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Relationship Between Length of NICU Stay and Mothers' Trauma and Self-Efficacy for Childcare Post-NICU Discharge

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Abstract

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Childcare Post-NICU Discharge

by

Suzanne Switzer

MS, Erikson Institute, 2010

BA, Willamette University, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Recent research has shown that having an infant admitted to the neonatal intensive care unit (NICU) can be a traumatic experience for parents. However, less is known about whether this trauma is related to later parenting self-efficacy for childcare after NICU discharge and whether that relationship is affected by the length of NICU stay. This quantitative study, guided by Bandura's self-efficacy theory and Ehlers and Clark's cognitive model of post-traumatic stress disorder (PTSD), examined the relationship between mothers' trauma of having had a child in the NICU and maternal parenting self-efficacy related to childcare post-NICU discharge, with length of NICU stay as a moderator. Data from online surveys were analyzed using SPSS software to conduct a multiple regression moderation analysis. Mothers' trauma was measured by the PTSD Checklist for DSM-5 and maternal parenting self-efficacy was measured by the Perceived Maternal Parenting Self-Efficacy questionnaire. Length of stay was measured in days in the NICU. Results did not yield statistical significance between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy, and length of NICU stay did not moderate the relationship between mothers' trauma and maternal parenting self-efficacy. Nevertheless, understanding the relationship among these variables may lead positive social change by medical and professional staff helping mothers during and after their infant's transition from the NICU.

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Dedication

This dissertation is dedicated to my late father, Dr. Kenneth Switzer, who always believed in me and inspired me to do my best.

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Table of Contents

iv

List of Tables

Chapter 1: Introduction to the Study

Most pregnant women do not expect their baby to be admitted to the neonatal intensive care unit (NICU), but every year roughly 10% of babies born in the United States are admitted (Harrison & Goodman, 2015; OakBend Medical Center, 2021). Factors such as the appearance of their sick child, fear that their child might die, and feelings of inadequacy that they cannot provide the proper care of the infant can all contribute to the trauma parents experience. These factors may negatively affect parental well-being and can result in psychological symptoms that affect parenting skills and parents' ability to interact, bond, and care for their infants (Schecter et al., 2020). But parents of NICU infants who achieve higher levels of self-efficacy in their parental roles are better equipped to care of their infants and to facilitate the growth and proper development of their baby (Pedrini et al., 2018). In my study I explored the relationship between a mother's trauma of having an infant in a hospital's NICU and maternal self-efficacy in childcare after discharge and what role time in the NICU plays in this relationship.

In the following sections, a brief synopsis of the existing literature relevant to the current study is explained, and a gap in the research that this study focuses on is presented. The problem statement is introduced with further explanation of the gap in current research literature. Next, the purpose of the study is described, and the research questions is presented. The final sections include assumptions, scope, delimitations, and limitations. Last, the significance of the study is stated and why the topic of this study is important to the larger discipline of psychology.

Background

Most babies who are admitted to the NICU are born preterm. According to the Centers for Disease and Control and Prevention (2015), one out of every 10 babies is born prematurely each year in the United States (White et al., 2017). A premature birth occurs when the baby is born before 37 weeks of gestation and is the leading cause of neonatal mortality (Adama et al., 2016), with 75% of pediatric deaths occurring within the first month of life (Glass et al., 2015). Human viability is considered at the gestational age of 23–24 weeks, and then the chance of survival is only 50% and requires extensive NICU care (Glass, et al., 2015; Petteys & Adoumie, 2018). NICU admissions occur not only when a baby is born prematurely but also when an infant has complications requiring intensive medical care such as congenital malformations, infections, or critical illness (Loewenstein, 2018). In 2014, statistical data from the Centers for Disease Control and Prevention reported the top causes of infant death as congenital malformations, deformations, and chromosomal abnormalities followed by disorders relating to short gestation and low birth weight (Petteys & Adoumie, 2018).

In general, parents who have an infant in NICU may feel helpless as they lack control (Schecter et al., 2020). Once an infant is admitted to the NICU, prognosis is not always clear, and life-threatening or life-long illnesses can ensue, leaving parents wondering if their baby will survive. Very preterm infant and infants with more medically complex conditions typically require longer hospitalization stays in the NICU (Welch et al., 2017). NICU infants often need specialized care by a team of highly trained neonatologists, therapists, nurses, and therapists (White et al., 2017). Many NICU infants

require the assistance of feeding tubes and breathing machines to help them progress. It can be complicated for parents to maneuver in the NICU environment; in addition, it can be frightening to see the machines and medical equipment attached to the infants, and the policies and procedures around infant care are often structured and strict. Thus, an NICU admission may negatively affect parental well-being as well as parenting skills and parents' ability to interact, bond, and care for their infants (Schecter et al., 2020). Parents may even experience trauma symptoms related to having an infant in the NICU that may manifest into posttraumatic stress over time. This trauma can affect various areas of parents' lives including their behavior and attitudes toward their children and their ability care for them (Kress et al., 2021).

As parents are unable to participate in the care of their infant, their sense of overall parenting self-efficacy is affected (Chen et al., 2016; McGowan et al., 2017). Studies have shown that parenting self-efficacy, based on Albert Bandura's (1977) theory of self-efficacy, is a necessary component in the development of a child and directly influences parenting competence (Pedrini et al., 2018). Parenting self-efficacy is the belief that one has the capability to perform duties associated with parenting (Pedrini et al., 2018). Parents who judge themselves to have the skills necessary to successfully care for their baby tend to report higher levels of confidence in their parental roles (Copeland & Harbaugh, 2017). Therefore, parents of NICU infants who achieve higher levels of self-efficacy in their parental roles are better equipped to care of their infants and to facilitate the growth and proper development of their baby (Pedrini et al., 2018).

Though both parents are affected by NICU admission, for the purpose of the present study, only mothers were included and their trauma of having an infant in the NICU was compared to their maternal parenting self-efficacy once home. The psychosocial stress and the perception of stress related to the experience of having an infant in the NICU was higher among mothers than fathers (Baía et al., 2016). Furthermore, mothers have expressed heightened concerns about their lack of preparedness for their baby's birth and how that negatively affected their maternal roles (Pinar & Erbaba, 2020). In some of these cases the emotional and psychological trauma associated with a NICU admission can mean mothers do not develop a true sense of parenting until after discharge and even then, it can take substantial time for those positive feelings to develop (White et al., 2017). Furthermore, it is possible that the longer an infant is in the NICU, the more distress a mother feels due to the physical separation between herself and baby, and the impact it has on the mother and child bond (Petteys & Adoumie, 2018). Therefore, length of NICU stay was explored as a moderating variable.

Problem Statement

Research has shown that having an infant admitted to the NICU can be a traumatic experience for parents (Alinejad-Naeini et al., 2021; Baía et al., 2016; Sabnis, et al., 2019). Compared to parents of full-term and healthy infants, parents of infants that require NICU hospitalization experience higher levels of psychological distress and increased rates of posttraumatic stress disorder (PTSD; Salomè et al., 2022). However, less is known about how much of the long-term trauma is related to parenting self-

efficacy for childcare after NICU discharge (White et al., 2017), and whether that relationship is affected by the length of NICU stay (Bonacquisti et al., 2020). Specifically, there is little or no literature on the relationship between mothers' trauma (Assal-Zrike et al., 2021; Bonacquisti et al., 2020; Molloy et al., 2021) and maternal parenting self-efficacy (Copeland & Harbaugh, 2017; Puspasari et al., 2018) for childcare for NICU infants after discharge and whether length of NICU stay moderates this relationship. In addition, much of the research that does exist is focused on populations outside of the United States (Assal-Zrike et al., 2021; Pedrini et al., 2018; Salomè et al., 2022). The current study filled this gap in understanding by focusing on the relationship among these variables through the experiences of mothers in the United States.

Purpose of the Study

The purpose of this quantitative study was to address the gap in the literature by examining the relationship between the level of mothers' trauma of having had a child in the NICU and maternal parenting self-efficacy related to childcare post-NICU discharge, with length of NICU stay as a moderator. The study used a multiple linear regression design with data obtained through online surveys.

Research Questions and Hypothesis

The following research questions guided this study.

Research Question 1: Does mothers' trauma post-NICU discharge predict maternal parenting self-efficacy for childcare?

$H_1$1: Mothers' trauma post-NICU discharge predicts maternal parenting self-efficacy for childcare.

$H_0$1: Mothers' trauma post-NICU discharge does not predict maternal parenting self-efficacy for childcare.

Research Question 2: Does length of NICU stay moderate the relationship between mothers' trauma and maternal parenting self-efficacy for childcare?

$H_1$2: Length of NICU stay moderates the relationship between mothers' trauma and maternal parenting self-efficacy for childcare.

$H_0$2: Length of NICU stay does not moderate the relationship between mothers' trauma and maternal parenting self-efficacy for childcare.

Theoretical Framework

The theories that grounded this study are Albert Bandura's (1977) self-efficacy theory and Ehlers and Clark's (2000) cognitive model of PTSD. The term *self-efficacy* is defined as how well one can execute courses of action required to deal with prospective situations (Bandura, 1977). In short, self-efficacy is an individual's beliefs in their capabilities to control their own functioning over the events that happen in life. Self-efficacy can be the foundation for motivation, well-being, and personal accomplishment (Bandura, 1989). Individuals with high levels of self-efficacy may benefit in various ways that affect their daily lives, such as more resilience to adversity and stress (Bandura, 1989).

