

DEPRESSION, SOCIAL NETWORKS, AND SOCIAL SUPPORT DURING THE  
PERINATAL AND POSTPARTUM PERIOD AMONG MILITARY-AFFILIATED WOMEN

A Dissertation

By

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## ABSTRACT

The purpose of this dissertation was to provide a foundation for future research aimed at understanding associations between social network analysis measures and perinatal depression symptoms among military spouses. This work summarizes how social network analysis measures have been associated with depression in adults (systematic literature review), what is known regarding perinatal depression in the military-affiliated population (scoping literature review), and provides a description of women's experience of the perinatal period and social support during the COVID-19 pandemic (phenomenological qualitative study).

There is a gap in the literature regarding how structural, compositional, and functional SNA characteristics associate with depressive symptoms among adults. However, it does appear that having similar others and various types of social support consistently associates with decreased symptomology. Future studies examining SNA properties and associations with depression in adults should adequately describe the population of interest and statistical analysis methodology. More specific information on which qualities of homophily relate to decreased depression will be helpful to design treatment interventions.

I found 10 articles that warranted inclusion in the scoping review addressing perinatal depression among military-affiliated women—there is a scarcity of research being conducted in this field. Major findings include a lack of information from analytical and qualitative study designs. Documenting conflicts of interest and study limitations such as the self-report nature of PND screening tools, were not adequately addressed in the included studies. Future studies should define periods of separation to accurately reflect the influence of deployments and

temporary duties as well as aim to capture risk and protective factors for military spouses versus active-duty military women.

Lastly, I carried out a phenomenological qualitative study to better understand women's perinatal and social support experiences during the pandemic. My findings indicate that women experienced a wide range of emotions, changes to their perinatal care and social support, other factors that compounded being pregnant or having a baby during a pandemic, and a dissatisfaction with postpartum care. Implications for more effective communication and information on how to receive support during a period of isolation are warranted among this population.

## DEDICATION

This work is dedicated to mothers and military spouses. I have been inspired and encouraged by their stories, their resilience, and their willingness to share their wisdom so freely. It is my deepest hope that I can emulate their example and serve our communities as they have. In particular, this work would not have been possible without the women that gave of their time and energy and shared their stories with me for chapter four—I hope this work honors them and others like them.

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I could not have accomplished this work without the support of my mother who offered a listening ear, hugs, and free childcare so I could work. My mom is a truly amazing woman that has always believed in me and my ability to overcome challenges. Her strength and faith fuel me every day and God blessed me in a huge way by making her my mom.

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In addition, my small circle of friends has really lifted me up and carried me through this process. I have had support and encouragement unlike anything I could have imagined. My friends are the most giving and authentic women I know—and I am so grateful they think I am

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## CONTRIBUTORS AND FUNDING SOURCES

### **Contributors**

This work was supervised by a dissertation committee consisting of Dr. Sherman (Chair), Dr. Wilson and Dr. Patterson of the Department of Health and Kinesiology, and Dr. Gorman from the Department of Epidemiology and Biostatistics in the School of Public Health. Dr. Sherman served as a reviewer for the two studies presented in chapters two and three. The data analyzed for chapter four was audited by Dr. Sherman. All committee members offered feedback and suggestions for multiple drafts of the dissertation document. All other work conducted for the dissertation was completed by the student independently.

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## NOMENCLATURE

|       |                                                     |
|-------|-----------------------------------------------------|
| AD    | Active Duty                                         |
| AFB   | Air Force Base                                      |
| CDC   | Child Development Center                            |
| CES-D | Center for Epidemiological Studies Depression Scale |
| GPC   | Group Prenatal Care                                 |
| JBSA  | Joint Base San Antonio                              |
| L&D   | Labor and Delivery                                  |
| MAW   | Military Affiliated Women                           |
| MTF   | Military/Medical Treatment Facility                 |
| PNC   | Prenatal Care                                       |
| PND   | Perinatal Depression*                               |
| PPD   | Postpartum Depression*                              |
| USAF  | United States Air Force                             |
| USMC  | United States Marine Corps                          |
| USN   | United States Navy                                  |
| SNA   | Social Network Analysis                             |
| SS    | Social Support                                      |

\*Perinatal depression is used to describe depression that occurs during pregnancy or up to one year postpartum. Postpartum depression typically refers to depression during the postpartum period, after delivery. I use perinatal depression throughout the document unless speaking about a published article in which the author(s) refer specifically to postpartum depression.

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## CHAPTER I

### INTRODUCTION

#### **Definition, Description, and Epidemiology of Perinatal Depression**

The National Institute of Mental Health describes perinatal depression (PND) as depression that occurs during pregnancy and the period after childbirth. Specifically, prenatal describes the pregnancy period and postpartum the period following childbirth. Women with perinatal depression “experience feelings of extreme sadness, anxiety, and fatigue that may make it difficult for them to carry out daily tasks, including caring for themselves or others” (National Institute of Mental Health, n.d., para. 2).

According to the Centers for Disease Control and Prevention, the National Institute of Mental Health, and the American Psychological Association, there are a variety of signs and symptoms of perinatal and postpartum depression. For example, women can experience persistent sad, anxious or “empty” mood; irritability or restlessness; feelings of hopelessness or pessimism; racing, scary thoughts; feelings of fear regarding caring for baby or being left alone with baby; feelings of guilt, worthlessness, or helplessness; trouble bonding with baby or forming an emotional attachment; persistent doubts about caring for the new baby; and thoughts of death, suicide, or harming oneself or the baby (American Psychological Association, 2008; Center for Disease Control and Prevention, 2020b; National Institute of Mental Health, n.d.). Additionally, lifestyle changes can occur as women experience a loss of interest in hobbies and activities; fatigue or abnormal decrease in energy; difficulty sleeping (even when baby is sleeping), including difficulty falling asleep, or oversleeping; abnormal appetite or appetite and weight changes (outside that expected due to pregnancy or return to normal weight after

delivery), including overeating or loss of appetite (American Psychological Association, 2008; National Institute of Mental Health, n.d.). Mental challenges such as difficulty concentrating, making decisions, or remembering are also known symptoms (American Psychological Association, 2008; National Institute of Mental Health, n.d.). Lastly, physical manifestations of perinatal depression such as aches or pains, including headaches, cramps or digestive problems that do not have a clear cause or improve with treatment are also associated with perinatal depression. (National Institute of Mental Health, n.d.).

The prevalence of postpartum depression (PPD) seems to have a consistent range. According to the Centers for Disease Control and Prevention (2020b), the estimated prevalence of postpartum depression in the United States ranges from 12.5% to 20%. The American Psychological Association (2008) notes one in seven women (14%) experience postpartum depression. The World Health Organization (2020a) states 10% to 16% of pregnant women and 13% to 20% postpartum women experience a mental health disorder, primarily depression.

Known risk factors for PPD as stated by the American Psychological Association (2020) include the following:

change in hormone levels after childbirth; previous experience of depression or anxiety; family history of depression or mental illness; stress involved in caring for a newborn and managing new life changes; having a challenging baby who cries more than usual, is hard to comfort, or whose sleep and hunger needs are irregular and hard to predict; having a baby with special needs, premature birth, medical complication, illness; first time motherhood, very young motherhood, or older motherhood; other emotional stressors such as death of a loved one or family problems; financial or employment problems; isolation or lack of social support (para. 3).

Postpartum depression has a multifaceted etiology including physiological, psychological, and psychosocial agents. For example, evidence indicates support for the role of an altered immunological profile in PPD (Petralla et al., 2019). Papadopoulou et al. (2019) detected molecular changes in women with postpartum depression, specifically an elevated concentration of glutathione-disulfide (endogenous antioxidant compound), adenylosuccinate (intermediate in nucleotide biosynthesis), and adenosine triphosphate (main cellular energy currency). Additionally, Kettunen and Hintikka (2017) discuss a history of depression or anxiety, the mother having poor parental relationships throughout childhood, and a history of violence and/or abuse in relation to PPD etiology.

### **Postpartum Depression among Military Affiliated Women**

There is clearly some ambiguity regarding the prevalence of PPD in military affiliated women (MAW). For example, an article by Spooner et al. (2012) notes that the rates of perinatal depression in MAW range from 11% to 24% while Schachman and Lindsey (2013) report a range of 19% to 47% in various military study populations. A potential contributing factor to the wide range of prevalence figures is that some studies exclusively include female military members, some only military spouses, and some studies include both. Additionally, various screening tools are used to measure PPD or depressive symptoms. A systematic review by Klamann and Turner (2016) examined the prevalence of PPD in military populations and concluded the following:

Findings from this review suggest that the overall prevalence of PND symptoms in military service women and spouses of military servicemen ranges from 4.60 to 50.7%.

The studies varied in sample size, methodological rigor, and cutoff scores for determining



women at an increased risk for PND, which may explain the wide variability in prevalence estimates (p. S63)

With such a wide range of prevalence, it is difficult to say how PPD in MAW compares to the general population, however it seems at least as prevalent as that in the civilian population. Military life is accompanied by challenges that could further complicate the existent difficult transition into motherhood. These challenges, above and beyond typical risk factors, could increase the incidence of PPD in MAW. For example, in an article by Liu and Tronick (2013), the PRAMS (Pregnancy Risk Assessment Monitoring System) included stressful life events such as moving, loss of employment (for mother or father), arguments at home, and financial challenges. Military families move, on average, every two to three years, and each move is most likely accompanied by a loss of employment for the spouse, which could easily translate to arguments at home and financial burden. The same article highlighted findings that women who experience at least one stressful life event in the year prior to childbirth were three to three and a half times more likely to experience PPD symptoms (Liu & Tronick, 2013). When considering there are roughly 100,000 births to military families per year, there could be a significant number of mothers and families impacted by PPD (Schachman & Lindsey, 2013).

There is reason to believe that MAW are at increased risk for PPD. Research regarding PPD and MAW has specifically focused on deployment or wartime and lack data regarding military life in general (Haas & Pazdernik, 2006). For example, Spooner et al. (2012) found that spouse deployment status, including upcoming deployment or current deployment, tended to increase risk of perinatal depression in military spouses. Interestingly, studies concentrating specifically on active duty (AD) women, found that AD status could be protective against PPD in

the form of professional identity, returning to work, and having access to healthcare as well as support services (Appolonio & Fingerhut, 2008).

### **Social Network Analysis**

Social network analysis (SNA), as used in public health and related fields, is a systems approach to understanding the patterns of how relationships form and influence behavior (typically health behaviors) among groups of people (Valente, 2010; Scott, 2017). It should be noted there are applications that do not investigate relationships among people but perhaps symptoms or other factors, and how these relate to one another relative to the development of illness or health outcomes. For example, Beard et al. (2016) reported on relations of anxiety and depression symptoms in a psychiatric sample, Lee et al. (2020) discuss psychosocial syndemic indicators among sexual minority men, and Choi et al. (2019) examined a network of psychosocial risks during pregnancy.

Furthermore, SNA is both a theoretical perspective and a methodology to understand relationships and the subsequent impact on health behaviors (Valente, 2010). Scott (2017) describes the theoretical perspective as having roots in exchange theory, the theory of social capital, and the actor-network theory. The methodology involves collecting attribute data including characteristics, attitudes, and behaviors of agents, and relational data which is the connections, ties, or relationships that relate agents to each other (Scott, 2017). Previously, SNA has been used in health to describe the diffusion of health behaviors or conditions such as obesity (Christakis & Fowler, 2007), smoking (Christakis & Fowler, 2008), loneliness (Cacioppo, Fowler, & Christakis, 2009), and happiness (Fowler & Christakis, 2008).

As military members and their families relocate frequently, it stands to reason that the structure and content of their networks are constantly changing. Social Network Analysis could

offer novel and illuminating information regarding how military affiliated individuals operate within their social networks, obtain information from their network (including health information), and how they are supported by their networks (particularly in health behaviors and during illness). It can be of public health interest to understand these phenomena and the impacts on health outcomes.

### **Social Network Analysis and Perinatal Depression**

With the aid of a Systematic Review Librarian, I conducted a preliminary search of SNA and PND by searching APA PsycINFO (Ebsco) with a list of terms synonymous with or related to SNA and PPD. I also searched google scholar independently using the same terms.

Unfortunately, this search was unsuccessful because this topic is scarce, if existent at all, within published research literature; I was unable to find a single study that used SNA to describe or examine PND. There doesn't seem to be a foundation of literature describing PND from a SNA perspective, particularly not in a military population.

Therefore, the scope of the search was broadened to include depressive symptoms in the adult population. After expanding the search, I was able to find that studies exist discussing depression or depressive symptoms from a SNA perspective. Reviewing the preliminary search results, studies seem to fall into two categories, one describing how social networks of depressed individuals form (for example: Xu & Zhang 2016; Takahashi et al., 2009), and one determining how the social network of individuals influences development or incidence of depression. The second category is aligned with my research interest and, as an example, Rosenquist, Fowler, and Christakis (2011) found that the Center for Epidemiological Studies Depression Scale (CES-D) scores, both high and low, were correlated among individuals within their network. Additionally, Knowlton and Latkin (2007) examined structural (e.g. size, density, closeness) and functional

(e.g. emotional, financial, instrumental support, and conflictive ties) network measures to predict depressive symptoms among a highly disadvantaged population.

### **Social Support and Perinatal Depression**

The idea of social support (SS) is somewhat intuitive and the role of SS in health has existed for decades; Cooke et al. (1988) noted that “social support is viewed by family practitioners as one of the potential keys to well-being of individuals, and particularly for those experiencing major life transitions and crises” (p. 211). More recently and related specifically to the perinatal period, a review by Yim et al. (2015) note that social support has been found to have a moderate protective effect in women. Authors have characterized variables related to social support such as perceived support, received support, need for support, support satisfaction, and sources of support, with perceived support being studied most frequently (Yim et al., 2015). Glanz et al. (2008) discuss the types of social support defined by House (1981) such as emotional support, instrumental support, informational support, and appraisal support.

Perceived social support is the idea that help is available from one’s network or community if and when needed. A review by Yim et al. (2015) found that of the 50 articles studying perceived social support and PPD, almost half report negative associations between perceived support and PPD outcomes; the remaining questions include the pathways linking perceived social support to better PPD outcomes as it is “well established that it is a major protective factor” (p. 119).

According to Yim et al. (2015), enacted or received support findings are inconsistent; however, with regard to a need for support and support satisfaction, the review found that increased need for support and unmet support needs increase likelihood of PPD. Also, there appears to be consistent evidence that partner support is beneficial, as is that of family support

(Yim et al., 2015). Interestingly, a study investigating the functional aspect of social support (the types of support: emotional, instrumental, informational, and appraisal) in first time mothers found that all four components were important in lowering depression in mothers, but the best predictor of PND at 12 weeks postpartum was emotional support at birth (Leahy-Warren et al., 2011).

Regarding the military community, an interesting form of prenatal care (PNC) has been explored with group prenatal care (GPC). Some military treatment facilities (MTFs) have offered CenteringPregnancy® which was developed in the 1990s, and consists of small cohorts of patients (typically 5-12) meeting for two-hour sessions every two to four weeks throughout pregnancy, and focuses on nutrition, exercise, social support, health self-awareness, and relaxation, (Carter et al., 2016). These GPC initiatives could incorporate information from studies describing social support needs and perhaps fill some of the gaps within the military community. Understanding the impact of social support and how it influences the development of PPD symptoms could be beneficial information in designing interventions aimed at reducing prevalence of PND, particularly in the military community.

### **Social Ecological Models of Health**

There have been many theories from behavioral scientists and philosophers that attempt to explain human behavior including the role of external and internal factors. For example, Kurt Lewin described the “life space” as early as the 1930’s, which is essentially the physical, social, and conceptual facts about a person that may dictate their behavior (Tai-Seale, 2021). Roger Barker developed the idea of “behavior settings” which are defined by physical clusters of specific time, place, and props as well as social clusters or behavior patterns that are attached to the physical cluster—both aspects are necessary to create a behavior setting (Scott, 2005).

According to Glanz et al. (2008), Rudolph Moos, Thomas Glass and Matthew McAtee, and Urie Bronfenbrenner, all developed theories that involve categories, hierarchies, or levels of behavioral influence that explain behavior. These categories or levels include the physical or environmental setting and social settings (Glanz et al., 2008).

Among the models designed to guide interventions, Albert Bandura spoke of the influence of social interactions in behavior and self-regulation (Bandura, 1991). B.F. Skinner theorized that behavior was influenced by consequences which came from the environment—an individual’s sensitivity to consequences impacted their ability to adapt to situations in which they found themselves (Overskeid, 2018). Stokols added four “core assumptions about the dynamics of human health and the development of effective strategies to promote personal and collective well-being” (1992, p. 7). These assumptions were as follows: health behaviors are influenced by personal attributes, and physical and social settings; environments are multidimensional; interactions between people and the environment happen at multiple levels; and people influence their environment which in turn impact health behaviors (Stokols, 1992). McLeroy et al. (1988) describe five levels of influence including intrapersonal, interpersonal, institutional, community, and public policy.

## **COVID-19**

Towards the end of 2019 a novel coronavirus, severe acute respiratory syndrome coronavirus or SARS-CoV-2, emerged in China (CDC, 2020a). COVID-19, the resulting illness of infection with the SARS-CoV-2 virus, is characterized by upper respiratory symptoms, fever, muscle aches, diarrhea, nausea and vomiting, and loss of taste or smell (CDC, 2020a). The CDC confirmed the first US COVID-19 case in Washington State on January 21, 2020 and President Trump declared a state of National Emergency on 13 March 2020 (AJMC Staff, 2020). In March

of 2020, various health agencies and governmental authorities began implementing mitigation strategies to stop the spread of the virus (Moreland et al., 2020). The resulting measures to stop the spread of the virus are a phenomenon that presents a unique challenge for healthcare and severely limits aspects of social health including social support; this is problematic as loneliness and isolation can lead to depression and other poor mental health outcomes (Diamond et al., 2020).

Previous research on disease outbreaks shows increases in depression and anxiety and pregnant and postpartum women could be particularly vulnerable to these poor mental health outcomes (Lebel et al., 2020). COVID-19 was not originally part of my research interest, however, being that this research investigates social support and the social networks of individuals, it would be irresponsible to proceed without considering the pandemic's impact.

### **Statement of the Problem**

There is a lack of research and thus an incomplete understanding of the unique challenges facing military affiliated women, particularly military spouses, during pregnancy, childbirth, and the postpartum period. There is a dearth of network analysis research within the MAW population regarding PPD. Likewise, the associations and intricacies between social support and PND within the military population is not described in the literature. Given that MAW experience consistent, dynamic shifts, and constant upheaval in their personal networks, which are responsible for providing much of their social support, it stands to reason that more information and understanding of their networks and the minutiae of how they obtain social support, can offer helpful insights into ways to help women through this transitional time.

## **Significance of the Study**

This study is intended to facilitate a strong foundation for future research into the potential of using SNA to examine how structure, composition, and function of personal networks mitigate the development of PND in MAW. The information about networks and how they contribute to the development of PND can further be used when deciding PNC and how to assist women preparing for motherhood, and support them postpartum, within the military setting.

Military treatment facilities (MTFs) are already exploring Group Prenatal Care (GPC) which could be improved by a better understanding of MAW's personal networks and how they obtain social support. Understanding compositional, functional, and structural measures of personal networks could better inform the matching process in creating each GPC cohort.

This study will illustrate gaps in the literature and facilitate future meaningful research in the field of PND in the military setting. This research can inform healthcare providers, support services, and hopefully military families about the importance of social support. Of particular interest to families is the kind of support they should ask for, and who they should seek out within their network for best results. This can also inform leadership within the military and perhaps help units or groups organize support for their members during the perinatal period.

## **Overall Aim and Guiding Research Questions**

The purpose of this dissertation is to establish a foundational work towards a better understanding of how social networks, social support, perinatal depression, and military life intersect. Specifically, this work serves as a foundation for a future SNA study to determine the structural, compositional, and functional components of MAW's networks that associate with



perinatal depression symptoms. The dissertation had three studies, each with a specific research question(s). This research will address the following questions:

- 1) How do social network properties associate with depression or depressive symptoms in adults?
- 2) Using a socio-ecological framework, what is known regarding PND among military affiliated women?
- 3) What is the experience of perinatal women during the COVID-19 pandemic?
- 4) How do women experience social support during the pandemic?

## CHAPTER II

### RESEARCH STUDY #1: SYSTEMATIC LITERATURE REVIEW

#### Social Network Analysis Measures and Association to Depression or Depressive Symptoms among Adults

##### **Introduction**

##### ***Depression in Adults***

Depression is a mood disorder characterized by feelings and behavior changes that persist consistently for at least two weeks, and subsequently impact a person's daily functions such as sleeping, eating, and working (National Institutes of Mental Health, 2018; American Psychiatric Association, 2020). Signs and symptoms of depression can include sad or "empty" mood, change in sleeping or eating patterns, loss of interest in hobbies or activities, feelings of guilt or worthlessness, thoughts of suicide, difficulty concentrating, and restlessness (National Institutes of Mental Health, 2018; American Psychiatric Association, 2020). Additionally, forms of depression or related conditions include peripartum depression, seasonal affective disorder, persistent depressive disorder, psychotic depression, bipolar disorder, and premenstrual dysphoric disorder (National Institutes of Mental Health, 2018; American Psychiatric Association, 2020).

Established risk factors for depression include genetic, physiological, psychological, and environmental or social determinants (National Institutes of Mental Health, 2018; American Psychiatric Association, 2020). Furthermore, adverse life events such as unemployment or trauma, a family history of depression, or exposure to violence, neglect, and poverty, can increase chances of developing depression (American Psychiatric Association, 2020; World Health Organization, 2020b; National Institutes of Mental Health, 2018).

In 2019, the National Health Interview Survey Early Release Program found that 4.7% reported depressed feelings in the past seven days (Clarke, Schiller, & Boersma, 2020). According to the National Institute of Mental Health, over the previous year 7.1% of adults experienced major depressive episode, which they defined as “a period of at least two weeks when a person experienced a depressed mood or loss of interest or pleasure in daily activities, and had a majority of specified symptoms, such as problems with sleep, eating, energy, concentration, or self-worth” (2017, para. 2). Hasin et al. (2018) concluded that the 12-month prevalence of Major Depressive Disorder was 10.4% while the lifetime prevalence was 20.6% in an adult sample of Americans. Furthermore, white adults, women, adults aged 18-29, and those of low income had higher odds of reporting Major Depressive Disorder (Hasin et al., 2018). It is important to note that during the COVID-19 pandemic, there was an increase in the symptoms of depressive disorders; from August to December of 2020, adults experienced a significant change in symptoms of depressive disorder, from 24.5% to 30.2% (Vahratian et al., 2020).

According to the World Health Organization (2020b), treatments for depression include interpersonal psychotherapy, cognitive behavioral therapy, medication, and in mild cases of depression, psychosocial treatments. Use of medication should not be a primary consideration for adolescents or for those with mild cases of depression (World Health Organization, 2020b). Additionally, the National Institute of Mental Health (2018) discusses brain stimulation therapies as an option if medication is ineffective. Lastly, a systematic review of social interventions aimed at reducing depressive symptoms found that a variety of programs were effective and there was no single study, participant, or program characteristic that predicted a greater decrease in depressive symptoms (Dingle et al., 2021).

### ***Social Network Analysis***

Social network analysis (SNA), as used in public health and related fields, is a systems approach to understanding the patterns of how relationships form and influence behavior (typically health behaviors) among groups of people (Valente, 2010; Scott, 2017). It should be noted there are applications that do not investigate relationships among people but perhaps symptoms or other factors, and how these relate to one another relative to the development of illness or health outcomes. For example, Beard et al. (2016) reported on relations of anxiety and depression symptoms in a psychiatric sample, Lee et al. (2020) discuss psychosocial syndemic indicators among sexual minority men, and Choi et al. (2019) examined a network of psychosocial risks during pregnancy.

Furthermore, SNA is both a theoretical perspective and a methodology to understand relationships and the subsequent impact on health behaviors (Valente, 2010). Scott (2017) describes the theoretical perspective as having roots in exchange theory, the theory of social capital, and the actor-network theory. The methodology involves collecting attribute data including characteristics, attitudes, and behaviors of agents, and relational data which is the connections, ties, or relationships that relate agents to each other (Scott, 2017). Previously, SNA has been used in health to describe the diffusion of health behaviors or conditions such as obesity (Christakis & Fowler, 2007), smoking (Christakis & Fowler, 2008), loneliness (Cacioppo, Fowler, & Christakis, 2009), and happiness (Fowler & Christakis, 2008).

The scope of the literature search included depressive symptoms in the adult population. Understanding the social networks of individuals and the associations with depression or depressive symptoms can inform prevention, intervention, and treatment in the future. Reviewing the preliminary search results, studies seem to fall into two categories, one describing how social networks of depressed individuals form (for example: Xu & Zhang 2016; Takahashi et al., 2009),

and one determining how the social network of individuals influences development or incidence of depression. The second category is aligned with my research interest and was used to select relevant studies for inclusion in the study.

The research question is, *How do social network properties associate with depressive symptoms in adults?* This question was addressed by conducting a systematic review using the PRISMA guidelines (PRISMA checklist can be found at <http://www.prisma-statement.org/>). The purpose of this study was to present a narrative synthesis of current published literature describing how social network properties associate with depressive symptoms in adults.

## **Methods**

### ***Search Strategy***

The research team included a systematic review librarian to aid in conducting searches and two reviewers that independently screened and sorted articles based on inclusion and exclusion criteria. Any disagreement regarding exclusion was decided via discussion between the two reviewers. Covidence is an online tool that streamlines the systematic review process—this site was used for data extraction, quality assessment, and screening and sorting articles.

The following databases were used in the study: APA PsycINFO (EBSCO), MEDLINE Complete (EBSCO), Academic Search Complete (EBSCO), Embase (Ovid), SocIndex (EBSCO). The search terms included synonyms of depression and depressive symptoms, and terms encapsulating social network analysis. The study protocol was registered with PROSPERO (ID number CRD42020202479), which is an online database of prospectively registered systematic reviews where there is a health-related outcome. See table 2.1 for a detailed search strategy.

### ***Inclusion/Exclusion Criteria***

For inclusion in the systematic review, studies must have met the following criteria: the population must be adults ages 18 to 55 (not adolescents or older adults), at least one outcome measure must be depression or depressive symptoms as measured by a validated tool (such as the Center for Epidemiologic Studies Depression Scale/CES-D, Beck Depression Inventory/BDI, Hamilton Depression Rating Scale/HAM-D, Montgomery-Åsberg Depression Rating Scale/MADRS), the study must collect and comment on SNA measures (structural, compositional or functional measures were acceptable; this can include size, tie strength, density and constraint, homophily, or social support), and the manuscript must be available in English. The only specification for study context omitted online networks; multiple contexts or settings were included. As previously mentioned, studies exploring how the social network of individuals influences the development or incidence of depression were included while studies that analyzed how social networks of depressed individuals form were excluded. Study designs were cross-sectional or cohort studies conducted between 1970 and 2020.

Studies using social network surveys (for example the Social Network Index or the Lubben Social Network Scale) that do not require the use of a name generator or network generator question were not included. Specific data on multiple nodes as opposed to a general composite score for an individual's network was required to qualify for inclusion in the study.

Outcome measures include associations of depression or depressive symptoms and social network characteristics as measured by SNA (for example, density, centrality, transitivity, and centralization). Information on the following items was extracted: country or region and setting the of study; population demographics; study design, duration, funding and conflicts of interest; if the study addressed specific comorbidities; methods of recruitment, sampling and data

collection; how depression was measured; the SNA measures analyzed; and the outcomes of the study which will be presented in a narrative format. Additionally, we used tools developed by the Joanna Briggs Institute (JBI) for quality assessment protocol (JBI critical appraisal tool <https://jbi.global/critical-appraisal-tools> ). Covidence was used for screening, extraction, and quality assessment activities.

## **Results**

Our search yielded 3,425 studies imported for initial screening. Of these, 1,452 duplicates were removed leaving 1,973 studies screened for title and abstract. After removing irrelevant studies, 77 full-text articles were subsequently considered for inclusion. Ultimately, 15 studies were determined to satisfy the inclusion criteria for the review. See figure 2.1 for the PRISMA Flow Chart.

