 2009; Leahy-Warren et al., 2011; Leung, 2001; Rahman et al., 2003; Surkan et al., 2006), two studies examined only anxiety (Mohammad et al. 2019; Racine et al. 2019), and three studies examined both depression and anxiety (Razurel & Kaiser, 2015; Razurel et al., 2017; Schwab-Reese et al. 2017). No studies reported specifically on symptoms of anhedonia. The EPDS was used in 8 of the 11 studies to measure depressive symptoms (Alhasanat-Khalil et al., 2018; Ege et al., 2008; Fan, 2007; Gao et al., 2009; Leahy-Warren et al., 2011; Leung, 2001; Razurel & Kaiser, 2015; Razurel et al., 2017). Three of these studies used the original English version (Leahy-Warren et al., 2011; Razurel & Kaiser, 2015; Razurel et al., 2017) and the remaining five used versions in other languages. No study reported on the EPDS subscales of depression, anxiety, and anhedonia.

Differences were evident in the conceptualization of social support across the studies. Of the thirteen studies, eight examined the perception of available social support with four measuring only the source (Alhasanat-Khalil et al., 2018; Ege et al., 2008; Gao et al., 2009; Racine et al., 2019), two measuring the types (Fan, 2008; Schwab-Reese et al., 2017), and two measuring both the source and types of perceived availability of support (Razurel & Kaiser, 2015; Razurel et al., 2017). The remaining five studies examined the actual support received by mothers with three studies measuring the source (Mohammad et al., 2019; Rahman et al., 2003; Surkan et al., 2006) and two measuring both the sources and types (Leahy-Warren et al., 2011; Leung, 2001). Some researchers operationalized social support in terms of its quality by measuring mothers' satisfaction with perceived support (Racine et al., 2019; Razurel & Kaiser, 2015; Razurel et al., 2017) while others focused on the quantity of support by having mothers

identify the frequency or number of supports available (Leung, 2001; Sukan et al., 2006). Across the thirteen studies, eleven different social support instruments were used with two studies focusing on instrument development. The instrument developed by Razurel and Kaiser (2015) measured the mothers' satisfaction with four types of social support (emotional, informative, esteem, material) from five different sources (woman's mother, spouse, family, friends, and professionals). Leahy-Warren et al. (2011) developed an instrument that operationalized social support in terms of structural (sources, informal and formal) and functional (informational, instrumental, emotional, and appraisal) support.

## Association Between Concepts

### *Depression and Social Support*

Of the 13 studies, 11 examined the association between depression and social support (Alhasanat-Khalil et al., 2018; Ege et al., 2008; Fan, 2007; Gao et al., 2009; Leahy-Warren et al., 2011; Leung, 2001; Rahman et al., 2003; Razurel & Kaiser, 2015; Razurel et al., 2017; Schwab-Reese et al., 2017; Surkan et al., 2006). All 11 studies reported this association was statistically significant and inverse (negative) indicating mothers who reported higher levels of support tended to report lower levels of depressive symptoms. Three studies reported the strength of the association as moderate ($r$ = -.47 to $r$ = -.68; Alhasanat-Khalil et al., 2018; Gao et al., 2009; Razurel & Kaiser, 2015) and three reported the strength as weak ($r$ = -.13 to $r$ = -.36; Ege et al., 2008; Fan, 2007; Leung, 2001). Mixed findings were reported by Leahy-Warren et al. (2011) who reported a weak association between depression and structural (source) support but moderate between depression and total functional (type) support. They described the

strength of associations between depression and four types of social support as moderate for emotional and appraisal but weak for informational and instrumental. The associations between depression and social support were examined in terms of the likelihood of mothers experiencing depressive symptoms in two studies (Rahman et al., 2003; Schwab-Reese et al., 2017). Both studies reported a negative association, Rahman et al. (2003) reported that mothers who reported more sources of support were less likely to experience symptoms of depression (OR 0.6, 95% CI 0.4, 0.8) while Schwab-Reese et al. (2017) reported that mothers who perceived the types of support (affectionate, emotional/informational, positive interaction) as better were less likely to experience depressive symptoms (RR 0.56, 95% CI 0.44, 0.71). In a longitudinal study, Razurel et al. (2017) reported social support moderated the relationship between stress and depression. It was difficult to interpret findings from the study by Surkan et al. (2006) as they reported negative associations but with betas greater than 1 (i.e., source of support $B$ = -1.8, number of supports $B$ = -9.4) which could suggest the reporting of the unstandardized regression coefficients (b-weights) or a problem with collinearity among the predictor variables (Polit, 2010).

***Anxiety and Social Support***

Of the 13 studies, five examined the association between anxiety and social support (Mohammad et al., 2019; Racine et al., 2019; Razurel & Kaiser, 2015; Razurel et al., 2017; Schwab-Reese et al., 2017). Three of the studies reported statistically significant and inverse (negative) associations indicating that mothers who reported higher levels of social support tended to report lower levels of anxiety ($r$ = -.65, $r$ = -.48, RR 0.61, 95% CI 0.41, 0.89; Mohammad et al., 2019; Razurel & Kaiser, 2015; Schwab-

Reese et al., 2017). The association was reported as not statistically significant by Racine et al. (2019) and Razurel et al. (2017).

***Depression or Anxiety and Parity***

Only two studies examined the association between depression and parity (Rahman et al., 2003; Surkan et al., 2006) and one examined the association between anxiety and parity (Mohammad et al., 2019). A statistically significant positive association was reported in these studies indicating mothers with other children tended to report poorer mental status. Rahman et al. (2003) reported mothers who had two or more female children under 7 years of age were more likely to report depressive symptoms (OR 1.8, 95% Cl 1.3 to 2.4). Surkan et al. (2006) also reported the association as positive and statistically significant, but the beta was greater than 1 (i.e., $B = 1.7$). In the one study that examined the association between anxiety and number of children the strength of the association was reported to be very weak but statistically significant ($r = .14$; Mohammad et al., 2019).

In summary, the studies examined provide evidence that social support affects the mothers' mental status during the postnatal period, at least in terms of depressive symptoms. There is less evidence to support an association between mothers' anxiety and their social support. One possible explanation is that the tools used to measure anxiety are not specific to postnatal anxiety. It is also possible that the tools used to measure postnatal depression capture more than depressive symptoms. Although prior research has suggested the EPDS is multidimensional comprised of three factors (depression, anxiety, anhedonia) it continues to be primarily used in research and practice as a unidimensional measure.

**Table 2**

*Review of Studies Reporting Associations between Mental Well-being Measured by Level of Depression, Anxiety, or Anhedonia and Social Support in Postnatal Mothers with Uncomplicated Pregnancy and Delivery*