The trauma experienced by mothers of infants who have been in the NICU can also be viewed through the lens of the cognitive model of PTSD by Ehlers and Clark (2000). It is important to note that trauma operates on a continuum and not everyone who experiences trauma will develop posttraumatic stress which is on the severe end of the

trauma continuum. According to Ehlers and Clark, one of the strongest predictors of whether an individual experiences PTSD relates to how severe a trauma was perceived to be (Ehlers & Clark, 2000). According to this model, memories, appraisals, and behaviors surrounding a previous traumatic event can alter one's sense of current threat or danger. The experience of current threat may be described in intrusive symptoms, emotional symptoms such as fear, shame, guilt, or anger, and physiological symptoms that relate to one's current emotional state or their state during the time of the trauma (Ehlers & Clark, 2000). The trauma of having had an infant in the NICU may influence a mother's ability to recover post discharge, and the memories of the event may affect her sense of current threat and subsequent confidence in ability to provide care to the child (Sharp et al., 2021). The length of NICU stay may increase the trauma because the traumatic experience lasts longer.

Nature of the Study

To address the research questions in this quantitative study, the specific research design included moderation analysis to determine whether there was a relationship between mothers' trauma and maternal parenting self-efficacy for childcare and whether length of NICU stay moderated the relationship. SPSS was used to analyze the data. For my research design, I needed to collect data by utilizing online questionnaires. I evaluated experienced trauma of mothers who have had an infant in the NICU using the PTSD Checklist for DSM-5 (PCL-5). Maternal parenting self-efficacy was evaluated using the Perceived Maternal Parenting Self-Efficacy questionnaire (PMP S-E). Length

of stay was measured in days in the NICU; participants entered the number of days that reflected their infant's experience.

Mothers were prescreened for the study by answering whether their infant was admitted into the NICU within the last 2 years, and the length of hospitalization of their infant. Specifically, inclusion criteria for this study included (a) first time mothers, (b) who have had a single infant in the NICU, (c) the infant was hospitalized in the NICU for at least 1 week, and (d) the infant was hospitalized in the NICU within the last 2 years. Data sources included the PCL-5 and PMP S-E surveys, as well as some questions about demographic information of the participants and their infants, specifically the length of hospitalization and how long ago the infant left the NICU. Together, these items were compiled and presented as one form, including the informed consent, that participants accessed through an online link. Participants were recruited through Qualtrics.com, utilizing their participant database.

Definition of Terms

Length of NICU stay: The total duration of hospitalization in the NICU. Inpatient days are calculated by the subtraction of the admission day from the discharge day.

Maternal parenting self-efficacy: A mother's belief in her abilities to deal with parenting situations (Pedrini et al., 2018). In the present study, maternal parenting self-efficacy was the outcome variable and was operationally defined as scores on the PMP S-E.

Neonatal intensive care unit (NICU): Specialized units staffed and equipped to provide medical care for newborn infants who have prenatal complications or those who are born congenitally ill, low birth weight, or premature (Bonacquisti et al., 2020).

Posttraumatic stress disorder (PTSD): A reaction that one has to traumatic events and includes symptoms such as the repeated or unwanted reexperiencing of the event, emotional numbing and avoidance of stimuli that serve as reminders of the event, and hyperarousal (APA, 2022). PTSD may develop as one experiences increased trauma along the continuum.

Trauma: An emotional response to a terrible event. Long term reactions may include unpredictable emotions, flashbacks, physical pain, and strained relationships (American Psychological Association, 2021). Trauma exists on a continuum and can vary from few symptoms to a combination of symptoms that may develop into severe distress. In the present study, trauma was the predictor variable and was operationalized as scores on the PCL-5.

Assumptions

Assumptions are parts of the study that I believed to be true for the purpose of the study but cannot be proven to be true. The assumptions that I made included that participants were truthful and forthcoming in their answers on the surveys. Another assumption was that the validated scales and questions used in the surveys were successful in accurately measuring the intended constructs. Finally, I assumed that the participants acted voluntary and their involvement in the study were not coerced in any way.

Scope and Delimitations

The research sample I used was limited to mothers who have had an infant in the NICU within the last 2 years. The scope was limited to this time frame and excluded mothers who have previously had an infant in the NICU due to the need to understand experienced trauma associated with first-time NICU admissions. It is possible that mothers who have had an infant in the NICU previously may experience lower levels of trauma associated with subsequent NICU admissions due to their understanding and increased preparedness from their past experience. Research has shown that the chance of giving birth to a future premature infant increases as the number of premature births a mother has also increases, with chances ranging between 15% (one previous premature birth) to 70% (three previous premature births; Pan American Health Organization, n.d.). It has also been found that preterm births may run in families (Wadon et al., 2020). Though trauma was operationalized using the scores from the PCL-5, and was the predictor variable in this study, mothers did not have to meet criteria for PTSD or report trauma to be included.

Limitations

One limitation to this study was the use of online surveys. Though online surveys are used to gather the most data in the least amount of time, there is always risk that the responses may not be the most representative of the larger population, because those without access to the internet or email may not be able to participate (Zahl-Thanem et al., 2021). On the other hand, the ability to share a link to an online survey may increase the reach of the researcher beyond the researcher's network and geographical location if

snowball sampling is used. I included only mothers in my research and limited the participants to those in the United States, so the study results were not generalizable to fathers or mothers in other countries. Another potential limitation was the use of surveys only in English, and participants who did not speak English well may have been excluded. By using quantitative research, I did not have the opportunity to add follow-up questions or clarify any ambiguities that participants might have perceived. Last, it was possible that finding the needed number of participants who meet the screening criteria could be challenging. However, using Qualtrics participant database, I was able to obtain the needed number of participants.

Significance

This study was significant in that it addressed a gap in understanding by focusing on the relationship between mothers' trauma and maternal parenting self-efficacy for childcare and whether length of NICU stay moderated the relationship. NICU staff and professionals can use my findings to provide support to mothers that may increase their levels of parenting self-efficacy in childcare once they return home and no longer have the support of the NICU team. To date, much of the literature has focused on the experience of mothers of NICU infants with very little follow up after the transition home, and much of the literature comes from studies overseas.

My study may impact social change in the way that medical staff, social services, and even policy makers view the experience of having an infant in the NICU in the United States and whether the length of NICU stay affects mothers' parenting self-efficacy once home post-discharge. Understanding the relationship between mothers'

trauma of having an infant in the NICU and their parenting self-efficacy at home, while also considering length of NICU stay, may provide information used to train medical staff and professionals, ultimately improving knowledge and training. This would be beneficial to help mothers who need support during and after their infant's transition. It is important that medical and professional staff consider all mothers from a multi-faceted point of view. Not only is the care of the infant important, but the mental health and overall well-being of the mothers must also be addressed since they will be the ones to care for the baby after discharge. NICU staff and professionals can use my findings to provide support to mothers that will increase their levels of maternal parenting self-efficacy in caring for their infants once they return home and assume the role of primary caregiver, which could lead to positive social change.

Summary

In this chapter, I presented the background information for this study and briefly summarized the research literature as it related to the study. I then described the problem statement and purpose of the study. I presented the research questions and hypotheses next, followed by the theoretical framework for the study, nature of the study, definitions, assumptions, scope and delimitations, limitations, and significance of the study. The next chapter will focus on an overview of the current literature that relates to the study's topic of whether there is a relationship between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy in childcare after discharge, and whether the length of NICU stay has an impact on this relationship.

Chapter 2: Literature Review

Childbirth is frequently an experience of joy and happiness, but when there are complications with the birth that threaten the well-being of the baby and require time in the NICU, it can also be a traumatic experience (Kress et al., 2021). For some mothers who are unable to overcome the feelings and memories of this traumatic event, the development of more severe psychopathology, such as PTSD, may ensue (Beck & Woynar, 2017). Most babies who are admitted to the NICU are born preterm (White et al., 2017), though there are babies who are also admitted due to signs of distress during or after birth, and/or medical complications and conditions. Infants are often taken immediately after birth, and mothers are left unprepared, with feelings of uncertainty and questions about their maternal parenting roles in childcare (Bourque et al., 2021), concerns about their infant's future, complicated medical information, and the balancing act of managing their own health along with other family needs (Alinejad-Naeini et al., 2021).

The length of time an infant remains in the NICU depends on the complexity of their medical needs, and infants may stay for only a couple of days to extended periods of time. The differences in length of NICU stay may affect maternal parenting self-efficacy for childcare following discharge. Premji et al. (2018) found that mothers with preterm infants in the NICU felt less confident transitioning from hospital to home unless they mastered basic tasks such as feeding, diapering, and bathing of their infant prior to discharge. Though some mothers can remain at the hospital, or visit daily, to participate in such tasks, others do not have the ability to visit as frequently due to living a distance

from the hospital or have other competing responsibilities. Therefore, the length of time after birth in which mothers' confidence in their childcare abilities may be different based on the amount of time their infant was hospitalized.

During longer hospital stays, some mothers experience an increase in opportunities to be involved in their infant's care especially if they are able to be present at the NICU often. For instance, a longer NICU stay may contribute to an increase in readiness of parenting tasks post-discharge when mothers are offered support to prepare for discharge (Chen et al., 2016). The purpose of this quantitative study was to examine this relationship between mothers' trauma and maternal parenting self-efficacy related to childcare post-NICU discharge, with length of NICU stay as a moderator.