The most common reason for exclusion (28 studies) was having a population age range outside of 18-55 years old. Most of these studies examined older populations while a few examined youth or adolescent populations. Additional common reasons for exclusion were examining outcomes or variables outside the scope of this study (16 studies) and using a scale or index or some other form of network analysis that does not include a name generator and not including SNA measures (12 studies). Infrequently, a study design was outside the scope of this review or used an online network (4), the article was not available in English (1), or the researchers did not use a validated tool to measure depression (2).

### ***Demographics***

Most studies (13) were conducted in the United States, one study was from Italy, and one study included data collected in Taiwan. Three studies did not include a measure of central tendency for age, but the studies that did report averages or medians ranged from 25 to 54. Eight

studies examined women only, six studies included both male and female participants, and only one study exclusively considered men. Four studies did not describe the race/ethnicity breakdown of their sample, four were majority white or Caucasian, four were majority black, one was exclusively black, one was exclusively Latino, and one exclusively Mexican descent. Additionally, five studies did not define their population by or examine a comorbidity. Those that did consider a comorbidity examined AIDS/HIV (4) most frequently. Finally, nine studies utilized the Center for Epidemiological studies depression scale (CES-D) to measure depression. The other studies used a variation of the CES-D (2), the Patient Health Questionnaire—9 (2) or a variation (1), one study used the Beck Depression Inventory and a diagnostic interview, and one study used the Clinical Depression Questionnaire (CDQ) Scale of depression.

### ***SNA Measures Overview***

All the included studies (table 2.4 includes a summary of each study) examined egocentric networks. In egocentric networks, data is collected for a single person about their personal network, from their perspective. The SNA measures were divided into three main categories: structural, compositional, and functional. See table 2.2 for a list of SNA terms and definitions; SNA measures by study ID can be found in figure 2.2 and table 2.3.

The structural measures studied included: size, density, multiplexity, cohesion, efficiency, hierarchy, constraint, stability, reciprocity, and closeness. Most studies (11) looked at total network size and/or size of subnetworks (such as social support network, drug network, or sexual partner network). Network density was another common structural element examined by seven studies. Stability was included in two studies, and only one study measured multiplexity, cohesion, efficiency, hierarchy, constraint, reciprocity, and closeness.



Compositional elements described the individuals that made up a network. Many studies (9) were concerned with relationship type, specifically, what proportion of a network was composed of friends/coworkers (5), family (8), healthcare providers (1), spiritual leaders/contacts (1), sexual partners or Spouse (7). Another area of interest was homophily. This was commonly operationalized as nodes that shared certain important characteristics such as same diagnosis (2), same life circumstance (2), or same gender (2).

Lastly, functional elements were divided into social support (7), interpersonal strain (3), and frequency of contact or availability (7). Social support was further subdivided into emotional (6), instrumental (6), informational (2), treatment-specific (2), financial (2), and socialization (1).

### ***Structural Measures***

A vast majority of the studies included in the review measured network size in some way. Latkin (2017) found that depression was common among people that were unable to list members of a network and that depression levels were significantly associated with the size of emotional, financial, and medical appointment support networks in a sample of black men who have sex with men—larger networks related to decreased depression. Similarly, McDowell (2009) found that size of network was inversely related with depressive symptoms among women living with HIV/AIDS. Mothers of children with autism spectrum disorder (ASD) were found to have greater perceived social support with larger network size which directly and indirectly impacted mental health—more support associated with decreased maternal depression (Benson, 2016).

Vielehr (2016) found a positive association between network size and depressive symptoms when analyzing data from the Taiwan Social Change Survey; as size increased so did depressive symptoms. Within a sample of inner-city residents of Baltimore, Maryland, Yang

(2015) reported larger drug networks were significantly related to depression and depression was predictive of a larger drug network. Also found were studies where network size was not significantly associated with depression or depressive symptoms (Grace, 2019; Messer et al., 2020; Soto et al., 2016; Cederbaum et al., 2017; Franks et al., 2004; Knowlton & Latkin, 2007).

Higher network density was associated with a decrease in depressive symptoms while efficiency was associated with increased symptomology; interestingly, moderate constraint was beneficial, but higher levels increased depressive symptoms (Vielehr, 2016). Alternatively, among a sample of women living with HIV/AIDS, McDowell (2009) found that density and network cohesion were not significant predictors of depressive symptoms. Cederbaum et al. (2017) also found no significant association between density and depressive symptoms. Three studies measured density but did not report any associations with depression (Knowlton & Latkin, 2007; Pollack et al., 2014; Messer et al., 2020). Gagliardi et al. (2009) did not comment on the direct relationship between density and depression but noted that women with breast cancer had higher levels of depression and ill women also had more dense networks compared to healthy women in their sample. Soto et al. (2016) and McDowell (2009) did not find statistically significant associations between stability and depression.

### ***Compositional Measures***

The study by Grace (2019) found that among premedical students, the greater number of similar others, specifically other premedical students, was protective against depressive symptoms, so long as they had low levels of anticipatory stress towards medical school admission. In a sample of people living in public housing, Pollack (2014) found an increase in the number of alters with depressive symptoms related to higher rates of depression in the ego.

Messer (2020) found that having family members and additional HIV-infected alters in their network resulted in a reduction in the PHQ—9 depression scores of HIV—infected women of color. Cederbaum (2017) reports the same finding regarding the relationship between number of HIV-infected alters and a decrease in depressive symptoms among women living with HIV/AIDS; however, their data did not support a relationship between the number of network familial ties and decreased depressive symptoms. Additionally, having more doctors or medical providers in the social networks of women with HIV/AIDS increased the likelihood of reporting depressive symptoms (Cederbaum, 2017). Soto (2016) reported that within a sample of Latinos, having more women in the social network increased the likelihood of depression while McDowell (2009) found that a sample of women living with HIV/AIDS reported a decrease in depressive symptoms relative to an increase in females in their network.

Yang (2015) conducted a study comparing inner city resident of Baltimore, Maryland with and without depression and found that those without a main partner reported increased depressive symptoms. Likewise, analysis of data from the Taiwan Social Change Survey indicated that the presence of a spouse in your network was protective against depressive symptoms (Vielehr, 2016). Knowlton (2007) reported that among a sample of inner-city former and current drug users, conflictive ties were a predictor of increased depressive symptomology.

### ***Functional Measures***

Vielehr (2016) found that support was associated with decreased depression in a sample from Taiwan. Additionally, among a sample of women with Fibromyalgia Syndrome, social support variables explained a significant percentage of CES-D scores and social support satisfaction associated with lower depression scores.

Benson (2016) assessed mothers of children with Autism Spectrum Disorder and found that instrumental support seemed to lessen depressive symptoms while interpersonal strain had the opposite effect. Similarly, McDowell (2009) reported that among women living with HIV/AIDS, expressing dissatisfaction with relationships was predictive of increased depressive symptoms. Women with early-stage breast cancer and higher levels of depression tend to receive less informational support and emotional support from kin in their social support networks, indicating that ill women who receive love, information, affection, and care from kin have less depression (Gagliardi 2009).

O'Hara (1983) compared depressed and nondepressed postpartum women and found that depressed women report giving less instrumental support and receiving less emotional support from their network, particularly spouse, parents, and friends. Specifically, depressed women reported a lack of communication regarding problems with their spouse, and an inability to rely on their spouses for emotional or instrumental support or provide emotional and instrumental support to their spouses (O'Hara, 1983). Not surprisingly then, depressed women reported more marital problems and less happiness with their marriage as well (O'Hara, 1983).

O'Hara (1983) also noted that depressed women were unable to depend on their friends for emotional support, talk with them about personal issues, or provide them with instrumental support. The depressed women also received less emotional support from mothers and were unable to provide instrumental support to their parents (O'Hara, 1983). There was no difference between depressed and nondepressed women with regard to access to childcare (O'Hara, 1983).

Messer (2020) found that financial support decreased depressive symptoms of HIV-infected women of color. Additionally, among Mexican immigrant women, larger family support and income are strong predictors of lower depression scores (Vega, 1991). Among current and

former injection drug users in an inner-city setting, less enacted financial support was associated with increased depressive symptoms (Knowlton, 2007)

Latikin (2017) found that depression levels among men who have sex with men were slightly associated with frequency of contact, specifically, with members of the network seen weekly. Alternatively, in a sample of Mexican immigrant women, Vega (1991) found that frequency of contact with friends and family was not associated with depression. O'Hara (1983) reports that depressed postpartum women were more likely to have weekly contact with members of their social network. One instance where social support network was associated with increased depression indirectly comes from Yang (2015); data support that an increased social support network related to a larger drug network which was associated with increased depression.

### ***Quality Assessment***

The quality assessment followed the Joanna Briggs Institute (JBI) critical appraisal tools (Appendix B) to determine the possibility of bias in study design and analysis. A summary of the quality assessment is presented in figure 2.3. Overall, the studies included in the review measured exposure, condition, and outcomes in a valid and reliable way. This is largely due to inclusion criteria such as a requirement to use a validated tool to measure depression or depressive symptoms.

Four studies out of the 15 did not identify or address strategies to deal with confounders. Only seven studies adequately described the study participants and setting, making it difficult for other researchers to determine the relevance of the findings for their population of interest. Lastly, statistical analysis methods were not clearly described in ten studies. These studies

typically did not include information on variables and if statistical assumptions such as normality and linearity were adequately addressed.

## **Discussion**

The research question for this study was *how do social network properties associate with depressive symptoms in adults?* The key finding of this review is that network characteristics and the association with depression or depressive symptoms is still unclear. The review highlights a scarcity of studies examining this topic, and an inconsistency between various SNA measures and measures of depressive symptomology among a variety of subpopulations.

Network size does not consistently associate with depression or depressive symptoms. This could be because the measure of size alone is not descriptive enough to capture the impact of the ties. For example, when network size is reflective of a large degree of social support, it seems protective, alternatively if there are many conflictive ties that contribute to the overall network size, it may contribute to depression or depressive symptoms. Studies should measure associations with size but need to include other measures of compositional and functional nature to more accurately describe the network ties and their purpose to the ego. Density was another commonly measured characteristic, but only three studies specifically commented on the association with depression—one indicated that density decreased depression and the other two noted no significant association. There is a dearth of available information regarding structural aspects of SNA and the relationship to depression in the adult population.

The key finding related to compositional measures was that having similar others in the network associated with decreased depression symptoms. The findings indicate that having people with the same diagnosis or life circumstances in the network decrease depressive symptoms. Assessing characteristics of homophily that make having similar others in network

important should be studied further. In other words, a better understanding of the mechanism responsible for a reduction of depressive symptoms based on greater homophily should be examined. Understanding this relational mechanism can lead to more effective intervention and treatment strategies.

For example, does having others in your network that experientially understand your specific situation decrease isolation and thus decrease depressive symptoms? An interesting future line of research could measure the associations between various aspects of similar others (homophily) and isolation. As mentioned by Messer (2020), “reducing perceived isolation, rather than providing support per se, may be important for reducing depressive symptoms” (p. 7). Further determination of influential aspects of homophily in someone’s social network could inform social interventions and group treatment options. This could subsequently be followed up with inquiries of social support, especially emotional support, and the correlations with feeling understood or validated. More research should focus on the decrease in depression independently of social support and discover the impact of homophily versus emotional social support.

With regard to homophily, an important finding is the caveat that having other depressed individuals in the social network increased depression scores. Rosenquist et al. (2011) similarly concluded that depression scores were strongly correlated to friends and neighbors in one’s network (this study was not included in the review as the mean age of the sample was not within the scope of the current study). If individual levels of depression can be influenced by members of a social network, perhaps more longitudinal data to better understand this relationship is warranted. It may be possible to find key positions in a network for depression management or treatment initiatives that have influence throughout the network.

It is not surprising that increased social support decreased depressive symptomology. Multiple types of social support including emotional, instrumental, and informational, contributed to a decrease in depression or depressive symptoms. Along the same lines, increased satisfaction with relationships and decreased conflictive ties or relational strain, also associated with decreased depression. Future considerations based on this information may include interventions aimed at decreasing depression that incorporate relationship health and conflict resolution content. For example, findings that support the use of marital counseling to manage or treat depression have previously been described in the literature (Gilliam & Cottone, 2005; Waring et al., 1995).

In cases of decreased social support, it may be important to determine other factors that mitigate depressive symptoms. This information can also be gained by SNA and studying those with low depression scores and low social support—what other factors are at play that are contributing to the positive mental health outcomes despite the lack of support? For example, Benson (2016) found that maternal self-efficacy reduced depressive symptoms and decreased the impact of perceived support on depression to insignificance. This is an interesting find because it may indicate that for some populations, particularly mothers, providing education and appraisal support that increased self-efficacy could positively impact depressive symptomology and aid in maternal well-being and functioning.

Also important to mention is the critical appraisal findings and lack of detailed methodology in the included studies. Future studies should aim to describe their population of interest and statistical methods better for the purposes of transparency, generalizability, and replication. A clear understanding of the sample and setting are necessary for practitioners and



researchers to conclude that the findings are applicable to their population of interest, especially given the differences in associations of SNA measures and depression in various subpopulations.

In conclusion, SNA properties may associate with depression in a variety of ways depending on the population, but these relationships, particularly those of a structural or compositional nature, are still largely unclear at this time. With regard to functional characteristics, the findings of this review indicate that a variety of social support types mitigate depressive symptoms. Future research is needed that adequately describes the population of interest, design, and methodology. Detailed information on the impact of social networks on measures of depression can benefit the future design and implementation of intervention and treatment options.

**Table 2.1—Detailed Search Strategy**

6/17/2020 updated 7/16/2020

APA PsycINFO (ebSCO) no limits, 1097 retrieved

DE "Social Network Analysis" or TI (social network analysis) or AB (social network analysis) OR ( AB ("social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) OR ( ( TI "social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) )

AND

( DE "Major Depression" OR DE "Anaclitic Depression" OR DE "Dysthymic Disorder" OR DE "Endogenous Depression" OR DE "Late Life Depression" OR DE "Postpartum Depression" OR DE "Reactive Depression" OR DE "Recurrent Depression" OR DE "Treatment Resistant Depression" ) OR ( TI depress\* or AB depress\* )

Medline Complete Ebsco 11/13/2020, 1260 results

TI (social network analysis) or AB (social network analysis) OR ( AB ("social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) OR ( ( TI "social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) )

AND

( (MH "Depression") OR (MH "Depressive Disorder+") ) OR ( ( TI depress\* or AB depress\* ) )

CINAHL Ebsco 11/13/2020, 632 results

(MH "Social Network Analysis (Saba CCC)") OR ( TI (social network analysis) or AB (social network analysis) OR ( AB ("social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) OR ( ( TI "social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) ) )

AND

(MH "Depression+") OR ( TI depress\* or AB depress\* )

SocIndex (ebSCO) 11/13/2020, 232 results

( TI depress\* or AB depress\* ) AND ( ( TI (social network analysis) or AB (social network analysis) OR ( AB ("social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) OR ( ( TI "social network" or "network analysis" or "network science" or "Egocentric network" or "sociometric network" or "sociocentric network") ) ) ) )

Embase (Ovid) 11/13/2020, 1917 results, 147

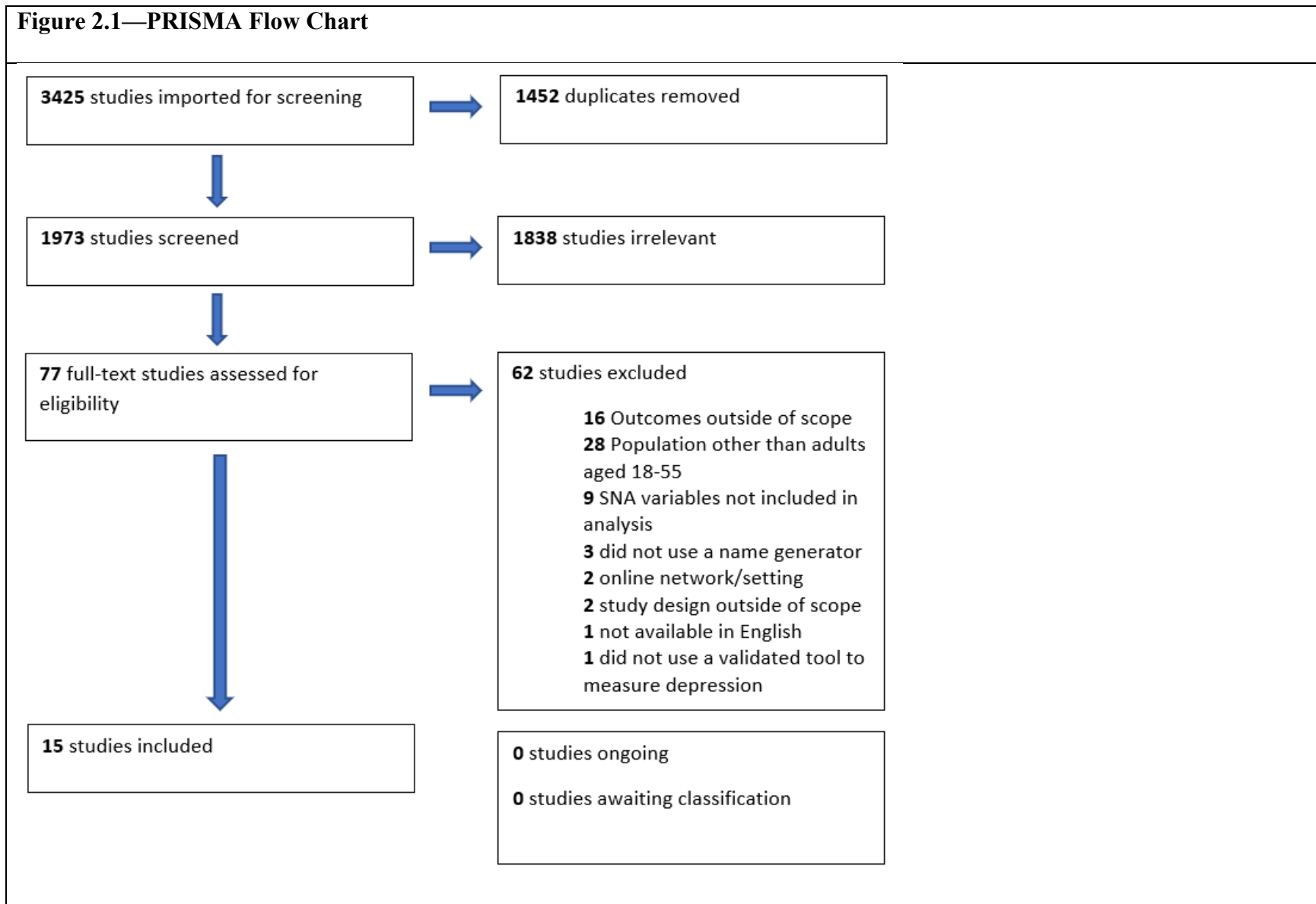
depress\*.ti,ab,kw. Or exp depression/

and

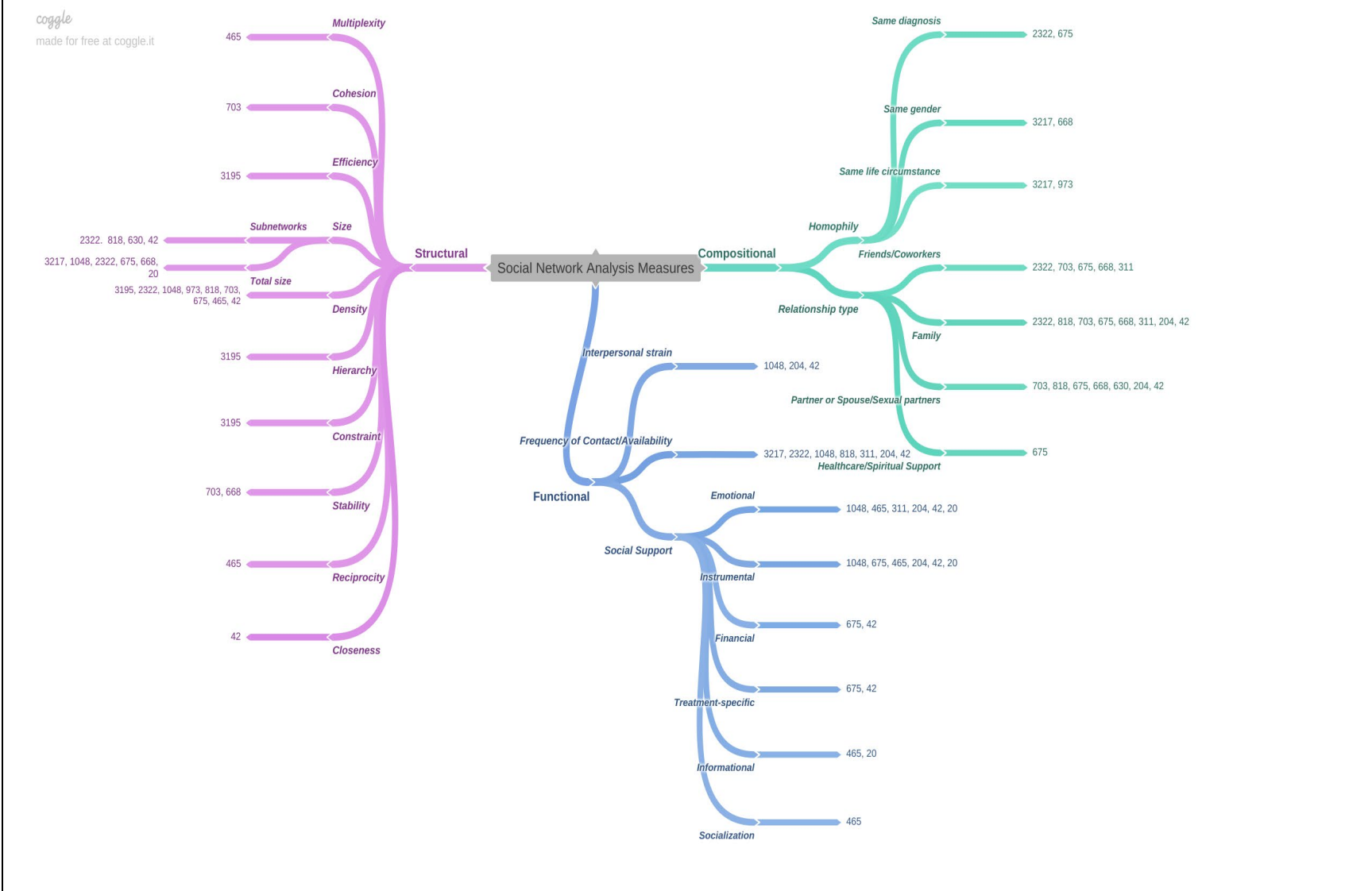
(network adj1 (social or analysis or science or egocentric or sociometric)).ti,ab,kw.

|              |                                                                                                                                                                                                                                                                                                               |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Closeness    | The average distance a node is from all other nodes in the network                                                                                                                                                                                                                                            |
| Cohesion     | A measure of connectedness within a network. Valente discusses the Average Path Length (APL) or “the average of the distances between all nodes in a network” (2010, p. 135)                                                                                                                                  |
| Constraint   | Level to which a node is nested within their network                                                                                                                                                                                                                                                          |
| Contact      | Frequency of contact with alters; typically ranging from “less than once a month” to “daily”                                                                                                                                                                                                                  |
| Density      | Extent to which nodes are connected. Specifically, the number of connections as a fraction of the total possible ties.                                                                                                                                                                                        |
| Efficiency   | A measure of how efficient information exchange is in a network. “The number of non-redundant ties divided by the network size” (Vielehr, 2016, p. 10)                                                                                                                                                        |
| Hierarchy    | “Investment of alters in a single alter” which may shift focus/support/power to someone other than the ego within a network (Vielehr, 2016, p. 10). “A situation in which one position holds a high status position and possibly members of this position enjoy a position of power” (Valente, 2010, p. 121). |
| Homophily    | The degree of “sameness” between an nodes                                                                                                                                                                                                                                                                     |
| Multiplexity | Count of separate social connections between nodes                                                                                                                                                                                                                                                            |
| Reciprocity  | The direction between ties                                                                                                                                                                                                                                                                                    |
| Size         | The number of nodes in a network                                                                                                                                                                                                                                                                              |
| Stability    | Length or duration of association                                                                                                                                                                                                                                                                             |

**Figure 2.1—PRISMA Flow Chart**



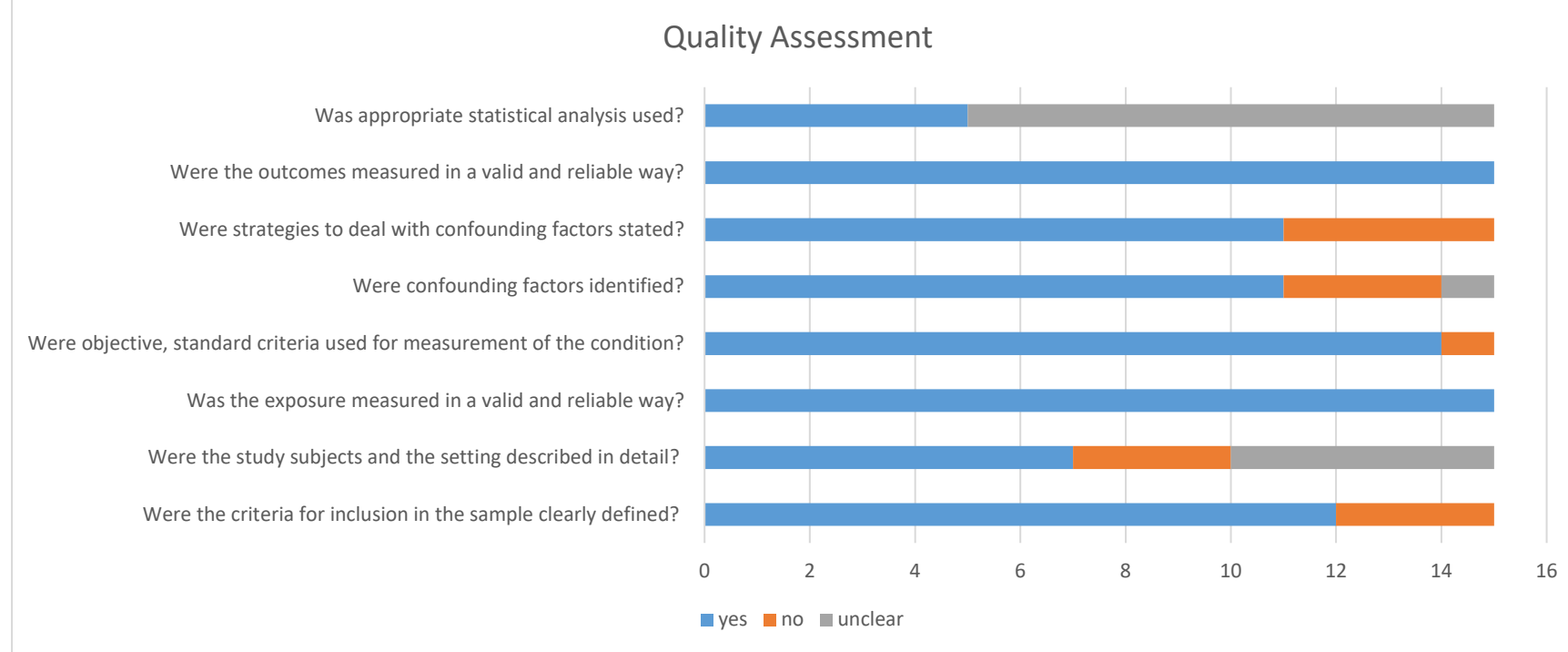
**Figure 2.2—Concept Map of SNA Measures by Study ID**