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| Alhasanat-Khalil et al., (2018)<br><br>USA | Cross-sectional<br><br>1 to 12 months postnatal | N=115<br><br>Primip/Multip<br><br>Immigrant women of Arabic descent<br><br>Clinics | Edinburgh Postnatal Depression Scale (EPDS)<br><br>10-items measuring depressive symptoms<br><br>Arabic<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores not reported | Multidimensional Scale of Perceived Social Support Arab women (MSPSS-AW)<br><br>12-items measuring sources of perceived support from family, friends, spouse<br><br>Higher score = ↑ perceived support<br><br>Total possible scores 12 – 36; range of study scores not reported | Moderate -ve assoc social support and depressive symptoms ($r$ = -.49)<br><br>Regression analysis: 47% of variance for postnatal depression was explained by social support, maternal years of educ., gest. age at birth, & antenatal anxiety |
| Ege et al. (2008)<br><br>Turkey | Cross-sectional<br><br>6 to 48 weeks postnatal<br><br>Group 1 = 6 - 24 weeks | N= 364<br><br>Group 1 (n=234)<br>Group 2 (n=130)<br><br>Primip/Multip | EPDS<br><br>10-items measuring depressive symptoms<br><br>Turkish<br><br>Higher scores = ↑ depression | Multidimensional Scale of Perceived Social Support (MSPSS)<br><br>12-items measuring sources of perceived social support from family, friends, & significant others | Weak -ve assoc EPDS and MSPSS ($r$ = -.39)<br><br>Prevalence of depression (EPDS ≥13)<br>Group 1= 29.9% (early postnatal)<br>Group 2 = 39.2% (late postnatal) |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| | Group 2 = 25 - 48 weeks | Married women<br><br>Primary Healthcare Center | Higher scores = ↑ perceived support<br><br>Total possible scores 0 – 30; range of study scores 3 – 24 | Total possible scores not reported; range of study scores 12 – 84 | |
| Fan (2008)<br><br>USA and Taiwan | Dissertation<br><br>Comparative study<br><br>1to 3 months postnatal | N=162<br>n=81 (immigrant)<br>n=81 (non-immigrant)<br><br>Primiparous<br><br>Married Chinese women who immigrated to the USA from Taiwan & Chinese women who stayed in Taiwan | EPDS<br><br>10-items measuring depressive symptoms<br><br>Chinese<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores not reported | Interpersonal Support Evaluation List (ISEL)<br><br>40-items measuring perceived availability of social support<br><br>4 types of social support tangible, appraisal, self-esteem & belonging<br><br>Higher scores = ↑ perceived support<br><br>Total possible scores not reported; range of study scores not reported | Weak -ve assoc EPDS and ISEL ($r$ = -.36)<br><br>Multiple regression: Immigrant group 31% of variance in EPDS score explained by social culture predictors ILRM (β = .02), ISEL ($\beta$ = -.19), & DAS ($\beta$ =-.46)<br><br>Non-immigrant group 25% of variance in EPDS scores explained by social-cultural predictors ILRM ($\beta$ = -.19), ISEL ($\beta$ =-.22), & DAS ($\beta$ =-.30) |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| Gao et al. (2009)<br><br>China | Cross-sectional<br><br>6 to 8 weeks postnatal | N= 130<br><br>Primiparous<br><br>Mothers and Fathers<br>Outpatient Postpartum Clinic | EPDS<br><br>10-items measuring depressive symptoms<br><br>Chinese<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores 3 – 23 | Social Support Rating Scale (SSRS)<br><br>10-items measuring sources of perceived support and support-seeking behaviours<br><br>Higher scores = ↑ perceived support<br><br>Total possible scores not reported; range of study scores not reported | Moderate -ve assoc maternal EPDS and SSRS (*r* = -.68)<br><br>Weak +ve assoc maternal EPDS and partners EPDS (*r* =.37) |
| Leahy-Warren et al., (2011)<br><br>Republic of Ireland | Instrument Development<br><br>Descriptive Correlational<br><br>6 weeks postnatal | N=410<br><br>Primiparous<br><br>Caucasian women<br><br>Large Maternity Unit | EPDS<br><br>10-items measuring depressive symptoms<br><br>English<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores not reported | Functional & Structural Social Support Dimensions:<br><br>Structural: 4 sources of social support (health care professionals) & informal (family, friends & significant others)<br><br>Functional: 4 types of social support (informational, | Moderate -ve assoc depression & total functional support (*r* = -.43)<br><br>Weak -ve assoc depression & types of support for informational, instrumental, emotional, & appraisal (*r* = -.29, r= -.33, *r* = -.40, *r* = -.41) |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| | | | | instrumental, emotional, & appraisal)<br><br>22-items measuring the source and types of support<br><br>Higher scores = ↑ support received<br><br>Total possible scores 22 – 88; range of study scores 47 – 88 | Weak -ve assoc depression & informal structural support ($r$ = -.20) |
| Leung (2001)<br><br>China | Thesis<br><br>Longitudinal Prospective Study<br><br>(T1) 36 week gestation<br><br>(T2) 6 weeks postnatal<br><br>(T3) 6 months | (T1) N= 385<br>(T2) n = 289<br>(T3) n = 59<br><br>(T2) n= 53 depressed (EPDS ≥ 13) n= 216 non-depressed (EPDS ≤ 12)<br><br>(T3) n= 32 depressed (EPDS ≥ 13) | EPDS<br><br>10-items measuring depressive symptoms<br><br>Chinese<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores 0 – 27 | Postpartum Support Questionnaire (PSQ)<br><br>34-items measuring 4 types of support emotional, material, informational, & comparison<br><br>Higher scores = ↑ support received | Weak -ve assoc between EPDS and emotional & material support ($r$ = -.15, $r$= -.14)<br><br>Weak -ve assoc between EPDS and spousal & parent support ($r$ = -.22, $r$ = -.13)<br><br>Regression:<br>After controlling for demographic and antenatal characteristics, 11% of |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| | postnatal (participated in interviews 6-7 months after delivery) | n = 27 non-depressed (EPDS≤ 12)<br><br>Primip/Multip<br><br>Chinese women who delivered in hospitals of Hong Kong | | Total possible scores 34 – 238; range of study scores not reported<br><br>Postpartum Social Support Questionnaire (PSSQ)<br><br>50-items measuring source of support by spouse, parents, parent-in-law<br><br>-respondents rate source & extent of support (how often support offered and how often they would like it to occur)<br><br>higher scores = ↑ support received and desired<br><br>Total possible scores 35 – 245; range of study scores not reported | variance in EPDS scores explained by emotional, material, spousal, & parental support |
| Mohammad et al. (2019) | Cross-sectional | N=324<br><br>Primip/Multip | Depression, Anxiety, and Stress Scale (DASS) | Maternity Social Support Scale (MSSS) | Moderate -ve association anxiety & support ($r$ =-.65) |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| Jordan | 6 to 8 weeks postnatal | Jordanian women<br><br>4 health care clinics | 7 -items measuring anxiety only<br><br>Higher scores = ↑ anxiety<br><br>Total possible scores 0 – 21; range of study scores 0 – 21 | 6-items measuring extent and sources of support<br><br>Higher scores = ↑ support received<br><br>Total possible scores 6 – 30;<br>range of study scores 6 – 27 | Weak +ve association anxiety & number of children (*r* =.14)<br><br>Regression: 42.2% of variance in anxiety explained by social support (β= -.57), number of children (β=.11), sex of baby, female (β= .14), and financial difficulty (β= -.10) |
| Racine et al., (2019)<br><br>Canada | Longitudinal Cohort<br><br>Primip/Multip<br><br>Dynamic Structural Equation Modeling<br><br>(T1) <25 wks gestation<br>(T2) 34 to 36 wks gestation<br>(T3) 4 months postnatal | N=3 388<br><br>Laboratory & health care clinics | Spielberger State Anxiety Scale (STAI)<br><br>20-items measuring anxiety<br><br>Between-person or trait-level (stable over time)<br><br>Within-person or state-level (changes over time)<br><br>Higher scores = ↑ anxiety | Perceived Social Support (PSS)<br><br>3- items measuring satisfaction from source of perceived support (partner, family, & friends)<br><br>Higher score = ↑ satisfaction in perceived support<br><br>Total possible scores 3 – 12; range of study scores not reported | Association between anxiety and partner, family, or friend support not statistically significant |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| | (T4) 12 months postnatal | | Total possible scores 20 – 80; range of study scores not reported | | |
| Rahman et al. (2003)<br><br>Pakistan | Longitudinal<br><br>6 weeks before delivery & 10 to 12 weeks postnatal | N=541<br><br>Primip/Multip<br><br>Pakistan Women<br><br>Rural Pakistan | Schedule for Clinical Assessment in Neuropsychiatry (SCAN)<br><br>a semi-structured interview to measure maternal depression<br><br>Range of study scores not reported for instrument | Personal Information Questionnaire (PIQ)<br>A semi-structured instrument used to explore events & difficulties in the previous year (age, education, employment, family structure and composition and social support)<br><br>Measuring the availability of social support received<br><br>Range of study scores not reported for instrument<br>Satisfaction with social support | Depression + ve associated with 2 or more female children < 7 yrs (OR 1.8, 95% CI 1.3, 2.4)<br>Depression -ve assoc with support by extended family (OR 0.6, 95% CI 0.4, 0.8)<br><br>Logistic Regression: statistically significant +ve assoc between depression > 2 female children (OR 3.1, 95% CI 1.7, 5.9, $p < .01$) |
| Razurel & Kaiser, 2015 | Instrument Development | N=176<br><br>Primiparous | EPDS | 20-items measuring 4 types of perceived support (emotional, informative, | Regression analysis: 13.1% of variance in depression explained by satisfaction |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| Switzerland | Longitudinal<br><br>(T1) Last month of pregnancy<br>(T2) 6 weeks postnatal | University Hospital | 10-items measuring depressive symptoms<br><br>English<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores not reported<br><br>Spielberger's Anxiety State-Trait form Y (STAI)<br><br>20-items measuring anxiety<br><br>Higher scores = ↑ anxiety<br><br>Total possible scores 20 – 30; range of study scores not reported | esteem, & material) from 5 sources (woman's mother, spouse, friends, family, professionals)<br><br>Instrument Development<br><br>Higher scores = ↑ perceived support<br><br>Total possible scores 20 – 100; range of study scores not reported | with postnatal support (largest beta for spousal support β = -.37).<br><br>Regression analysis: 3.3% of variance in anxiety explained by satisfaction with postnatal support (largest beta for spousal support β = -.33).<br><br>Moderate -ve assoc with depression (T2) and anxiety (T2) with all types spousal support, but strongest association was informative ($r$ = -.47, $r$ = -.48) |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| Razurel et al., 2017<br><br>Switzerland | Longitudinal<br><br>(T1) Last month of pregnancy<br>(T2) 2 days post-delivery<br>(T3) 6 weeks postnatal | N=235<br><br>Primiparous<br><br>French-speaking women<br><br>University Hospital | EPDS<br><br>10-items measuring depressive symptoms<br><br>English<br><br>Higher scores = ↑ depression<br><br>Total possible scores 0 – 30; range of study scores not reported<br><br>Spielberger's Anxiety State-Trait form Y (STAI) measure anxiety<br><br>20-items measuring anxiety<br><br>Higher scores = ↑ anxiety<br><br>Total possible scores 20 – 80; range of | Satisfaction with social support<br><br>20-items measuring 4 types of perceived support (emotional, informational, esteem, & instrumental) from 5 sources (spouse, mother, family, friends, professionals)<br><br>Instrument previously developed by authors.<br><br>Higher scores = ↑ perceived support<br><br>Total possible scores 20 – 100; range of study scores not reported | 18.6% exhibited depressive symptoms (EPDS>11) postnatally (T3)<br><br>26.6% exhibited anxiety (STAI> 40) postnatally (T3)<br><br>In regression analysis, reported that social support moderated relationship between stress and depression (correlation coefficients and betas for social support not reported) |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| | | | study scores not reported | | |
| Schwab-Reese et al., (2017)<br><br>USA | Longitudinal<br><br>Examine moderating and mediating effects of social support<br><br>(T1) At birth<br>(T2) 3 months postnatal<br>(T3) 6 months postnatal | N= 334<br><br>(T1) n=125<br>(T2) n= 110<br>(T3) n=99<br><br>Primip/Multip<br><br>English-speaking women<br><br>Large Hospital in Iowa | Depression, Anxiety, Stress Scales (DASS-21)<br><br>21-items, 7 for each concept, measuring depressive, anxiety, and stress symptoms<br><br>Higher scores = ↑ negative emotions<br><br>Total possible scores 0 – 21; range of study scores not reported | RAND Medical Outcomes Study Social Support Survey (MOS-SSS)<br><br>19-items measuring 3 types of perceived support (emotional/informational, affectionate, & positive social interaction subscales)<br><br>Higher scores = ↑ perceived support<br><br>Total possible scores 19 – 95; range of study scores not reported | Proportion experiencing only depression ↑ over time (5% T1 →14% T2 →22 % → T3)<br>Proportion experiencing only anxiety ↓ over time (18% T1 → 5% T2 → 3% T3)<br>High mean scores for support over times<br><br>In unadjusted analyses: ↑ social support = ↓ risk of experiencing depressive & anxiety symptoms at T2 (RR .56, 95% Cl 0.44, 0.71; RR .61, 95% Cl 0.41, 0.89). Social support continued to have significant affect at T2 when adjusted for maternal age, educ, after del. mental health symptoms, stress, & social support during the same time period. |