In this chapter, I present a synopsis of the literature related to the topic for this study, examining the relationship between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy for childcare post-discharge, and whether length of NICU stay moderates this relationship. I also present the search strategies and theoretical framework used in this study. Key variables and concepts related to the present study will be comprehensively described through similar studies and justified in the rationale for their selections. Last, an assessment of the study's research questions will be reviewed and compared to previous studies, focusing on how they relate, and which areas still require further exploration.

Literature Search Strategy

The literature search for this study was conducted using the following databases: APA PsycInfo (formally PsycInfo), Google Scholar, and SAGE Journals. The following

keywords were used singularly and/or together: *neonatal intensive care unit (NICU),*
preterm, mother, infant, (maternal) trauma, posttraumatic stress disorder (PTSD), length
of NICU stay, childcare, and *(maternal) self-efficacy*. Most of the articles were published
within the last 5 years; however, seminal publications and select older resources were
used to provide important information from earlier work.

<p style="text-align:center">Theoretical Framework</p>

The two theoretical frameworks that guided the present study are Albert
Bandura's (1994) self-efficacy theory and Ehlers and Clark's (2000) cognitive model of
PTSD. These two theoretical frameworks lay the foundation for understanding the
experience of having an infant in the NICU and how that experience may affect mothers'
self-efficacy in childcare once the infant is home.

Self-Efficacy Theory

Self-efficacy was the dependent variable in the present study of mothers who have
had an infant in the NICU. Despite a possible lack of preparation, countless parents can
take on the responsibilities of parenting and provide the necessary care (Cunningham &
Renk, 2018). Certain situations, however, may result in the parents questioning their
sense of ability and competence to care for their children. This is especially true for those
who do not have prior parenting experience (Kim et al., 2015). Albert Bandura's (1982)
self-efficacy theory is applicable to parenting because it relates to how people judge their
capabilities and the subsequent choices they make about their activities and surrounding
environments. Bandura (1997) suggested that self-efficacy is developed through four
main sources of influence: experiences of mastery or skills, especially when acquired in

the face of difficulty of challenges; modeling; verbal persuasion or social influences; and somatic and emotional states. The primary source of self-efficacy information is developing mastery because it relates to control (Bandura, 1982). However, mothers of NICU infants are often unprepared for their infant's condition and have little control over their experience in the NICU. These mothers may judge themselves to be incapable to act competently and manage the situation, which affects their self-efficacy (Lappin, 2006). They may feel guilt and failure for giving birth too soon or having an infant who required medical care in the NICU (Cunningham & Renk, 2018). Though most people make decisions based on their coping abilities, avoiding activities that they believe are beyond their capabilities (Bandura, 1977), having an infant in the NICU is not something that can be easily avoided.

Maternal parenting self-efficacy, a mother's belief in her abilities to deal with parenting situations, is a crucial component to a baby's development and is especially important when facing difficult situations, such as having an infant in the NICU. In line with Bandura's self-efficacy theory, maternal parenting self-efficacy can be improved through vicarious experience and learning by observing others. Some mothers reported experiencing an increase in their beliefs in their own abilities by seeing other mothers in similar situations with infants in the NICU who had successful outcomes (Pedrini et al., 2018). Mothers' self-efficacy also increased as they participated in enactive learning, learning by doing, through tasks such as diapering, bathing, and feeding (Pedrini et al., 2018). Specifically developing parenting self-efficacy via feeding behaviors helped

mothers gain maternal confidence in their abilities and begin to recover from their experiences of having an infant in the NICU (Brockway et al., 2020; Premji et al., 2018).

Once an infant is discharged from the NICU, mothers may assume the primary caregiver role because the support from the NICU team has ended. But transitioning home may result in feelings of uncertainty and worries of being ill-prepared and incapable of managing the needed childcare tasks required by their infant. Perceptions of inefficacy can affect both emotional reactions to situations, as well as behaviors (Bandura, 1982). However, if mothers can lessen their fears, their beliefs in their parenting self-efficacy may increase. Furthermore, mothers may maintain, and even increase, their parenting self-efficacy once home, through the support and persuasion by others. Previous research showed that if parents had support from the proper network of people, such as health care workers and formal support groups, their overall confidence in childcare increased, and the process of adjusting into the parental role became easier (Adama et al., 2016). Increasing parenting self-efficacy has also shown to be related to improved psychological well-being, especially in new parents (Brockway et al., 2020). Therefore, Bandura's self-efficacy theory was employed in the present study.

Cognitive Model of Posttraumatic Stress Disorder

Mothers' trauma was the dependent variable in the present study of mothers who have had an infant in the NICU. The impacts of this trauma exist on a continuum (Mulder et al., 2013), and some mothers can fully recover after experiencing such an event, whereas others may continue to experience trauma symptoms. Individuals who experience more severe traumatic events that lead to negative impacts and symptoms tend

to move up on the trauma continuum, and their chances of developing PTSD increase. Those at the high end of the continuum are often characterized by long-term severe trauma that results in complex PTSD (Mulder et al., 2013).

Ehlers and Clark's (2000) proposed a cognitive model of PTSD that explains factors related to persistent PTSD. This occurs when an individual continues to relive something that has already happened and processes the trauma in a way that leads to a sense of severe current threat. The DSM-5 defines PTSD as a reaction that one has to traumatic events that includes symptoms such as the repeated or unwanted reexperiencing of the event, emotional numbing and avoidance of stimuli that serve as reminders of the event, and hyperarousal (APA, 2022). Prevalence rates of PTSD in NICU parents have been reported as high at 53% among NICU mothers and 33% among NICU fathers (Schecter et al., 2020). Mothers who experienced traumatic childbirth perceived threat to their infant's life at the time of birth, which led to traumatic childbirth appraisal (Sharp et al., 2021). According to Ehlers and Clark's model, individuals who experience persistent PTSD recall the traumatic event in a way that is biased by their appraisals and typically retrieve only information that is consistent with their appraisals (Beierl et al., 2020). Unlike individuals who can recover naturally from symptoms of increased trauma and PTSD, those who suffer from persistent PTSD are unable to see the trauma as an event that has already occurred and one that does not have to limit their future. This may perpetuate a sense of current threat and the persistence of trauma symptoms.

Furthermore, appraisals concerned with one's responsibility in the traumatic event may lead to guilt, and those concerning a particular internal standard may lead to shame

(Ehlers & Clark, 2000). Some mothers blame themselves for their infant's NICU admission and dwell on how they are still "inadequate" parents (Sharp et al., 2021), which only intensifies their symptoms (Ehlers & Clark, 2000). They may also re-experience the feelings they had during the traumatic event and feel that they are forever doomed (Beierl et al., 2020). Increased trauma and PTSD can also lead to negative impacts on parental well-being, psychological health, and parenting capabilities and self-efficacy (Aftyka & Rozalska, 2020; Schecter et al., 2020), including negative attitudes towards their infants. Moreover, infants with parents suffering from significant trauma and PTSD are at a greater risk for developing behavioral, cognitive, and emotional problems (Schecter et al., 2020).

This study employed the cognitive model of posttraumatic stress disorder in parent of infants who have been in the NICU. Mothers' trauma was also assessed using the PCL-5 questionnaire. Non-clinical use of this scale focused on the relationship between mothers who report experiencing any symptoms of the PSL-5 in relationship to maternal parenting self-efficacy in childcare post-NICU discharge, with a cutoff of Yes/No to symptoms of trauma.

Literature Review Related to Key Variables

In this study, I explored whether length of NICU stay moderated the relationship between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy for childcare post NICU discharge.

Predictor Variable: Trauma in the NICU

Unexpected medical complications or a premature birth that leads to an infant's admission into the NICU can be a traumatic experience for many parents (Kress et al., 2021). The American Psychological Association (2021) defined trauma as an emotional response to a terrible event, including a threat of death or serious injury to oneself or a loved one (Sharp et al., 2021). Moreover, traumatic events are things that happen which are more than just upsetting (Jones, 2021). Jones examined 600 descriptions of traumatic events and found that events surrounding "actual death, [and] threat of death" (Jones, 2021, p. 774) were marked most traumatic. Threat of death is what is often associated with a newborn admitted to the NICU and why the experience is so traumatic for many mothers.

No parent is prepared for the significant range of emotions that come with caring for a preterm or critically ill infant (Janvier, et al., 2016). Many NICU hospitalizations are a matter of life or death, and infants are in critical conditions that may require life-saving procedures. Parents of these NICU infants are faced with making vital decisions, understanding new medical terms, navigating the NICU environment, and figuring out how to fulfill their parenting roles during this time. Many parents lack proper knowledge about the different treatments their child may face while in the NICU and may rely on the support staff for help in proper decision making (Sabnis et al., 2019). The fear of the unknown is very hard for many parents, and a constant worry that something might go wrong may contribute to heightened levels of experienced trauma.

Loewenstein (2018) found that infant characteristics such as their physical appearance, medical diagnoses at birth, and the presence of NICU mechanical equipment were also correlated with increased levels of parental trauma. In addition, parents' previous histories of mental health issues, low-income levels, single marital status, and decreased levels of social support were all risk factors for experiencing higher levels of experienced trauma. In addition, Baía et al. (2016) found that parents' perception of trauma during the hospitalization of a preterm infant was higher among mothers, and their "change in parental role" came with many heightened emotions (Baía et al., 2016). Mothers with multiple pregnancies seemed to cope better than mothers with just one pregnancy (Baía et al., 2016), and it is possible that second time NICU mothers employ better coping mechanisms.