**Table 2.3—SNA Measures by Study ID**

| SNA Measures                        | Study Identification number as listed in the summary table |      |      |      |     |     |     |     |     |     |     |     |     |    |    |
|-------------------------------------|------------------------------------------------------------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
|                                     | 3217                                                       | 3195 | 2322 | 1048 | 973 | 818 | 703 | 675 | 668 | 630 | 465 | 311 | 204 | 42 | 20 |
| Multiplexity                        |                                                            |      |      |      |     |     |     |     |     |     | X   |     |     |    |    |
| Cohesion                            |                                                            |      |      |      |     |     | X   |     |     |     |     |     |     |    |    |
| Efficiency                          |                                                            | X    |      |      |     |     |     |     |     |     |     |     |     |    |    |
| Size                                | X                                                          | X    | X    | X    |     | X   | X   | X   | X   | X   |     |     |     | X  | X  |
| Density                             |                                                            | X    | X    |      | X   |     | X   | X   |     |     | X   |     |     | X  |    |
| Hierarchy                           |                                                            | X    |      |      |     |     |     |     |     |     |     |     |     |    |    |
| Constraint                          |                                                            | X    |      |      |     |     |     |     |     |     |     |     |     |    |    |
| Stability                           |                                                            |      |      |      |     |     | X   |     | X   |     |     |     |     |    |    |
| Reciprocity                         |                                                            |      |      |      |     |     |     |     |     |     | X   |     |     |    |    |
| Closeness                           |                                                            |      |      |      |     |     |     |     |     |     |     |     |     | X  |    |
| Homophily—Diagnosis                 |                                                            |      | X    |      |     |     |     | X   |     |     |     |     |     |    |    |
| Homophily—Gender                    | X                                                          |      |      |      |     |     |     |     | X   |     |     |     |     |    |    |
| Homophily—life circumstance         | X                                                          |      |      |      | X   |     |     |     |     |     |     |     |     |    |    |
| Relationship type—Friends/coworkers |                                                            |      | X    |      |     |     | X   | X   | X   |     |     | X   |     |    |    |
| Relationship—Family                 |                                                            |      | X    |      |     | X   | X   | X   | X   |     |     | X   | X   | X  |    |
| Relationship—Spouse/partner         |                                                            |      |      |      |     | X   | X   | X   | X   | X   |     |     | X   | X  |    |
| Relationship—Healthcare/Spiritual   |                                                            |      |      |      |     |     |     | X   |     |     |     |     |     |    |    |
| Interpersonal strain                |                                                            |      |      | X    |     |     |     |     |     |     |     |     | X   | X  |    |
| Contact/availability                | X                                                          |      | X    | X    |     | X   |     |     |     |     |     | X   | X   | X  |    |
| Social Support—Emotional            |                                                            |      |      | X    |     |     |     |     |     |     | X   | X   | X   | X  | X  |
| Social Support—Instrumental         |                                                            |      |      | X    |     |     |     | X   |     |     | X   |     | X   | X  | X  |
| Social Support—Financial            |                                                            |      |      |      |     |     |     | X   |     |     |     |     |     | X  |    |
| Social Support—Treatment specific   |                                                            |      |      |      |     |     |     | X   |     |     |     |     |     | X  |    |
| Social Support—Informational        |                                                            |      |      |      |     |     |     |     |     |     | X   |     |     |    | X  |
| Social Support—Socialization        |                                                            |      |      |      |     |     |     |     |     |     | X   |     |     |    |    |

**Figure 2.3—Quality Assessment**



| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                                                                                                        | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>SNA Measures</b>                                                                                                                                | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #3217 Grace—2019                                   | United States  | <p><b>Specified Group:</b> Premedical students</p> <p><b>Mean Age:</b> not specified</p> <p><b>Age Range:</b> not specified</p> <p><b>Gender:</b> male (31%) and female (69%)</p> <p><b>Comorbidity:</b> none</p> <p><b>Race/Ethnicity:</b> White (70%), Black(8%), Asian American(11%), Hispanic(8%), American Indian / Alaska Native /Non-Hispanic multiracial(3%)</p> | N=286              | <p>Research questions:</p> <p>(1) Is within-individual change in the proportion of experientially similar others in support networks associated with depressive symptoms? (2) Does the presence of additional similar others in support networks over time buffer or exacerbate the positive associations between anticipatory stress and depressive symptoms? (3) What mechanisms explain the buffering or exacerbating effects of experientially similar support?</p> | <p>Network Homophily (comprised of same-sex and same-race alters)</p> <p>Frequency of contact</p> <p>A log-transformed version of network size</p> | <p>Premeds whose support networks include a greater proportion of premedical peers over time experience fewer depressive symptoms. However, among premeds who report greater anticipatory stress about failing to achieve medical school admission, the presence of additional peers in support networks strengthens the detrimental effects of anticipatory stress.</p> |



| <b>Table 2.4—Summary of Included Studies</b>       |                                                     |                                                                                                                                                                            |                    |                                                                                                                                                                                                |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b>                                      | <b>Population</b>                                                                                                                                                          | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                          | <b>SNA Measures</b>                              | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| #3195<br>Vielehr—2016                              | data came from the Taiwan Social Change Survey 1997 | <b>Specified Group:</b><br><b>Mean Age:</b> 51.5<br><b>Age Range:</b> 31-85<br><b>Gender:</b> male (48%) and female (52%)<br><b>Comorbidity:</b><br><b>Race/Ethnicity:</b> | N=1737             | This paper examines functional support as a mediator between ego-network structure and depressive symptoms and network structure as a moderator of support function on psychological distress. | Density<br>Efficiency<br>Hierarchy<br>Constraint | The results do not support a mediation process, rather, network structure moderates the effect of functional support on depressive symptomatology. In general, the findings suggest increased efficacy of social support when emotional networks have fewer structural holes and greater closure. However, high constraint shows a curvilinear relationship with moderate constraint being beneficial but depressive symptoms increasing as constraint increases toward high levels. |

| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                                                      | <b>SNA Measures</b>                                                                                                                                                                                                                                                                                               | <b>Key Findings</b>                                                                                                                                                                                                                                                      |
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| #2322—Messer et al., 2020                          | United States  | <p><b>Specified Group:</b> Women of Color<br/> <b>Mean Age:</b> 45.5<br/> <b>Age Range:</b> 18+<br/> <b>Gender:</b> female<br/> <b>Comorbidity:</b> HIV/AIDS<br/> <b>Race/Ethnicity:</b> Approximately 90% of the women who participated in the social network data collection were black non-Hispanic, 7% were Native American and the remaining 6% self-identified as Hispanic or other (in non-mutually-exclusive categories).</p> | N=87               | <p>1) Describe the egocentric social network characteristics of a sample of HIV-infected women of color (WOC) and 2) Evaluate how social network characteristics were associated with depression and social support among these women.</p> | <p>Family ties<br/> Non-family ties<br/> Advice ties<br/> Emotional support ties<br/> Financial support ties<br/> Transportation support ties<br/> Alters who know ego’s HIV status<br/> Alters who are also HIV-infected<br/> Total network size<br/> Connectivity<br/> Density<br/> Alter contact frequency</p> | <p>This cross-sectional study of HIV-infected WOC in an academic HIV clinic demonstrated that network size and functional characteristics were associated with both decreased depression and increased social support, especially treatment-specific social support.</p> |

| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                           | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                                                                                                                              | <b>SNA Measures</b>                                                                                                                                                                                                                                                                                                                                                       | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                    |
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| #1048—Benson 2016                                  | United States  | <p><b>Specified Group:</b> Mothers of children with Autism Spectrum Disorder<br/> <b>Mean Age:</b> 42.1<br/> <b>Age Range:</b> not specified<br/> <b>Gender:</b> female (100%)<br/> <b>Comorbidity:</b><br/> <b>Race/Ethnicity:</b> 85% Caucasian, race/ethnicity not clearly specified</p> | 110                | (1) to assess the longitudinal effects of social network characteristics on two key maternal coping resources, perceived social support and parenting self-efficacy, and (2) to assess the direct and indirect effects of network factors on maternal mental health (depressed mood and psychological well-being). | (1) network size<br>(2) network diversity<br>(3) network availability<br>(4) the proportion of core network members providing emotional support to the mother,<br>(5) the proportion of core network members providing instrumental support to the mother, and<br>(6) the proportion of network members engendering interpersonal strain in interactions with the mother. | Two network factors, proportion providing instrumental support and proportion engendering interpersonal strain, significantly predicted maternal depression over time, with increased instrumental network support being associated with a decrease in depressed mood, while increased network strain was associated with an increase in this outcome. |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                                                                                    |                    |                                                                                                                                                                                                                                             |                           |                                                                                                                                                                                                                                                                       |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                  | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                                                       | <b>SNA Measures</b>       | <b>Key Findings</b>                                                                                                                                                                                                                                                   |
| #973—Pollack et al., 2014                          |                | <b>Specified Group:</b> people living in public housing<br><b>Mean Age:</b> 44<br><b>Age Range:</b> not specified<br>Gender: male (12%) and female (88%)<br><b>Comorbidity:</b> N/A<br><b>Race/Ethnicity:</b> Hispanic (15%), Black (69%), Asian (3%), White (13%) | 453                | We assessed whether 2 types of public housing--scattered among market-rate housing developments or clustered in small public housing projects--were associated with the perceived health and health behaviors of residents' social networks | Structure and composition | A 10- percentage-point increase in the proportion of alters with depressive symptoms was associated with a higher rate of respondent depression (a 3-percentage-point increase), though this result did not remain significant when we adjusted for multiple testing. |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                                    |                    |                                                                                                                                         |                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                  | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                   | <b>SNA Measures</b>                                                                                                                                                                                   | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                                                             |
| #818—Latkin et al., 2017                           |                | <b>Specified Group:</b><br>Black Men who have sex with Men<br><b>Mean Age:</b> not specified<br><b>Age Range:</b> 18+<br><b>Gender:</b> male<br><b>Comorbidity:</b><br>HIV/AIDS<br><b>Race/Ethnicity:</b><br>Black | 1547               | The current study examines the relationship between social network functional support and level of depressive symptoms among Black MSM. | Total network size of financial support, medical support, and emotional support networks<br>Family members in the network<br>Sexual partner network<br>Frequency of interactions with network members | Having family in social network, the number of sexual partners in social network, the total size of social network, the size of network seen daily, and the size of network seen rarely were not associated with depression. The number of network members seen weekly was marginally associated with lower levels of depression. At baseline larger functional support networks were significantly associated with lower levels of depression. |

| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                                                               | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                     | <b>SNA Measures</b>                                                        | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| #703—<br>McDowell 2009                             |                | <p><b>Specified Group:</b><br/>Women living with HIV/AIDS</p> <p><b>Mean Age:</b> 39.6</p> <p><b>Age Range:</b> 18 to 63</p> <p><b>Gender:</b> female (100%)</p> <p><b>Comorbidity:</b><br/>HIV/AIDS</p> <p><b>Race/Ethnicity:</b><br/>African American (73.8%), Caucasian (21.2%), Hispanic/Latino (2.5%), or Other (2.5%)</p> | 80                 | The objective of the current study was to examine the relationship between the constellation of social networks and mental health for HIV-positive women. | <p>Network composition</p> <p>Density</p> <p>Cohesion</p> <p>Stability</p> | <p>Network size was an indicator in all three of the models, significantly predicting levels of depressive symptoms over the past few days and over the past few years. Participants' dissatisfaction with their relationships with members was also an important predictor, as well as stability of network members over the course of the study</p> <p>Density, cohesion, and family-to-network cohesion were not significant predictors of any mental health indicators for this sample</p> |

| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                        | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                      | <b>SNA Measures</b>                            | <b>Key Findings</b>                                                                                                                                                                                                                                                    |
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| #675—<br>Cederbaum et al., 2017                    | United States  | <b>Specified Group:</b><br>HIV-positive women<br><b>Mean Age:</b> 47.4<br><b>Age Range:</b> 27-65<br><b>Gender:</b> female (100%)<br><b>Comorbidity:</b><br>HIV/AIDS<br><b>Race/Ethnicity:</b><br>African American (43.5%), White (4.3%), Latina (52.2%) | 46                 | in this study we examined the structure and composition of HIV-positive women’s social networks. We hypothesized that women with more HIV-positive network members would report fewer depressive symptoms. | Network size<br>Network density<br>Composition | Depressive symptoms were positively associated with an increased number of doctors reported in a woman’s network<br>Conversely, we found a significant negative relationship between depressive symptoms and an increase in the number of HIV-positive network members |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                      |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>SNA Measures</b>                                                                                                                 | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                  |
| #668—<br>Soto et al., 2016                         | United States  | <p><b>Specified Group:</b> Latinos with Chronic Health Conditions</p> <p><b>Mean Age:</b> 44</p> <p><b>Age Range:</b> not described</p> <p><b>Gender:</b> male (27%) and female (73%)</p> <p><b>Comorbidity:</b> Chronic Conditions (diabetes, heart disease (includes arteriosclerosis, angina/coronary heart disease, or stroke), hypertension, high cholesterol, asthma, cancer, and/or arthritis or other joint pain).</p> <p><b>Race/Ethnicity:</b> Latino (100%)</p> | 393                | <p>The purpose of this study was to examine the “buffering hypothesis” of social network characteristics in the association between chronic conditions and depression among Latinos.</p> <p>It is anticipated that the presence of a larger social network, more family in the network (vs. friends), more women in the network (vs. men), and longer lasting relationships in the network will buffer the association between having a chronic condition and reporting moderate-to-severe depressive symptoms among Latinos</p> | <p>Alter’s gender</p> <p>Alter relationship</p> <p>Alter length of association</p> <p>Size of the network</p> <p>Marital status</p> | <p>Having a greater proportion of the network comprised of friends increased the likelihood of depression among those with high cholesterol. Having a greater proportion of women in the social network was directly related to the increased likelihood of depression, regardless of the presence of chronic health conditions.</p> |



| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                                                                                                                                  | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                        | <b>SNA Measures</b>                                                                                                                                                                  | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                                   |
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| #630—Yang et al., 215                              | United States  | <p><b>Specified Group:</b> Inner-City residents of Baltimore, Maryland</p> <p><b>Mean Age:</b> 43 (with depression) and 44 (no depression)</p> <p><b>Age Range:</b> 18-55</p> <p><b>Gender:</b> male with depression(18.4), male no depression (33.7), female with depression (81.6%), female no depression (66.3%)</p> <p><b>Comorbidity:</b> N/A</p> <p><b>Race/Ethnicity:</b> not described</p> | 746                | We investigated the directional relationship between social network factors and depressive symptoms among a sample of inner-city residents in Baltimore, MD. | <p>Information regarding alter’s HIV-related risk behaviors, drug use history and relationship</p> <p>The size of the drug network</p> <p>The size of the social support network</p> | <p>Those with higher levels of depression did not have a main partner. Larger size of drug network was significantly associated with depression and using depression to predict size of drug network, the data suggested that depression was associated with larger size of drug network.</p> <p>Larger size of social support network was found to be significantly associated with larger size of drug network.</p> |

|                                             |              |                                                                                                                                                                                                                                                                    |            |                                                                                                                                                                                                   |                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| <p>#465—<br/>Gagliardi et al.,<br/>2009</p> | <p>Italy</p> | <p><b>Specified Group:</b><br/>women with early<br/>stage breast cancer<br/><b>Mean Age:</b> 54<br/><b>Age Range:</b> 40 to<br/>65<br/><b>Gender:</b> female<br/>(100%)<br/><b>Comorbidity:</b><br/>breast cancer<br/><b>Race/Ethnicity:</b><br/>not specified</p> | <p>105</p> | <p>The present study<br/>examines the<br/>relationship between<br/>the social network<br/>structure and social<br/>support and<br/>depression and<br/>anxiety in women<br/>with breast cancer</p> | <p>Density<br/>Multiplexity<br/>Reciprocity<br/>Instrumental<br/>support<br/>Informational<br/>support Emotional<br/>support<br/>Socialization</p> | <p>Depression correlated<br/>with different<br/>variables in the two<br/>groups.<br/>In the ill group anxiety<br/>and depression<br/>correlated with<br/>emotional and<br/>informational support<br/>received from kin and<br/>kin multiplexity,<br/>signifying that kin<br/>perform many roles in<br/>the relationship:<br/>showing that those<br/>who receive more<br/>love, care, support,<br/>and affection from<br/>their kin enjoy better<br/>mental health<br/>The support structure<br/>of the healthy women<br/>indicated that<br/>emotional support and<br/>instrumental support<br/>given by friends and<br/>coworkers have a<br/>positive influence on<br/>mental health. The<br/>multiplexity of<br/>friendship and<br/>coworker<br/>relationships, and<br/>therefore the variety of<br/>roles performed by<br/>these sources of</p> |
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| <b>Table 2.4—Summary of Included Studies</b>       |                |                   |                    |                       |                     |                                                                                                                                                                                                                      |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b> | <b>Sample Size</b> | <b>Aim/Hypothesis</b> | <b>SNA Measures</b> | <b>Key Findings</b>                                                                                                                                                                                                  |
|                                                    |                |                   |                    |                       |                     | support, underlines that the strength of the relationship can have an effect on depression. Reciprocity or the perception of an equal exchange of support, in this case received from coworkers, produced an effect. |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                               |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                       |                                                                                                                                                                                                                     |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                             | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>SNA Measures</b>                                                                                                                                                                                   | <b>Key Findings</b>                                                                                                                                                                                                 |
| #311—Vega et al., 1991                             | United States  | <b>Specified Group:</b> Immigrant Mexican Women<br><b>Mean Age:</b> not specified<br><b>Age Range:</b> 35 to 50<br><b>Gender:</b> female (100%)<br><b>Comorbidity:</b> N/A<br><b>Race/Ethnicity:</b> Hispanic | 679                | This paper examines immigrant social networks in terms of contact frequency with parents, siblings, adult children, and other relatives and friends; 2. examine levels of both friend and family expressive social support in relation to contact frequency and network configuration; 3. examine network composition to distinguish modal network types; and, 4. describe the relationship between network contact, social support, and depression. | morphological characteristics of natural networks, role relationships, frequency of contact, and respondent perceptions about their satisfaction with these personal relationships.<br>Social support | Family support and family income are the best predictors of low depression scores for immigrant Mexican women. In contrast, interaction contact frequency with friends and family is not correlated with depression |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                                                                        |                    |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                      |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                      | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                               | <b>SNA Measures</b>                                                                                                                                                                                                                                                                                 | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                  |
| #204—O'Hara et al., 1983                           | United States  | <b>Specified Group:</b><br>Postpartum women<br><b>Mean Age:</b><br>depressed (25.64)<br>not depressed (28.37)<br><b>Age Range:</b> not specified<br><b>Gender:</b> female (100%)<br><b>Comorbidity:</b> N/A<br><b>Race/Ethnicity:</b><br>90% Caucasian | 30                 | determine the extent to which social network variables distinguish between women experiencing postpartum depression and those women making a successful adjustment. | Proximity of the network member and frequency of contact, Changes in the relationship and Feelings toward each network member giving and receiving of instrumental and emotional support<br>Mutual sharing of problems<br>Frequency of arguments with their spouses and degree of marital happiness | depressed subjects were more likely to have at least weekly contact with members of their social network<br>depressed subjects reported giving less instrumental support to their spouses, parents, and confidants and receiving less emotional support from the same group.<br>Depressed subjects rated themselves as having more frequent marital problems and being less happy in their marriage. |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                                                                                                               |                    |                                                                                                                                                                                   |                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                                                                                             | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                             | <b>SNA Measures</b>                                                                                                                                                                                                                                                     | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| #42—Knowlton et al., 2007                          | United States  | <p><b>Specified Group:</b> highly vulnerable inner-city population<br/> <b>Median Age:</b> 40<br/> <b>Age Range:</b> not specified<br/> <b>Gender:</b> female (36%) and male (64%)<br/> <b>Comorbidity:</b> former and current injection drug users<br/> <b>Race/Ethnicity:</b> 96% Black</p> | 393                | The present study sought to examine effects on psychological well-being of a highly vulnerable inner-city population from aspects of social support and qualities of network ties | <p>Social support<br/> Perceived and enacted support<br/> Conflictive ties<br/> total support<br/> network size<br/> Closeness<br/> Measures of number of kin and of active drug users in the support network<br/> Network density and average frequency of contact</p> | <p>The study findings indicate that among low-income, predominantly African American, former and current injection drug users, high depressive symptoms at follow-up were predicted by lesser enacted financial support and greater number of conflictive network ties at baseline. Results indicated that after adjusting for current drug use, prior depressive symptoms, and other confounders, for each additional conflictive network tie at baseline, the odds of high depressive symptoms 1 year later were 57% higher.</p> |

| <b>Table 2.4—Summary of Included Studies</b>       |                |                                                                                                                                                                                                                              |                    |                                                                                                                                                                                             |                                                                                                                 |                                                                                                                                                                                                                                                       |
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| <b>Article ID, Author, and Year of Publication</b> | <b>Country</b> | <b>Population</b>                                                                                                                                                                                                            | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                       | <b>SNA Measures</b>                                                                                             | <b>Key Findings</b>                                                                                                                                                                                                                                   |
| #20—Franks et al., 2004                            | United States  | <b>Specified Group:</b><br>Women with FMS<br><b>Mean Age:</b> 53.9<br><b>Age Range:</b> not specified<br><b>Gender:</b> female (100%)<br><b>Comorbidity:</b><br>fibromyalgia syndrome<br><b>Race/Ethnicity:</b><br>85% White | 568                | examined the effects of the perceived quality of social support, quantity of social support, and the type of social support on the psychological and physical well-being of women with FMS. | size, social support (emotional, tangible, informational), functional support, satisfaction with social support | The results indicated that the social support variables accounted for 14.4% of the variance in CES-D scores, $F(5, 562)=18.88, p<.01$ ; increased satisfaction with social support was significantly associated with a decrease in depression scores. |

## CHAPTER III

### RESEARCH STUDY #2: SCOPING REVIEW

#### Perinatal Depression Among Military-Affiliated Women

##### **Introduction**

##### ***Definition, Description, and Epidemiology of Perinatal Depression***

The National Institute of Mental Health describes perinatal depression (PND) as depression that occurs during pregnancy and the period after childbirth. Specifically, prenatal describes the pregnancy period and postpartum the period following childbirth. Women with perinatal depression “experience feelings of extreme sadness, anxiety, and fatigue that may make it difficult for them to carry out daily tasks, including caring for themselves or others” (National Institute of Mental Health, n.d., para. 2).

According to the Centers for Disease Control and Prevention, the National Institute of Mental Health, and the American Psychological Association, there are a variety of signs and symptoms of perinatal and postpartum depression. For example, women can experience persistent sad, anxious or “empty” mood; irritability or restlessness; feelings of hopelessness or pessimism; racing, scary thoughts; feelings of fear regarding caring for baby or being left alone with baby; feelings of guilt, worthlessness, or helplessness; trouble bonding with baby or forming an emotional attachment; persistent doubts about caring for the new baby; and thoughts of death, suicide, or harming oneself or the baby (American Psychological Association, 2008; Center for Disease Control and Prevention, 2020b; National Institute of Mental Health, n.d.). Additionally, lifestyle changes can occur as women experience a loss of interest in hobbies and activities; fatigue or abnormal decrease in energy; difficulty sleeping (even when baby is



sleeping), including difficulty falling asleep, or oversleeping; abnormal appetite or appetite and weight changes (outside that expected due to pregnancy or return to normal weight after delivery), including overeating or loss of appetite (American Psychological Association, 2008; National Institute of Mental Health, n.d.). Mental challenges such as difficulty concentrating, making decisions, or remembering are also known symptoms (American Psychological Association, 2008; National Institute of Mental Health, n.d.). Lastly, physical manifestations of perinatal depression such as aches or pains, including headaches, cramps or digestive problems that do not have a clear cause or improve with treatment are also associated with perinatal depression. (National Institute of Mental Health, n.d.).

The prevalence of postpartum depression (PPD) seems to have a consistent range. According to the Centers for Disease Control and Prevention (2020b), the estimated prevalence of postpartum depression in the United States ranges from 12.5% to 20%. The American Psychological Association (2008) notes one in seven women (14%) experience postpartum depression. The World Health Organization (2020a) states 10% to 16% of pregnant women and 13% to 20% postpartum women experience a mental health disorder, primarily depression.

Known risk factors for PPD as stated by the American Psychological Association (2020) include the following:

Change in hormone levels after childbirth; previous experience of depression or anxiety; family history of depression or mental illness; stress involved in caring for a newborn and managing new life changes; having a challenging baby who cries more than usual, is hard to comfort, or whose sleep and hunger needs are irregular and hard to predict; having a baby with special needs, premature birth, medical complication, illness; first time motherhood, very young motherhood, or older motherhood; other emotional stressors

such as death of a loved one or family problems; financial or employment problems; isolation or lack of social support (para. 3).

Postpartum depression has a multifaceted etiology including physiological, psychological, and psychosocial agents. For example, evidence indicates support for the role of an altered immunological profile in PPD (Petralla et al., 2019). Papadopoulou et al. (2019) detected molecular changes in women with postpartum depression, specifically an elevated concentration of glutathione-disulfide (endogenous antioxidant compound), adenylosuccinate (intermediate in nucleotide biosynthesis), and adenosine triphosphate (main cellular energy currency). Additionally, Kettunen and Hintikka (2017) discuss a history of depression or anxiety, the mother having poor parental relationships throughout childhood, and a history of violence and/or abuse in relation to PPD etiology.

Adverse health outcomes for maternal and child health result from perinatal depression and are associated with increased risk of mortality and morbidity. Poor outcomes of untreated perinatal depression include decreased maternal-infant attachment, poor neonatal outcomes, poor adherence to medical care, relationship strain or loss of support resources, substance abuse and smoking, childhood developmental delays, suicide, and infanticide (Alhusen & Alvarez, 2016; Kendig, 2017).

### ***Social Ecological Models of Health***

There have been many theories from behavioral scientists and philosophers that attempt to explain human behavior including the role of external and internal factors. For example, Kurt Lewin described the “life space” as early as the 1930’s, which is essentially the physical, social, and conceptual facts about a person that may dictate their behavior (Tai-Seale, 2021). Roger Barker developed the idea of “behavior settings” which are defined by physical clusters of

specific time, place, and props as well as social clusters or behavior patterns that are attached to the physical cluster—both aspects are necessary to create a behavior setting (Scott, 2005).

According to Glanz et al. (2008), Rudolph Moos, Thomas Glass and Matthew McAtee, and Urie Bronfenbrenner, all developed theories that involve categories, hierarchies, or levels of behavioral influence that explain behavior. These categories or levels include the physical or environmental setting and social settings (Glanz et al., 2008).

Among the models designed to guide interventions, Albert Bandura spoke of the influence of social interactions in behavior and self-regulation (Bandura, 1991). B.F. Skinner theorized that behavior was influenced by consequences which came from the environment—an individual’s sensitivity to consequences impacted their ability to adapt to situations in which they found themselves (Overskeid, 2018). Stokols added four “core assumptions about the dynamics of human health and the development of effective strategies to promote personal and collective well-being” (1992, p. 7). These assumptions were as follows: health behaviors are influenced by personal attributes, and physical and social settings; environments are multidimensional; interactions between people and the environment happen at multiple levels; and people influence their environment which in turn impact health behaviors (Stokols, 1992). McLeroy et al. (1988) describe five levels of influence including intrapersonal, interpersonal, institutional, community, and public policy.

### ***Statement of the problem***

Military life is accompanied by challenges that could further complicate the existent difficult transition into motherhood. These challenges, above and beyond typical risk factors, could increase the incidence of PND in MAW. For example, in an article by Liu and Tronick (2013), the PRAMS (Pregnancy Risk Assessment Monitoring System) included stressful life

events such as moving, loss of employment (for mother or father), arguments at home, and financial challenges. Military families move, on average, every two to three years, and each move is most likely accompanied by a loss of employment for the spouse, which could easily translate to arguments at home and financial burden. The same article highlighted findings that women who experience at least one stressful life event in the year prior to childbirth were three to three and a half times more likely to experience PND symptoms (Liu & Tronick, 2013). When considering there are roughly 100,000 births to military families per year, there could be a significant number of mothers and families impacted by PND (Schachman & Lindsey, 2013). There is reason to believe that MAW are at increased risk for PND. Research regarding PND and MAW has specifically focused on deployment or wartime and lack data regarding military life in general (Haas & Pazdernik, 2006).

The purpose of this study was to summarize what is known regarding PND in the military-affiliated population. This study addresses the overarching research question: *using a social-ecological framework, what is known regarding perinatal (prenatal and postpartum) depression among military-affiliated women?*

This research question was addressed by conducting a systematic scoping review and collecting data on the social-ecological levels examined in the current literature. Scoping reviews are ideal for mapping the key concepts of a research area and providing an overview of existing evidence (Peters et al., 2015). They are used to identify available evidence in a particular field, to identify knowledge gaps, and to examine how research in a given field is conducted (Munn et al., 2018).