| Source & Country | Study Design | Sample & Setting | Measurement of Depression, Anxiety or Anhedonia | Measurement of Social Support | Reported Associations between Concepts |
|---|---|---|---|---|---|
| Surkan et al. (2006)<br><br>USA | Cross-sectional<br><br>Group 1 = 6 weeks to 6 months postnatal<br>Group 2 = 6 to 12 months postnatal<br>Group 3 = 12 to 18 months postnatal<br>Group 4 = 18 to 24 months postnatal | N= 415<br><br>Group 1 (n= 85)<br>Group 2 (n= 91)<br>Group 3 (n= 117)<br>Group 4 (n= 122)<br><br>Primip/Multip<br><br>Multiethnic sample of African American, Hispanic and White<br><br>Community Health Center | Center for Epidemiologic Studies of Depression Scale (CES-D)<br><br>20-items measure of depressive symptoms<br><br>Higher score = ↑ depression<br><br>Total possible scores not reported; range of study scores not reported | Medical Outcomes Study Social Support Survey (MOS SSS)<br><br>20-items measuring the sources social support and availability of social networks<br><br>Social network categorized into 2 categories 0-1 or 2 or more<br><br>Higher score = ↑ support received<br><br>Total possible scores 0 – 100; range of study scores not reported | No significant assoc varied by race/ethnicity between depression & social support<br><br>Depressive symptoms inversely related to source of social support and social networks (β = -1.8; β = -9.4)<br><br>Statistically significant assoc between higher score on CES-D & number of children under 5yrs (β = 1.7) |

Note: Association (Assoc); Primiparous (Primip); Multiparous (Multip); Interpersonal Support Evaluation List (ISEL); In-Law Relationship Measure (ILRM); Dyadic Adjustment Scale (DAS); Stat (Statistically); +ve (positive); -ve (negative)
*r* (Pearson's correlation coefficient); *B* (beta coefficient); RR (Relative Risk); OR (Odds Ratio); $p < .05$ (p value).
Strength of correlation coefficient (weak = 0 to 0.39; moderate = 0.40 to 0.59; strong = 0.60 to 0.99) the guidelines used for interpretation of Pearson's correlation coefficient by (Dancey & Reidy; 2007; as cited in Akoglu, 2018).

## Chapter III: Methods

The primary goal of this study was to examine the potential utility of the subscales of the EPDS to determine the extent that alterations in mothers' mental well-being reflect feelings of depression, anxiety, or anhedonia. For mothers experiencing alterations in their mental well-being, correctly identifying the source [2] of their symptom experience could offer insight on ways to intervene. The secondary goal was to examine if mothers' mental well-being following delivery is affected by their perceptions of social support and whether they are a first-time mother.

### Research Objectives

The study involved a secondary analysis of pre-existing data and addressed five research objectives:

1. To describe the alterations in mental well-being of mothers who were classified as moderately depressed in terms of their levels of depression, anxiety, and anhedonia.
2. To determine the proportion of mothers who exhibit levels of anxiety or anhedonia that are equal to or greater than their level of depression.
3. To examine the associations between mothers' levels of depression, anxiety, and anhedonia and their perceptions of social support and whether they are a first-time mother.

[2] In this document, source refers to the nature or type of symptoms experienced by mothers that may reflect feelings of depression, anxiety, or anhedonia.

4. To determine the amount of variability in mothers' depression that can be explained by their perceptions of social support and whether they are a first-time mother.
5. To determine the amount of variability in mothers' anxiety that can be explained by their perceptions of social support and whether they are a first-time mother.

**Benefits and Challenges of Secondary Analysis**

There are benefits and challenges associated with conducting secondary analysis. A benefit is the possibility of having access to a larger sample than what might be recruited if a primary study was conducted. The time and costs associated with participant recruitment and data collection are eliminated. For graduate students access to pre-existing data can contribute to more timely completion of their thesis research. However, it is also important to recognize the challenges associated with secondary analysis. Modifications may need to be made to the research questions due to constraints imposed by the variables included in the data file and the level at which the data were collected. The quality of the data also needs to be evaluated based on an examination of the documentation outlining the procedures used to collect, enter, code, and validate the data. This examination can be facilitated by the availability of a resource person with in-depth knowledge of the original study and the data history (Wile, 2016).

**Overview of Primary Study**

The original study was a one group, repeated measures study investigating the effect of telephone-based peer support (TBPS) on the levels of depression and perceived social support reported by mothers classified as being moderately depressed (Letourneau et al., 2015). Data were collected from a community-based, convenience sample of

mothers living in the province of New Brunswick, Canada. To be included in the study mothers had to speak English or French, be between 16 and 45 years of age, and within 24 months of delivery. Mothers who experienced a history of mental illness or were taking medication or participating in psychotherapy for depression were eligible to take part in the study. Mothers were classified as being moderately depressed if they obtained a score of 12 to 19 on the EPDS during a screening interview. The data used for this secondary analysis were collected from mothers at the time of their enrollment into the study. Data included demographic characteristics and obstetrical history of the mothers as well as measures of depression and social support.

Depression was measured using the EPDS which consists of 10 items answered on a 4-point rating scale measuring the frequency of the mothers' symptom experience during the last 7 days with higher scores indicating greater severity of symptoms. Items for the EPDS were summed to create a total score that could range from 0 to 30. In addition to computing a total score, three subscales measuring depression, anxiety, and anhedonia were created based on the three-factor solution recommended by Coates et al. (2017; see Table 3). Prior to computing the scores, reverse coding was completed for the seven negatively phased items.