Mothers' Experiences in the NICU

For some mothers, the traditional perceptions of maternal roles are altered when an infant is admitted to the NICU, and these mothers have to find ways to adapt and adjust to the situation where they have little control. Research has shown that a mother's psychological stress in response to trauma is associated with the birth and development of a high-risk infant (Bonacquisti et al., 2020; Kim et al., 2015). A preterm birth or birth that requires NICU hospitalization can greatly affect a mother's self-belief and confidence, because the mother may feel helpless in her immediate maternal role (Molloy et al., 2021). This can lead to struggles with coping and inability to care for the infant (Molloy et al., 2021).

When a mother does not have the opportunity to be with her baby, she may feel anxious and confused. "Staying with the baby" and attachment are important factors to many mothers, and a source of comfort and encouragement. Research has suggested that mothers with poor maternal-infant attachment experience higher levels of distress and trauma symptoms (Bonacquisti et al., 2020). For mothers of NICU infants, those who can participate in neonatal care may experience positive effects on their emotions due to being close to their baby (Molloy et al., 2021). Turner et al. (2015) found that the mothers of NICU infants reported challenges in getting to know their baby, forming their maternal role, and having to rely on the nursing staff which, led to feelings of resentment when they could not be there. Mothers are responsible for their child's survival and growth, keeping it safe, and making sure the proper decisions are made. When a mother is unable to do so due to the barriers of the NICU environment, she may feel heightened distress. As a result, mothers may become more emotionally distance from their infant. This is especially true when they feel that their self-knowledge or self-perception of their bodies were questioned during birth, and whether they are capable of fully caring for the infant afterwards. These feelings are extended if there are further challenges with daily care tasks such as breastfeeding or diapering that are associated with their maternal role and their capacities to parent (Molloy et al., 2021).

PTSD

PTSD is classified as a trauma and stressor-related disorder that follows exposure to or witnessing a highly distressing event (Beck & Woynar, 2017). PTSD is at the extreme end of the trauma continuum and not something that every mother who has an

infant in the NICU experiences. However, symptoms of PTSD are often the same as the symptoms felt by mothers who have experienced any level of trauma related to having an infant in the NICU. The main difference tends to be whether multiple symptoms are felt together and whether these symptoms continue to persist, resulting in PTSD. Some mothers, possibly all, included in this study may not meet DSM-5 criteria for PTSD, but their experience of trauma symptoms as they relate to having an infant in the NICU is enough to include them in the study.

Having an infant in the NICU is a frightening experience for mothers, regardless of the level of disease of their infant, and even short-term hospitalization is labeled as "traumatic" for mothers (Fowlie & McHaffe, 2004, as cited in Yaman & Altay, 2015). In some cases, mothers recount how shocked and horrified they were at the suddenness and speed of their births and how they feared for the life of their newborn (Beck & Woynar, 2017). Mothers described their experiences of first laying eyes on their infant in the NICU as "traumatic and anxiety-provoking" (Beck & Woynar, 2017, p. 350). One mother stated,

> I just saw him and started to freak out and had to leave right away. He was so
> tiny, and the beeping and all the writes stuck out to me like he was hook up to
> everything and the IV and I just couldn't process everything at that moment.
> (Beck & Woynar, 2017, p. 350)

Another mother stated, "My son…he didn't look like a baby, he looked like an alien" (Beck & Woynar, 2017, p. 350). Additional factors including the medical equipment used, confusing medical language used by hospital staff, fear of losing the newborn, and

feelings of failure to meet maternal roles can all influence the level of trauma a mother experience (Yaman & Altay, 2015). Compared to mothers of healthy infants, Kim et al. (2015) found both early and delayed onset of PTSD symptoms in mothers of infants in the NICU and PTSD has been observed at rates as high as 53% among NICU mothers (Schecter et al., 2020).

Currently, traumatic childbirth it is not specifically expressed as a major traumatic stressor in the DSM-5, however, research has found that it can just as easily manifest into PTSD as other types of traumas do over time (Kim et al., 2015). Studies have also found that women are more likely than men to develop PTSD following trauma (Jones, 2021; Yaman & Altay, 2015), and the trauma of having an infant in the NICU may persist still after discharge in these mothers (Kim et al., 2015). Even many years later, mothers remember their NICU experiences as one of the most traumatic moments in their life, and sometimes indicators of PTSD may still be observed in mothers after hospitalization (Aftyka & Rozalska, 2020). Consequently, experienced trauma and posttraumatic stress can affect the quality of a mother's ability to parent and her self-efficacy for childcare and may also affect the overall well-being and child's development (Yaman & Altay, 2015).

Outcome Variable: Self-Efficacy for Childcare

Maternal parenting self-efficacy refers to a mother's belief in her abilities to deal with parenting situations (Pedrini et al., 2018), as well as her confidence, self-esteem, success, perceived competence, and perception of her motherhood role (Puspasari et al., 2018). Although the experience of motherhood often comes with feelings of great

satisfaction, it can also be accompanied by feelings of doubt regarding parenting capacity and the ability of mothers to support and care for their infant (Strauss et al., 2019). Premature birth or medical conditions that require and infant to be admitted to the NICU interrupts the process of mothers' preparation into motherhood (Stefana et al., 2018) and may lead mothers to question their abilities and competencies for proper childcare.

Mothers of infants in the NICU often need to adjust their expectations of motherhood and reshape their maternal roles to accommodate the reality of having a fragile infant (Heydarpour et al., 2017). By actively engaging in this process and participating in basic baby care, they are able to develop a meaningful maternal role in the NICU and increase their parenting self-efficacy. These first maternal experiences are critical in forming the patterns of motherhood and child dependency, and an effective adaption to the maternal role while their infant is in the NICU may increase the mother's self-confidence and satisfaction in caring for their infant (Heydarpour et al., 2017), thus increasing their parenting self-efficacy. On the other hand, having low maternal parenting self-efficacy may lead to a decrease in a mother's ability to cope with her new role as primary caregiver and the responsibilities that come with it (Mohammad et al., 2021). In addition, negative beliefs and low self-esteem are associated with low maternal parenting self-efficacy. Therefore, understanding and identifying the different elements of motherhood of infants hospitalized in the NICU can improve the quality of childcare post-discharge and increase a mother's confidence in her maternal identity.

NICU Discharge and Transitioning Home

When an infant is discharged from the NICU, mothers quickly transition to the full-time responsibilities of caring for their infants, but preterm infants and infants who have been hospitalized come with even more challenges at home (McGowan et al., 2017). Many mothers feel anxious about their new roles and being the primary caregiver at home without the support of the NICU staff (Adama et al., 2016; Raines, 2017). Moreover, a mother's emotional readiness, explained as her desire to care for her infant, and factors affecting this readiness can be also influenced by her mental health (McGowan et al., 2017). Maternal wellbeing is supported by the mother's sense of self-efficacy, self-competency, and emotional self-confidence to provide for her infant. Mothers with a history of mental health disorders, or those experiencing significant mental health distress, are less likely to provide breastmilk at discharge, report less favorable experiences of the NICU, and are at increased risk of symptoms associated with stress-related disorders following discharge (McGowan et al., 2017).

Discharge from the NICU also elicits many uncertainties and concerns that may not be addressed during the discharge progress. White et al. (2017) found that the types of uncertainties (e.g., medication, personal, social) parents face may complicate their experiences following discharge. Mothers may also find that the strategies used to manage uncertainties contradict other strategies, resulting in a dilemma of what to do. Many NICU discharges are not an on-going, co-collaborative process with parents which can further exacerbate parental uncertainties (White et al., 2017). These parental

uncertainties and management strategies may be affected by the health of their infant and the amount of time spent navigating the NICU environment.

Some mothers' feelings of uncertainty may lead them to reach out for support or lean on their partners. Research has found that social support may alleviate the impact of stress appraisal by providing a solution to the problem or help reduce the perceived importance of the problem, leading to more healthy behaviors (Haeusslein et al., 2021). On the other hand, Adama et al. (2016) found that mothers especially look for ways to compensate for the guilt they feel about their infant NICU hospitalization and blame themselves for the experience. In some cases, this overcompensation led to becoming extremely overprotective and excessively worried about the well-being of their infant, limiting interactions with other people, not allowing fathers to participate in care, and restricting what the infant would be allowed to do. This may lead to poorer coping skills on the mother's part and also a limited capacity for their infant to grow and develop.

Moderating Variable: Length of NICU Stay

The average length of stay for a patient in the United States is 4.5 days. Research has found that the longer a patient stays in the hospital, the less likely they are to have a positive outcome (Sahiledengle et al., 2020). Medically complex individuals typically require prolonged hospitalization stays and care from various specialists. The same is true for babies in the NICU (Welch et al., 2017). Many infants who are born prematurely or with complications to their health require NICU hospitalization stay that, for many, extends 2 to 3 months (Petteys & Adoumie, 2018). This extended hospital stay can cause family distress due to the physical separation between baby and parent, and the impact it

has on the parent and child bond. "Bonding" relates to the relationship that is developed between parent and infant and the feelings they have for one another (Petteys & Adoumie, 2018). Within the first hours after birth, critical bonding is encouraged through physical contact and closeness, and serves as the foundation for long-term attachment. When infants are rushed away immediately following birth, mother and baby do not have the opportunity for this initial bonding time. Bourque et al. (2021) found that increased skin-to-skin time between infant and mother shortens the length of stay in the NICU.