The scope of this review focused on studies of military-affiliated women related to perinatal (prenatal or postpartum) depression. Objectives of the study included describing the

information currently available regarding military affiliated women and PND from a social-ecological perspective. Questions addressed by the review include the following:

- 1) What study designs and social-ecological levels have been explored relative to PND in military-affiliated women?
- 2) What risk factors at various socio-ecological levels have been examined in predicting PND in the military-affiliated population?
- 3) What interventions have been developed to address PND in the military-affiliated population and what socio-ecological levels do they target?
- 4) What barriers or facilitators exist to receiving care and treatment for PND in the military-affiliated population and what are their corresponding socio-ecological levels?

## **Methods**

### ***Search Strategy***

The following databases were searched for articles pertaining to search terms and synonyms (see table 3.1) for perinatal depression, military affiliated women, qualitative, risk factors, interventions, and treatment: APA PsycINFO (EBSCO), MEDLINE Complete (EBSCO), Academic Search Complete (EBSCO), Embase (Ovid), SocIndex (EBSCO).

Searches were conducted with the aid of a systematic review librarian. Two additional reviewers screened titles and abstracts and subsequently full text articles independently and discussed any discrepancies to reach an agreement about inclusion status. The Covidence Systematic Review website was used for data extraction, and to house and sort the articles. The PRISMA flow diagram for the review process was completed and included here (see figure 3.1).

Data on the following extraction fields were collected: title, lead author, and article ID; population and sample size; funding source and conflicts of interest; aim or objective of the

study; study design, variables, measures, and socio-ecological level of measurement; main findings and conclusions. Specific demographics that were collected included the population (military spouses, active-duty women, or both), the branch(es) of service sampled, and mean age of participants. Socio-ecological levels were defined in accordance with McLeroy et al., (1988); in this model, behavior is determined by:

- 1) Intrapersonal factors—characteristics of the individual such as knowledge, attitudes, behavior, self-concept, skills, etc. This includes the developmental history of the individual.
- 2) Interpersonal processes and primary groups—formal and informal social network and social support systems, including the family, work group, and friendship networks.
- 3) Institutional factors—social institutions with organizational characteristics, and formal (and informal) rules and regulations for operation.
- 4) Community factors—relationships among organizations, institutions, and informal networks within defined boundaries.
- 5) Public policy—local, state, and national laws and policies. (p. 355)

For each instrument or measure, we determined the socio-ecological level of influence. Some instruments only had one socio-ecological level addressed whereas others had items that addressed multiple levels—in this case, we noted the multiple levels associated with the instrument, even if there was only a single item related to that level.

### ***Inclusion and Exclusion Criteria***

Studies were included in the review if the population was active-duty military women, spouses of active-duty military members, or a combination of both. Initially, the inclusion criteria for this study did not specify a particular country or region; research from any country or

nation could be included. However, upon completing the search and only identifying one article which was conducted on individuals that were not affiliated with the United States Military, we decided to omit that study and proceed with simply addressing those conducted using women affiliated with the American military.

Included studies assessed PND as measured by a validated tool such as the Center for Epidemiological Studies-Depression Scale (CES-D), Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HAM-D), Montgomery-Åsberg Depression Rating Scale (MADRS), or reported on women with a diagnosis of PND. Studies reporting on risk factors or treatment, quantitatively or qualitatively were included, as were intervention studies. The study could investigate primiparous or multiparous women. Studies addressing the prenatal and the postpartum period were included.

Studies examining reservists or reservist spouses, as well as National Guard or Guard families were not considered in this review. These families, while part of the armed forces, do not experience some of the traditional obstacles as those families on active-duty orders and thus were not included in the review; for example, reservists and Guard families do not typically relocate frequently as part of their terms of service. Studies addressing pregnancy loss/abortion or pre-existing depression during pregnancy were not included.

## **Results**

Our database searches utilizing the predetermined terms identified 55 articles for title and abstract screening; there were no duplicate studies requiring removal. From the 55 screened for title and abstract, 38 studies were considered irrelevant and 17 full text articles were subsequently examined for inclusion in the review. During the full text screening, a total of seven studies were removed. Five of these studies were excluded for wrong population and two

because they were book chapters, one of which was based on a study that was already included in the review. Finally, we extracted data on the previously mentioned fields and reached consensus for ten studies. See figure 3.1 for the PRISMA flow chart and table 3.2 for a summary of the included studies.

While all the included studies examined military-affiliated women, there was some variation in demographics. For example, some studies examined active-duty women only or military spouses only. Additionally, the inclusion and proportion of various military branches varied between studies. Other demographic information collected includes ethnic/racial breakdown and mean age or age range for each study sample.

### ***Study Designs and Socio-Ecological Levels Explored Regarding PND in Military-Affiliated Women***

Ten studies examined PND in the military-affiliated population. There were three RCTs, three descriptive studies, two descriptive longitudinal studies, one qualitative study, and one systematic review. The systematic review differs from this scoping review in regard to the research questions—this review is much broader while the previously published review strictly addresses PND prevalence among MAW, deployment as a risk factor, and screening of PND among MAW.

Every study addressed intrapersonal level factors. Additionally, every study except two (the systematic review and a longitudinal descriptive study), also collected data on interpersonal characteristics. Community was assessed by five studies while institutional and policy levels were far less common with only two studies including these measures. Table 3.3 contains a list of study designs and socio-ecological levels.

### ***Risk Factors for Perinatal Depression in Military-Affiliated Women***



There were four articles that addressed risk and protective factors, two of which focused solely on deployment as a unique potential risk factor for MAW. Two of the four studies only addressed intra-and interpersonal levels while the other two included community and policy levels.

Schachman and Lindsey (2013) reported on military wives only. They found that those “with depressive symptoms had greater family changes and strains, lower self-reliance, and lower social support” compared to military spouses without depressive symptoms (Schachman & Lindsey, 2013, p. 157). Additionally, while not statistically significant, those with depressive symptoms had lower educational levels and were disproportionately part of the junior enlisted ranks (Schachman & Lindsey, 2013).

Appolonio et al. (2008), found ten psychosocial factors that significantly associate with PPD symptoms in active-duty women: “low self-esteem, prenatal anxiety, prenatal depression, history of previous depression, social support, poor marital satisfaction, life stress, childcare stress, difficult infant temperament, and maternity blues” (p. 1085). This study also concluded that women in dual military families and those facing deployment were not at increased risk for PPD. Additionally, they report that moving, rank, and military housing are unassociated with PPD symptoms (Appolonio et al., 2008).

Regarding deployment as a unique potential risk factor, Spooner et al. (2012) found that women dealing with deployment had a significantly higher proportion of PPD screenings that were positive. Specifically, at the initial obstetrical visit, there was no difference for those dealing with any aspect of deployment and the referent group (Spooner et al., 2012). At the 28–32-week prenatal visit, there was an increase in depressive symptoms for those anticipating a deployment or for those with spouses currently deployed, although not statistically significant

(Spooner et al., 2012). At the six-week postpartum visit, women whose husbands were planning, currently experiencing, or returning from a deployment had statistically significant higher proportions of positive PPD screenings (Spooner et al., 2012). Rastle (2013) concluded that for active-duty women and military spouses, deployment status did not produce higher PPD screening scores compared to a civilian population.

### ***Interventions for Perinatal Depression in Military-Affiliated Women***

The articles contained limited information on interventions aimed at addressing PND in the military-affiliated population. Specifically, there were three articles reporting on RCTs—two articles looked at GPC and the other described a mentoring program for new moms. The two articles looking at GPC did not necessarily target a specific area or level with the intervention, but rather reported on their findings and we comment on the levels they examined. The mentoring program was specifically trying to target self-esteem, maternal resilience, perinatal depression, and anxiety through a group class that addressed knowledge and skills pertinent to new moms (intrapersonal and interpersonal level intervention).

The first article by Kennedy et al. (2011), aimed to compare GPC and individual prenatal care (IPC) effects on outcomes such as perceived stress, depression, social support, maternal and infant outcomes, satisfaction, and prenatal care access. Perceived stress, depression, maternal and infant outcomes, and satisfaction are intrapersonal factors. Whereas social support is interpersonal and prenatal care access is a community level factor. Furthermore, Kennedy et al., (2011) used the Kotlechuck Index (intrapersonal), the Prenatal Health Behavior Scale (intrapersonal), the Childbirth Self-Efficacy Inventory (intrapersonal), various perinatal health outcomes (intrapersonal), the Norbeck Social Support Scale (interpersonal), and the Patient Participation and Satisfaction Questionnaire (community) as instruments in their study. With

regard to PND, the researchers found no differences between groups in prenatal or postnatal depression symptoms, although those in GPC were less likely to report feelings of guilt or shame (Kennedy et al., 2011). There were no observed differences between groups for breastfeeding, self-efficacy, perinatal outcomes, missed work, perceived stress, or perceived social support; however, those in GPC were more likely to receive adequate prenatal care, be satisfied with their care, and receive epidural analgesia (Kennedy et al., 2011).

Another study compared the effects of CenteringPregnancy (CP), a specific brand of GPC, to traditional care (TC) with the specific endpoints of neonatal outcomes and maternal well-being (Tubay et al., 2019). A demographic and medical history was taken for each participant; it is assumed that these were intrapersonal level measures, but I cannot be certain as the specific data collection items were not mentioned. They also used the State-Trait Anxiety Inventory (STAI) and the CES-D which are both intrapersonal level assessments. The Short-Form Patient Satisfaction Questionnaire (PSQ-18) was also used, and this measured influences at the community level. Additionally, birth outcomes were obtained from medical records (intrapersonal level) and postpartum data was collected regarding readmissions to the hospital, partner deployment, and breastfeeding (intrapersonal and interpersonal). Tubay et al. (2019) found depression and anxiety levels did not significantly vary between groups, those in the CP group scored accessibility and convenience higher in patient satisfaction ratings, and those in the CP group were more likely to have babies with appropriate weight for gestational age.

Weis et al. (2017) conducted an RCT to test the efficacy of a prenatal support program for military spouses and active-duty women aimed at building maternal resilience and decreasing PND and anxiety. The study used the Lederman Prenatal Self-Evaluation Questionnaire—Short Form (PSEQ-SF) which measures items at the intra- and interpersonal levels; the Rosenberg

Self-Esteem Scale, the Brief Resilience Scale, and the Edinburgh Postnatal Depression Scale (EPDS) were also used which are intrapersonal level instruments. Demographic information was also collected which addressed questions about marriage and periods of separation from partner (intrapersonal and interpersonal). Weis et al. (2017) found no significant changes in depression scores between groups. However, women in the intervention group had greater decreases in anxiety regarding motherhood role and labor (Weis et al., 2017). Single women had higher anxiety regarding wellbeing of self and baby, nulliparous women had higher anxiety regarding labor, and those with a deployed partner had higher anxiety scores in the domain of motherhood role (Weis et al., 2017).

### ***Barriers and Facilitators to Treatment for Perinatal Depression in Military-Affiliated Women***

Regarding barriers and facilitators to receiving care for PND within the military-affiliated population, the literature was even more sparse. Only one article addressed treatment and recovery from PND as the main objective of the study. Gaige (2014) conducted a qualitative study as part of a dissertation and aimed to address the lived experiences of military spouses recovering from postpartum depression and the military culture's role in those experiences. The study included 12 participants, with a mean age of 29, primarily affiliated with the USMC and USN. Gaige's (2014) study found the following:

Six major themes emerged from the qualitative data analysis of the results, including military wives found it difficult to be the ones to reach out for help; the difficulty in finding resources for recovering from postpartum depression in a military culture; military wives felt less comfortable utilizing mental health services than other resources; deployment/long work hours of the husband made postpartum depression symptoms more severe and recovery more difficult; it is easy to forget self-care as a mother; and

there are positive benefits of the military culture that decrease postpartum depression symptoms...All participants described the experience of the lack of social support, especially the lack of support from the military service member, as well as the lack of dissemination of available resources contributed to difficulty with recovering from postpartum depression. (p. v)

Table 3.4 shows a complete listing of the major and minor themes reported by Gaige (2014) and the corresponding socio-ecological levels. The first theme, *military wives found it difficult to reach out for help*, can be applied to a variety of socio-ecological levels. For instance, there is an intrapersonal level aspect based on the beliefs and attitudes, and/or self-efficacy of the wives with regard to finding and using resources. Specifically, wives mentioned having to feel psychologically strong for their husbands, not having education regarding PPD nor the ability to self-identify, and that they wanted others to reach out to them.

At the interpersonal level, husbands were the first to identify PPD symptoms in their wives and encourage them to seek help. Also at the interpersonal level, or the community level, there was a lack of childcare which also contributed to the theme of finding it difficult to reach out for help. On the interpersonal level, childcare can be provided by family or friends, and at the community level by a Child Development Center (CDC) or Family Child Care (FCC).

There is also a component at the institutional or community level as the organizational unit (i.e., squadron or battalion) or military culture has a stigma towards mental health services. Gaige (2014) states, “The participants stated that there is a general discomfort of mental health services in the military culture because of a poor reputation that is circulated amongst wives and active-duty military service members” (p. 84). While mental health stigma may vary slightly

depending on the organizational unit and the leadership at a given time, there is as previously stated, a “general discomfort of mental health services.”

The second theme, *it was difficult to find resources for recovery from PPD in the military culture*, had minor themes at the community and policy level. Referral sources for resources being inconsistent and/or inappropriate as well as a lack of dissemination of available resources is a problem throughout the military in general. I listed the policy level for referral sources as sometimes the difficulty is with Tricare and having clear guidance on the policy and procedure to secure the appropriate care, particularly from an off-base provider.

The third theme, *military spouses felt less comfortable utilizing mental health services than other resources*, had minor themes at the intrapersonal, community, and policy levels. At the intrapersonal level, having a bad first experience with mental health services made spouses less likely to use those services. On a community level, religious resources were helpful for spouses. Also on the community level, medical providers and good screening practices, were able to identify and treat PPD. On a policy level, wives felt that the medical services were easy to use because of coverage from Tricare.

The fourth theme regarding *deployment and long work hours of the husband*, could be at an interpersonal level, institutional, or even community level. For example, PPD symptoms improved immediately once the husband returned, the husband was main source of social support, there was a sense of isolation which worsened PPD symptoms, and sometimes wives were able to find social support in the form of family or friends to help in the husband’s absence; all of which could be reflected at the interpersonal level. Additionally, at an institutional or community level, the feeling of “doing it alone” is a common theme for military wives and

deployment and long hours are required by many missions within a variety of organizational groups across all the military branches.

The fifth theme, *easy to forget self-care*, could be at an intrapersonal, interpersonal, and community level. For example, the belief that one needs permission to make time or spend energy on self-care, and the preference of exercise as a coping mechanism because of body image, are at the intrapersonal level. Additionally, exercise preference as a coping mechanism and a way to get out of the house could be determined at the interpersonal level if a family member, spouse, or friend babysat, or at a community level if the workout facility had childcare or a parent-with-child-friendly area to workout.

The last theme, *positive benefits of the military culture that decrease PPD symptom*, were at the intrapersonal, institutional, community and policy level. For example, a wife's belief that the husband's military career made it easier to stay home and avoid stress would be on the intrapersonal level. The wives indicated that there is access to many resources and programs which would be facilitative on the institutional and community levels, but also that there is a lack of dissemination regarding programming and resources. Lastly, having excellent healthcare benefits is facilitative at the policy level.

## **Discussion**

The purpose of this study was to summarize what is known regarding PND in the military-affiliated population. This study addressed the overarching research question: *using a social-ecological framework, what is known regarding perinatal (prenatal and postpartum) depression among military-affiliated women?* Specifically, four questions addressing study designs, risk factors, interventions, and treatment barriers and facilitators for PND among MAW were examined by this review.

Regarding study designs, a key finding is the lack of research available, particularly analytical studies, examining PND among military-affiliated women. Analytical studies are designed to “allow assessment of hypotheses of associations of suspected risk factor exposures with health outcomes” whereas descriptive studies, make “use of available data to examine how rates vary according to demographic variables...for prevention purposes” (Szklo & Nieto, 2019, p. 3). As for socio-ecological levels, multiple studies have addressed intrapersonal and interpersonal factors, while research on institutional, community, and policy levels and their impact on PND for military-affiliated women are lacking.

Risk factors that consistently associated with PND include intrapersonal aspects such as low self-esteem or self-reliance. At the interpersonal level, decreased social support, and life stress including family and marital strain were associated with PND. Deployment, which was studied as a unique risk factor for perinatal military-affiliated women, was not consistently associated with higher rates of PND.

Three RCTs described interventions aimed at outcomes including PND among military-affiliated women. Two studies reported on intra- and interpersonal factors, as well as community level aspects related to GPC in a military setting—there were no significant differences in depressive symptoms between intervention and control groups in either study. Likewise, the mentoring intervention study which reported on intra- and interpersonal socio-ecological levels, did not find significant differences in depression scores between experimental and control groups.

The literature describing barriers and facilitators to receiving care and treatment for PND among military-affiliated women is almost non-existent. The one qualitative study available



implicates barriers and opportunities for facilitators at all five socio-ecological levels of influence.

As previously stated, I originally intended to include studies from any military affiliation, but ultimately decided to omit the single study conducted outside of the American population. This also has to do with the limitation of only including articles available in English. The study we omitted was a cross sectional correlational study examining the PPD prevalence and psychosocial predictors of Arabic Muslim women serving in the Jordanian military (Yehia et al., 2013). Not surprisingly, Yehia et al. (2013), found a positive correlation between perceived stress and PPD symptoms that was quite strong and statistically significant. Sixteen percent and 67% of their sample had high and mild to moderate PND symptoms respectively, and yet, 75% reported adequate social support; women with fewer symptoms of PND had lower perceived stress and greater satisfaction with social support (Yehia et al., 2013). When compared to our findings from this review for women affiliated with the American military, stress and social support are likewise associated with PND.

A study by Feinberg et al. (2020) aimed to provide first time military-affiliated parents preventative intervention during the transition to parenthood via an online platform. They conducted a randomized pilot trial with a pre and posttest design and found statistically significant lower levels of depression in the intervention group (Feinberg et al., 2020). This study was not included in the review because inclusion criteria specify that the population under examination is active duty or active-duty spouses; this study included reservists and National Guard families. This study is important because it demonstrates preliminary evidence that a program that is feasible and accessible (because of the virtual nature) may be effective for military families. This study has some limitations that should be addressed in future research

such as specifying the sample to ensure that active-duty military families have similar positive outcomes, and the researchers' stated issues with attrition.

Many of the articles in this review listed a funding source, but most articles did not disclose or even address a potential conflict of interest. Providing transparency in the research process is tantamount to integrity and being able to trust the legitimacy of findings. Within the military community as with any other institution or large organization, conflicts of interest could create a potential to over or under report on findings of mental health, for spouses as well as active-duty members.

All studies used some form of self-report measure. While self-report is an acceptable tool, it also has inherent bias that bears mentioning. I would argue that it is especially problematic in the military community when measuring mental health. For active-duty, the reasoning is clear—perhaps a history of mental health could impact a service-member's career. However, the truth can also be said of the military spouse. There are policies in place to protect military families to the highest degree possible by ensuring that any duty station to which they are assigned has the necessary services to accommodate their healthcare needs. While this is meant to protect families, it can be seen as a punishment or hindrance for those with certain medical conditions, including a history of mental health issues or illness. Verdelli et al., (2011) report on issues of treating depression among military spouses including acceptability of treatment—while perceptions of stigma are improving, there is still concern for the service member's career when reporting mental illness. The measures for depression and risk factors were self-report. While researchers may not have had other options available for this type of data collection, I found it interesting that the none of the studies mentioned the nature of self-report

screening tools or data collection and the inherent limitations, especially given the possibility of military-affiliated women to be more guarded regarding mental health issues.

When discussing deployment as a potential risk factor, it is important to define deployment. Unfortunately, none of the studies addressing deployment as a potential risk factor for PND specifically defined deployment. Each branch, and even different organizational units within the same military branch, have different deployment schedules. Challenging aspects of deployments include family separation and potential travel to dangerous areas or war zones (Cramm et al., 2018; Huebner & Mancini, 2005; Verdelli et al., 2011). The duration and location of a deployment matter. Likewise, none of the studies addressed Temporary Duties (TDYs). Both deployments and TDYs involve family separation. Additionally, TDYs can be stateside or to dangerous areas/war zones. So again, location and duration matter when discussing periods of separation. This lack of clarity on the definition of deployment could be contributing to the lack of consensus seen in studies that examine deployment as a potential risk factor.

Furthermore, studies combining military spouses and active-duty women, particularly on items such as risk factors, could be problematic. While active-duty women and military spouses share commonalities, there could be some major differences that put them at different risk level for PND. For example, active-duty women may have a protective effect from the social support and sense of purpose they receive from their job (Appolonio & Fingerhut, 2008); however, they may have increased risk due to duty-related trauma or previous PTSD (Klaman & Turner, 2016). For these reasons, it is beneficial for future risk factor analysis to address active-duty service women and military spouses separately.

Further research on PND among MAW is necessary to better understand the role of factors at various socio-ecological levels of influence, and design better programing for

prevention and treatment within this specific population. As a community, understanding the impact of various socio-ecological levels on PND in MAW is important to ensure issues are mitigated in a productive manner. Mitigation strategies will look different and be addressed by different levels depending on what the data shows.

Upcoming studies should include information on potential conflicts of interest and aim for transparency. Specific risk factors for PND such as deployment should be accurately defined and potential confounders like TDY or other instances of separation should be considered. Use of triangulation in addition to self-report screening and other diagnostic tools may be beneficial for ascertaining more accurate levels of PND prevalence. Ultimately, more quantitative and qualitative information will improve initiatives aimed at increasing the mental health of military-affiliated mothers.

**Table 3.1—Search strategy terms**

APA PsycInfo 55 results 1/14/2021 Ebsco

TI (postpartum depression or postnatal depression or ppd or pnd or post-partum depression or post-natal depression) OR AB (postpartum depression or postnatal depression or ppd or pnd or post-partum depression or post-natal depression) OR (DE "Postpartum Depression") OR

(DE "Depression (Emotion)") OR (TI depress\* or AB depress\*) AND ((AB (prenatal or perinatal or antenatal or pregnan\*)) OR (TI (prenatal or perinatal or antenatal or pregnan\*)))

AND

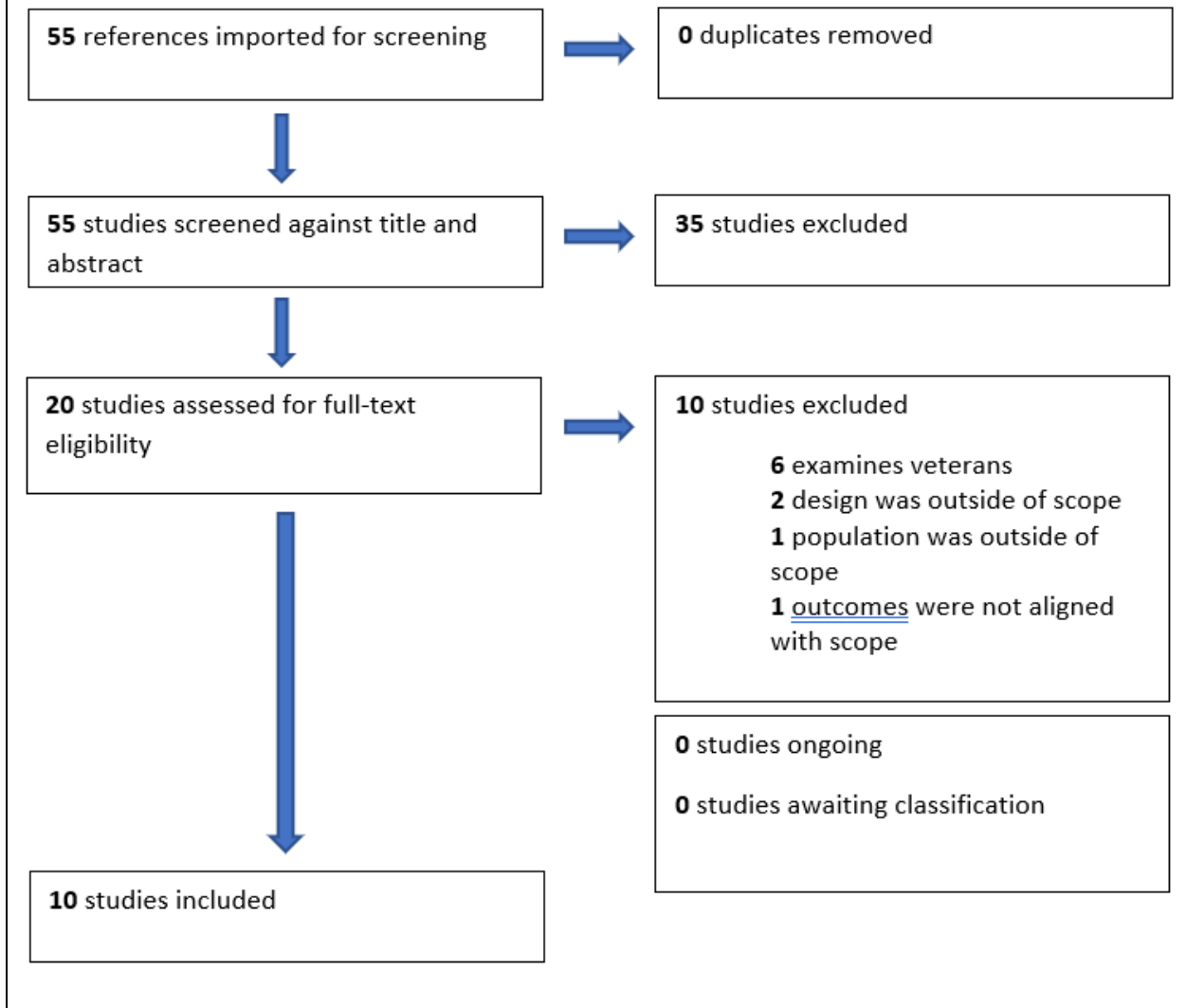
(DE "Military Families" OR DE "Military Personnel") OR (AB (military or soldier\* or veteran\*)) OR (TI (military or soldier\* or veteran\*)) TI (postpartum depression or postnatal depression or ppd or pnd or post-partum depression or post-natal depression) OR AB (postpartum depression or postnatal depression or ppd or pnd or post-partum depression or post-natal depression) OR (DE "Postpartum Depression") OR

(DE "Depression (Emotion)") OR (TI depress\* or AB depress\*) AND ((AB (prenatal or perinatal or antenatal or pregnan\*)) OR (TI (prenatal or perinatal or antenatal or pregnan\*)))

AND

(DE "Military Families" OR DE "Military Personnel") OR (AB (military or soldier\* or veteran\*)) OR (TI (military or soldier\* or veteran\*))