Mothers' perception of their social support was measured using the Social Provisions Scale (SPS; Cutrona, 1984; Cutrona & Russell, 1987). The instrument is comprised of 24 items that address six dimensions of social support: (1) guidance, advice or information offered by trustworthy individuals; (2) reliable alliance, the assurance that others can be counted on for assistance; (3) reassurance of worth, the individual's ability or skills are recognized by others; (4) opportunity for nurturance,

relationships where the individual is responsible for the well-being of another; (5) attachment, emotional closeness that provides a sense of safety and security; and (6) social integration, sense of belonging to a network or group who have similar interest or concerns (Cutrona & Russell, 1987; Milgrom et al., 2019). Each dimension is measured using 4 items, two indicating presence of the dimension and two indicating its absence. Agreement with each item is reported on a 4-point Likert scale (1 'strongly disagree' to 4 'strongly agree'). After reverse coding the twelve negatively phased items, scores were computed for each dimension as well as a total score (see Appendix A).

**Analysis**

Descriptive-correlational analysis was used to address the research objectives. The data were analyzed using SPSS (version 28.0.1.0). Upon receipt of the data file, a quality check was completed to ensure completeness of the variable coding and detect any out of range (outliers) or missing data. The level of significance was pre-set to alpha .05. Descriptive statistics (numeric and graphic) were conducted for each variable. Cronbach's alpha was used to examine the internal consistency of items for the EPDS and its three subscales as well as for the SPS and its six subscales (dimensions).

To permit comparison among the scores for the three subscales of the EPDS, average summative scores were computed by summing the scores for each subscale and dividing by the number of items so the range of possible scores for each subscale was 0 to 3. To determine the proportion of mothers who exhibited levels of anxiety or anhedonia equal to or greater than their level of depression, two dichotomous variables were created. A value of 1 was assigned to indicate those mothers whose summative

score for anxiety (anhedonia) was equal to or greater than their score for depression, a score of 0 was assigned to the remaining cases.

Separate stepwise linear regressions were conducted to determine the amount of variability in mothers' scores for depression and anxiety that could be explained by their perceptions of social support and whether they were a first-time mother. The decision to use stepwise regression was made given the number of cases available for analysis and the exploratory nature of this study; however, it is acknowledged that the use of stepwise regression is controversial as decisions about which and how variables are included in the analysis are determined solely by the statistics computed for the particular sample. However, according to Tabachnick and Fidell (1996), stepwise regression produces the best prediction equation among the three types of statistical regression (forward, backward, and stepwise; p. 150). Prior to conducting the regression analyses, Pearson's product-moment correlations were generated to examine the direction, strength, and statistical significance of the associations among mothers' levels of depression, anxiety, and anhedonia and their perceptions of social support and whether they were a first-time mother. An examination of the strength of the correlations among the independent variables as well as the collinearity diagnostics were completed to assess for the possibility of multicollinearity. Scatterplots were also generated to observe the nature of the associations between variables.

**Table 3**

*Subscales of the Edinburgh Postnatal Depression Scale*

**EDINBURGH POSTNATAL DEPRESSION SCALE**

**ANHEDONIA**

**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 as 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

**ANXIETY**

**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
- ☐ Yes, sometimes I haven't been coping as well as usual
- ☐ No, most of the time I have coped quite well
- ☐ No, I have been coping as well as ever

**DEPRESSION**

**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, sometimes
- ☐ 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

**Instructions**

- **Response categories are scored 0, 1, 2, and 3 according to increasing severity of symptoms.**
- **Response categories are marked with asterisks are reverse coded (scored 3, 2, 1, and 0).**
- **Responses for the 10 items are summed to create a total score ranging from 0 to 30.**
- **Higher scores indicate greater severity of depressive symptoms.**

**(Cox, Holden, & Sagovsky, 1987)**

## Ethical Considerations of Secondary Data Analysis

The study was guided by the three core principles outlined in the Tri-Council Policy Statement: *Ethical Conduct for Research Involving Humans* - TCPS 2: respect for persons, concern for welfare, and justice (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 2018, p.6). Permission to conduct a secondary analysis of data from the primary study was obtained from the principal investigator Dr. Nicole Letourneau (see Appendix B). Dr. Loretta Secco, who was a co-investigator in the primary study, is a thesis committee member and helped ensure the variables and findings were interpreted correctly based on her knowledge of the study and data history. The study involved minimal risk to the women who took part in the primary study. Consent to participate was obtained from the mothers during their recruitment into the original study. The data file consisted of a subset of the original variables and did not include any information that could be used to identify individual participants. The data file was accessed electronically and stored on a password protected, personal computer. Only those directly involved in the project (myself and thesis committee members) had access to the data. Following completion of the thesis research and the Master of Nursing (MN) program, the data file will be returned to Dr. Secco and deleted from my personal computer. Although I am unable to share my findings with the study participants, I will share them with Dr. Letourneau. No funding was received for this study and no conflict of interest was foreseen. Prior to commencement of the study ethical approval was obtained from the Faculty of Nursing Ethics Committee and the University of New Brunswick (UNB) Research Ethics Board (REB #2021-078).

# Chapter IV: Results

The data file consisted of 65 cases from a community-based sample of mothers. One case was removed from the data file as responses for a mother with twins had been entered twice. In addition, 10 cases were removed from the file as data for the SPS were missing. Upon inspection, it was noted that the response for two of the items on the SPS were missing for one case: one item from the nurturance subscale and one item from the reassurance of worth subscale. A decision was made to compute the mean score for the remaining three items of each subscale and replace the missing response with this value.

## Sample Characteristics

Based on the data for the 54 cases with responses for the EPDS and SPS, participants ranged in age from 17 to 43 years with a mean age of 29.7 years. Nearly three-quarters of the participants were English speaking and had a partner or spouse. Approximately half of the participants reported living in an urban area (53.7%). The proportion of first-time mothers (46.3%) to those with more than one child (53.7%) was relatively equal (see Table 4).

## Mothers' Mental Well-being

Prior to computing scores for the total EPDS and the three subscales, the internal consistency of responses to the items were examined using Cronbach's alpha. The computed Cronbach's alpha was .30 for the total EPDS scale and ranged from -.08 for the depression subscale to .69 for the anhedonia subscale (see Table 5). Given the values obtained, the descriptive statistics for each item and the inter-item correlations were examined. Boxplots were generated to visualize the distribution of scores for each of the 10 items (see Figure 2). The distribution of scores for items 3, 4, 5, and 10 were severely

skewed which could contribute to the values obtained for the Cronbach's alphas. The inter-item correlations revealed negative correlations among some of the items (see Table 6). Three of the six correlations for the items of the depression subscale were negative, all of which involved item 7 (I have been so unhappy that I have had difficulty sleeping). Three negative correlations were also noted among the four items of the anxiety subscale, the two strongest negative correlations involved item 6 (Things have been getting on top of me). The implications of these findings were discussed with the members of my thesis committee. Although the findings raise questions about the reliability of the items of the EPDS, a decision was made to proceed with the analysis.

Because the study was limited to mothers classified as moderately depressed, scores for the EPDS ranged from 12 to 20. To permit comparison among scores for the subscales, average summative scores were computed so the possible scores could range from 0.0 to 3.0. The highest mean score was computed for the anxiety subscale (M = 2.12) and the lowest was for the anhedonia subscale (M = 1.01; see. Table 5). The distribution of scores for the three subscales is depicted in Figure 3. It was also noted that all the participants had an anxiety score that was equal to or higher than their scores for depression and for anhedonia. Forty-four percent of participants had an anhedonia score equal to or greater than their score for depression (see Table 7).

**Table 4.**

*Descriptive Statistics for Postnatal Mothers at Time of Study Enrollment (n = 54)*

| | Descriptive Statistics | |
|---|---|---|
| | (n) | Mean (SD) |
| Participant Age in Years | 52 | 29.7 (6.8) |
| | Frequency (n) | Percentage (%) |
| Language | | |
| English | 40 | 74.1 |
| French | 8 | 14.8 |
| Both French and English | 6 | 11.1 |
| Partner or Husband | | |
| Single, separated or no partner | 14 | 25.9 |
| Married or common-law | 40 | 74.1 |
| Location | | |
| Rural | 25 | 46.3 |
| Urban | 29 | 53.7 |
| First-time Mother | | |
| No, -multiparous | 29 | 53.7 |
| Yes, -primiparous | 25 | 46.3 |