Longer NICU hospitalizations may result in challenges surrounding the continuity of care due to the rotation in staff and the demands for time required of each specialist (Welch et al., 2017). Though it would be ideal that each time a new provider joins the care team, a comprehensive understanding of what has already happened is provided; that is rarely the case. Along with decreased collaboration and stability in care, negative impacts are seen in the patient's outcomes, and parents' well-being. Thus, longer stays in the hospital can delay a patient's recovery, so shortening hospital length of stay is better (Rotter et al., n.d.). Positive outcomes often improve when patients can get faster and more consistent care. Then, further recovery can occur at home in a comfortable environment, surrounded by family. Unfortunately, childcare post-NICU discharge may include complex care for certain medical conditions that are difficult to manage. Therefore, it is meaningful to understand whether extended lengths of NICU stay for these infants allow mothers more time to become proficient and comfortable in the care required. The length and frequency of mothers' visits to the NICU should also be considered because the number of hours spent learning may vary between mothers. On

the other hand, extended length of NICU stay might result in the reliance on the NICU

staff and leave mothers even more ill-equipped to deal with the challenges of childcare

once home.

<p align="center">**Summary and Conclusion**</p>

In this chapter, I presented a background of the study's theoretical frameworks,

Albert Bandura's self-efficacy theory and Ehlers and Clark's cognitive model of PTSD. I

also presented the key variables of trauma of having an infant in the NICU, parenting

self-efficacy for childcare post-NICU discharge, and length of the NICU stay as it relates

to mothers. I reviewed scholarly articles on these variables independently as well as

together. Studies have shown maternal parenting self-efficacy is a critical component in

forming the bond between mother and infant, as well as the growth and development of

the infant (Mohammad et al., 2021). At the same time, research has shown that length of

NICU stay may affect the level of trauma experienced by mothers and may also lead to

decreased levels of parenting self-efficacy and difficulties in proper care for the infant

once home (Adama et al., 2016; White et al., 2017).

Research to date has shown are that there are connections between trauma

experienced by mothers and having an infant in the NICU (Loewenstein, 2018; Sabnis et

al., 2019) and maternal parenting self-efficacy and having an infant in the NICU

(Puspasari et al., 2018), but very little research, if any, has explored these variables

together or tested length of NICU stay as a moderator between mothers' trauma of having

an infant in the NICU and maternal parenting self-efficacy after discharge. In Chapter 3, I

discuss the research design and rationales, methodology, and data analysis strategy used

to examine the relationship between mothers' trauma and maternal parenting self-efficacy post-NICU discharge as moderated by length of NICU stay in first time mothers of single infants who have been in the NICU within the past 2 years.

Chapter 3: Research Method

The purpose of this quantitative cross-sectional survey study was to explore whether the length of a baby's stay in a NICU moderated the relationship between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy in childcare at home post NICU-discharge. This chapter includes an explanation of the research design and methodology, including the steps taken to recruit participants, use of instrumentation to gather data, and the statistical analyses performed on the data. This chapter also examines the study's ethical implications as well as potential threats to internal and external validity.

Research Design and Rationale

Using data collected from an online survey, I explored whether length of stay in the NICU (moderator) affected the relationship between the long-term trauma of having an infant in the NICU (predictor/independent variable) and parenting self-efficacy in childcare (outcome/dependent variable) after NICU discharge in mothers within the United States. Moderation analysis is conducted to find out whether the relationship between the predictor/independent variable and the outcome/dependent variable is significantly different depending on the value of a third variable, the moderating variable (Yuan et al., 2014). The most commonly used model for moderation analysis is a multiple regression analysis. Since the purpose of this study was to examine the relationship between these variables and test this moderation, a quantitative research design using a multiple linear regression analysis was appropriate (see Yuan et al., 2014).

A quantitative design was most appropriate for this study because its purpose was to establish whether a relationship exists between the variables. Furthermore, much of the research that has been done on similar topics to this study has been qualitative and conducted overseas. The little quantitative research that has been done has employed similar research designs to this study and examined the complex relationships among different variables. Therefore, I chose to conduct a quantitative research design to contribute to the quantitative research available and to include only mothers in the United States. Through my study, I was able to determine: (a) if a correlation existed between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy post-NICU discharge, and (b) if the length of NICU stay acted as a moderator to the relationship between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy post-NICU discharge. The survey design allowed for data to be gathered quickly and efficiently, reaching participants across the country, and was easier for participants to complete online rather than coming into an office.

Methodology

Population

The target population for the current study was English-proficient mothers in the United States who are first time mothers and have had a single infant in the NICU within the last 2 years. Infants must have been hospitalized for at least 1 week in the NICU. Mothers who have experienced multiple infants in the NICU at the same time or subsequent infant NICU admissions were not included in this study. Since the mothers

were surveyed online, they needed to have access to the internet and sufficient online experience to complete the survey.

Sampling and Sampling Procedures

After considering the type of analyses I would use, the power and alpha levels, and effect size recommended in the literature (see Frankfort-Nachmias & Leon-Guerrero, 2000), I conducted a power analysis to obtain the suggested sample size for my study. I used the G*Power 3.1.9.7 software, which is recommended for sample size and power calculations for correlation and regression analyses (see Kang, 2021). The suggested sample size for a multiple regression study with four variables, using an α error probability of 0.05, a power level of 0.95, and an estimated effect size of 0.15, was 89 participants.

When conducting quantitative research, it is typically ideal to draw a random sample of participants that is as representative as possible of the larger population, and every member of the population has an equal chance of being included (Frankfort-Nachmias & Leon-Guerrero, 2000). However, in many cases it may be quite difficult to do so (Creswell & Creswell, 2018). This was especially true in the present study because the target sample was specific group of participants, first-time mothers who have had a single infant in the NICU within the last 2 years. Though any mother who was contacted and met study criteria had as much opportunity to participate as another, it was highly unlikely that I was able to reach every mother who fell into this population. Therefore, true random sampling was not a feasible method to use. Instead, nonprobability convenience sampling was employed. Data were collected through an online survey and

sent to mothers who were known to meet study criteria. Any mothers who did not meet the criteria to participate in the study were excluded from the study. The participation in this study was strictly voluntary.

Recruitment, Participation and Data Collection

Recruitment

Data were collected through online surveys. Data and surveys were managed using an online platform through Qualtrics.com. Qualtrics offers both an online survey software platform, Qualtrics XM, as well as research services. Once I gained Institutional Review Board (IRB) approval (approval no. 07-21-22-0995404), I used Qualtrics' Research Services to recruit from their participant database as the source of participants for my survey. Qualtrics was founded in 2002 and had its start in academic research, so their research services have been used in higher education for 20 years. Qualtrics recruits participants from various sources, including website intercept recruitment, member referrals, targeted email lists, customer loyalty web portals, permission-based networks, and social media. The research consumer panel members' names, addresses, and dates of birth are typically validated via third-party verification measures prior to their joining a panel.

Participation

Inclusion criteria for this study included (a) first time mothers, (b) who have had a single infant in the NICU, (c) the infant was hospitalized in the NICU for at least 1 week, and (d) the infant was hospitalized in the NICU within the last 2 years. All participation was strictly voluntarily, and participants could withdraw from participation at any point.

Participants remained anonymous and no personally identifiable information was gathered.

Data Collection

Qualtrics served as the host data collection platform. Potential participants accessed the survey link and reached a first screen where they were presented with the informed consent form (see Appendix A) that detailed the process, purpose, autonomy, and rights of the survey participants. Participants were required to select whether they consented and if they choose not to, they were thanked for their time and exited out of the survey. Those who did consent were directed to answer the prescreen questions to ensure they met the study's inclusion criteria. If they did not meet criteria, they were thanked for their time and exited out of the survey. Those who met criteria were directed to the rest of the online survey, which consisted of a series of demographic questions. In the first set of questions, length of hospitalization, the moderator, was assessed. Following the demographic survey, participants reached the two validated instruments that measured trauma and parenting self-efficacy. Qualtrics was set up so that participants could not move forward without answering all survey items. To avoid forcing participants to answer questions that may make them uncomfortable, all scales included a "prefer not to answer" option.

Qualtrics was used to recruit participants and notified me when the needed number of surveys had been attained. Survey data were then downloaded from Qualtrics database to SPSS software for data analysis. I continued to check Qualtrics.com to see if

survey completion and sample size had been met. All data were anonymous and safeguarded throughout the process.

Instrumentation

There were three variables in the study that were asked about in the online survey: mothers' trauma of having an infant in the NICU (predictor), maternal parenting self-efficacy (outcome), and length of NICU stay (moderator).

Demographic and Predictor Variable Survey

I created a set of questions that assessed the demographic characteristics of the sample. Length of infant's NICU hospitalization (in days), the moderating variable in this study, was asked in this survey. Additional demographic information was obtained to help describe the sample population. These questions included participant's age, race, ethnicity, approximate number of NICU visits per week (presented as ranges), average length of each NICU visit (presented as ranges), gestational age of infant (in weeks) at birth, and how long ago the infant left the NICU (in weeks). This questionnaire was estimated to take no more than 2 minutes to complete.