**Figure 3.1—PRISMA flow chart**



**Table 3.2—Summary of included studies**

| Study                    | Population       | Sample Size | Aim/Hypothesis                                                                                                                                                                                                                                                                                                                                                                                                                                     | Key Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gaige 2014               | Military spouses | 12          | <p>The primary goal of this study was to better understand the lived experience of military spouses' recovery process from postpartum depression.</p> <p>The research questions that guided this study are as follows. What are the experiences of military spouses while recovering from postpartum depression? How does the military culture play a role during this experience, including in coping with spouse absences due to deployment?</p> | <p>Six major themes emerged from the qualitative data analysis of the results, including military wives found it difficult to be the ones to reach out for help; the difficulty in finding resources for recovering from postpartum depression in a military culture; military wives felt less comfortable utilizing mental health services than other resources; deployment/long work hours of the husband made postpartum depression symptoms more severe and recovery more difficult; it is easy to forget self-care as a mother; and there are positive benefits of the military culture that decrease postpartum depression symptoms.</p> <p>All participants described the experience of the lack of social support, especially the lack of support from the military service member, as well as the lack of dissemination of available resources contributed to difficulty with recovering from postpartum depression</p> |
| Schachman & Lindsey 2013 | Military spouses | 71          | <p>The purpose of this study was twofold: to estimate the prevalence of postpartum depressive symptoms in a sample of military wives and to provide a comparative descriptive analysis of demographic, risk,</p>                                                                                                                                                                                                                                   | <p>More than one half of the participants (50.7%,n=36) scored above the cutoff point for elevated depressive symptoms suggestive of PPD. Examination of the risk and protective factors showed that military wives with depressive symptoms had greater</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**Table 3.2—Summary of included studies**

| Study                  | Population                             | Sample Size | Aim/Hypothesis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Key Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------|----------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                                        |             | and protective factors in depressed and non-depressed military wives.                                                                                                                                                                                                                                                                                                                                                                                                                         | family changes and strains, lower self-reliance, and lower social support than those without depressive symptoms.                                                                                                                                                                                                                                                                                                                                                                        |
| Appolonio et al., 2008 | Active duty women                      | 87          | Determine (1) What is the prevalence rate of PPD in an AD military sample? (2) What psychosocial and demographic risk factors are associated with PPD symptoms for military mothers? (3) Are these risk factors different from those identified in studies of civilian mothers?                                                                                                                                                                                                               | A score of > or = to 12 indicating the presence of significant PPD symptoms was found for 19.5% of the sample. Ten significant psychosocial factors were associated with PPD, including low self-esteem, prenatal anxiety, prenatal depression, history of previous depression, social support, poor marital satisfaction, life stress, child care stress, difficult infant temperament, and maternity blues. There was a lack of association between PPD and military-specific factors. |
| Rastle 2013            | Active duty women and military spouses | 1277        | The purpose of the study was to analyze archival data to determine the rate of depressive symptoms experienced by new OB patients, any differences between pregnant active duty service members and military dependent wives, the impact of deployment status of the patient's spouse at the time of the survey as a possible risk factor for depression, and compare findings to the general nonmilitary population to determine if there is a statically significant difference between the | Active-duty members had higher rates of depression than military dependent wives (12% vs 7%). Both scores were within range of scores for nonmilitary community.<br><br>Preparing to deploy, deployed, or returning from deployment did not appear to increase risk assessment scores significantly for active duty women at their first obstetrical visit in 2008<br><br>Mil spouses                                                                                                    |



| <b>Table 3.2—Summary of included studies</b> |                   |                    |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------|-------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Study</b>                                 | <b>Population</b> | <b>Sample Size</b> | <b>Aim/Hypothesis</b>                                                                                                                                                                               | <b>Key Findings</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                              |                   |                    | general population and the population served by the NHCP military treatment facility.                                                                                                               | <p>Interestingly, the returning from deployment category showed some of the higher percentage scores for symptoms of depression.</p> <p>There was not a statistically significant difference between active duty members and military dependent wives when areas of deployment were considered</p>                                                                                                                                                                                                                                                                                                                 |
| Rychnovsky & Beck, 2006                      | Active duty women | 109                | The purpose of this study is to report data from a larger study that evaluated the concept of postpartum fatigue in military women, in which depression was one of the studied predictor variables. | <p>Almost one-half of the mothers in this study scored either significant postpartum depressive symptoms or positive screening for postpartum depression after delivery. This number remained virtually unchanged at time 2. By time 3, 40% of women still reported depressive symptoms. At 2 weeks and 6 weeks after delivery, 13% and 11% of mothers, respectively, had positive screening for postpartum depression, consistent with the national average of 10 to 15%.</p> <p>Mothers were found to be experiencing the greatest severity of symptoms in the category of sleeping and eating disturbances.</p> |

**Table 3.2—Summary of included studies**

| Study                 | Population                             | Sample Size | Aim/Hypothesis                                                                                                                                                                                                                                                                                                                                                                     | Key Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|----------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Klaman & Turner, 2016 | Active duty women and military spouses | 10 studies  | This systematic review has three aims: (1) to examine prevalence of perinatal depression (PND) among military women and spouses of military servicemen; (2) to examine deployment as a unique risk factor for PND among military women and spouses of military servicemen; and (3) to assess the quality of PND screening among military women and spouses of military servicemen. | <p>Prevalence for PND symptoms ranges from 4.6 to 50.7 %</p> <p>Deployment status during pregnancy and during postpartum may be a risk factor uniquely associated with PND among military populations. Future research should examine how deployment characteristics, such as length of deployment, impact PND risk</p> <p>The findings of this review suggest that health care systems vary in the quality of PND screening among military women and spouses of military servicemen. The timing of the screening also varied widely across the studies. Several studies also excluded women at high risk for PND, potentially underestimating true prevalence.</p> |
| Spooner et al., 2012  | Military spouses                       | 3882        | The purpose of this study was to evaluate the rates of perinatal depression among women receiving care at a Navy and Marine Corps military treatment facility. Questions to assess the impact of deployment as a potential risk factor for peripartum depression were asked. In addition, unique social support structures at this facility are examined and discussed as possible | <p>The overall prevalence of surveys with an EPDS score of 14 or higher was 4.6% at the initial obstetric visit, 4.5% at the 28- to 32-gestational week visit, and 4.7% at the 6-week postpartum care visit.</p> <p>When compared to the group with no deployment planned, women who indicated that their husband was currently deployed had a significantly higher proportion of</p>                                                                                                                                                                                                                                                                               |

**Table 3.2—Summary of included studies**

| Study                | Population                       | Sample Size | Aim/Hypothesis                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Key Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|----------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                  |             | mitigating factors with respect to perinatal depression rates, and offered as a model for other facilities to consider                                                                                                                                                                                                                                                                                                                                                      | positive EPDS screens (8.6% compared with 4.3%, $p = 0.04$ ).<br>6 week postpartum care visit. Women with husbands who were planning to deploy, currently deployed, or recently returned from deployment all had higher proportions of positive EPDS screens when compared to surveys completed by women whose husbands had no planned or recent deployment experience. The groups with current deployment or planned deployment of the husband had statistically significantly higher proportions of positive maternal depression screens.                        |
| Kennedy et al., 2011 | active duty and military spouses | 224         | <p>The primary purpose of this randomized clinical trial was to compare the effects of group prenatal care (GPC) with individual prenatal care (IPC) on the out-comes of family health care readiness.</p> <p>Primary hypotheses tested examined for differences between groups on perceived stress, depression, and social support. Secondary hypotheses examined for difference in perinatal maternal and infant outcomes, satisfaction, and access to pre-natal care</p> | <p>No significant difference in depressive symptoms between groups.</p> <p>Women in GPC almost 6 times more likely to receive adequate prenatal care.</p> <p>Women enrolled in GPC were significantly more likely to be satisfied with their care and felt they were more able to participate than those in IPC</p> <p>women in GPC were more likely to have epidural analgesia.</p> <p>No changes between groups for initiating breastfeeding, or continuing breastfeeding, no difference on PHBS or the Childbirth Self-Efficacy Inventory, no difference in</p> |

**Table 3.2—Summary of included studies**

| Study              | Population                                 | Sample Size | Aim/Hypothesis                                                                                                                                                                                                    | Key Findings                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|--------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                            |             |                                                                                                                                                                                                                   | perinatal outcomes except epidural, no differences for missed days or work, perceived stress, or perceived social support, no differences in identification of prenatal or postnatal depression symptoms<br>GPC were significantly less likely to report feelings of guilt or shame compared to women in IPC                                                                                           |
| Tubay et al., 2019 | Active duty women and Military Spouses     | 129         | The purpose of this study was to evaluate the effects of CenteringPregnancy group prenatal care in a low-risk military population on the pre-specified endpoints of neonatal birthweight and maternal well-being. | Mean depression and anxiety levels as measured by the CES-D and STAI instruments did not show any significant differences between groups. CES-D scores remained similar for both groups throughout the study and the incidence of positive CES-D scores (>16) did not differ between groups throughout the study.                                                                                      |
| Weis et al., 2017  | Active duty women (40%) or military spouse | 246         | To determine the efficacy of the Mentors Offering Maternal Support (MOMS) program to reduce pregnancy-specific anxiety and depression and build self-esteem and resilience in military women                      | No significant changes in depressive symptoms observed between groups. Rates of prenatal anxiety on the Identification with a Motherhood Role(p=0.49) scale and the Preparation for Labor(p=.017) scale were significantly reduced for participants in MOMS. Nulliparous participants showed significantly lower anxiety on the Acceptance of Pregnancy scale and significantly greater anxiety on the |

| <b>Table 3.2—Summary of included studies</b> |                   |                    |                       |                                                                                                                                                                                                                                                                    |
|----------------------------------------------|-------------------|--------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Study</b>                                 | <b>Population</b> | <b>Sample Size</b> | <b>Aim/Hypothesis</b> | <b>Key Findings</b>                                                                                                                                                                                                                                                |
|                                              |                   |                    |                       | Preparation for Labor scale. Single participants had significantly greater anxiety on the Well-Being of Self and Baby in Labor scale, and participants with deployed husbands had significantly greater anxiety on the Identification with a Motherhood Role scale |

**Table 3.3—Study designs and socio-ecological levels addressed by study**

| Study                    | Design                                          | Socio-Ecological levels |               |               |           |        |
|--------------------------|-------------------------------------------------|-------------------------|---------------|---------------|-----------|--------|
|                          |                                                 | Intrapersonal           | Interpersonal | Institutional | Community | Policy |
| Gaige 2014               | Qualitative                                     | X                       | X             | X             | X         | X      |
| Schachman & Lindsey 2013 | Descriptive cross-sectional (comparative study) | X                       | X             |               | X         |        |
| Appolonio et al., 2008   | Cross-sectional (exploratory)                   | X                       | X             | X             | X         | X      |
| Rastle 2013              | Descriptive cross-sectional                     | X                       | X             |               |           |        |
| Rychnovsky & Beck, 2006  | Descriptive longitudinal prospective            | X                       |               |               |           |        |
| Klaman & Turner, 2016    | Systematic Review                               | X                       |               |               |           |        |
| Spooner et al., 2012     | Descriptive cross-sectional                     | X                       | X             |               |           |        |
| Kennedy et al., 2011     | RCT                                             | X                       | X             |               | X         |        |
| Tubay et al., 2019       | RCT                                             | X                       | X             |               | X         |        |
| Weis et al., 2017        | RCT                                             | X                       | X             |               |           |        |

**Table 3.4—Major and minor themes identified from Gaige (2014) and corresponding socio-ecological levels**

|                                                                                                                                                     |                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Theme 1: military wives found it difficult to be the ones to reach out for help                                                                     |                            |
| Stigma of mental health in the military was a barrier in seeking help                                                                               | Community<br>Institutional |
| Felt they had to be mentally/emotionally/psychologically strong for husbands                                                                        | Intrapersonal              |
| Uneducated about how to identify PPD                                                                                                                | Intrapersonal              |
| Lack of childcare presented a barrier to getting help                                                                                               | Interpersonal<br>Community |
| Wives wanted others to be the ones to reach out to them                                                                                             | Intrapersonal              |
| Husbands were the ones who initially diagnosed PPD in the wives and urged them to seek support                                                      | Interpersonal              |
| Sense of regret not reaching out sooner or being the ones to reach out                                                                              | Intrapersonal              |
| Theme 2: it is difficult to find resources for recovering from PPD in the military culture                                                          |                            |
| Referral sources for resources are inconsistent/inappropriate                                                                                       | Community<br>Policy        |
| Lack of dissemination of available resources                                                                                                        | Community                  |
| Theme 3: military wives felt less comfortable utilizing mental health services than other sources                                                   |                            |
| The ER/medical providers (in-home nurse visitors) were first line of care for many wives                                                            | Community                  |
| Medical services were easier to utilize because of the good healthcare benefits                                                                     | Policy                     |
| There was a good screening of PPD from medical providers so identification by those providers was natural/easy                                      | Community                  |
| Bad first experience with mental health services if they were utilized at all, which also perpetuated the stigma of military mental health services | Intrapersonal<br>Community |

|                                                                                                                                                                                                  |                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Religious resources were a preferred method of mental health services over licensed mental health professionals                                                                                  | Community                                   |
| Theme 4: deployment/long work hours of husband made PPD more severe and recovery more difficult                                                                                                  |                                             |
| PPD symptoms improved immediately upon return of husband                                                                                                                                         | Interpersonal                               |
| Husband was largest source of social support regardless of deployment status                                                                                                                     | Interpersonal                               |
| A sense of isolation/"doing it alone" was a part of the military wife's identity, which made PPD symptoms worse                                                                                  | Intrapersonal<br>Community                  |
| Wives were sometimes able to find social support in the form of family, one best friend who was a military wife, or a Family Readiness Officer, to take the place of the husband in his absences | Interpersonal<br>Institutional<br>Community |
| Theme 5: Its easy to forget self-care as a mother                                                                                                                                                |                                             |
| Need permission from friends/professionals to engage in self-care activities because of the guilt/self-critical thoughts while experiencing PPD                                                  | Intrapersonal                               |
| Exercise was a preferred method of self-care due to the effect on body image and the fact that it got them out of the house                                                                      | Intrapersonal<br>Interpersonal<br>Community |
| Theme 6: there are positive benefits of the military culture that decrease PPD symptoms                                                                                                          |                                             |
| Access to many resources/programs but no dissemination of information and there was only one PPD-specific program and it was not advertised                                                      | Institutional<br>Community                  |
| Excellent potential access to healthcare benefits                                                                                                                                                | Policy                                      |
| Husband's military career made it easier to not have work outside the home which reduced stress in some spouses                                                                                  | Intrapersonal<br>Community                  |



## CHAPTER IV

### RESEARCH STUDY #3: QUALITATIVE STUDY

#### Perinatal Experiences and Social Support During the COVID-19 Pandemic

##### **Introduction**

Towards the end of 2019 a novel coronavirus, severe acute respiratory syndrome coronavirus or SARS-CoV-2, emerged in China (CDC, 2020a). COVID-19, the resulting illness of infection with the SARS-CoV-2 virus, is characterized by upper respiratory symptoms, fever, muscle aches, diarrhea, nausea and vomiting, and loss of taste or smell (CDC, 2020a). The CDC confirmed the first US COVID-19 case in Washington state on 21 January 2020 and President Trump declared a state of National Emergency on 13 March 2020 (AJMC Staff, 2020). In March of 2020, various health agencies and governmental authorities began implementing mitigation strategies to stop the spread of the virus (Moreland et al., 2020). The resulting measures to stop the spread of the virus (e.g., stay at home orders, social distancing, mask mandates) are a phenomenon that presents a unique challenge for healthcare and severely limits aspects of relational health including social support; this is problematic as loneliness and isolation can lead to depression and other poor mental health outcomes (Diamond et al., 2020). In fact, there was an increase in the symptoms of depressive disorders during the COVID-19 pandemic; from August to December of 2020, adults experienced a significant change in symptoms of depressive disorder, from 24.5% to 30.2% (Vahratian et al., 2020). More importantly, Lebel et al., (2020) found fears of COVID-19 illness, concerns about prenatal care, relational strain, and social isolation contributed negatively to the significantly increased symptoms of depression and anxiety among pregnant women during the pandemic. Previous research on disease outbreaks

shows increases in depression and anxiety and that pregnant and postpartum women could be particularly vulnerable to these poor mental health outcomes (Lebel et al., 2020). While previous literature suggests the importance of social support in preventing or reducing depression and anxiety for pregnant and postpartum women, there is currently no research on how the pandemic might have impacted these mental health outcomes among this population, and how social support needs may have changed during the COVID-19 pandemic.

### ***Social Support and Perinatal Depression***

The idea of social support (SS) is somewhat intuitive and the role of SS in health has existed for decades; Cooke et al. (1988) noted that “social support is viewed by family practitioners as one of the potential keys to well-being of individuals, and particularly for those experiencing major life transitions and crises” (p. 211). More recently and related specifically to the perinatal period, a review by Yim et al. (2015) noted that social support has been found to have a moderate protective effect in women. Authors have characterized variables related to social support such as perceived support, received support, need for support, support satisfaction, and sources of support, with perceived support being studied most frequently (Yim et al., 2015). Glanz et al. (2008) discuss the types of social support defined by House (1981) such as emotional support, instrumental support, informational support, and appraisal support.

Perceived social support is the idea that help is available from one’s network or community if and when needed. A review by Yim et al. (2015) found that of the 50 articles studying perceived social support and PPD, almost half report negative associations between perceived support and PPD outcomes; the remaining questions include the pathways linking

perceived social support to better PPD outcomes as it is “well established that it is a major protective factor” (p. 119).

According to Yim et al. (2015), enacted or received support findings are inconsistent; however, regarding a need for support and support satisfaction, the review found that increased need for support and unmet support needs increase likelihood of PPD. Also, there appears to be consistent evidence that partner support is beneficial, as is that of family support (Yim et al., 2015). Interestingly, a study investigating the functional aspect of social support (the types of support: emotional, instrumental, informational, and appraisal) in first time mothers found that all four components were important in lowering depression in mothers, but the best predictor of PND at 12 weeks postpartum was emotional support at birth (Leahy-Warren et al., 2011).

### ***Pregnancy, Labor and Delivery, and Postpartum Experiences***

The perinatal period is a time of profound change for most women. A scoping review by Prinds et al. (2013) found the transition to motherhood, “can be interpreted as an existentially changing event, reorganizing values and what makes life worth living, and to some women also being interpreted as a spiritual experience” (p. 733). Previous qualitative research has described various aspects of becoming a mother including pregnancy, labor and delivery, and the postpartum period.

In one study, most respondents felt their body changed with the pregnancy in ways that brought about feelings of unfamiliarity and foreignness that were outside of the mother’s control; the more change the mother experienced, the less control she felt she had over her body (Neitherman and Fox, 2017). Neiterman (2012) concluded the process of pregnant embodiment is shaped and informed by social interactions and context.

The experience of childbirth is influenced by the environment and human interactions and is described as a constant state of dynamic flux between keeping it together and falling apart (Hall et al., 2018). A review found that obstetric factors played a role in perceived subjective experiences of childbirth; vaginal birth, decreased labor pain, shorter duration of labor and delivery, and higher amounts of control have all been associated with a more positive childbirth experience (Chabbert et al., 2020). Of the studies that examined the role of a partner, all found that a positive and supportive attitude in the partner contributed to positive subjective experiences of childbirth (Chabbert et al., 2020). Having support and presence of healthcare professionals was tantamount to a perceived positive experience; providers that were responsive, competent, professional, and good communicators throughout the pregnancy and delivery experience enhanced the subjective perception of the mothers (Chabbert et al., 2020).

Slomian et al. (2017) studied the maternal needs of women after childbirth and identified four overarching themes including the need for information, psychological support, material support, and the need to be understood and share experiences. Hennekam et al. (2018) report on the identity change of women as they transition to motherhood and return to the workplace; in particular, they found women experience this transition relative to the interplay of multiple socio-ecological factors.

### ***COVID-19 and Pregnancy***

There has been research published on the impact of the pandemic on pregnancy and vice versa. Specifically, articles addressing clinical effects of COVID-19 on pregnancy exist including a systematic review on pregnancy loss during the pandemic (Kazemi et al., 2021), a summary of pregnancy and COVID-19 lessons learned (Nowakowski et al., 2021), and an

overview of systematic reviews on clinical presentations, vertical transmission, and maternal and infant outcomes related to COVID-19 (Ciapponi et al., 2021).

From a social and behavioral standpoint, Kar et al. (2021) found that self-reported rates of substance use during pregnancy were comparable to pre-pandemic levels, however, there were COVID-19-related circumstances or concerns that predicted substance use. Özkan Şat & Yaman Sözbir (2021) conducted a study in Turkey regarding the use of mobile applications, behaviors, and perceptions of pregnant women during the pandemic. They found most women did use mobile applications for the purposes of understanding normal changes during pregnancy, risks and disease during pregnancy, and checking infant's development (Özkan Şat, & Yaman Sözbir, 2021). They also found that a little over half the women said they worried too much about COVID transmission and subsequently changed behaviors such as limiting people in their homes, not going to visit others, wearing a mask when they went out, and frequent hand washing (Özkan Şat, & Yaman Sözbir, 2021).

Lastly, regarding mental health, Khoury et al. (2021a), found the subjective negative effects, financial challenges, and social isolation of COVID-19 are associated with emotion-focused and dysfunctional coping mechanisms that associated with mental health. Additionally,

Social isolation, financial trouble, relationship difficulties and threat of COVID-19 were associated with mental health. Social support was associated with lower mental health problems and negative cognitive appraisal was linked to more mental health problems. Furthermore, social support and cognitive appraisal interacted, such that higher social support acted as a protective factor, particularly for those who appraise the impact of COVID-19 to be more negative (Khoury et al., 2021b, p. 1161).

## **Statement of the Problem and Research Questions**

We do not have qualitative information on how women experienced their perinatal period during the pandemic and how they received social support during this time of restrictions and social distancing. Therefore, the purpose of this study was to better understand the perinatal experiences of women during the pandemic, and in particular, social support. Thus, this study had two research questions:

- 1) What was the perinatal experience of women during the COVID-19 pandemic? And
- 2) How did women experience social support during their pregnancy and postpartum period during the pandemic?

## **Methods**

### ***Approach and Design***

I used a phenomenological approach for this study in order to gain an understanding of women's perinatal experiences during the COVID-19 pandemic. Husserl, the founder of phenomenology, was interested in how an object presents itself to consciousness (Giorgi, 2009). Phenomenology was not intended to provide evidence to support a hypothesis; rather, it aims to communicate the feelings, values, and meanings of a phenomenon or experience as it is lived by someone (Santiago, 2020). According to Creswell and Poth, "phenomenologists focus on describing what all participants have in common as they experience a phenomenon" (2018, p.75). Phenomenological approaches revisit the experience in order to acquire a comprehensive description of the essence of the phenomena; "the human scientist determines the underlying

structures of an experience by interpreting the originally given descriptions of the situation in which the experience occurs” (Moustakas, 2011, p. 11).

Creswell and Poth (2018) describe hermeneutic phenomenology which is cited most frequently in the health literature. Heidegger contributed to the hermeneutic phenomenology emphasizing “an understanding and meaning of ‘being’ based on interpretive sciences, which focuses on ontological questions. He posits that the presuppositions or pre-understanding are part of being, and disregards the use of bracketing” (Santiago, 2020, p. 1). Bracketing is the disclosure of personal experiences pertaining to the phenomenon by the researcher(s); this exercise presents a type of transparency where “readers learn about the researcher’s experiences and can judge for themselves whether the researcher focused solely on the participant's experiences in the description without bringing himself or herself into the picture” (Creswell and Poth, 2018, p. 77).

I chose qualitative interviews to address this research topic as “qualitative interviews are used when the researcher wishes to gain an understanding of how participants view, experience, or conceptualize an aspect of social life” (Kelly, 2010, p. 309). I chose a sample size of 20 because, given the type of information being gathered, this sample size should be adequate; “in a study in which in-depth semi-structured interviews are used to examine experiences and perspectives within a defined population group a sample of 6–10 may be adequate” (Kelly, 2010, p. 318). Lastly, the semi-structured interview allowed open-ended questions where I could focus on specific topic areas while allowing for additional relevant information and new questions to emerge (Kelly, 2010).

### ***Recruitment, Participants, and Setting***

I recruited using convenience and snowball sampling techniques. I sampled military spouses and non-military affiliated women from multiple geographic areas within the continental United States. I used my own networks, such as the JBSA (Joint Base San Antonio) and Offutt AFB (Air Force Base) Spouse groups, to contact individuals regarding participation in the study. I sent emails to colleagues and peers requesting that they share the flyer within their networks as well.

Thirty-one women initially contacted me. Some women never responded to follow up emails while two women rescheduled interviews multiple times and could not complete the interview process. Ultimately, the first twenty to schedule and complete the consent and interview process were included in the study. I reached saturation, described by Creswell and Poth (2018) as a situation in which continued interviewing does not provide further or new insight.

Participants had to be female, English-speaking, and between the ages of 22 and 35 (risk for PND increases with young and old mothers, those less and greater than 22 and 35 respectively). Women were eligible for inclusion if they were postpartum or expectant mothers that conceived between June 2019 to June 2020 and maintained their pregnancy or delivered their baby to date.

Recruitment was strictly online through email of known social networking contacts or social media platforms. Interviews were conducted via Zoom; participants were in the comfort of their own homes, typically with their children nearby, during the interview process.



### ***Procedures and Data Collection***

This research was approved by the IRB at Texas A&M University (IRB ID IRB2020-1187D, Reference number 118329). Potential participants volunteered for inclusion by emailing me to communicate their interest in the study. I responded with a short introductory email to which I attached the informed consent document. I followed up with each participant within a week of sending the introductory email to see if they had questions, concerns, or an interest in participating in the study. If women indicated they wished to participate, I asked for their availability, and we scheduled a Zoom meeting at their convenience.

During the Zoom meeting I followed a pre-approved script (Appendix A) to introduce myself, the research, and the reason for their participation. I addressed the participant criteria to ensure they were eligible for participation, and I reviewed the entire informed consent document with them. There were two areas of consent required for participation—they consented to participate in the research study, and they consented to being audio recorded for the purposes of accurate data collection. They were given multiple opportunities to address questions or concerns and subsequently consent to the interview process which included two separate consent questions, one for participation in the study and one addressing their interview being audio recorded.

I was initially contacted by 31 women that were interested in the study. Of these, nine never responded to the introductory email and two missed their Zoom meetings and we were not able to reschedule. I conducted semi-structured, one-on-one interviews with 20 women regarding their experiences with pregnancy and/or postpartum, and social support during the time of the COVID-19 pandemic. The data collection period lasted roughly six weeks from late April to

early June 2021. I conducted a single or one-time interview with each participant via Zoom. The interviews lasted an average of 36 minutes with the shortest interview being 13 minutes and the longest 68 minutes.

The interview guide (see Appendix A) was developed with the aid of expert opinion and after a review of literature in order to establish content validity. It was also pilot tested and altered slightly based on feedback from the piloting process prior to conducting interviews. The interview questions addressed women's overall experience, who provides support, what support they provide, and how support has been impacted by the pandemic. I also asked about their feelings during the pandemic and if they could describe a scenario in which they experienced a particular emotion. In order to better understand, categorize, and describe the support received, I used the following four types of support defined by House (1981) and described by Glanz et al. (2008) with their accompanying descriptions:

- Emotional support involves the provision of empathy, love, trust, and caring.
- Instrumental support involves the provision of tangible aid and services that directly assist a person in need.
- Informational support is the provision of advice, suggestions, and information that a person can use to address problems.
- Appraisal support involves the provision of information that is useful for self-evaluation purposes—in other words, constructive feedback and affirmation (p. 190).

### ***Data Analysis***

I based my phenomenological data analysis procedures on those described in Creswell and Poth (2018). I began the process of analysis by organizing the data and confirming accuracy

of the transcription. A third party transcribed the interviews, so the first action I took was to correctly format the transcriptions for ease of analysis and processing. From there, I had to revisit the interview recording with the transcript in front of me and correct any inaccuracies as I listened and re-experienced the interview. I proceeded to read and re-read the transcripts of the interviews to immerse myself in the data as described by Burnard (1991) and Creswell and Poth (2018). During this process, I made notes in the margins and memos pertaining to emerging ideas and themes as well as noting my own impressions or personal connections to the content (Burnard, 1991; Creswell & Poth, 2018; Creswell & Creswell, 2018).

Once the initial read through was complete, I went back and identified significant statements. These were transferred to an excel spreadsheet where I could group the statements according to meaning units or themes that arose inductively throughout the process. From here I drafted descriptions of what the participants experienced and how they experienced it; these descriptions provided the foundation for the comprehensive description that appears in the results.

Methods to ensure rigor in qualitative research have been presented since the 1980s. The idea of *trustworthiness* was first described by Lincoln and Guba in 1985 and included parameters such as credibility, dependability, transferability, and confirmability, with authenticity being added later (Billups, 2014). Credibility was presented as a parallel concept to internal validity and indicated truth or believability of the research (Lincoln and Guba, 1986; Billups, 2014).

In order to address credibility in the present study, I implemented peer debriefing, negative or deviant case analysis, and member checks. I used peer debriefing as described in Houghton et al. (2013) to determine if another researcher agreed with the data labels and found

that I arrived at the data labels logically. According to Hanson, “By searching data for elements that fail to support or appear to contradict patterns or explanations that are emerging from the data, negative case analysis can strengthen the validity of the qualitative research process and provide added enrichment for both the researcher and the reader” (2017, p. 1). I used member checking after the transcription phase and before the analysis phase to determine if I had accurately captured the participants’ thoughts. All 20 participants were asked to review their transcripts and 12 participants responded, all those that responded indicated the transcripts were accurate.

Dependability and confirmability are described as analogs for reliability and objectivity, respectively (Billups, 2014; Lincoln & Guba, 1986). An audit trail was used to address both dependability and confirmability in this study; “the part of the audit that examines the process results in a dependability judgement, while the part concerned with the product (data and reconstructions) results in a confirmability judgment” (Lincoln & Guba, 1986). Furthermore, reflexivity, incorporated in this study by the use of bracketing and inclusion of my own background and biases as the researcher, is also a strategy employed for confirmability (Billups, 2014).