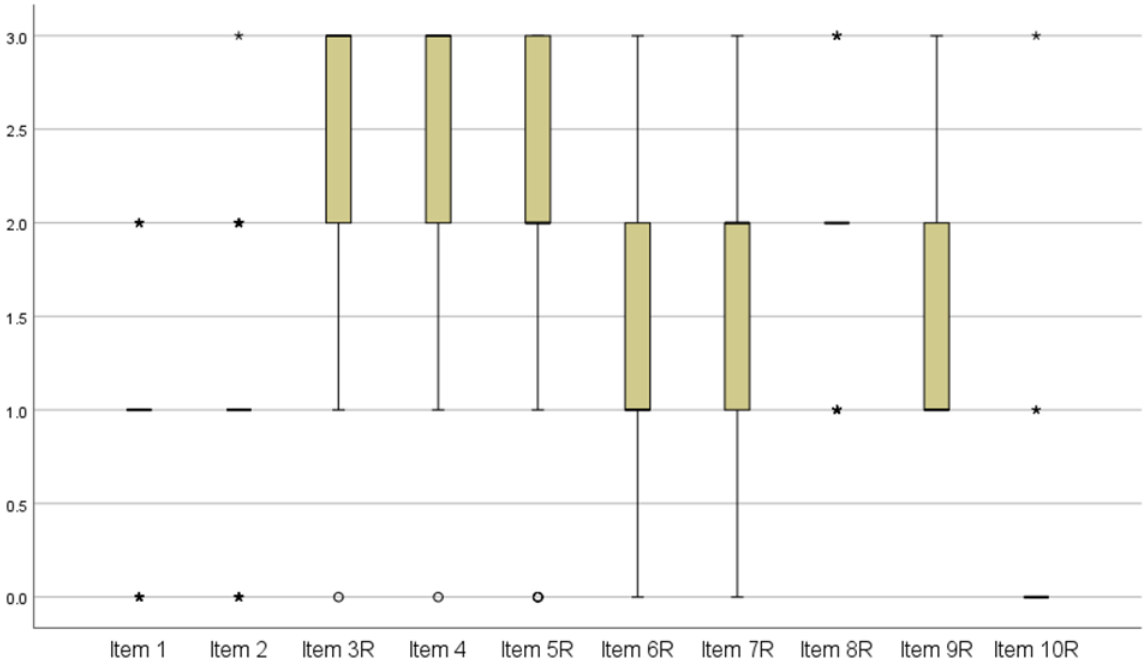
**Table 5**

*Cronbach's alpha and Average Summative Scores for Total EPDS and Three Subscales (n= 54)*

| | Cronbach's alpha | Mean (SD) | Range of Scores |
|---|---|---|---|
| Total Scale | .30 | 15.43 (2.52) | 12.00 - 20.00 |
| Anhedonia Subscale | .69 | 1.01 (0.54) | 0.00 - 2.50 |
| Anxiety Subscale | .20 | 2.12 (0.38) | 1.25 - 2.75 |
| Depression Subscale | -.08 | 1.23 (0.33) | 0.50 - 2.00 |

**Figure 2**

*Boxplot for Distribution of Scores for the EPDS Items (n = 54)*




Note: R = Reverse coded items

**Figure 3**

*Boxplot for Distribution of Scores for Anhedonia, Anxiety, and Depression Subscales (n = 54)*

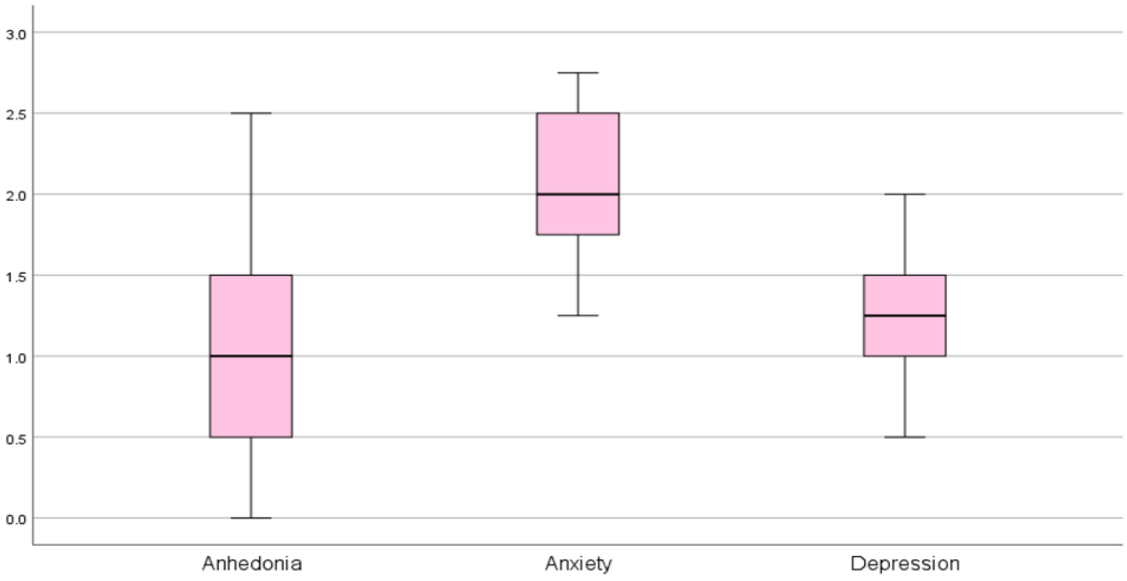


**Table 6**

*Inter-item Correlations for EPDS (n = 54)*

| Items | Mean (SD) | Inter-item Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Anhedonia | | | | | | | | | | |
| 1. I have been able to laugh and see the funny side of things | 0.91 (0.56) | 1.00 | | | | | | | | |
| 2. I have looked forward with enjoyment to things | 1.11 (0.66) | .537 | 1.00 | | | | | | | |
| Anxiety | | | | | | | | | | |
| 3. I have blamed myself unnecessarily when things went wrong* | 2.54 (0.67) | .187 | .033 | 1.00 | | | | | | |
| 4. I have been anxious or worried for no good reason | 2.54 (0.69) | -.064 | .073 | .140 | 1.00 | | | | | |
| 5. I have felt scared or panicky for no very good reason* | 2.07 (0.84) | -.025 | .120 | -.039 | .512 | 1.00 | | | | |
| 6. Things have been getting on top of me* | 1.33 (0.84) | .213 | .000 | .357 | -.358 | -.320 | 1.00 | | | |
| Depression | | | | | | | | | | |
| 7. I have been so unhappy that I have had difficulty sleeping* | 1.54 (1.06) | .022 | .075 | .038 | .088 | .060 | .010 | 1.00 | | |
| 8. I have felt sad or miserable* | 1.87 (0.52) | .023 | .319 | -.178 | .040 | .066 | -.042 | -.008 | 1.00 | |
| 9. I have been so unhappy that I have been crying* | 1.43 (0.54) | .008 | -.029 | -.019 | .033 | -.029 | .020 | -.012 | .135 | 1.00 |
| 10. The thought of harming myself has occurred to me* | 0.09 (0.45) | -.192 | -.163 | .147 | .141 | .132 | -.048 | -.227 | .053 | .069 |

*Reverse coded items. The inter-items correlations for the three subscales are highlighted.

**Table 7**

*Percentage of Cases Based on a Comparison of the EPDS Subscales Scores (n = 54)*

| Dichotomous Variables | n (%) |
|---|---|
| Anxiety Score Compared to Depression Score | |
| Less than | 0 (0.0%) |
| Equal to or greater than | 54 (100.0%) |
| Anhedonia Score Compared to Depression Score | |
| Less than | 30 (55.6%) |
| Equal to or greater than | 24 (44.4%) |
| Anxiety Score Compared to Anhedonia Score | |
| Less than | 0 (0.0 %) |
| Equal to or greater than | 54 (100.0%) |

**Mothers' Perception of Social Support**

Prior to computing scores for the total SPS and six subscales, the internal consistency of responses to the items were examined using Cronbach's alpha. The computed Cronbach's alpha was .90 for the total SPS and ranged from .60 for the attachment subscale to .82 the guidance subscale (see Table 8). Although possible scores for the total SPS can range from 24 to 96, computed scores ranged from 54 to 92 with a computed mean score of 70.5. Possible scores for the SPS subscales can range from 4 to 16. The highest mean score was for the opportunity of nurturance subscale (M = 12.65) and the lowest mean score was for the attachment subscale (M = 10.89; see. Table 8). To visualize the distribution of scores for the six subscales see Figure 4.