PCL-5

I assessed the predictor variable, experienced trauma of mothers who have had an infant in the NICU, using the PCL-5. The PCL-5 is a 20-item self-report measure that assesses the 20 DSM-5 symptoms of PTSD (Blevins et al., 2015). This measure is a widely used DSM-correspondent self-report measure of PTSD symptoms (Weathers et al., 2013). The PCL-5 is the most recent version of the PCL that was revised to reflect changes to the PTSD criteria in the DSM-5 (Blevins et al., 2015). For the purpose of this

study, I used the term "NICU experience" rather than "experience" in the survey

questions to specify the traumatic event.

The psychometric properties of the PCL-5 were initially examined by its authors

in two original studies involving trauma-exposed college students. They found that the

PCL-5 exhibited strong internal consistency ($\alpha = .94$), test-retest reliability ($r = .82$), and

convergent ($rs = .74$ to $.85$) and discriminant ($rs = .31$ to $.60$) validity (Blevins et al.,

2015). More relevant to this study, Sharp et al. (2021) utilized the PCL-5 to assess the

relationship between PTSD symptomology and traumatic childbirth appraisal. They

found a Cronbach's α to be a value of 0.95, indicating strong reliability (Sharp et al.,

2021). Permission to employ the PCL-5 was not needed as it is available in the public

domain and obtained by direct download from the Nation Center for PTSD website

(Weathers et al., 2013).

PMP S-E

Maternal parenting self-efficacy was evaluated using the Perceived Maternal

Parenting Self-Efficacy questionnaire (PMP S-E; Barnes & Adamson-Macedo, 2007).

The PMP S-E consists of 20 items rated between 1 and 4 (1=strongly disagree,

4=strongly agree). The authors of the PMP S-E originally tested the psychometric

properties of the measure with "relatively healthy and hospitalized mother-preterm infant

dyads" (Barnes & Adamson-Macedo, 2007, p. 550) in two neonatal units in the United

Kingdom between 2003 and 2005 (Barnes & Adamson-Macedo, 2007). Internal

consistency reliability of the PMP S-E tool was 0.91, external/test-retest reliability was

0.96, $p<0.01$ (Barnes & Adamson-Macedo, 2007), which indicated that the PMP S-E is a

psychometrically robust, reliable, and valid measure of parenting self-efficacy in mothers of hospitalized preterm infants (Barnes & Adamson-Macedo, 2007). Written permission to employ the PMP S-E was obtained from the authors (Barnes & Adamson-Macedo, 2007).

Data Analysis Plan

Once all data were obtained from the Qualtrics website, it was uploaded into the Statistical Package for Social Sciences (SPSS) Graduate Pack for Windows. All data obtained from Qualtrics' participant database were carefully examined by their research services team. They checked for poor quality in responses, suspicious or fraudulent completion of the survey, and any responses that appeared to be answered randomly or in a manner indicative of "straight- lining." I also thoroughly cleaned the data by checking for any missing data, outliers, independence of variables, normality, linearity, homoscedasticity of residuals, and multicollinearity to ensure the data met the assumptions of multiple linear regression.

Multiple regression is appropriate when predicting the value of an outcome/dependent variable based on the value of two or more predictor/independent variables (Laerd Statistics, 2018). Furthermore, moderation analysis is appropriate to test whether the relationship between the predictor/independent variable and the outcome/dependent variable is significantly different depending on the value of a third variable, the moderating variable (Yuan et al., 2014). I used the Hayes PROCESS macro add-on to SPSS to perform the moderated multiple linear regression analysis for this study.

Research, Hypotheses, and Statistical Analyses

Statistical analyses are presented for the two main research hypotheses listed below.

RQ1: Does mothers' trauma post-NICU discharge predict maternal parenting self-efficacy for childcare?

$H_1 1$: Mothers' trauma post-NICU discharge predicts maternal parenting self-efficacy for childcare.

$H_0 1$: Mothers' trauma post-NICU discharge does not predict maternal parenting self-efficacy for childcare.

RQ2: Does length of NICU stay moderate the relationship between mothers' trauma and maternal parenting self-efficacy for childcare?

$H_1 2$: Length of NICU stay moderates the relationship between mothers' trauma and maternal parenting self-efficacy for childcare.

$H_0 2$: Length of NICU stay does not moderate the relationship between mothers' trauma and maternal parenting self-efficacy for childcare.

The RQs, hypotheses, and associated statistical procedures are noted in Table 1.

Table 1

Research Questions and Statistical Procedures

Research Questions	Hypotheses	Variables	Statistical procedure
Quantitative: Does mothers' trauma post-NICU discharge predict maternal parenting self-efficacy for childcare?	H1: Mothers' trauma post-NICU discharge predicts maternal parenting self-efficacy for childcare.	Independent: Mother's trauma (continuous) Dependent: Parenting self-efficacy (continuous)	Regression Analysis

Quantitative: Does length of NICU stay moderate the relationship between mothers' trauma and maternal parenting self-efficacy for childcare?	H2: Length of NICU stay moderates the relationship between mothers' trauma and maternal parenting self-efficacy for childcare?	Independent: Mother's trauma (continuous) Dependent: Parenting self-efficacy (continuous) Moderator: Length of NICU stay (continuous)	Moderated Multiple Linear Regression

Threats to Validity

Threats to validity in quantitative research can affect whether or not a study's results are trustworthy and meaningful.

Internal Validity

Threats to internal validity are experimental procedures, treatments, or experiences that a participant may encounter which could alter the researcher's ability to draw accurate inferences from the data about the population studied in an experiment (Creswell & Creswell, 2018). In this study, the survey that was offered was in English only. Participants may have had differing levels of English proficiency and comprehension, which could have affected data results due to *selection* bias. Participants could have also dropped out or left the study at any point which meant that the results may have been based on a biased sample of only individuals who were motivated to complete the survey due to *attritio*n. Additional factors such as the social, political, or current events that occurred at the time the of the survey's distribution could also have had an influence on the participant's responses and pose threat due to *history*. Last, the study included a correlation design which did not measure causality between variables, even if correlations existed (see Creswell & Creswell, 2018). Data may have yielded

changes in the outcome variable based on an alternative factors different from what was already being measured due to *confounding*. The less confounding a study is, the higher the study's internal validity, though any of these threats may have decreased internal validity.

External Validity

Threats to external validity relate to the utility of a study's results when transferred beyond the group surveyed or to similar groups at another time (Creswell & Creswell, 2018). Threats to external validity for survey studies may include sample characteristics, low response rates, response bias, and social desirability (Laerd Dissertation, 2012). Using a large, randomly selected group of participants can increase generalizability and decrease sample bias. However, this does not fully eliminate potential threats to external validity. In this study the narrow characteristics of participants did not fully represent the larger population and findings may not be generalizable to individuals who do not have the same characteristics of the participants (see Creswell & Creswell, 2018). There may have also been discrepancies between demographics such as race and ethnicity, age, income, and education that were not accounted for due to the nature of the research questions, which may have also posed threat to external validity. In addition, both the PCL-5 and PMP S-E survey data were based on mothers' self-report. Mothers may have answered in a manner that was influenced by what they considered socially acceptable or that which presented them in a good light. Finally, the total number of participants was 134 for this study; however,

because that number was not very large, statistical power may not have been reached, also increasing the threat to external validity.

Construct Validity

Threats to construct validity must also be considered when conducting quantitative research. Construct validity is the extent to which a research instrument measures what it is intended to measure, and threats to construct validity can occur when a researcher does not use adequate definitions to measure variables (Creswell & Creswell, 2018). Both measures that were used in this study, the PCL-5 and the PMP S-E, are validated scales used to measure trauma and maternal parenting self-efficacy. However, the purpose of using the PCL-5 was not for clinical use and was not used to make any sort of diagnosis. Though the measure aligned with the present study's research questions and purpose, there may still have been potential threat to construct validity.

Ethical Procedures

Participants were provided informed consent that explained the expectations, procedures, and risks associated with the participation in this study. Participation was voluntary only and participants could have withdrawn from the study at any time without penalty. Confidentiality of the participants was protected by not collecting or sharing any identifying information or any of the results from their questionnaires, therefore making participation anonymous. Qualtrics.com was used as the survey host site to collect data from the participants in an anonymous manner and provided it to me in SPSS format. All raw data will be stored in a locked cabinet in my home for 5 years and then destroyed.

There were minor physical risks associated with participating in this study.
Participants were not likely to experience physical pain, discomfort, or illness as a result
of completing this online survey, and participants answered on their own devices at their
own pace and time. However, due to the topic of my study, there was risk of
psychological distress after completing the questionnaires. The participants may have
experienced difficult memories and/or relived trauma of the experience of having an
infant in the NICU which may have caused them stress or distress that were previously
perceived. Resources for mental health and emotional support hotlines were provided to
participants at the start of their participation, listed on the informed consent form, and
again at the end. There were no benefits of participating in this study, though the
information obtained may assist in creating awareness of the role long-term trauma
associated with having an infant in the NICU has on a mother's self-efficacy in childcare
at home. Participants were offered a small compensation from Qualitrics.com as part of
their voluntary participation in this study.

Summary

The purpose of this chapter was to describe the research methods that were used
in my quantitative correlational design which explored the relationship between mothers'
trauma of having an infant in the NICU and parenting self-efficacy for childcare post-
NICU discharge and whether length of NICU stay has a moderating effect on this
relationship. The chapter included information about research design and rationale,
sample population, instrumentation, operationalization of variables, data analysis, threats

to validity, and ethical considerations. In Chapter 4, I will present the information about

the data collected and the study results.