Transferability in qualitative research, which is comparable to generalizability, is achieved through the use of ‘thick descriptions’ (Billups, 2014; Lincoln & Guba, 1986; Houghton et al., 2013). It is the responsibility of the researcher to provide enough information regarding the methodology, raw data, and interpretations, for readers to determine if the present study is transferable to another context (Houghton et al., 2013). In this study, efforts were made to provide detailed information on the participants, setting, context, methodological procedures,

and interpretations of findings so readers can determine transferability for themselves (see table 4.3 for examples of significant statements, formulated meanings, themes, and subthemes).

Authenticity is the final measure of trustworthiness and relates to accuracy and elements outside of the positivist paradigm such as representation, empowerment, and accountability (Billups, 2014; Lincoln & Guba, 1986; Amin et al., 2020). Strategies used in this study to address fairness include each interview being conducted using the same detailed guide and using the same theoretical approach to analyze all interviews (Amin et al., 2020; Lincoln & Guba, 1986). Lastly, educative authenticity, “increased understanding of (including possibly a sharing, or sympathy with) the whats and whys of various expressed constructions” (Lincoln & Guba, 1986, p. 81) was addressed through use of external audit trails in this study (Amin et al., 2020).

## **Results**

### ***Description of the participants***

The final sample consisted of 20 women (table 4.1 contains participant demographics by individual and table 4.2 contains a summary of participant demographics) who ranged in age from 23 to 35 (mean age of 30.65). There were 19 white women and one black woman in the study. Eight women were designated high risk pregnancies, were actively monitoring some aspect of the pregnancy, or experienced complications from labor and delivery (L&D). All of the women in this sample were married to men although heterosexuality nor marriage was a requirement for inclusion in the study.

All of the women attended college and six held graduate degrees. Fifteen of the women worked at least part time for at least a portion of their pregnancy and/or postpartum period. Two

women did not work at all, two did not disclose working status and one was a full-time graduate student in an online program.

The 20 participants in this study delivered at different times and thus experienced various aspects of pregnancy, L&D, and postpartum during the pandemic. Two women delivered just before shutdowns began and only experienced postpartum during the pandemic while two women delivered during the shutdowns and the remaining 16 women experienced their pregnancy, L&D, and postpartum during the shutdown/post-shutdown period.

### *Description of the researcher*

I am a 38-year-old white woman married to an active-duty service member in the United States Air Force. I have experienced three pregnancies and given birth to two live children as a military spouse. I have only experienced pregnancy, birth, and postpartum within the military healthcare system and the military culture. My lived experience of pregnancy and postpartum never included a pandemic; however, I experienced reduced social support and isolation due to lack of family support nearby and being in a relatively new community with only superficial community connections.

### *Themes*

There was a total of 207 significant statements from the 20 interview scripts. From these statements, I created six over-arching themes: women experienced a wide range of emotions throughout the perinatal period, things unrelated to having a baby made the perinatal period more challenging or stressful, perinatal care and services were altered to varying degrees, women

received social support during the pandemic, postpartum depression, and relationships and social tension.

**Women experienced a wide range of emotions throughout the perinatal period.**

Women made the choice to continue to try and conceive through the pandemic. Some women had been actively trying to conceive before the pandemic while others were not actively trying to conceive but were not preventing pregnancy and allowing a natural growth of their family. During the pandemic, most women in this study experienced some level of isolation, fear/anxiety, gratitude, and sadness. Becoming pregnant was received with a mix of emotions that were influenced by the virus. This mix of emotions permeated the entirety of the perinatal experience.

*You know my husband and I were trying to conceive and we got to the point during the pandemic where we're like, okay, should we keep trying, or should we hold off and we decided to keep trying and then I got pregnant with the two and so we're really excited but I'm kind of nervous at the same time, because they didn't know how COVID affected pregnancy and babies and unborn baby, so it was a little nerve wracking.*

*It was it was hard being isolated and not being able to really have my family or my friends, you know help me ... and so there were a lot of very like sad moments like not really being able to have my mom come in to help me you know get the house ready, having to do all of my doctor's appointments on my own. In a very weird way I'm very thankful that I had some complications early on because those were the only times my husband was allowed to you know actually see the ultrasound and that was pre-pandemic. And then there were some*

*sweet moments of being able to have time together as a family of three before we had my son um. And so it wasn't, it wasn't all bad, but there is just a sense of unknown the entire time.*

### ***Isolation.***

Women in this study frequently reported feeling isolated. They experienced isolation for various reasons and in various ways. They experienced emotional and physical isolation, and even when surrounded by a spouse and/or other children, they generally felt alone.

*It was very isolating, we felt very on our own really, unable to kind of go anywhere and do anything and... I would say [it] nearly kind of broke us very much....It was still, it felt very isolating even though you're kind of living with someone.*

Some women reported lacking the normal, everyday social interactions that they may encounter at work, in a store, or generally out and about that made them feel normal and seen. Women mentioned that seeing other parents parenting or talking to other parents about parenting made them feel understood and connected in a way.

*I've had to go to the store a few times, and you know just other moms in the store, there was a mom getting she got a giant pack of diapers at the store. She didn't have any kids with her and then my oldest was like running down the aisle and almost ran into a cart and you know, I'm like stop, you know, look where you're going, kind of thing right, and the mom says, the other mom is like I get it, you know, so we had like a little off hand bonding moment in the store and I haven't, like that hasn't really been as present ....We kind of miss out on all those uplifting moments like trying to build each other up in these moments, because we don't see each other as*



*fellow moms as fellow parents or anything so I feel like we've kind of missed out on those...and it's just like okay I'm not alone*

Multiple women really missed the connections that come with physical contact and physically being in the presence of another person. For these women, trying to “connect” through phone calls, text, or video chat was “exhausting”, “impersonal” and “just not the same.”

*I find facetime just impersonal um I don't I don't know. I'm just, I'm physical space. I want to see you, I'm going to hug you, um physical touch you know what I mean and ...that was very different and hard for me so for me I needed that like physical appearance physical touch of you know my friends and family.*

Other women described feeling isolated because of a lack of social support and visitors during the perinatal period. Some women discussed preparing their home or particularly a nursery completely by themselves and how this was isolating and sad. Others described caring for a baby in the absence of help from family or friends and how this created a sense of isolation. For some women they didn't want to complain or put their hardships on others and keeping all those feelings inside was isolating.

*I think the biggest thing was like the family couldn't come visit. Right, I think, before the pandemic, like my father was supposed to come to visit the baby, of course, and to help out and whatnot and maybe a few friends might have been able to come over more to just give us a chance to shower, have a date night and or whatever, and none of that was an option, you know... it wasn't just that the isolation from the outside the isolation from the inside as well you know, like you, you, I literally felt like I was by myself. ...you also feel like*

*you can't necessarily talk to them about it, because you know they're going through something too. I, so yeah, very isolating*

There were a couple negative or deviant cases regarding isolation. One woman spoke specifically about getting out and about in town. She felt she finally had space for herself and her belly and avoiding the unsolicited comments of others during her pregnancy was a welcome experience.

*Not being able to go out to the store, or like really interact with a lot of people, I was honestly, I was kind of okay with because when I was pregnant the first time, I found that people asked me: Oh, how are you, when's the baby due, people asking me a lot of questions about my pregnancy really you know kind of put me on edge and like oh is everything okay? And am I, am I gaining enough weight? Am I gaining too much weight? Kind of thing, so I didn't have all of those extra stressors coming in, so that was really nice. And I didn't have people touching my belly which was awesome. Like I absolutely love that people gave me space because as I felt with my first pregnancy, as I felt like my belly was expanding and like Oh, I feel so big and there's not enough room for me. Suddenly, everybody has to be six feet away and there's plenty of space like it really did give me this very strange like, like there's space for me and my pregnant belly, nobody's touching me, nobody's getting into my bubble, and I thought it was great.*

The other deviant case came from a woman in a smaller town who had a consistent outlet for her children and a small group of neighborhood friends to interact with throughout the pandemic.

*I wouldn't say that, like, I felt too, I don't know, isolated or, or whatnot. We still, we kind of kept our one neighbors as like our quarantine buddies like so our kids would play together outside, like every day and we would still, yeah you know, talk to each other, actually ended up kind of being like 2 my neighbors, it's one, one family with kids who are you know kind of have some overlap with my kids ages and um and then an older couple who lives across the street ...and so that was very nice too, I felt like you know it wasn't like quite as isolating you know, with at least with my kids having siblings to play with and having the friends across the street to play with. It was a nice outlet there for all of us ...And so, I didn't necessarily feel like overly isolated or anything.*

### ***Fear/Anxiety.***

Primiparous and multiparous mothers experienced fear or anxiety associated with multiple factors of the perinatal period during this time. Of particular relevance was the fear associated with the unknowns of COVID-19 and how it might impact their health or that of their baby. Similarly, they experienced fear for those that they relied on for support—how would COVID-19 impact parents and family that were supporting them along their perinatal journey? This fear often caused a change in routine and behavior in order to manage sources of exposure.

*And it was so scary you know my, my parents, my husband's parents, being more at risk than we were and not knowing the risks of pregnant women was terrifying. I completely, we completely shut down. We, we stayed home, we had grocery delivery, we didn't go anywhere, except for walking around our neighborhood. Because we didn't know what the risk to pregnant women were. We knew, you know our age group my husband was fine, but we had no idea what the risks to me or to the baby would be. And that, that*

*stayed the entire time I was pregnant,...it was kind of scary to see both sets of parents, knowing that we could be you know, giving it, putting them at risk for COVID since we're just in a hospital, knowing that my daughter didn't have an immune system yet. Knowing that they could bring something, both our moms are nurses and while they took as many precautions as they could, they were still interacting with patients. We weren't entirely positive what the risks were.*

Women generally agreed that they had to “figure things out” regarding pregnancy and the pandemic. When it came to fear specifically, one woman mentioned that she had to do what was best for her and her family regardless of the fear.

*You just have to sort of work around and figure things out but, I think that at some point we had to sort of make a decision on ... where the line is for what's okay and what's safe, what's not Okay, and what we need to just do anyway, for our my own like wellbeing or, or sanity, you know.*

Fear and anxiety during labor and delivery is to be expected, but in this case, women noted fear at the inability to read peoples’ faces because of masks. Women discussed when they were in labor or pushing and looking to the faces of nurses, midwives/physicians, and even spouses. The inability to read others’ expressions or understand what they were saying was “terrifying.” This was especially true when there was a complication.

*And you know I'm in a new environment, everybody's like head to toe PPE...When it came time for me to start pushing, I think that's where things got really intense, but it was scary because you couldn't read people's faces, and so I knew something wasn't right. ...And I kept trying to like I was looking at my doula looking at my husband looking at my*

*midwife and, like, I could not read anybody's face, all I could see where their eyes. And that was absolutely terrifying and ...I'm screaming like what's wrong with my baby. And I can't read anybody's face,...And again, like can't get a sense of so what's happening at all, again trying to hear people, but everything is so muffled because of the amount of PPE that people are wearing. um. So it was just absolutely terrifying*

### **Gratitude.**

The American Psychological Association defines gratitude as “a sense of thankfulness and happiness in response to receiving a gift, either a tangible benefit (e.g., a present, favor) given by someone or a fortunate happenstance (e.g., a beautiful day)” (*APA Dictionary of Psychology*, 2020). Every woman in this study exhibited gratitude. Throughout the interviews, every woman noted how she was “grateful,” “blessed,” or “fortunate” during her pregnancy or postpartum experience. For example, women expressed gratitude for social support, emotional and instrumental support, received from friends and family.

*Thankfully my little sister was here...she was able to be here and help me through those early parts of labor, she's a nurse as well. And yes, and take care of the cats, while we are at the hospital and to entertain my in-laws and then later my parents when they were here, so I was really, really grateful for her being here. She basically moved in with us for a month and that was great. I wouldn't have made it through those first couple weeks without her.*

Additionally, women were able to identify positives in situations and note these occurrences as “lucky” or “fortunate” happenstances. A woman that delivered during shutdowns noted, “I was lucky I still had a baby shower.” Another expectant mother who had to manage a

move and care for her toddler while her husband was deployed said, “it could have been a lot worse.” Rather than complaining about a situation they couldn’t change, they highlighted a positive aspect of the situation. “We have a healthy child and a happy family and a healthy family.”

Along these lines, during the interviews participants often mentioned imagining others that might have a greater struggle and how grateful they were for their own situation. Examples include being mindful of women that didn’t have the family support they had, acknowledging the exceptional medical care they had that may not be readily accessible to others, or women that experienced policies that made labor more difficult like masking and limitations on support during labor.

*I was really grateful that I didn't have to wear a mask when delivering since I wasn't um. You know, since like breathing heavily like I just wouldn't have wanted anything in my in the way and just distracting me and whatnot*

There were also things that women noted as “blessings” of the pandemic or wonderful little moments or outcomes that resulted from the time at home during the pandemic. These things were positives that came out of the pandemic.

*One thing that you know it's kind of, you know, has been a blessing during the pandemic is just with everybody working remotely like my husband has been home and so that has been nice, you know to be able to help with the kids or you know mealtimes or you know when I put baby down for a nap I can still run to the grocery store or take the other kids out for a little bit. So that's been one nice part about you know about having him home more to be able to help with that for a while.*

*Because the pandemic has allowed us to kind of slow down and have a little bit more time at home in these first couple of months it's like, I feel, like I feel bad saying it, but I feel a much stronger bond in this like timeframe, with our second daughter than what I felt, with our first... And with our first I had a really hard time with nursing, and I did get a lot of support and went to like moms groups and things with our first and like, I sought so much external support for it. But with our second, because everything has to be here at home, like it's working so much better.*

### ***Sadness.***

Women experienced sadness in a variety of ways during the pandemic. When thinking about celebrations during pregnancy that were missed, or the inability to share joy in the birth of a new baby, women experienced sadness. This is especially true when women recognized that others in their family were not experiencing the same isolation or lack of togetherness as they were during that time.

*I have no photos of my son with any of my family. No photos of my son with any of my husband's family. We managed to, on mother's day, take a group photo because my husband managed to set up the timer on our camera. You know so it's it, and then seeing my family at home. Although they were in a lockdown as well. Because of the way, because they're so close to each other, and you know my parents are retired and things like that, but my sister was still able to access family, she wasn't as isolated for as long with my nephews and they could still meet in a park or something like that, at a distance,*

*but I, because we have, we have no one here, I think definitely that's, there was an extra layer of sadness that I still go, we carry around now*

Often, sadness accompanied a dissonance between expectations or visions of the perinatal period and actual experiences. Many women look forward to celebratory events during pregnancy such as showers and gender reveals. These activities take place with family and friends, and they were sorely missed during the pandemic.

*I would have like bouts of sadness, while I was pregnant. Things I just I just wasn't going the way I had always planned that it would be going, like I always pictured. All of the luncheons and you know baby showers and sprinkles and all those things and getting to really spend time a lot of time with all of my friends and all of my family when I didn't see in face to face a single one of my friends of the duration of my pregnancy, not my sister. So I feel like it was incredibly isolating, that coupled with the fact that you know we're all we were all on like lockdown orders. And stuck in your House for so long and one, are you not getting to do the pregnant things that you want to do, but just your regular social interaction was, you know nil, or at the very least incredibly reduced so. I would definitely say that there were times that I kind of lost it a little bit and was just maybe a little overcome with sadness.*

**Things unrelated to having a baby made the perinatal period more challenging or stressful.**

Women do not experience pregnancy and postpartum in a vacuum; life continues to happen and aspects unrelated to the pregnancy or adjustment to a new baby still play a role in the overall experience. For example, relocation for employment or to be closer to family is not



uncommon. For some families, relocation is more common than others, particularly for military or certain other industries. Moving during the pandemic added an additional layer of challenge for perinatal women. Challenges associated with moving during the pandemic that caused stress during pregnancy include selling/renting and buying a home, packing and unpacking, and reestablishing yourself in a new community when restrictions and social distancing were in place.

*I think the worst part was postpartum wise my husband got orders in March to move ... and we had to move five weeks postpartum. It was, there's just a lot of like big events happening in like a week. Um, but I mean we had, it was, we put our house on the market because we found out, we had to move and we sold it within the day, which was the day before I was induced but because I was induced, I knew the day and it was just easier to plan, I guess. But it was more stressful I guess than I was expecting because then we brought home a newborn two days later and had to pack up and start organizing everything to leave in five weeks um. And I just didn't expect how much work a newborn was, and then I wasn't prepared either with like how much pain I was going to be in physically; I just kind of thought I'd be able to get back like packing and that I'd be able to clean and research all this stuff and really I was in so much pain I didn't do any of that at first. But I just don't think I was prepared to recover but um cause of COVID though, we did a lot of our own packing, or else they normally cover all of that, but just for precautions we did it and then, when we moved, we probably did the trip a lot quicker than we would have we probably would have stopped and made it more of a road trip, but because of COVID we just kind of kept going so don't know if that was good or bad, but. I don't know*

Another challenging aspect was caring for their other children. Over half of the women in this sample were multiparous and had children at home they were caring for during their most recent perinatal experience. Because of the COVID-19 pandemic, schools and daycares shut down or altered the ways in which they were able to offer services. Some people kept their kids home out of an abundance of caution, and some were unable to find adequate childcare. Some women conducted virtual school for their children as the school was closed.

*I think well, childcare for my older son was, was a challenge, because they, they were not available to watch him, and he wasn't going to school. His, my aunt used to watch him on a daily basis, but then whenever I ended up staying home for work she was not able to, she decided not to watch him anymore, so he was home with us. So childcare was a, or lack of childcare. You know, at 20 and 30 and 40 weeks pregnant, I, it was hard to chase around a two-year-old. Yeah, so that was that was challenging.*

Alternatively, one mother had a great experience with their childcare provider and was able to maintain care relatively consistently throughout the pandemic.

*My three-year-old goes to preschool so we continued her in her preschool program we I guess we're fortunate enough that throughout the pandemic...there was a couple times when child care was not available because of restrictions, you know they had people that had been sick or tested positive for COVID, and so they would shut down...But childcare wise we've been very fortunate on that, and when I needed childcare outside of that one of her teachers was actually able to babysit for us like, if I had to work on the weekend, so at least she was somebody that she was already exposed to that she wasn't having to get exposed to, to people outside of their circle.*

Over half of the women in this sample worked. At least two women quit their jobs during the pandemic. The first woman quit because she worked in healthcare and was unsure how COVID would impact her and her family. She said it actually turned out to be beneficial that she could leave her job because she was able to focus more on herself, the pregnancy, and other life events. The second woman was in a situation where she had terrible morning sickness, and because schools were closed, she was bringing her other children to work with her—it all became too much to handle.

*I worked at a pediatric ER and in a laboratory and so, since we didn't know at that time how it would affect children, and my husband was out of town working in California, and so my mom and my mother in law will be helping me and they're older and they have allergies and asthma and stuff like that, so I ended up quitting my job, ...and we went into quarantine...which it actually helped that I wasn't working because I worked nights before and I worked shift work. It was very tiring and it was hard for me to get enough sleep, let alone exercise...and so it was actually almost beneficial that I could leave my job early, let myself leave my job, and focus on the pregnancy, so I was actually able to focus a lot more on the pregnancy, and eating and taking care of my body.*

For the women that continued to work, this created a situation where the mother's attention was needed for their children and they struggled to balance focus on themselves if pregnant, or the new baby if postpartum. In some cases, they also had to attend to other children and possibly facilitate virtual schooling. All of this in addition to regular household chores and maintenance was a lot to handle.

*I think the biggest challenge was having to wear all the different hats that once you're a mother to a newborn you have all those hormones going through you, you're also, for me at least, working from home at the same time having to be a preschool teacher ... so the biggest the challenges was essentially having to still do it all, on my own isolated within my house, as well as from the outside world.*

Women experienced the sense of being torn between responsibilities and not feeling confident or good about themselves or their performance in all the obligations they were attempting to balance.

*I was just super alone at that time, of course, and then you don't have anyone going through the same thing as you. And then, a lot of people don't see what's happening behind closed doors. They don't see how many times you're waking up or the colic or you know, whatever it is that you're having to deal with just as a new parent. And then, on top of that, having to work like a full day and then having to cook dinner, right after and keep a clean house and just everything that goes with that. You just feel like you're failing at everything like you can't be good at one thing, because one thing doesn't have all of your attention so, even if I was to do laundry one day and I'm like, yep crushing it, like I have an upset baby and it's like oh man, like maybe I'm not, like I'm a horrible mother. Like why is my baby still crying or they're having a great day, and then you completely like destroyed dinner and it's burnt like out I gave it my all or I thought I gave it my all and you're just super bummed about it, even though it's not a big deal to like other people. You're going into this thinking you know I want to succeed at everything and that's the person I am I try to give my all with everything I'm doing. And so when I fail at one thing or it seems like I'm failing at one thing I think I'm inadequate as a person as a whole,*

*and so I had so much going on at that time that I felt, inadequate in every area of my life, and it was like I can't do one thing right. Every time I would try to do one thing and say hey I'm just gonna focus on this thing today I'm going to get these reports done, I would go back over my reports, once the baby was asleep like wow this is a crappy report. I'm not even making sense here, did I even go to school, do I have a degree, I would be so upset with myself, and I mean I would have to remind myself like hey you had a baby spitting up on you, while you were typing this, you didn't have your full attention on this, and so, I mean that was really it. That just had me in a downward spiral, because I just was really looking at myself like I don't I can't even recognize who you are anymore I was looking in the mirror, I was like I don't know who I am. Then, you know you can't go to a gym so you feel huge even when you're not just like oh my gosh I can't lose the baby weight and so that, on top of everything, so you try not to eat as much so you're not getting as much calories. And then not getting as much calories you're not producing enough breast milk, you want to breastfeed for a full year that was my goal, and then you know I'm forgetting to drink water because I'm not putting myself first. I'm thinking of everything else, I have to do. And so, just the ups and downs of that it was God, I was all over the place just mentally and physically I'm exhausted and. Ugh yeah.*

**Women received various forms of social support from multiple sources during the pandemic.**

### ***Spouse Support.***

Support from the spouse was extremely important and made a huge difference for the women. Most women said that their husband offered the most emotional, appraisal, and

instrumental support to them throughout the perinatal period. Even when a spouse was working or geographically distant (due to work) women said they still made an effort and were able to offer support.

*I received a ridiculous amount of support from him um and still do, thank goodness, I don't honestly know what I would have done like I would mention things to my friends and I would talk to my family a little bit. But I feel like you kind of get to the point where you don't really want to, I mean you don't want to complain so much all the time, so I feel like all of your outside sources really only probably hear about like a fraction of what you're thinking, or how you feel but I definitely feel like I put the lion's share of that on my husband and luckily, for me, he was a blessing*

*I didn't mention my husband [yet], he has been just an unbelievable help during this time because of the pandemic, he was home working from home. You know he is he started working from home last March he's still working from home. And so it, that was unbelievably helpful so while he went back to work, and while he was you know working upstairs he was still able to hold the baby, so I could take a nap or he was still able to make sure that I was eating, eating, even on the special diet like he would cook for me and make me food and make sure I was still eating. He went through all of this with me. And I think, had he been physically in the office, and I would have been even more isolated that would have been another level of challenging so having his support was unbelievably helpful and it wouldn't have been possible without the pandemic. I also feel like he's way more involved in [my daughter's] life and he got that special time with her as a newborn that he wouldn't have necessarily had so, a small part I'm grateful for.*

On the other hand, a deviant or negative case regarding spousal support was also reported. While most women said their spouse was emotionally and instrumentally supportive, one woman reported some challenges, especially as her husband was struggling too.

*I literally felt like I was by myself. Because it's a lot. Because how, because of my husband had his own issues that he's working from you know he wouldn't get up until two in the afternoon and that entire time I was still having to work from home and take care of two kids and do the preschool and, and, you know, ...it was very stressful. And frustrating, which did not help anything so, ...and, of course, you know he's a man so he's not quite, quite get the postpartum stuff like that's just not possible for them to fully empathize with it.*

#### ***Meal trains and visitors.***

In this study, women were more impacted by the gifts of meals and quality time than by the gift of material items such as pampers, baby clothes, or baby gear. The meals seemed to accommodate a practical and immediate need, as well as making the mothers feel emotionally supported and cared for in a time of vulnerability and isolation due to the pandemic. A meal train has become a common method for communities to support individuals through the organized delivery or supply of meals during times of hardship.

Multiple mothers commented on the difference in expectations or previous experiences with meal trains and what they actually experienced. Prior to the pandemic, and when women envisioned meal support, people gifting meals would come and visit in order to drop off the meal. They may stay for a bit and possibly hold the baby so the mother could take a break or eat a hot meal. With the pandemic, this is not what women experienced. People would drop a meal

on the porch or doorstep and leave almost immediately. Many mothers mentioned gift cards for meals and gift cards for meal delivery services such as Doordash, Uber Eats, or GrubHub.

One mother said she was emotionally moved by the gift of food, primarily because it demonstrated people's consideration and showed they wanted to do something to support her. She was actually grateful for the "drop and dash" nature of meal delivery during the pandemic. She noted that with her first child she felt obligated to let them hold the baby and this experience actually allowed her to bond to her child more than when she felt expected to "share" the baby.

*After our daughter was born, we had people just dropped meals off on the porch which was really nice. Like I definitely cried a few times over that because I didn't have to try and plan anything for dinner and I have dietary, I have dietary restrictions, so it was just really nice that there were people that were like, but no, like what can you eat, I want to make sure I drop off the right things. You know, just like taking that extra step of consideration...it kind of felt like with our first looking back that people just wanted to come over and hold the baby, but this time people didn't want to come over and hold the baby, they just wanted to do something so it was really nice having food or gift cards dropped off um. Just so that it gave me a really good opportunity to she was already nursing well but to like super establish that, and just like getting that chance to bond with the kid I feel like...But for me receiving the gifts of the meal train was like that was like the emotional support that I needed that okay somebody's thinking of me and because I have those dietary restrictions they're taking that extra step and I don't have to plan a meal for everybody, because it was me it's me trying to feed the whole family.*



However, for some women, while meals were appreciated, what they really needed was quality time. Women that were multiparous mentioned meal trains in previous pregnancies being an opportunity for socialization and interaction with other adults such as friends that dropped off food. A major difference from previous postpartum experiences and this one was the lack of interaction when food was delivered.

*It was so appreciated and in the meal train I was hoping, I was like oh like people will drop food off and I'll get to see them. And oftentimes it was like door dash or grub hub delivery. So again, like the food was helpful. Um, but like the love language that registers, the least for me is acts of service. The love language that registers than most for me, is quality time. And so, while the things were appreciated, that's not what I needed.*

The impact of the meals may be due to the fact that none of the women in this sample had spouses that lost employment during the pandemic. The multiparous women really didn't need many material things for baby because they "had it from the last one" and had kept most items from previous children. The primiparous mothers reported getting many generous gifts from friends and family.

*We did get our registry items and it seems like people were even more generous than we expected, because they couldn't come to a baby shower. So we got a lot more like the big ticket items the swings and the stroller and you know just the big stuff and eventually we actually like after one baby shower had to put more stuff on our registry, because we heard from friends and family that they're like they're like we don't have enough gifts to buy you and they were scared to go off registry, because we didn't know she was a girl.*

*So we had to add more so the generosity in terms of gifts was more than we expected, I think, because the pandemic. But the amount of support we got after she was born was nonexistent from most of those same people.*

***Family provided postpartum support.***

For many postpartum mothers, they still were able to have people come and stay with them once they came home from the hospital. However, this support was typically from family only, and it involved much more forethought than pre-pandemic times. For example, people had to consider vaccination status to protect the baby but also their visitors, conversations about exposure had to happen, and people had to plan ahead and quarantine prior to visiting.

*Our big thing was we were fortunate enough that we're late enough into this whole pandemic that my parents were able to get vaccinated before coming up, and then they were able to actually travel they drove obviously avoiding plane travel, but they were able to come up and stay with us for a couple weeks after getting vaccinated.*

***Perinatal care and services were altered to varying degrees.***

All the women in this study talked about their experience with perinatal care and services. Regarding doctor's appointments, some women discussed difficulties with limited appointment availability and scheduling. Sometimes this was due to a provider limiting their hours or simply not having appointments available. Additionally, staff was often not in a position to help and address the scheduling issue.