**Figure 4**

*Boxplot for Distribution of Scores for SPS Subscales (n = 54)*

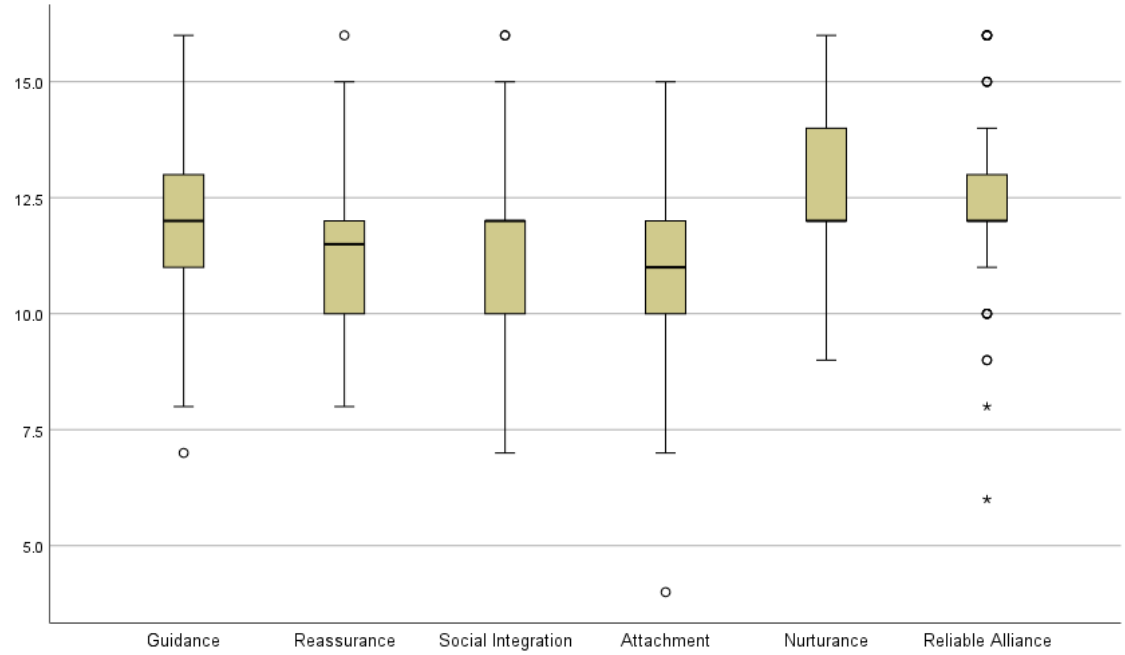



**Table 8**

*Cronbach's alpha and Summative Scores for Total Social Provision Scale and Six Subscales (n= 54)*

| | Cronbach's alpha | Mean (SD) | Range of Scores |
|---|---|---|---|
| Total Scale | .90 | 70.46 (8.46) | 54.0 - 96.0 |
| Subscales | | | |
| Guidance | .82 | 11. 81 (2.00) | 7.0 - 16.0 |
| Reliable Alliance | .79 | 12.35 (2.00) | 6.0 - 16.0 |
| Reassurance of Worth | .67 | 11.46 (1.70) | 8.0 - 16.0 |
| Opportunity for Nurturance | .62 | 12.65 (1.74) | 9.0 - 16.0 |
| Attachment | .60 | 10.89 (1.85) | 4.0 - 15.0 |
| Social Integration | .79 | 11.30 (1.92) | 7.0 - 16.0 |

**Mothers' Mental Well-being and their Perceptions of Social Support**

Pearson's product-moment correlation coefficients and scatterplots were generated to examine the associations between mothers' level of mental well-being and

their perceptions of social support and whether they were a first-time mother. Although the correlation between the total EPDS and total SPS was not statistically significant ($r$ = -.254, $p$ = .06), examination of the correlations among the subscales revealed statistically significant, weak, negative associations between mothers' scores for depression and the reassurance of worth subscale ($r$ = -.327, $p$ = .016) and the reliable alliance subscale ($r$ = -.302, $p$ = .026). A statistically significant, weak, positive association was observed between scores for anxiety and the opportunity for nurturance subscale ($r$ = .285, $p$ = .036). A statistically significant, weak, positive association was also noted between whether it was the mothers' first baby and their score for the reassurance of worth subscale ($r$ = .274, $p$ = .045). No statistically significant associations were found involving anhedonia. The strongest correlation among the SPS subscales was between guidance and social integration ($r$ = .698, $p$ < .001; see Table 9).

***Post Hoc Power Analysis***

Although the analyses yielded statistically significant results, the Power Analysis feature in SPSS was used to conduct a post hoc power analysis. With alpha preset at .05, a desired power of .80, and a sample of 54, there was sufficient power for a correlation coefficient of .37 to be statistically significant.

**Explaining Variability in Mothers' Mental Well-being**

To determine the amount of variability in mothers' scores for depression and anxiety that could be explained by their perceptions of social support and whether they were a first-time mother, two stepwise linear regressions were conducted. Prior to conducting the regression analyses, collinearity diagnostics were conducted to assess for the presence of multicollinearity among the independent variables. The values computed

for the tolerances were all greater than .30 and the variance inflation factors (VIF) were less than 3.0 indicating no multicollinearity (Polit, 2010). The first regression analysis was performed using the depression subscale as the dependent variable and the six SPS subscales and whether a first-time mother as the independent variables. An examination of the results of this analysis suggests the model explained a statistically significant amount of variability in mothers' depression scores ($F_{[1, 52]}$ 6.205, $p$ = .016). Approximately 11% of the variance in depression scores was explained (Unadjusted $R^2$ = .107). Upon examination of the regression coefficients, it was noted that only one of the independent variables was entered into the model. A weak negative association was observed between mothers' scores for depression and for the reassurance of worth subscale suggesting that mothers who perceived that their ability or skills were recognized by others tended to report fewer depressive symptoms ($\beta$ = -.327, $p$ = .016). Although the correlation coefficients suggested that two of the SPS subscales (reassurance of worth and reliable alliance) were negatively associated with mothers' depression scores, only one was included in the regression analysis (reassurance of worth) suggesting the second variable added "little new information" (Polit, 2010, p. 245).

**Table 9**

*Correlations Among EPDS Subscales, SPS subscales, and First-time Mother using Pearson's r (n= 54)*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Anhedonia | 1 | | | | | | | | |
| 2. Anxiety | .133 (.339) | 1 | | | | | | | |
| 3. Depression | .054 (.699) | .120 (.387) | 1 | | | | | | |
| 4. Guidance | -.165 (.232) | -.026 (.853) | -.261 (.057) | 1 | | | | | |
| 5. Reassurance of Worth | -.036 (.797) | -.022 (.874) | -.327 (.016) | .630 (<.001) | 1 | | | | |
| 6. Social Integration | -.159 (.252) | .002 (.989) | -.176 (.203) | .698 (<.001) | .599 (<.001) | 1 | | | |
| 7. Attachment | -.075 (.590) | -.148 (.286) | -.218 (.113) | .402 (.003) | .412 (.002) | .530 (<.001) | 1 | | |
| 8. Nurturance | -.219 (.112) | .285 (.036) | -.167 (.229) | .323 (.017) | .362 (.007) | .433 (.001) | .111 (.425) | 1 | |
| 9. Reliable Alliance | -.126 (.363) | -.143 (.302) | -.302 (.026) | .695 (<.001) | .660 (<.001) | .630 (<.001) | .276 (.044) | .394 (.003) | 1 |
| 10. First-time Mom | .054 (.700) | .196 (.156) | -.173 (.210) | .162 (.243) | .274 (.045) | .226 (.100) | .178 (.198) | .168 (.224) | .116 (.403) |

Note. p values in parentheses. Statistically significant correlations between the SPS subscales and the EPDS subscales and parity are highlighted.

A second stepwise regression analysis was performed using the anxiety subscale as the dependent variable and the six SPS subscales and whether a first-time mother as the independent variables. The first variable entered into the model was opportunity of nurturance which explained a statistically significant amount of the variance in mothers' anxiety scores ($F_{[1, 52]}$ 4.609, $p$ = .036). Entry of this variable explained 8.1% of the variance (Unadjusted $R^2$ = .081). The standardized regression coefficient (Beta) indicated a weak positive association ($\beta$ = .285, $p$ = .036). Reliable alliance was entered as a second variable into the model and explained an additional 7.8% of the variance. The total variance explained by the two SPS subscales was 15.9% (Unadjusted $R^2$ = .159; $F_{[2, 51]}$ 4.808, $p$ = .012). Examination of the regression coefficients revealed a weak positive association between opportunity of nurturance and anxiety ($\beta$ = .404, $p$ = .006) but a weak negative association between reliable alliance and anxiety ($\beta$ = -.302, $p$ = 0.35; see Table 10). This finding is noteworthy as the correlation coefficient between reliable alliance and anxiety was not statistically significant which suggests the presence of a suppression effect. In regression analysis it is possible for an independent variable to make a significant contribution to explaining the variance even though it is not correlated with the dependent variable due to its association with the other independent variables (Polit, 2010). The results of this analysis suggest that mothers tended to report higher anxiety if they perceived greater responsibility for the well-being of another and were less assured that they could count on others for assistance.