Chapter 4: Results

The purpose of this quantitative study was to examine whether the length of an

infant's stay in a NICU moderated the relationship between mothers' trauma of having an

infant in the NICU and maternal parenting self-efficacy in childcare at home post-NICU

discharge. Two research questions were tested in this study using a regression analysis

and a moderated multiple linear regression analysis:

- RQ 1: Does mothers' trauma post-NICU discharge predict maternal parenting

  self-efficacy for childcare?

- RQ 2: Does length of NICU stay moderate the relationship between mothers'

  trauma and maternal parenting self-efficacy for childcare?

In this chapter, the data collection method is reviewed as well as descriptive and

demographic characteristics and data analysis results. The chapter ends with a summary

of the study findings to answer the research questions.

Data Collection

The data for this research were gathered via Qualtrics research services, utilizing

their participant database, between July 25, 2022, and August 2, 2022. Qualtrics initially

conducted a soft launch of the survey and usable data were collected from the first 10

participants. This was conducted first before releasing it for broader distribution to check

the response rate, catch any inconsistencies within the survey, and confirm that the

survey was set up to collect data according to expectations. Qualtrics then completed a

full launch of the survey resulting in 134 total participants who supplied data for this

study. Participation was voluntary for those who met study inclusion criteria, and

participants could leave the survey at any point without penalty. Inclusion criteria consisted of first-time mothers who had a single infant hospitalized in the NICU within the last 2 years. Their infant's hospitalization in the NICU had to have lasted for at least 1 week. Demographic information, including mother's age, mother's ethnicity, and mother's race was collected, as well as information about their infant's NICU stay. These questions included gestational age of their baby at birth, length of NICU stay of their infant, approximate number of mother's NICU visits per week, average length of each of these NICU visits, and how long ago their infant left the NICU. Categorical data were re-coded and represented by numerical values to be used in the regression analyses.

Data Cleaning

Qualtrics research services conducted an initial scrub of the survey data and checked for poor quality in responses, suspicious or fraudulent completion of the survey, and any responses that appeared to be answered randomly or in a manner indicative of straight-lining. Data were also checked for missing responses and there did not appear to be any from the 134 participants. The survey was set up so that participants could not move forward without answering all survey items, so an option of "prefer not to answer" was provided to meet IRB requirements and not force participants to answer questions that could have made them uncomfortable. The "prefer not to answer" option was selected by participants for a number of questions on both the PCL-5 and the PMP S-E, as shown in Table 2. From the PCL-5 items where more than three participants chose this option, it seemed that participants preferred not to answer questions related to assigning negative feelings or blame to self. From the PMP S-E items where more than three

participants chose this option, it seemed that participants preferred not to answer

questions related to their ability read their baby's cues and to calm them when crying. For

these responses, data were re-coded in SPSS using the mean replacement value for each

participant. Mean replacement is an acceptable approach to replace missing data value

(Kang, 2013).

Table 2

"Prefer Not to Answer" Response by Participants

Instrument (Question number)	Total Number of Responses
PCL-5	
Question 3	1
Question 4	1
Question 5	2
Question 6	2
Question 7	2
Question 8	1
Question 9	5
Question 10	6
Question 11	3
Question 12	1
Question 13	2
Question 14	1
Question 15	2
Question 17	3
Question 18	2
Question 19	1
PMP S-E	
Question 1	2
Question 3	1
Question 6	4
Question 10	1
Question 11	1
Question 12	1
Question 13	1
Question 14	4
Question 17	1
Question 18	2

Evaluations of Statistical Assumptions

Multiple regression analysis is a statistical method used when predicting the value of an outcome variable based on the value of two or more predictor variables (Laerd Statistics, 2018). In multiple regression analysis, tests of reliability are conducted and there are certain assumptions that need to be met for the data to be considered reliable and valid. Tests for the assumptions of normality, no significant outliers, independence, homoscedasticity, and the absence of multicollinearity were performed.

Normality for the variables was tested with skewness and kurtosis using SPSS. Skewness refers to the where the data lies, meaning whether it is heavily weighted to the left (high) end or to the right (low) end (Warner, 2013). Kurtosis refers to the overall shape of the distribution, meaning how flat or how peaked it is. The general rule is if either of the values for skewness of kurtosis fall between -1.0 and 1.0, then the distribution is not outside the range of normality, and can be considered normal (Warner, 2013). Study results showed that the skewness values for PMP S-E and PCL-5 were both between -1.0 and 1.0, indicating no issues. In both cases, the kurtosis values were negative which means that the distributions are slightly flatter (platykurtic) than normal, and flatter in the larger negative value of -0.601 seen in the PMP S-E distribution. The skewness values for length of stay does show issues as the value is higher than 1.0. This indicates that the distribution is weighted to the high end. A kurtosis value of 18.206 indicates that distribution is leptokurtic. Together, all variables were plotted on a P-Plot (see Appendix A). This was done to examine whether the error terms (residuals) were normally distributed. If the predicted values of the normal distribution are approximately

linear to the observed sample values, then the dots plotted should follow along the diagonal line (Warner, 2013). Results showed many of the data points were not touching the diagonal line, likely due to the variable outliers of length of NICU stay.

Outliers are observed data points that have a dependent variable value that is very different from what is predicted by the regression equation (Laerd Statistics, 2018), and may impact the distribution of scores. No outliers were found for the variables of mothers' trauma and maternal parenting self-efficacy. However, there were outliers observed in the data for length of NICU stay. Specifically, there were eight participants whose stay was two standard deviations from the mean, and two participants whose stay was three standard deviations from the mean (see Appendix B). The scores for the two participants whose stay was three standard deviations from the mean were recoded to one and two more than the most extreme score in the distribution that is not an outlier. This method, proposed by Tabachnick and Fidell (2007) maintains these scores at the tails of the distribution but eliminates their undue influence on the distribution of scores. Once this recoding was completed, I re-examined skewness and found a value of 2.346, and kurtosis and found a value of 4.968. After making these outlier adjustments, the extreme influence of those scores on the overall distribution was eliminated. To normalize the data even further, a log transformation was then run which resulted in little deviation from the assumption of normality (see Table 3). Significant impacts on a study's findings typically occur only when there are extreme deviations from normality (Warner, 2013). The range of values for length of stay in the NICU changed from seven to 240 to seven to

120, and the mean and standard deviation from x = 24.10, SD = 31.67 to x = 22.93, SD = 25.676; and these values were used in the analyses.

Table 3

Skewness and Kurtosis of Study Variables

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Length of NICU Stay	3.716	0.209	18.206	0.416
(After adjusting outliers)	2.346	0.209	4.968	0.416
(After log transformation)	1.023	0.209	0.144	0.416
PMP S-E Total	-0.601	0.208	-0.601	0.413
PCL-5 Total	-0.012	0.208	-0.624	0.413

Independence is the assumption that the residuals for the outcome variable are independent from one another and uncorrelated. The Durbin-Watson statistical test was used to test for independence in the regression analysis. Values can vary from 0 to 4, ideally falling close to a value of 2. Results yielded a Durban-Watson score of 1.972, indicating that the assumption of independence of residuals was met (Warner, 2013).

Homoscedasticity assumes that the variance of the dependent variable is the same for all of the data. Data are considered homoscedastic if the residuals are equally distributed rather than grouped together at some values and spread far apart at other values (Laerd Statistics, 2018). Plots of the predicted values and residuals on a scatterplot showed that the data were randomly distributed, and the assumption of homoscedasticity was met (see Appendix C).

Multicollinearity refers to when the predictor variables are highly correlated to one another (Laerd Statistics, 2018). If this occurs, the effects of the predictor variables

on the outcome variable cannot be separated. To check for the absence of multicollinearity, two methods were employed. In the first method, the values for the tolerance and variance inflation factor (VIF) were computed in SPSS. A tolerance value above 0.2 and a VIF value below 10 indicates that the assumption of multicollinearity was met. Data yielded a VIF value of 1.000 for the predictor variable, mothers' trauma of having an infant in the NICU, and a VIF value of 1.000 for the moderator variable, length of NICU stay. In the second method, a correlation matrix was computed (Table 4). Correlation values of more than 0.8 may be problematic and indicate that the assumption of multicollinearity was not met. Data indicated that all variables had correlation coefficients less than 0.8. Therefore, both methods evidenced that there was no multicollinearity in the data.

Table 4

Correlation of Predictor and Outcome Variables

	PMP S-E Total	PCL-5 Total	Length of NICU Stay
PMP S-E Total	1.000	0.121	0.049
PCL-5 Total	0.121	1.000	0.021
Length of NICU Stay	0.049	0.021	1.000

In addition to testing the assumptions for multiple regression, Cronbach's alpha was computed. This evaluates an instrument's internal consistency which can be quantified by a value that ranges between 0.0 and 1.0 and is the most important form of reliability for multi-item instruments (Creswell & Creswell, 2018). Reliability for the

PMP S-E and the PCL-5 were computed, both with and without mean replacement for missing data, and had acceptable Cronbach's alpha values (Table 5).