*It was a little, it was more difficult to see the doctor I think because um I had to schedule so out in advance. And I think, I'm not sure if they just had so many guidelines,*

*restrictions, now we are with COVID going on, like you couldn't, or the doctors were there were less doctors or they had a limited amount of appointments they could make. I think that's what it was. So I'm not sure if they were just trying to minimize the doctors' exposure to things, or what. So I was trying to call and schedule an appointment and I couldn't even get anyone to answer the phone and I remember one time, it was frustrating, and I was, luckily, it was about a month out and then finally I'm like, I'm just, I just have to stay on the line. So it was like on the line for an hour and finally somebody picked up or I got to talk to somebody and started, you know letting them know that I needed to make an appointment and I hadn't been able to get a into anywhere and she was like oh well just stay on the line you know, okay I'm like they just didn't know how to help me*

Another issue that multiparous women experienced when scheduling appointments was childcare. With schools and daycares closed, women had their child(ren) at home with them. During prenatal visits, spouses and children were not allowed in the appointment. For women with spouses that were not working from home during the pandemic, this created a real problem with regard to making prenatal appointments.

*One of the one of the most difficult things, has been the inability to bring my current children to my doctor's appointments which makes it really difficult to find people who are able to watch them since we're new in town so that's, that's a big challenge but it's related to the pandemic, because we have not been able to make as many contacts, as we normally would, since there are social distancing measures and there's cause for concern. And we have been lucky enough to know some people because we are military, we do know some people from prior military stations who are, who are stationed here as*

*well, that we can use those resources for childcare. And we've been lucky to know my neighbors. To meet our neighbors who, some of them are military and understand the situation as well, who's been able to watch the, the children for my doctor's appointments but that's, that's been the most consistent and notable challenge throughout the pregnancy.*

The inability to have a spouse present for perinatal appointments was a widely discussed topic. Most women felt it was an annoyance, certainly worth mentioning, but not too upsetting. In many cases they were sad for their spouses or noted that the spouse felt left out or disconnected from the pregnancy. The absence of their spouse at appointments was felt most when addressing complications or potential complications with the pregnancy.

*The biggest challenge during, during pregnancy was not being able to have my partner with me for office visits. Yeah like especially, especially ultrasounds because, if he would have been there, honestly, if he would have been there for op baby's too big, op baby's too small, but nobody's like too worried about it it's in a monitoring phase, he would've reassured me of that and I would have, he comes home with me so he can keep reassuring me of that, instead of just the once, like nope we're just monitoring so it's good, because that doesn't stick in my head. I kind of forget some things sometimes because I'm growing a human so having, having that person there, who was able to leave the office with me to help reassure me of things would have made a big difference for me.*

There was also some miscommunication with COVID protocols and procedures. One woman discussed policies changing almost daily at one point and thus leading to confusion

among providers and staff on the current recommendations. This translated to miscommunication with patients.

*I tried every single time I will call ahead, hi what has changed, and can my husband come with me to this ultrasound because I had been told by different people like yes or no and here's why and nothing really ever lined up um. But then they would tell me, you know the morning of, somebody would call and be like remember please don't bring anybody with you well, I thought he could come with me so we rearranged some work schedule things you know. So, then, I had to go in by myself and I'm at the second or the third ultrasound at that point, I was like I don't know what you're going to tell me.*

Additionally, women experienced telehealth appointments and alternative appointment interfaces. Most women had virtual or appointments over the phone at some point in their perinatal care. Some women were given the option to still come to appointments in person while others were directed to telehealth for routine appointments. There also seemed to be a sense of decreased number of prenatal visits or exams for some women.

*I had some of my appointments from my car, they would come out with the doppler they would do my lab work from my car check the baby's heartbeat measure me and my size and then, I'll just slip my seat back a little bit, they would check for heartbeat and I would be on my way. And so I think that the pandemic just put some time restrictions in place, you know and they had to limit the number of people who could be there, so they had to shorten the number of appointments to maximize the time during the day. So I definitely think that had a lot to do with it....I will never understand how I had so few appointments. With even in the middle of a pandemic ...with this pregnancy, ... I had my I*

*think I was released from the Obygn at like the 10 week mark 10 to 12 week mark. Um, and then I didn't have an ultrasound again until 20 weeks, that was the anatomy scan. And I did not have another ultrasound. And I always measured on track. But my baby ...took up all of like the available real estate. And I think, had I known that I would have elected to be in the hospital from the beginning. And you know they said that we didn't do any more ultrasounds because of, I passed my gestational diabetes screening. ...I just would have thought that they would have done more ultrasounds and just to monitor like fluid levels and stuff like that, given the complications with my first, but they kept saying like you're low risk everything's great and so, and then I even have like a pretty long run of like virtual appointments. Um so I did not have many I would say it's probably, probably wasn't until the 32 week mark where appointment in person became more regular, but even then like we never did ultrasounds.*

Multiple mothers also commented on the ineffectiveness of virtual appointments. The women did not feel that the appointments accomplished much--if they had been feeling fine they felt the appointments were not necessary and if they had issues, the issues were oftentimes not resolved through virtual appointments.

*I think I probably would have recovered faster, but my for my I had a few postpartum checkups. Because I had some issues and they're all three of them were virtually. So, like, I had the six week postpartum checkup virtual and then, once we moved I was still in a lot of pain, so I kept trying to go to the doctor, but they were all virtual, and so I was getting like miss diagnosed a lot. Um because I was just trying to verbally explain what was wrong and so finally I just went to the doctor a week ago and... almost 10 months*

*postpartum and I think I'm finally going to start feeling better but it's just been a long time coming to where I think I could have been healed six months ago.*

Alternatively, other women described the prenatal visits as normal and expected. A few multiparous women didn't note any changes in the care they had received during previous pregnancies and this most current one.

Most women in this study had to wear a mask while at the hospital for L&D. Many women reported wearing a mask during labor and some during delivery. All participants that delivered during or after the shutdowns had to wear masks at the hospital. The mask policy largely depended on the hospital and the stage of the pandemic. For some women they were only expected to mask if they left their room or when hospital staff entered the room. Some women noted that even though they had been told the policy was to be masked when staff were present in the room, it was not enforced (for which many were grateful). Multiple women also commented on how they tried to be considerate of the hospital staff and their safety.

*It was a long labor but I was able to push for two, two and a half hours, and she was born and I was in a mask pushing for, I mean that whole time. I think my mask finally slipped off about 10 minutes before she was born, and I just left it left it down because at that point, that point I was not pulling it back up. But I was trying to be very cautious of you know, the nurses who were around who were helping us through Labor...But just that whole time in the hospital ... having to pull up our masks and find them anytime anyone came in the room.*

Women also had to get tested for COVID prior to L&D. This was not as common and, in some cases, it was specifically if the woman was being induced or having a scheduled C-section.

Interestingly, the husband accompanying the expectant mother was not required to get tested upon entering the hospital or the maternity floor—this may be because they were not the patient and not being admitted to the hospital.

*By the time I actually got admitted to the hospital they gave me a COVID test, which was like the most acute pain of that I had felt thus far. Contractions were, were long and painful, but they weren't like acutely painful yet so having something jammed up my nose was not fun. It was really, it was really painful COVID test, um yeah. It's the only one I've had so I have no idea if they've got, well no, I did take one a little later, but it was you know 10, 10-20 seconds up each nostril. Luckily, it was a rapid test came back negative and yet my husband and my husband didn't have to get a test at but both of us have our masks on the entire hospital time, even though I was COVID negative. And They knew that from right when I when I got there.*

The hospitals all had a policy in place limiting visitors on maternity floors. Two women wanted the opportunity to have their older children come in the hospital and take a photo with the new baby but other than that, mothers were largely grateful for the reduced visitor policy. “I actually didn't mind not having visitors, so I like using that excuse.” They appreciated an excuse to not invite family into the hospital and focus on themselves and the new baby.

*Since it was you know all of the COVID procedures, the only person who is allowed to be there was my husband. And I was kind of worried that I would sort of like regret not having all of our family in there, but, honestly, it ended up working really nicely, because I was in so much pain after the C section, and I really didn't want to have like anyone besides my husband there anyway, so that part was pretty nice and convenient.*



The support services of a lactation consultant were mentioned multiple times throughout interviews. Many women in this sample breastfed or wanted to breastfeed. Some women had trouble accessing a lactation consultant and that became a barrier to breastfeeding. This was particularly true towards the beginning of the pandemic and during the time of shutdowns.

*I pretty much gave up on trying to breastfeed with, within a few days of my child being born and I think, I'm not saying that I wouldn't have gone down the formula route that I did, but I think if I was physically able to go and see a lactation consultant and stuff like that, then I might have tried a bit longer it still might not have worked out but I feel like those kind of things was very much not available anymore.*

Alternatively, one woman described her relationship with the lactation consultant as a weekly interaction and as the provider responsible for uncovering her PPD. This woman delivered later in the pandemic when, perhaps, at least some services had been safely reinstated.

Expectant mothers in this sample sought information about childbirth and breastfeeding through classes offered in the community or at their hospital. During the early stages of the pandemic, these classes were simply cancelled, and virtual options were not operationalized until a later date. This caused some unease for mothers, particularly primiparous mothers with little or no prior exposure to infants. In one case specifically, the lack of instruction created more anxiety.

*It was a very interesting experience, and I remember just being absolutely panicked because our newborn class got canceled and I was like I don't even know how to change a diaper or swaddle or do anything.... so, then I was just panicked because I'm like the*

*baby's gonna come home, and you know what if the car seat's not safe and no one checked it like what do I do so, I was just an absolute mess over that specifically.*

Women that were due later in the progression of the pandemic often had a virtual option for classes. However, women noted that unfortunately these classes were not very helpful, particularly because they didn't feel that they could 'practice' the skills or information learned.

*Virtual childbirth classes were completely useless. Yeah, just not helpful um you know we did them through a hospital, I was annoyed that they were the same price as in person classes, because while we learned breathing techniques, we didn't really work on them. We didn't do any of you know, I really would have liked to learn like counter pressure if my husband could have learned that it would have helped me significantly during labor but we couldn't learn that I mean they didn't teach that over Zoom for childbirth classes. And it just wasn't helpful um the only part that was helpful from those virtual childbirth classes was watching videos of other women in Labor and kind of realizing Oh, this is going to be hard. This is going to be an ordeal, this is going to be long, this is going to be painful, because ... I'm the first of my friends to have a baby, I'm the first of my family's to have a baby, so I didn't know the realities of labor ... so that was an eye opener and I was really glad for that, but nothing else about virtual childbirth classes were helpful. Virtual breastfeeding classes, was not at all helpful, I, by the time the baby was my arms and they said, you can breastfeed her I said how on earth do I do that, even though I had had hours of breastfeeding classes.*

### **Postpartum depression.**

#### ***Screening.***

Women in this study described being screened for PPD. While some women seemed indifferent to the process, some women were notably disappointed and, in some cases, angered, with postpartum care in general and screening for PPD specifically.

*I feel like the majority of the time they make you do those fucking ridiculous questionnaires when you go in for like your, when you take the baby and for their checkups and stuff. Like have you ever had negative thoughts today and or in the last you know 10 to 15 days or have you felt sad at all rank your sadness on a scale of one to 10 and SMILEY faces and, you know everyone just answers no, because those questionnaires are stupid. I feel, I think that's how people sometimes get to be where they are with their struggles with postpartum depression, because one, I never understood postpartum before I had a baby and then after like sitting there watching myself and like no stupid question. No, no, no, like Oh, this is how women get caught like ending up in a place where they need help and everyone thought like, oh my God we didn't realize it was that bad because I feel like we just don't want to even like consider it ...there really aren't many like attempts to make sure that mommy is still okay after and just I mean it's just reduced to a 10 question piece of paper with SMILEY faces on how you're doing after like the biggest event of your whole life is just kind of laughable but I feel like the lack of checking in on how mom is doing kind of leads to, or opens the doorway at least, for women who get in a position where they find themselves waking up one day and they just realized that they're really struggling.*

Additionally, women felt like it was easy to lie on the screening and slip through the cracks. At times they were intentionally dishonest on the questionnaire because they didn't want

medication, and/or they struggled with conditioning or stigma. Women felt they needed to “handle” things on their own.

*Even when I would go to, you know my doctor's appointments and they would fill out, you know ask you and you would have to do that little survey every time you check in, and I would just say like nope, fine like I'm not having any of these symptoms, knowing full well I was having like all of them. I like had an emotional breakdown before I even walked in there, but it's just something that I didn't want to talk to anybody about especially a doctor, because like they're just going to give me medicine. I don't want to take the medicine, I won't be able to breastfeed like I just have to deal with it like it'll pass in a few months, like it will last forever...culturally um it's just something we don't talk about and then my husband and I's family are kind of similar where as like when you have problems like that you kind of deal with it on your own. And just kind of make do, and you get through it and you don't really talk about things like that and it's so toxic but it's just like what we grew up with.*

### ***Experiences of postpartum depression.***

Seven women in this study either self-identified or had been diagnosed with PPD. For some women, the realization that they were struggling with PPD was a surprise because the education they had on signs and symptoms of PPD did not apply to them. Their experience of PPD did not include wanting to hurt themselves or the baby; negative feelings and feelings of inadequacy just accumulated.

*I didn't feel like I had postpartum depression. Everything that I had read was about baby blues that just persisted passed when they should or you know feeling wanting to hurt*

*yourself or the baby and I had none of that. Like my, my baby blues lifted and then the postpartum depression surfaced later. And I had no feelings of harming myself or my baby so I didn't feel like I had postpartum depression. All I knew was that I was a terrible mother. I just constantly felt like I wasn't good enough. I, you know I have trouble breastfeeding her and then my milk supply dropped hugely and she got, she dropped from like the 50th weight percentile to under 10 and that took a huge toll on me. And eventually we started formula which was absolutely the right decision, but then I just felt inadequate. I wasn't sleeping, I felt like I just, I never felt like I was a good mother. And I'm just really guilty all the time and honestly that's, that's the only way I can describe like in the midst of postpartum depression. I just, I had always wanted to be a mother, and here I was failing at it. Is what it felt like um. So that was that was hard. And we didn't see anyone, it was a very, very isolating time and I just cried every day, it was multiple times a day.*

Another woman described the clarity of her realization that she was struggling with PPD and subsequent needs for treatment. Many women, those with PPD and those without, all noted the importance of having someone who understood what they were going through—they needed someone who would not judge and just “got it.”

*I think, for me, this is what, what clicked for me, this was postpartum. Um it wasn't like this overwhelming sense of like just like sadness or not feeling connected with my baby. I remember watching somebody else's birth video...And I remember just being like hysterical afterwards and then, when I realized that my sadness wasn't just sadness my sadness was grief. Grief over my experience and my birth story, grief over you know, having to do this, like feeling like I was doing this alone. Grieve over you know not being*

*able to have my husband there for pediatrician visits like it's the little things like where you want your partner in there for like milestones. And I realized like that where I was able to name it as grief and I wasn't shaking it like it wasn't ending that's whenever I kind of knew. I think this is, I was like I think this is postpartum depression....I began the process of trying to find a counselor and you know who is doing virtual sessions and had some understanding of. postpartum and what that was like and so I was really fortunate to find a counselor who fit that all of those criteria, and it was so incredibly helpful to not have to explain it to somebody, somebody who just got it. And like for me like that was such a relief. Because I felt like, for the first time, like I didn't have to justify why I was feeling the way I was feeling. Whereas I think with others like I would have to go through the whole, you know, isolation like explaining like isolation or explaining the trauma and my birth story to kind of justify the feelings that I was having.*

### ***Not getting help.***

Women struggling with PPD in this study either put off getting help at first, or never received help at all. They described a variety of reasons for not getting help or the delay in seeking help. For some, seeking help took extra energy they just didn't have to devote to the pursuit at that time. It was not until their situation got exceedingly bad that they reached out. Sometimes there was denial about their situation and women rationalized their feelings believing it would eventually dissipate on its own.

*I was open to the idea, but it was so much work to go find somebody that I didn't have the mental energy for that you know...I had no energy to devote to finding someone to talk to,*

*so I put it off, I put it off for a very long time, because I couldn't do it and plus I didn't feel like I had postpartum depression*

***Sense of overwhelm.***

Mothers typically described the feeling of being overwhelmed during the postpartum period. They felt big emotions and hormone surges, like they were balancing multiple obligations, and alone while doing all of it. This often led to a sense of overwhelm, which in some cases was deeply connected to postpartum depression and the realization of the devastating implications of this experience.

*Postpartum, which was a whole new monster. It was very hard. I remember just being so tired and being so tired of being in pain. I was just like sitting with my baby in the bathtub and I remember thinking that this is how it happens, like this is how you hear about moms who like drown their kids or something like that I just wanted. Sorry. It was such a terrifying thought like knowing like in this moment like I could just let her go and like that's how you hear about these horrific things that happen just being so sad and just being so alone.*

***Inability to receive help or support.***

Women with PPD in this study didn't always want for social support, particularly emotional support. Mothers described circumstances in which they were just unable to receive the support being given to them. For example, one woman described a moment when her mother was trying to comfort her and she essentially didn't trust what her mother said because "you have to say that, you're my mom." Other women commented on knowing the nature of their

community and their circle of friends and “knowing” that they were supported but being unable to feel it or act on it.

*I'm sure they did, knowing the Community and my friends and my family. In fact that I'm really sure they did. Can I remember or think they had an impact? I, I don't think so just because of the spiral that I was in just pure survival. So, I mean, and there was nothing they can do about it ...You know. On, on my thing it really was just more survival, so I don't think that anything really sunk in that anyone told me within those first few months.*

### **Relationships and social tension.**

This period was a time of great tension and dissension in our country. Perinatal women were not spared from the fallout of such strife. Women felt discord in relationships based on political or ideological views, in some cases this led to a termination of friendships. Additionally, in some cases women didn't feel comfortable or able to share their views because someone they relied on for social support may disagree or be offended and not help them anymore.

*I kind of tried to talk to moms over Facebook groups and stuff, but it's always hard cause with everything that's happened in the past year, it feels like people are on either one side or the other of this fence. Like you can't have like what's it called. Like you can't agree with somebody in one aspect and disagree with another and or in another and stay friends like it was a very black and white culture. Like it just, everything became very you're either with me or you're not, and if you're not you're a stupid person...I was not motivated to meet people because I didn't want people to hate me for having specific views on things going on last year.*



In some cases, there was not necessarily a difference in beliefs, but just a lack of communication regarding “COVID boundaries” that led to some tension and potentially lost friendships.

*I think a really awkward part of postpartum was this like COVID dance that happens. Like with friend interactions of nobody, nobody knew if I was comfortable having people over. And it was like nobody wanted to ask it, but then I'm like no, somebody please ask me because I'll say yes, because I'm desperate for support. But then I didn't know how to ask for help. And so I remember being so frustrated with my friends. Because I was like I don't understand why nobody's coming over or at least calling and saying hey are you okay if we come over to help you if we mask up or you know use hand sanitizer as soon as we walk in whatever that may look like. And at one point, like my husband, had to actually like call people and be like, if you are comfortable like I need you to come over to help her. And even then, like the response was very slow and very minimal. And so it kind of set this stage like really early on, of like. I, it's awkward asking for help when you don't know other people's COVID boundaries...in the midst trying to ask for help and not really getting much of a response because of other people's COVID boundaries, I think, made it really difficult and put a strain on a lot of my friendships. Which is kind of created this like other isolation, as we go later and later into the pandemic, even as things lighten up and are lifted. I do think it's drastically impacted relationships long term.*

Sometimes family was upset by COVID and the restrictions imposed preventing them from being involved in the birth of a new family member. Other times, family members had differing views of COVID and the severity of the pandemic, restrictions, and protocols. This

frustration or friction could cause tension or upset to the new mother and added to their already overflowing plate.

*The problem too with my family was very, very upset and there was nothing I can do about it, you know when your mum's crying I'm like well I can't change the situation and, your, her reaction, you know made me more upset because I was like I can't do anything about it, and now you're making me more upset.*

Lastly, general family tension existed. Unlike pre-pandemic times, family that came to visit could not stay at hotels or with other family for fear of more exposure opportunities. This served to increase the normal family tension when people got together.

*My in-laws just and then later my parents, they just didn't really know how to exist in our house without us hosting them. I remember my mother-in-law kept asking me what do you want for dinner, and like I, I can't make those decisions, right now, I was in severe pain from breastfeeding. You know I was healing from birth, I was incredibly sleep deprived and all I wanted to focus on was the baby and I, I couldn't make decisions about what I wanted for dinner. You know, I was like I don't care just please choose, something I don't care um. And it was a little harder for them, my in-laws are very much like go out and do something people and they couldn't, they didn't feel like they could leave us and then with COVID there was no place to go. I think if they had been able to stay at a hotel or, [my husband] has an aunt nearby if they could have stayed somewhere else and come over during the day that would have been great, but because of COVID they had to stay with us. And so it just ended up being a difficult situation where they didn't know what to do, I didn't know what they could do to help because I was in that very newborn phase haze of*

*I don't know what I need I don't know what the baby needs I can't tell you how you can help because I don't know.*

## **Discussion**

This study used a phenomenological research approach to understand the perinatal experiences of women during the pandemic and how they received social support. In relationship to their experiences, the key findings of this study indicate that women experienced a wide range of emotions during this time, they had multiple factors to contend with in addition to the pregnancy or new baby, perinatal care and services were impacted by COVID-19 to varying degrees, and women experienced some tension that may have impacted their relationships during this time due to ideological differences or politics. Regarding social support and how women received social support during the pandemic, women did receive support however, the nature of support was generally different from previous experiences or what was expected and required additional effort to organize.

The findings of this study echo conclusions from Slomian et al. (2017). While that study did not occur during pandemic times, many of the same conclusions can be drawn from this study. For example, Slomian et al. (2017) found that women needed emotional support, to share their experiences with others and be understood—a concept that came up in this study as well, particularly during times of struggle or for those with PPD. Women in the Slomian et al. (2017) study also noted the need for information, which in this study was communicated through disappointment and frustration with cancelation or ineffectiveness of virtual childbirth classes.

As Leahy-Warren et al. (2011) reports on the importance of emotional support during labor and the implications for PND after birth, it is fortunate that women were able to have their spouse present for L&D. Women in this study expressed gratitude for their spouse and in particular their ability to be present for birth at the hospital despite the restrictions of COVID-19 protocols.

Importantly, Chabbert et al. (2020) describe the impact of control and role of expectations in their review. In this study, having control was limited by the restrictions placed on mothers because of the COVID-19 pandemic. This led to a variety of outcomes such as isolation or even increased sense of anxiety or fear when delivering. Likewise, the role of expectations strongly impacted women's experiences. Women stated a dissonance between their vision or expectations of pregnancy, L&D, and postpartum. In some cases, this was detrimental and caused a sense of sadness or isolation. A few mothers mentioned a similar impact on their husband—the spouse also experienced sadness and isolation when confronted with decreased or limited family and friend interaction during the postpartum period. As reported by the women, fathers were sad that they were unable to share in the experience of their new child with family and friends and felt isolated in caring for their new baby and postpartum wife.

Chabbert et al. (2020) discuss the association of prenatal preparation classes in the subjective experience of childbirth and describe the findings as highly divergent, potentially because of the inconsistent or variable nature of the courses offered such as content, teaching methods, and structure. Interestingly, many women in this study desperately wanted a childbirth class. They were impacted by the cancelation of the classes and felt somewhat ill prepared for the physical and emotional demands of L&D. It seems that the omission of these classes due to COVID-19 restrictions could have had an impact on their overall birthing experience.

There were pros and cons of my position as the researcher and my personal experiences when conducting this study. I found that I was easily able to relate to these women and I had a visceral understanding of the situations and experiences they described. I feel that my role as a mother, and in some cases a military spouse, invited women to share their experiences with me in an open and honest fashion. However, I wonder if some descriptions were limited, as I did have a strong understanding and therefore, perhaps women didn't feel the need to fully describe their experiences.

Some strengths of this study were the depth of information and saturation of data. This sample of women were geographically diverse and presented perspectives from various regions of the country. This is particularly important as the virus has surged at different times and areas throughout the course of the pandemic. Also, women delivered at different times which allowed me to see changes in how experiences varied based on when women delivered relative to the progression of the pandemic.

This study also had some important limitations. One limitation of this study was the inability to see the participant and gather observational data during the interview. Because of the pandemic and the desire to create a safe environment, interviews were conducted via Zoom. In order to protect confidentiality and anonymity, videos were turned off during the interview process which didn't allow for collection of observational data. However, this was also a benefit for the participants because women were not as inconvenienced by the research process and were able to interview from the comfort of their own home while caring for their children.

Another limitation was the inability to interview partners or perinatal care providers for the purposes of triangulation. Ideally, data would be collected from other individuals or other sources to corroborate the experiences and situations described by the participants in this study.

Lastly, this study is limited by the lack of racial and ethnic diversity of the sample. It is reasonable to assume that social support and experiences may have been described differently if a wider range of diversity and cultural beliefs were included in the study. Additionally, while data on household income was not collected, none of these women reported their family income shifting dramatically during the pandemic and that may have changed the results as well.

This study serves as the first qualitative reporting on experiences and social support of perinatal women during the pandemic. From this information, physicians and hospitals may better understand the importance of offering birthing and breastfeeding classes to perinatal women and the lack of effectiveness of current online offerings. Perhaps revisiting a risk-to-benefit assessment and safety protocol for conducting these classes is in order to re-implement class offerings in a more effective manner.

Additionally, one of the common anxiety-producing aspects during delivery was not being able to read the faces of providers and nurses. Cultivating awareness of this relationship between masking and facial communication and encouraging more dialogue between the patient and the provider could help mitigate the patient's anxiety. Local breastfeeding groups managed by the hospital or local non-profit organizations can collaborate with mental health providers in their area. This could look like meetings that include a lactation consultant and a social worker or therapist making mental health support easier and more accessible. These efforts could also enhance screening initiatives and provide early identification of PND.

Given the reduced or different nature of social support during COVID-19, health educators and support service providers can instruct perinatal women and their spouse on various strategies to address these unique circumstances. For example, since traditional instrumental methods of support are not as realistic during this time (things like having a friend come and help with laundry, or other small housework activities) efforts to encourage women to be patient and understanding with themselves are increasingly important to combat the sense of overwhelm reported in this study. Helping women understand what constitutes realistic expectations of themselves and their spouse, as well as how to prioritize responsibilities, could be an area of focus for those supporting perinatal women during this time. Perhaps adding things like laundry or lawn services and grocery delivery to gift registries could be helpful to address household chores during the postpartum period with little or no instrumental support.

Lastly, inviting someone in a position to support or aid the new mother, besides the spouse, into conversations on PND prevention and mitigation could be helpful for identification and treatment of early symptoms. This also creates solidarity for the spouse during their time of transition into parenthood. This could be along the lines of creating a video presentation aimed at educating loved ones and identifying PND among women, including the compounding effects of COVID-19 on PND, and sharing it during the prenatal visits and again postpartum. Also establishing a helpline for PND and advancing advertising campaigns to make people aware of support resources is another step that can be taken to address the challenges of pregnancy and postpartum during the pandemic.

This study provides a detailed description of how women experience the perinatal period during a time of restriction and social isolation. The information included in this study can be used to further inform perinatal care and service providers on the impact of such restrictions and

isolation. Perhaps initiatives can be designed to decrease the impact of restrictions and social isolation on perinatal women in the future.