**Table 10**

*Stepwise Linear Regression Analyses for Depression and Anxiety Subscales (n = 54)*

| Independent Variables | Dependent Variable | | | | | |
|---|---|---|---|---|---|---|
| | B-weight | 95% Cl | Beta | t-value (p-value) | Adjusted $R^2$ | Test Statistics |
| | **Depression Subscale** | | | | | |
| Reassurance of Worth | -.064 | -.12 to -.01 | -.327 | -2.491 (p = .016) | .107 | F = 6.205 df 1, 52 p = .016 |
| Intercept | 1.96 | | | | | |
| | **Anxiety Subscale** | | | | | |
| **Step 1** | | | | | | |
| Nurturance | .063 | .004 to .121 | .285 | 2.147 (p = .036) | .081 | F = 4.609 df 1, 52 p = .036 |
| Intercept | 1.33 | | | | | |
| **Step 2** | | | | | | |
| Nurturance | .089 | .027 to .150 | .404 | 2.894 (p = .006) | .064 | F = 4.808 df 2, 51 p = .012 |
| Reliable Alliance | -.058 | -.111 to -.004 | -.302 | -2.163 (p = .04) | .159 | |
| Intercept | 1.71 | | | | | |

## Chapter V: Discussion

The primary goal of this study was to examine the potential utility of the subscales of the EPDS to determine the extent that alterations in mothers' mental well-being reflect feelings of depression, anxiety, or anhedonia. The EPDS is a widely used instrument in research and clinical practice for screening and assessing mental illness by those who are interested in the health and well-being of women and children. It is easy to use for both clients and health professionals because the scale only consists of 10 items, it takes approximately 2 to 5 minutes to complete, and the reading level is at or below grade 6 (Cox et al., 1987; Cox et al., 2014). Although the EPDS is commonly used as a unidimensional scale with calculation of a total score, research has suggested the EPDS is multidimensional with subscales. In fact, based on their review of 31 studies examining the factor structure of the EPDS, Coates et al. (2017) concluded there is little evidence supporting a one factor solution. Interestingly, findings from this study suggest mothers who had been labelled as being moderately depressed, based on their EPDS total score, scored higher on the anxiety subscale than the depression subscale.

To support its use in clinical practice, investigations of the psychometric properties of the EPDS have tended to focus on the sensitivity, specificity, and predictive ability of various cut-off scores for screening minor or major depression (Gibson et al., 2009). However, studies that have examined the internal consistency of the items have generally reported acceptable reliability for the total EPDS (Adewuya et al., 2005; Coates et al., 2017; Matsumura et al., 2020; Muzik et al., 2000; Tsai et al., 2013; Tuohy & McVey, 2008) as well as the subscales (Coates et al., 2017; Matsumura et al., 2020; Petrozzi & Gagliardi, 2013; Tuohy & McVey, 2008). Possible explanations

for the lower-than-expected Cronbach's alphas for the total scale and two of the subscales (depression and anxiety) in this study may be the relatively small sample, restricting the sample to mothers who were classified as being moderately depressed based on their total EPDS score, the skewed distribution of scores for several of the items, and the small number of items especially for the subscales. Another possible explanation for the lower-than-expected values could be the wording of items which may not reflect current vernacular as the instrument was developed in 1987 (Cox et al., 1987). For example, item 6 appeared to be problematic in this study because it was involved in the two strongest negative correlations for the anxiety subscales. This item was also identified as problematic by Allison et al., (2011). Wording of this item, "Things have been getting on top of me" may be problematic not only because of how the item is written but also the response options. The item might be answered differently depending on whether it is interpreted literally or figuratively. Because the response options are phrased in terms of coping, which is an abstract concept, they may be interpreted differently depending on the mothers' educational or cultural background. Comprehension of this item might be improved if it was written as, "I feel overwhelmed and am having difficulty dealing with tasks or problems" with the response options written in terms of frequency of occurrence (e.g., yes, most of time). Even Cox, the lead researcher involved in the development of the scale, recognized that "nuances of language, vagaries of mood disorders, and meanings of metaphors" can change over time and should be considered prior to using the EPDS in clinical practice or research (Cox, 2019, p. 127). Perhaps it is time for a critical review of the EPDS to evaluate its

suitability within the Canadian or North American context. It may also be time to revise the name of the instrument to convey that it measures more than just depression.

**Effect of Social Support on Mothers' Mental Well-Being**

The second goal of this study was to examine if mothers' mental well-being following delivery was affected by their perception of social support and whether they were a first-time mother. Mercer's (2004) Theory of Becoming a Mother is supported by the findings of this study as mothers' mental well-being was affected by their environment, in particular their perceptions of available support. Although research indicates social support acts as a protective factor to reduce negative feelings associated with mental well-being (Fellmeth et al., 2017; Hain et al., 2016), it is unclear which type of social support is most effective in enhancing mothers' mental well-being. In this study, three of the six types of social support measured by the Social Provision Scale (SPS; reassurance of worth, reliable alliance, opportunity for nurturance) appeared to affect mothers' sense of mental well-being.

**Depression and Social Support**

Only one of the types of social support measured by the SPS made a significant contribution to explaining mothers' depression. Findings from this study suggest mothers who perceived a higher sense of reassurance of worth in their current relationships tended to report lower severity of depressive symptoms. I view reassurance of worth as a type of emotional support because if mothers perceive others recognize their ability or skill, this provides affirmation that may enhance their mental well-being. Although items of the SPS are not specifically written in terms of caring for a newborn, I believe that given the context of the study, mothers who participated were likely to

answer the items, in large part, based on their ability to care for their newborn. Milgrom et al. (2019) examined the association between social support and the psychological well-being of 54 mothers from pregnancy up to 2 years after delivery, using the Beck Depression and Anxiety Inventories. Based on their analysis, Milgrom et al. (2019) found that reassurance of worth and reliable alliances were significantly correlated with mothers' postnatal depression. These results are consistent with my findings, however, in the regression analysis reliable alliance did not explain additional variance in mothers' depression scores and was, therefore, not entered into the model.

**Anxiety and Social Support**

In this study, mothers' anxiety was partially explained by both their perceptions of opportunity for nurturance and reliable alliance. Mothers who perceived more opportunity for nurturance in their current relationships and fewer reliable alliances tended to report higher severity of anxiety symptoms. I view opportunity for nurturance, as a type of emotional support because having someone to care for can provide a sense of value. However, opportunity for nurturance may not be an appropriate indicator of social support for new mothers because care of the newborn is a necessity, not an opportunity. According to the Association for Psychological Science (2017) feeling forced or obligated to care for someone, can be distressing. In this study, mothers who perceived higher opportunity/obligation for nurturance tended to report more symptoms of anxiety. Mothers' anxiety was also affected by their perceptions of reliable alliances. Reliable alliances can be viewed as a type of instrumental support because it is the perception that others are there to help which may include help with 'hands on tasks'. Interestingly in their study, Milgrom et al. (2019) did not observed significant

associations between anxiety and any of the social provision's subscales during the postnatal period. Possible explanations for the conflicting findings are that in the study by Milgrom et al. (2019) social support was measured at 6- and 24-months following birth, while mothers in this study could have given birth up to 24 months prior to their enrollment, average scores for the SPS subscales in the study by Milgrom et al. (2019) were all higher than those computed in this study, and Milgrom et al. (2019) only reported results from the correlational analysis. In this study, differences were evident in the statistical significance of the coefficients generated in the correlational analyses and the regression analyses.

**Mental Well-being, Social Support, and Parity**

Contrary to my expectations, statistically significant associations were not observed between the measures of mothers' mental well-being and whether they were a first-time mother. In this study, there was only one statistically significant correlation involving mothers' parity. A weak, positive correlation was observed between being a first-time mother and reassurance of worth, suggesting that first-time mothers tended to perceive more recognition from others in terms of their skills or ability than mothers with more than one child. Once again, although the items of the SPS are not specifically written in terms of caring for a newborn, I believe mothers who participated in the study were likely to respond in terms of their perceived ability as a mother. It is possible that family and friends are more likely to offer this type of support to first-time mothers because the situation is new and unfamiliar, whereas it is assumed mothers who have other children have experience and are more confident in the role. Another possible explanation is that mothers in this study were enrolled up to 24-months following

delivery. Dol et al. (2021) who examined the effect of parity and infant age on perceived social support and mental well-being for 561 mothers within the first 6 months postpartum found first-time mothers had higher anxiety symptoms compared to mothers with more than one child. In addition, mothers of younger children tended to perceive more support compared to mothers with older children.