**Table 4.1—Participant Demographics**

| <b>Identifier</b> | <b>Delivery date</b> | <b>Age</b> | <b>Location</b> | <b>Race</b> | <b>Highest Education</b> | <b>Pregnancy or delivery Complications</b> | <b>Working during pregnancy</b> | <b>Military spouse</b> | <b>Primiparous</b> |
|-------------------|----------------------|------------|-----------------|-------------|--------------------------|--------------------------------------------|---------------------------------|------------------------|--------------------|
| A                 | Oct 2020             | 32         | TX              | White       | College                  | Yes                                        | Yes                             | No                     | Yes                |
| B                 | Mar 2020             | 34         | TX              | White       | College                  | Yes                                        | Yes                             | No                     | Yes                |
| C                 | Feb 2021             | 23         | TX              | White       | College                  | Yes                                        | No                              | Yes                    | No                 |
| D                 | Apr 2020             | 28         | NC to TX        | White       | College                  | Yes                                        | Yes                             | Yes                    | Yes                |
| E                 | Sep 2020             | 34         | TX to ND        | White       | College                  | No                                         | Yes                             | Yes                    | No                 |
| F                 | June 2020            | 26         | NC to CA        | White       | College                  | Yes                                        | Undisclosed                     | Yes                    | Yes                |
| G                 | Mar 2021             | 34         | FL              | White       | College                  | No                                         | Yes                             | No                     | No                 |

**Table 4.1—Participant Demographics**

| <b>Identifier</b> | <b>Delivery date</b> | <b>Age</b> | <b>Location</b> | <b>Race</b> | <b>Highest Education</b> | <b>Pregnancy or delivery Complications</b> | <b>Working during pregnancy</b> | <b>Military spouse</b> | <b>Primiparous</b> |
|-------------------|----------------------|------------|-----------------|-------------|--------------------------|--------------------------------------------|---------------------------------|------------------------|--------------------|
| H                 | Sep 2020             | 30         | OH              | White       | Graduate                 | No                                         | Yes                             | No                     | Yes                |
| I                 | Dec 2020             | 28         | TX              | White       | College                  | Yes                                        | Yes                             | No                     | Yes                |
| J                 | Jun 2021             | 31         | NE              | White       | College                  | No                                         | No                              | Yes                    | No                 |
| K                 | Mar 2021             | 35         | NE              | White       | College                  | No                                         | Yes                             | Yes                    | No                 |
| L                 | Nov 2020             | 32         | KS to<br>AZ     | White       | Graduate                 | No                                         | Undisclosed                     | Yes                    | No                 |
| M                 | Sep 2020             | 34         | TX              | White       | Graduate                 | Yes                                        | Yes                             | No                     | No                 |
| N                 | Sep 2020             | 33         | MI              | White       | College                  | No                                         | Yes                             | No                     | No                 |
| O                 | Jan 2020             | 29         | CA to<br>TX     | Black       | College                  | No                                         | Yes                             | Yes                    | Yes                |

**Table 4.1—Participant Demographics**

| <b>Identifier</b> | <b>Delivery date</b> | <b>Age</b> | <b>Location</b> | <b>Race</b> | <b>Highest Education</b> | <b>Pregnancy or delivery Complications</b> | <b>Working during pregnancy</b> | <b>Military spouse</b> | <b>Primiparous</b> |
|-------------------|----------------------|------------|-----------------|-------------|--------------------------|--------------------------------------------|---------------------------------|------------------------|--------------------|
| P                 | Feb 2020             | 28         | NJ              | White       | College                  | No                                         | Yes                             | Yes                    | No                 |
| Q                 | Jun 2021             | 29         | WA              | White       | College                  | No                                         | Yes                             | Yes                    | No                 |
| R                 | Jan 2021             | 34         | NE              | White       | Graduate                 | Yes                                        | Yes                             | No                     | No                 |
| S                 | Jun 2020             | 30         | FL to TX        | White       | Graduate                 | No                                         | No                              | No                     | No                 |
| T                 | Aug 2020             | 29         | TX              | White       | College                  | No                                         | Yes                             | No                     | Yes                |

| <b>Table 4.2—Summary Demographics</b> |                                      |                    |                           |
|---------------------------------------|--------------------------------------|--------------------|---------------------------|
| Age at time of delivery               | Mean 30.65<br>Mode 34<br>Median 30.5 |                    |                           |
| Delivery date                         | Jan 2020 n=1 (5%)                    | Aug 2020 n=1 (5%)  | Jan 2021 n=1 (5%)         |
|                                       | Feb 2020 n=1 (5%)                    | Sep 2020 n=4 (20%) | Feb 2021 n=1 (5%)         |
|                                       | Mar 2020 n=1 (5%)                    | Oct 2020 n=1 (5%)  | Mar 2021 n=2 (10%)        |
|                                       | Apr 2020 n=1 (5%)                    | Nov 2020 n=1 (5%)  | Jun 2021 n=2 (10%)        |
|                                       | Jun 2020 n=2 (10%)                   | Dec 2020 n=1 (5%)  |                           |
| Race                                  | White n=19 (95%)                     |                    | Black n=1 (5%)            |
| Highest level of education completed  | College n=14 (70%)                   |                    | Graduate School n=6 (30%) |
| Pregnancy or delivery complication    | Yes n=8 (40%)                        |                    | No n=12 (60%)             |
| Employed during pregnancy             | Yes n=15 (75%)                       | No n=3 (15%)       | Undisclosed n=2 (10%)     |

**Table 4.3—Examples of Significant Statements, Formulated Meanings, and Themes and Subthemes**

| Interview Script                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Formulated Meaning                                                                                                                                                                                                                                                                                                        | Theme                                                              | Subtheme                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------|
| <p>I pretty much gave up on trying to breastfeed with within a few days of my child being born and I think I'm not saying that I wouldn't have gone down the formula route that I did but I think if I was physically able to go and see a lactation consultant and stuff like that then I I might have tried a bit longer it still might not have worked out but i feel like those kind of things was very much not available anymore</p>                                                                                                                                                | <p>without the support of a lactation consultant I gave up on breastfeeding which I may not have as quickly if I had access to the support</p>                                                                                                                                                                            | <p>Perinatal care and services were altered to varying degrees</p> | <p>Lactation consultant</p>                                             |
| <p>my mother came over and my husband's mother would come over and they helped with the baby and they still do my mother comes and watches her on Tuesdays and my mother in law, watches her on Thursdays, while I work, but in the beginning. When I was barely able to walk I had to have like assistance to get off the couch because the pain was so bad. I had my mother stayed for at least a week and my husband's mother stayed for another week and we had offers from you know both of my siblings family for continued support, so I was really lucky on the support front</p> | <p>my mother and my mother in law come and help with the baby when I have to work. after the baby was born, my mother and mother in law came and stayed at my house because I was in so much pain and couldn't move. I also had offers from my siblings' family for continued support, so I was lucky to have support</p> | <p>Women received social support during the pandemic</p>           | <p>Visitors to help with baby after delivery and home from hospital</p> |
| <p>I feel like the emotional support you get from like physical contact. And just time spending actual time with another human body is. I think really fills you up</p>                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>I receive emotional support from physical contact and spending time with another</p>                                                                                                                                                                                                                                   | <p>Women received social support during the pandemic</p>           | <p>Physical contact</p>                                                 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                             |                                                                                   |                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------|
| <p>as a person, or at least just me and I feel like those are the moments that were harder to come by because of the COVID restrictions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>person, it fills me up as a person and that was hard to come by because of COVID restrictions</p>                                                                                                                                                        |                                                                                   |                              |
| <p>nobody was going anywhere everyone was afraid to do anything. I mean when you have like federal mandates and statewide mandates and then everyone doesn't know what to think, because we have misinformation or lack of information or both, and. Plus, you yourself or find yourself terrified because I mean can babies get COVID can pregnant people get COVID can babies in utero get COVID if the pregnant mom gets COVID just so many things that. You know everyone's kind of on like defcon five like alert so nobody's going anywhere and nobody's coming over. Because of the pandemic.</p> | <p>no one was going anywhere or doing anything because of mandates and everyone doesn't know what to think because of misinformation or lack of information and you're terrified because you don't know the impact of COVID on babies or pregnant women</p> | <p>Women experienced a wide range of emotions throughout the perinatal period</p> | <p>Fear</p>                  |
| <p>As far as my appointments I had to I couldn't take anybody in there with me, and so I have four children, and then I couldn't see my mom so. I think they went ahead and let they didn't want me to take the Doc the children into the doctor's office but they let the my let me bring my children and then they had to stay. In the waiting room with a nurse, so they couldn't go into the room with me</p>                                                                                                                                                                                        | <p>For my prenatal appointments, I couldn't take anyone with me, including my children. I have four children and I couldn't have my mom watch them. So, they let my children wait with a nurse in the waiting room while I went in to see the doctor</p>    | <p>Perinatal care and services were altered to varying degrees</p>                | <p>Prenatal appointments</p> |
| <p>Like when I was trying to find the hospital and it was just all virtual like we did a virtual tour of the hospital, so I just had never even really been until giving birth and</p>                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>We did a virtual tour of the hospital and I had never physically been there until giving</p>                                                                                                                                                             | <p>Perinatal care and services</p>                                                | <p>Virtual appointments</p>  |

|                                                                         |                                                               |  |  |
|-------------------------------------------------------------------------|---------------------------------------------------------------|--|--|
| then the last couple appointments leading up to his birth, were virtual | birth. My last couple appointments before birth were virtual. |  |  |
|-------------------------------------------------------------------------|---------------------------------------------------------------|--|--|

## CHAPTER V

### DISCUSSION AND CONCLUSION

The purpose of this dissertation was to establish a foundational work towards a better understanding of how social networks, social support, perinatal depression, and military life intersect. Specifically, this work serves as a foundation for a future SNA study to determine the structural, compositional, and functional components of MAW's networks that associate with perinatal depression symptoms. Ultimately, I want to use this information to establish a social intervention that can successfully mitigate PND among MAW. The dissertation had three studies, each with a specific research question(s).

The first study aimed to describe how SNA measures associated with PND in MAW. This topic was not found in the literature, indicating a large gap in which to conduct future research. For the purpose of the present study, the scope of the question was broadened to include depression in an adult population. The research question became *how do SNA measures associate with depression or depressive symptoms?* This question was addressed by conducting a systematic literature review. Ultimately, 15 studies satisfied inclusion criteria and were analyzed to create a narrative summary of how SNA properties associate with depression in adults. The key findings of this study indicated an inconsistency with associations of SNA measures and depressive symptoms among subpopulations.

Structural elements don't consistently associate with depression scores in the same way among various populations. This could be because size is not descriptive enough to capture the impact of the ties on the ego. For example, when network size is reflective of a large degree of social support, it seems protective, alternatively if there are many conflictive ties that contribute



to the overall network size, it may contribute to depression or depressive symptoms. Other structural aspects were not measured frequently enough to form any notable conclusions regarding the association with depression or depressive symptoms.

Findings on compositional elements indicated that having similar others, or increased homophily, within a network decrease depressive symptoms. Future studies can address the mechanism for this relationship and use that information in designing social intervention and treatment strategies. Not surprisingly, increased social support and decreased relational strain or conflict associated with decreased depression scores or symptoms. This information has been used already, for example to treat depression with marital counseling.

Also important from this study was the finding that many SNA studies did not adequately report on the composition of the sample, the setting of the study, or the statistical analysis. This is problematic in that subsequent researchers are unable to determine if the findings apply to their population of interest. Researchers are also unable to replicate the study and produce comparable finding that add to the greater knowledge base.

The second study aimed to describe what is known regarding PND in a military-affiliated population. This question was addressed using a systematic scoping review and reported findings using a socio-ecological framework. The specific research questions included:

- 1) *What study designs and social-ecological levels have been explored relative to PND among MAW?*
- 2) *What risk factors at various socio-ecological levels have been examined in predicting PND in MAW?*

- 3) *What interventions have been developed to address PND among MAW and what socio-ecological levels do they target?*
- 4) *What barriers or facilitators exist to receiving care and treatment from PND among MAW and what socio-ecological levels do they target?*

The inclusion of 10 studies lead to the key finding that there is a lack of research in this topic area and the majority of information we have applies to intra-and interpersonal levels only. There is a dearth of analytical studies making causal inference difficult. Additionally, there were issues with transparency, mainly with reporting conflicts of interest, and the inclusion of study limitations such as the self-report nature of PND screening tools and the potential hesitancy to under report issues of mental health within a military affiliated population. Likewise, there were methodological issues with examining deployment as a unique risk factor for PND among MAW. Specifically, deployment was not defined and no mention of other forms of separation, such as TDYs, were addressed. This oversight could be responsible for the inconclusive nature of the association between deployment and PND risk.

In the third study, I initially wanted to study the role of social support and the relationship to PND among military spouses. With the pandemic, I saw an opportunity to better understand women's experience of pregnancy and postpartum during a period of social isolation and unprecedented restrictions. I also became curious as to how women received social support during such a period. The pandemic impacted life in a variety of ways, and I wanted to understand the consequences of such a phenomenon on the perinatal period. Therefore, the third study was a qualitative study using a phenomenological approach to address the questions: *What*

*was the perinatal experience of women during the COVID-19 pandemic, and how did perinatal women experience social support during the pandemic?*

I interviewed 20 women and used phenomenological analysis to create a narrative essence of their experience. Of particular interest were the changes experienced in their prenatal care, for example the inclusion of telehealth appointments and the inability of their spouse to be present for prenatal appointments. Additionally, there was a wide range of emotions described by the women including isolation, fear, gratitude, and sadness. Regarding social support, most participants described receiving support from friends and coworkers in the form of gifts and food and having family visit at some point postpartum. Participants also reported that social support varied from previous pregnancies, or in the case of a new mother there was a dissonance between expectations and their experience of support. Mothers also shared their dissatisfaction with postpartum care.

Implications for future research based on the findings of these studies are far-reaching. First, assessing characteristics of homophily that make having similar others in network important should be studied further. In other words, a better understanding of the mechanism responsible for a reduction of depressive symptoms based on greater homophily should be examined. It is possible that the important characteristics could vary depending on the subpopulation and thus, this line of inquiry should be pursued in many specifically defined groups of people. Understanding this relational mechanism can lead to more effective intervention and treatment strategies.

Second, if individual levels of depression can be influenced by members of a social network, perhaps more longitudinal data to better understand this relationship is warranted. It

may be possible to find key positions in a network for depression management or treatment initiatives that have influence throughout the network.

Third, in cases of decreased social support, it may be important to determine other factors that mitigate depressive symptoms. This information can also be gained by SNA and studying those with low depression scores and low social support—what other factors are at play that are contributing to the positive mental health outcomes despite the lack of support? This information would be particularly helpful to military families and those that support military families.

Fourth, further research on PND among MAW is necessary to better understand the role of factors at various socio-ecological levels of influence, and design better programming for prevention and treatment within this specific population. There is very little research available in general, but information is particularly scarce on community, institutional, and policy levels. This is particularly important as the qualitative data indicate opportunities for intervention on these levels of influence.

Fifth, upcoming studies on MAW and PND should include information on potential conflicts of interest and aim for transparency. Specific risk factors for PND such as deployment should be accurately defined and potential confounders like TDY or other instances of separation should be considered. Use of triangulation in addition to self-report screening and other diagnostic tools may be beneficial for ascertaining more accurate levels of PND prevalence.

Lastly, more qualitative research is needed to better understand the development of PND, particularly among MAW. Perhaps a grounded theory approach would be appropriate to better understand the mechanism for PND development and lead to testable hypotheses in subsequent analytical studies.

Future directions for this research for me include a revisit to the qualitative data to analyze differences between military-affiliated and nonmilitary affiliated participants. While there were certainly overarching themes within the sample, further analysis of experiences specific to the subsamples deserves attention. Additionally, plans for another qualitative study that examines the perinatal period of military affiliated women and their families will be undertaken. This study will dive deeper into how relationships form and change with partners, friends, and healthcare or service providers throughout the pregnancy and postpartum period.

Also of interest is a possible collaboration with the women's health clinic on base to conduct analytical studies of PND in MAW. This work would draw on my findings from the systematic and scoping reviews to design meaningful and robust studies that contribute to the knowledge base and aid practitioners, support services, and leadership in caring for MAW. As I said, more analytical studies with well-defined methods are required to work towards causal inference for risk factors of PND in MAW. Additionally, more studies and more data will lead to the ability for triangulation which can help to decrease the impact of bias and limitations of observational studies to learn more about how to prevent PND in MAW.

I may also reach out to support service providers and directors of programs on base related to perinatal women for research opportunities. These endeavors may be more aimed at evaluation-type work to understand the strengths and outcomes, as well as areas of improvement, for existent programs. This could also include a comparison of programs across installations and branches of the military. Perhaps these findings could aid in determining programs that need to be reimagined or discontinued, and those that need better advertisement and exposure to increase utilization and effectiveness.

The next step for me and work I want to be doing is multifaceted. For one, I want to continue to work for and with perinatal women in preventing, treating, and understanding PND among MAW. Through this experience, I have discovered a genuine interest and appreciation for qualitative research. I spoke earlier for the need of a grounded theory approach to understand the mechanism of PND development in MAW and generate testable hypotheses which is something I may pursue later as well. Ultimately, I would appreciate the opportunity to conduct research but also design interventions that address this issue. I believe the social health aspect is of great importance in this population and yet, it is not adequately addressed.

Additionally, I have been working on resilience initiatives for military youth and I am determined to follow this effort further in the future. I think a family approach to resilience will be most advantageous and I want to conduct research to see if that is true. I want to branch out and examine the social networks of military spouses and see what relationships exist between SNA measures and resilience.

I am currently the co-director for a program that teaches resilience curriculum to military youth. This curriculum could benefit from evaluation, specifically outcome and impact evaluations. I want to further refine the curriculum to aid our youth in acquiring and building resilience skills.

I am open to possibilities and will always be seeking opportunities to help military families. Research, teaching endeavors, advocacy—this is the work I want to be doing. After completing this dissertation, I have a good idea of where to start and the contributions I can make to my community.

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## APPENDIX

### Interview Script and Guiding Questions

Hello.

Thank you for taking the time to talk with me today.

I believe you have received information about this study, but I'd like to give you a summary, address any questions you may have, and see if you are interested in participating.

I will also need to ask you some questions to make sure you fit the inclusion criteria. Is this okay with you?

No:

Okay, thank you for your time. Have a great day. Good bye.

Yes:

Okay, great. I am interested in understanding the pregnancy and postpartum experiences of women during the COVID 19 pandemic. Specifically, I want to know about social support and challenges created by the pandemic.

The participants in this study are women, age 22-35, who have experienced a pregnancy and/or postpartum period during the COVID-19 pandemic. Expectant mothers that conceived between June 2019 to June 2020, and maintained or delivered their baby to date, are eligible for inclusion in this study. Do you meet these criteria?

No:

Okay, thank you for your time. Have a great day. Good bye.

Yes:

Okay, great. There is little research on the pregnancy and postpartum experiences of women during a pandemic. We are hoping to learn more about the support you received during this period and what challenges you faced. It is our hope that this information will be useful to families, clinicians, and anyone in the position to care for perinatal women during periods of isolation. This study is part of a dissertation and it is the intent that these findings are published and/or presented to share information.

Participating in this study will involve talking about your experience during your pregnancy and/or postpartum period. You will be asked about the support you received and from whom you received it. If you decide to participate, the interview will last no more than 1.5 hours

Does this sound like something you would be interested in?

No: ok. Thank you for your time. Goodbye.

Yes: Great. To reiterate, I am a graduate student and I am working on this study under the supervision of my graduate committee chair, Dr. Ledric Sherman. I am conducting this study

because I am interested in the pregnancy and postpartum experience of women during the pandemic, particularly concerning social support. I would like to review your rights as a participant, and my duties as a researcher in detail. Whether or not you take part is up to you. You can choose not to take part. You can agree to take part and later change your mind. Your decision will not be held against you. You can ask all the questions you want before you decide. **Agreement to be recorded is necessary for participation in this study.** Again, your participation is voluntary and can be withdrawn at any time. **During the interview only the sound or audio will be recorded. The purpose of these recordings is to make sure the research team accurately records what you have said and can re-visit your interview material later. The recordings will be transcribed and analyzed by the research team.** These materials will be kept completely confidential to the extent limited by law at all times during this study, and will be used only for the purposes of this research project. Once the interview has been transcribed, the actual audio file will be destroyed. Any information that is included in the actual write up of this study will not include your name or any other identifying information that could identify you. **The findings will be reported in an academic journal or presentation as well as the dissertation.**

**We will now review the consent form I sent you via email:**

***Title of Research Study:***

Social support for pregnant and postpartum women during the COVID-19 pandemic.  
IRB2020-1187, approved 03/26/2021

Investigator:

Ledric Sherman, PhD

Funded/Supported By:

This research is funded/supported by Texas A&M University

Why are you being invited to take part in a research study?

You are invited to participate in this study because you have experienced a pregnancy and/or postpartum period during the COVID-19 pandemic.

What should you know about a research study?

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

## Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the research team at 979-845-1266 or by email at [lsherman@tamu.edu](mailto:lsherman@tamu.edu).

This research has been reviewed and approved by the Texas A&M Institutional Review Board (IRB). You may talk to them at 1-979-458-4067, toll free at 1-855-795-8636, or by email at [irb@tamu.edu](mailto:irb@tamu.edu), if

- You cannot reach the research team.
- Your questions, concerns, or complaints are not being answered by the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

## Why is this research being done?

Understanding the postpartum experiences of women is important to being able to appropriately care for women in the future. Our goal is to further understand the role of social support to the health of women during their postpartum period. Additionally, the COVID-19 pandemic has presented challenges to women during pregnancy and postpartum and understanding how this situation has impacted mothers is also of interest and importance.

### Significance

This research can inform healthcare providers, support services, and hopefully families about the importance of social support, particularly during this difficult time of social distancing. Of particular interest to families is the kind of support they should ask for, and who they should seek out within their network for best results. For the military community and families, this can also inform leadership and perhaps help units or groups organize support for their members during the perinatal period.

## How long will the research last?

This study is being conducted during the spring semester (March through May) of 2021. We expect that your personal time investment in this research study is 1 to 2 hours. This includes roughly 30 minutes during the recruitment and scheduling process-to read and ask questions regarding the consent form-and no more than 90 minutes for the actual interview.

## How many people will be studied?

We expect to enroll about 20 people in this research study.

## What happens if I say “Yes, I want to be in this research”?

- If you agree to participate in this research, a one-time interview will be scheduled at your convenience. A private location is recommended for this interview. The interview will be

conducted over zoom with the cameras turned off. You will be emailed a password protected and waiting room enabled link to a zoom meeting at your assigned time at least 24 hours prior to the meeting. At the beginning of the interview you will be reminded of your rights during the research process and the voluntary nature of your participation. We will review this form and address any questions you may have at that time. Once all your questions have been answered and you consent to participate and be recorded, you will be asked questions about your pregnancy and/or the period after you gave birth. You may skip any question you like or stop the interview at any time.

- Agreement to be recorded is necessary for participation in this study. During the interview only the sound or audio will be recorded. The recordings will be transcribed and analyzed by the research team. The findings will be reported in an academic journal or presentation.
- The total time of your involvement in the research is estimated to be 1-2 hours. This includes about 30 minutes to set up an interview and address any questions you may have, and up to 90 minutes to complete the interview.
- As a participant you will interact with Michelle Strong, a PhD candidate and member of the research team.
- This research will be conducted from your personal computer over Zoom.
- The research project will be done in May but your part in the research is complete at the end of your interview.

#### What happens if I do not want to be in this research?

You can leave the research at any time and it will not be held against you.

#### What happens if I say “Yes”, but I change my mind later?

You can leave the research at any time and it will not be held against you.

If you decide to leave the research, contact the investigator so that the investigator can omit your interview as data and destroy the transcript.

#### Is there any way being in this study could be bad for me?

Taking part in this research study may lead to uncomfortable emotions or a breach of confidentiality. We will take all precautions to protect your anonymity and protect your confidentiality, but there is always a small chance of a breach. Additionally, some of the interview questions may bring back memories that create strong emotions. We have provided resources here if you wish to speak further about your feelings or experiences.

For military spouses, contact Military One Source (<https://www.militaryonesource.mil/health-wellness/mental-health/mental-health-support/mental-health-matters-in-the-military>) or the 24 hour crisis hotline (800-273-8255).

You may also contact the MFRC on base/post where you are assigned and ask to make an appointment with the MFLC (military family life counselor) if you don't want to go through TRICARE.



For civilian women, you can contact the Postpartum Support International or the Suicide prevention hotline. You are also encouraged to discuss any concerns or strong feelings with your physician or midwife.

<https://www.postpartum.net/>

1-800-944-4773

<https://suicidepreventionlifeline.org/>

1-800-273-TALK (8255)

Will being in this study help me in any way?

We cannot promise any benefits to you or others from your taking part in this research. There are no direct benefits to you for your participation.

What happens to the information collected for the research?

Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. We cannot promise complete privacy. Organizations that may inspect and copy your information include the TAMU HRPP/IRB and other representatives of this institution.

Limitations on confidentiality based on possible legal issues include the disclosure of abuse or neglect. This information must be disclosed to appropriate authorities as required by law.

Can I be removed from the research without giving my OK?

The person in charge of the research study or the sponsor can remove you from the research study without your approval. Possible reasons for removal include failing to schedule and complete the interview prior to 30 April 2021.

What else do I need to know?

***If you wish to be contacted with the results of the study you may indicate this to the research team and provide them with an email contact.***

Do you have any questions at this time regarding the consent form or the research project?

Do you consent to participate in this study?

No: ok well thank you for considering and taking the time to speak with me. Goodbye.

Yes: Great. Thank you.

Do you consent to have your audio recorded and transcribed?

No: ok well thank you for considering and taking the time to speak with me. Goodbye.

Yes: Great. Thank you.

Are you in a private setting or a place where you will be comfortable answering questions about social support and your pregnancy/postpartum experience.

I would like to ask you some questions about your experience when you were pregnant and after the birth of your child. I am interested in understanding what your experience was given the pandemic and how it may have impacted your overall experience. This may be upsetting to talk about, and I want you to know that if it's bothering you too much at any point, you can just tell me, and we can take breaks, or you that questions do not have to be answered and can be skipped if you like. Additionally, I provided resources in the informed consent document that you can reach out to and further discuss your feelings should you choose to do so. They are also listed here in the chat

\*\*list the following in the chat on zoom:

For military spouses, contact Military One Source (<https://www.militaryonesource.mil/health-wellness/mental-health/mental-health-support/mental-health-matters-in-the-military>) or the 24 hour crisis hotline (800-273-8255).

You may also contact the MFRC on base/post where you are assigned and ask to make an appointment with the MFLC (military family life counselor) if you don't want to go through TRICARE.

For civilian women, you can contact the Postpartum Support International or the Suicide prevention hotline. You are also encouraged to discuss any concerns or strong feelings with your physician or midwife.

<https://www.postpartum.net/>

**1-800-944-4773**

<https://suicidepreventionlifeline.org/>

1-800-273-TALK (8255)

The information that you provide will be kept confidential. Please try not to refer to yourself by name or provide information so specific that it can personally identify you or your family. In the event that this happens accidentally, we will redact that information in the transcription. Do you have any questions before we get started?

### Interview Questions

- 1) Please describe your pregnancy or postpartum experience during the pandemic.
- 2) What were some challenges of your pregnancy/postpartum period?

Do you feel that your any of your challenges are unique to the pandemic?

If so, which challenges are related to the pandemic?

- 3) Did you receive emotional support from friends, family, or your community (for example, love, empathy, or care)\*?

If so, from whom did you receive support?

Describe the support and scenario in which you felt emotionally supported.

- 4) Did you receive support from friends, family, or your community in the form of gifts and services (for example gifts such as pampers, clothes, furniture and services such as meal trains or assistance with meal preparation, help with house cleaning or maintenance, help with informal childcare such as a friend coming over to watch children while you slept or ran errands)\*?

If so, from whom did you receive gifts and services?

Describe the gifts and services or the scenario in which you received this support.

- 5) Did you receive support from friends, family, or your community in the form of information (for example, consulting friends on preparing for motherhood, finding a pediatrician, where to go for childcare, or how to install a car seat)\*?

If so, from whom did you receive informational support?

Describe the support and scenario in which you received informational support.

- 6) Did you receive support from friends, family, or your community in the form of affirmations or constructive feedback (for example, someone saying you're doing a great job, or advice that aided in your personal growth at the time)\*?

If so, from whom did you receive support?

Describe the support or the scenario in which you received appraisal support.

- 7) Share with me how the pandemic affected the support you received during your pregnancy/postpartum period?
- 8) How do you think the support you received during your pregnancy/postpartum period would have been different if there was not a pandemic?
- 9) Have you experienced feelings of isolation and sadness during your pregnancy/postpartum experience?

If so, how has the pandemic impacted these feelings? How much of these feelings are attributable to the pandemic?

- 10) How did the support you received affect your emotional state during your pregnancy/postpartum period?

11) If this is not your first pregnancy, how have your other pregnancies/postpartum periods been different from this most recent experience?

12) Are you currently the spouse of an Active Duty Service Member?

\*material in parenthesis will only be used if the participant needs further description or prompt