**Implications for Practice, Policy, and Research**

Despite the relatively small sample, findings from this study indicate the potential benefits of using the EPDS subscales in clinical practice and research to obtain a more accurate depiction of the symptom experience of mothers. However, such benefits will only be achieved if standards are developed in terms of the number of subscales, the items included in each subscale, and the timing of administration. It is noteworthy that the Reproductive Care Program of Nova Scotia (2022) has recently endorsed routine prenatal screening of women's mental well-being using the EPDS at least once every trimester. Space has even been allocated on the Prenatal Record for the documentation of the total EPDS scores. Given the importance of monitoring the health of the mother and newborn as a dyad, I recommend incorporating routine screening of mothers' mental status, using the EPDS subscales, to help differentiate the nature of any alteration in mental well-being, as part of each newborn wellness visit (e.g., at 2, 4, 6, 12, and 18 months corresponding with Nova Scotia immunization schedule). Studies have indicated that mothers may not always recognize changes in their mental status or seek help when experiencing alterations in their mental well-being (Fahey & Shenassa, 2013; Jomeen, 2004; Liberto, 2012; Negron et al., 2013). Therefore, it is important to be proactive by implementing policies that support routine screening.

## Strengths and Limitations

This secondary analysis extends findings from the original study by examining the potential utility of the subscales of the EPDS as well as the explanatory power of the six provisions of social support. Although replication of this study is warranted due to the small sample size which negatively affected the statistical power, decisions regarding the analyses of data, and generalizability of the findings, study findings suggest the potential value of the EPDS could be enhanced by utilizing the subscales. Because the EPDS is valued by clinicians and researchers, further investigations should be undertaken to examine the feasibility and utility of the EPDS subscales in both practice and research involving mothers. It is important to keep in mind that the EPDS is not diagnostic but is to be used as a screening tool for detecting symptoms suggestive of an alteration in mothers' mental well-being. Although, findings suggest the mothers' mental well-being is affected by their perceptions of the social support available, the analyzed data were collected at one point in time, which prohibits the ability to make inferences about cause and effect. Future studies would also be strengthened by the inclusion of additional demographic and obstetrical characteristics of the mothers that might explain differences in their symptom experience and perceptions of social support.

## Dissemination of Findings

Findings of this study will be shared with the lead investigator of the original study, as well as nursing students and faculty members at the University of New Brunswick. Preliminary findings from my research were presented at the 27$^{th}$ Annual UNB Faculty of Nursing Research Day held virtually in September 2022. The Canadian Association of Perinatal and Women's Health Nurses (CAPWHN) hosts annual

conferences which provide the opportunity for students and researchers to present their work. I previously presented a poster outlining my thesis plans in 2019 and would like to attend another CAPWHN conference to discuss my completed thesis work. A manuscript for publication will be also be prepared. In addition, I plan to network with local health professionals who work in private and public clinics and hospitals to discuss the potential utility of the EPDS subscales for promoting the mental well-being of mothers and their newborn.

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## Appendix A

### Social Provisions Scale



Instructions: In answering the following questions, think about your current relationships with friends, family members, co-workers, community members, and so on. Please indicate to what extent each statement describes your current relationships with other people. Use the following scale to indicate your opinion.

| STRONGLY DISAGREE | DISAGREE | AGREE | STRONGLY AGREE |
|---|---|---|---|
| 1 | 2 | 3 | 4 |

So, for example, if you feel a statement is very true of your current relationships, you would respond with a 4 (strongly agree). If you feel a statement clearly does not describe your relationships, you would respond with a 1 (strongly disagree).

| | RATING |
|---|---|
| 1. There are people I can depend on to help me if I really need it. | _____ |
| 2. I feel that I do not have close personal relationships with other people. | _____ |
| 3. There is no one I can turn to for guidance in times of stress. | _____ |
| 4. There are people who depend on me for help. | _____ |
| 5. There are people who enjoy the same social activities I do. | _____ |
| 6. Other people do not view me as competent. | _____ |
| 7. I feel personally responsible for the well-being of another person. | _____ |
| 8. I feel part of a group of people who share my attitudes and beliefs. | _____ |
| 9. I do not think other people respect my skills and abilities. | _____ |
| 10. If something went wrong, no one would come to my assistance. | _____ |
| 11. I have close relationships that provide me with a sense of emotional security and well-being. | _____ |
| 12. There is someone I could talk to about important decisions in my life. | _____ |
| 13. I have relationships where my competence and skill are recognized. | _____ |
| 14. There is no one who shares my interests and concerns. | _____ |
| 15. There is no one who really relies on me for their well-being. | _____ |

16. There is a trustworthy person I could turn to for advice if I were having problems. _____
17. I feel a strong emotional bond with at least one other person. _____
18. There is no one I can depend on for aid if I really need it. _____
19. There is no one I feel comfortable talking about problems with. _____
20. There are people who admire my talents and abilities. _____
21. I lack a feeling of intimacy with another person. _____
22. There is no one who likes to do the things I do. _____
23. There are people who I can count on in an emergency. _____
24. No one needs me to care for them. _____

Scoring
A score for each social provision is derived such that a high score indicates that the individual is receiving that provision.

Items that are asterisked should be reversed before scoring (i.e., 4=1, 3=2, 2=3, 1=4).

1. Guidance: 3*, 12, 16, 19*
2. Reassurance of Worth: 6*, 9*, 13, 20
3. Social Integration: 5, 8, 14*, 22*
4. Attachment: 2*, 11, 17, 21 *
5. Nurturance: 4, 7, 15*, 24*
6. Reliable Alliance: 1, 10*, 18*, 23

# Appendix B

## Potential Manuscript Authorship Agreement

*Potential Manuscript Authorship Agreement*

| | |
|---|---|
| **MN Student:** | Heather Jacklin, UNB |
| **Thesis Topic:** | Secondary Analysis (Topic to be determined) |
| **Thesis Committee Members:** | Dr. Marilyn Hodgins, Dr. Loretta Secco (Co-Investigator, Primary Study) |
| **Primary Study:** | *Sustainable Telephone-Based Peer Support for Mothers with Postpartum Depression (CIHR PHSI grant 1-130304-44-01)* |
| **Primary Study PI:** | Dr. Nicole Letourneau |

The thesis project proposed by ***Heather Jacklin, UNB MN student*** is a secondary analysis of data previously collected during a CIHR funded project (noted above). Dr. Nicole Letourneau was the Principle Investigator (PI) for the primary project and Dr. Loretta Secco was a Co-Investigator on the research team. As PI of the primary study, Dr. Nicole Letourneau has made a substantial contribution to the concept, design, and acquisition of the primary data. The proposed secondary analysis is in keeping with the Canadian Institute of Research vision, '*... To advance knowledge, expand research opportunities, and improve health services, products and outcomes by effectively accessing, analyzing, linking, integrating, using, reusing, storing and preserving health research data and health-related data in Canada*' http://www.cihr-irsc.gc.ca/e/50182.html.

Dr. Nicole Letourneau grants permission to Heather Jacklin (MN student) and her thesis committee to complete a secondary analysis of a subset of the primary data. For any manuscript that results from the thesis project, Dr. Letourneau will be asked to review the draft manuscript for content and writing accuracy and to contribute as author of any such manuscript

To achieve this outcome, Dr. Letourneau will be kept apprised of the thesis project by the thesis committee (i.e., Dr. Loretta Secco) at key points, she will be emailed the thesis proposal, ethics application, and a pdf of the final thesis. Should the student decide to develop a manuscript for publication, Dr. Nicole Letourneau will be invited to contribute as an author. Dr. Loretta Secco agrees to take the lead working with Heather, thesis committee members, and Dr. Letourneau to coordinate preparation of a potential manuscript for submission to a journal.

As Heather Jacklin, according to UNB intellectual property, is the owner of the thesis, she will be first author of any resulting manuscript.

Dr. Marilyn Hodgins will be a co-author of any manuscript resulting from this secondary analysis to acknowledge her contribution as Heather's thesis supervisor.

Dr. Loretta Secco will be a co-author to acknowledge her contributions in the primary study, supervisory guidance, and coordination of the potential manuscript.

Dr. Nicole Letourneau will be the final author to acknowledge her contributions as primary study Principal Investigator and advice on content and writing of the final draft of the manuscript.

| **Signatures:** | | **Date:** |
|---|---|---|
| Thesis Student: | Heather Jacklin | |
| | _____ | _____ |
| Thesis committee: | Dr. Marilyn Hodgins | |
| | _____ | _____ |
| | Dr. Loretta Secco | |
| | _____ | _____ |
| | _____ | _____ |
| Primary Study PI: | Dr. Nicole Letourneau | July 29, 2019 |

## Curriculum Vitae

**Candidate's full name**: Heather Paulette Jacklin

**Degrees Obtained:** Bachlor of Science in Nursing, St. Francis Xavier University, 2006

**Publications:** None

**Poster Presentations:**

**Jacklin, H.,** Hodgins, M., Secco, L. (2019, November). Examining Mothers' Mental Well-being Using the Subscales of the Edinburgh Postnatal Depression Scale. Canadian Association of Perinatal and Women's Health Nurses (CAPWHN).