Table 5

Cronbach Alpha Coefficients of Study Instruments for this Sample

Instrument	α
PCL-5	.944
PCL-5 (with mean replacement)	.938
PMP S-E	.932
PMP S-E (with mean replacement)	.926

Results

Descriptive Statistics

All participants identified as mothers and provided a variety of demographic information about themselves, including mother's age, mother's ethnicity, and mother's race. Mother's ethnicity was asked as "Are you of Spanish, Hispanic, or Latino origin?" and required an answer of "Yes" or "No." Mother's race was described in five different options including "White," "Black or African American," "Asian," "American Indian or Alaska Native," "Native Hawaiian or Pacific Islander," and "Other." Participants were asked to choose the option that best described them. Most of the sample were White mothers (n = 75, 55.1%) and most were of Non-Spanish/ Hispanic/ Latino origin (n = 91, 67.9%). The average age was 27.24 years old. This is similar to the most recent statistics by the Centers of Disease Control and Prevention, which found that the 2020 national mean average age of mothers at first birth was 27.1 years old (Hamilton et al., 2021).

Demographic information was also collected about the baby of each participant. These questions included the gestational age of their baby at birth in weeks, the approximate number of NICU visits each mother had per week (answer options were provided in ranges), the average length of each NICU visits by the mother (answer options were provided in ranges), and how long ago their infant left the NICU (re-coded into weeks). The mean value for length of time their infant left the NICU was 23.90 weeks, or approximately six months. However, responses from 11 participants about the timeline were not clear and thus, left out. Descriptive demographics of study participants are presented in Table 6.

Table 6

Demographic Characteristics of Study Participants

Demographic Characteristics	Mean (*SD*)	%	*n*
Age	27.24 (6.774)		
Ethnicity			
Spanish/ Hispanic/Latino origin		32.1	43
Non-Spanish/ Hispanic/Latino origin		67.9	91
Race			
White		55.1	75
Black or African American		27.2	37
Asian		2.9	4
American Indian or Alaska Native		0	0
Native Hawaiian or Pacific Islander		.7	1
Other		14.7	17
Infant's Gestational Age at Birth	31.00 (6.948)		
Approximate number of NICU visits			
0 times/week		0.7	1
1 -3 times/week		21.3	29
4-6 times/week		24.3	33
7-9 times/week		16.9	23
More than 10 times/week		35.3	48
Average length of NICU visit			
0 - 30 minutes		6.6	9
30 - 60 minutes		30.9	42
1 -2 hours		17.6	24
2 hours or more		43.4	59
Length of time since left NICU (in weeks)	23.90 (29.27)		123

Descriptive Information for Predictor Variable: Maternal Trauma

The PCL-5 was the scale used in this study to assess mothers' trauma of having an infant in the NICU. The PCL-5 is a 20 item self-report rated between 0 and 4 (0=Not at all; 1=A little bit; 2=Moderately; 3=Quite a bit; 4=Extremely). The maximum score was 80. These items are a measure of the 20 DSM-5 symptoms of posttraumatic stress disorder (PTSD). Though the purpose of the PCL-5 in this research study was not to provide clinical diagnoses, a cut-off raw score of 38 indicates a provisional diagnosis of PTSD (Weathers, et al., 2013). The mean raw score value of participants in this study was 40.01. Mothers were asked to think about their NICU experience before answering thePCL-5 questionnaire. Results suggest that many of the mothers in the study were still experiencing PTSD symptoms associated with the trauma experienced by having their infant in the NICU, even after having been discharged six months ago on average.

Within the PCL-5, there are four domains consistent with the four criteria of PTSD in the DSM-5: re-experiencing, avoidance, negative alterations in cognition and mood, and hyper-arousal items (Table 7). A "mean score" was computed by taking the average subscale score and dividing it by the number of subscale items (Weathers et al., 2013). These scores ranged between 0 to 5, consistent with the likert scale used to answer each PCL-5 item. A higher score represented a higher severity of symptoms (Weathers et al., 2013; see Table 7). Results suggested that the mothers in this study were still experiencing the four domains of trauma at a level between "A little bit" and "Moderately," with higher levels in hyper-arousal and negative alternations in cognition and mood. These results were not unexpected as much research suggests that having an

infant in the NICU is one of the most traumatizing events a mother can experience

(Alinejad-Naeini et al., 2021). Symptoms can present in different ways, and trauma

operates on spectrum.

Descriptive Information for Outcome Variable: Maternal Parenting Self-Efficacy

The PMP S-E was the scale used in this study to assess maternal parenting self-

efficacy. The PMP S-E is a self-report scale that consists of 20 items rated between 1 and

4 (1=strongly disagree; 2-diagree; 3=agree; 4=strongly agree). The maximum score was

80. The mean score value of participants in this study was 70.91. The PMP S-E form also

consisted of four sub-factors which included care taking procedures, evoking behaviors,

reading behavior, and situational beliefs (Barnes & Adamson-Macedo, 2007). The

maximum score for care taking was 16; the maximum score for evoking behaviors was

24; the maximum score for reading behaviors was 28; and the maximum score for

situational beliefs was 12 (Table 4). For each of the factors, a mean score was also

computed by taking the average subscale score and dividing it by the number of subscale

items for better comparison. Scores fell 2.75 to 3.11 indicating that the participants

responded mostly "disagree" or "agree" rather than "strongly disagree" or "strongly

agree." Percentages for each factor were also calculated by dividing the average score by

the maximum score of each factor. Overall, mothers in this study reported higher levels

of maternal parenting self-efficacy in the domains of reading behavior (77%) and evoking

behaviors (75.5%), followed by care taking procedures (72%) and situational beliefs

(68.7%). This indicates that while many mothers believe that they are capable of

fulfilling their maternal parenting roles, there are still some who appear to perceive their parenting abilities as a challenge.

Descriptive Information for Moderator Variable: Length of NICU Stay

Length of NICU stay was asked in the demographic questionnaire that each mother completed at the beginning of the survey. Mothers were asked to report the length of their infant's hospitalization in the NICU in days. Results from this study yielded a mean NICU stay value of 22.93 days. Research has found that the average NICU stay is 13.2 days (OakBend Medical Center, 2021), though there is a dramatic difference in length of stay for infants who are born prematurely or with complications to their health. Infants who are born prematurely or with medical complications typically require much longer NICU hospitalizations that, for many, can extend 2 to 3 months (Petteys & Adoumie, 2018). The descriptive statistics for all variables including predictor, outcome, and moderator, are presented in Table 7.

Table 7

Descriptive Statistics for Study Variables

Variable	*N*	*M*	*SD*	Min	Max
Mothers' Trauma of Having an Infant in the NICU (PCL-5)	134	40.01	18.35	0	80
Re-Experiencing	134	1.63	4.753	0	20
Avoidance	134	1.58	1.762	0	8
Negative Alterations in Cognition and Mood	134	1.73	6.194	0	28
Hyper-Arousal	134	1.74	5.121	0	24
Mothers' Trauma of Having an Infant in the NICU (PCL-5)	134	70.91	7.83	48	80
Care Taking Procedures	134	11.639	1.512	4	16
Evoking Behaviors	134	18.126	2.577	6	24
Reading Behaviors	134	21.758	2.674	7	28
Situational Beliefs	134	8.248	1.114	3	12
Length of NICU Stay	134	22.93	25.676	7	240*

Note. Mean scores on the PCL-5 were computed by taking the average score for each subscale and dividing it by the number of items per subscale so that the means could be compared.
*Outliers adjusted to a range of 7 to 120 for analyses

In order to better understand the sample, additional analyses were also conducted to look at whether there was a relationship between study variables and demographics. Specifically, multivariate analyses of variance (MANOVA) were conducted between race of the study participants as the predictor variable, the three study variables (mothers' trauma, maternal parenting self-efficacy, length of NICU stay), and also mother's age and gestational age of infant at birth as the dependent variables. Because only 5 participants reported race other than Black or White, they were excluded from these analyses. There were no differences in any of these variables between the White or Black participants ($p > .05$).

Chi-Square tests were also conducted between ethnicity (Hispanic vs. Non-Hispanic) and approximate number of visits per week and ethnicity and average length of visits. The same was also done to examine whether there was a relationship between race (Black vs. White) and approximate number of visits per week and race and average length of visits. No significance was found in any of these analyses, suggesting that there was no association between the variables of mothers' ethnicity or mothers' race and approximate number of visits per week and length of visits.

Correlation Analyses

A correlation analysis was conducted between the subscales of each study instrument (PCL-5, PMP S-E) (Table 8). Other than expected correlations among the various subscales of each instrument, there were small correlations between subscales from the two instruments. Specifically, between the variables of re-experiencing (subscale of the PCL-5) and caretaking (subscale of the PMP S-E), and between the

variables of negative alternations in cognition and mood (PCL-5) and reading behaviors

(PMP S-E).

Table 8

Correlation of Study Instrument Subscales

Variable	Re-exper. (PCL-5)	Avoidance (PCL-5)	Neg. Alt. (PCL-5)	Hyper-arousal (PCL-5)	Care-taking (PMP S-E)	Evoking Beh. (PMP S-E)	Reading Beh. (PMP S-E)	Situational Beh. (PMP S-E)
Re-exper. (PCL-5)	-	.68**	.68**	.59**	.19*	.09	.16	.11
Avoidance (PCL-5)	.68**	-	.63**	.62**	.13	.04	.05	.09
Neg. Alt. (PCL-5)	.68**	.63**	-	.78**	.07	.08	.18*	.07
Hyper-arousal (PCL-5)	.59**	.62**	.78**	-	.03	-.01	.08	.08
Care-taking (PMP S-E)	.19*	.13	.07	.03	-	.44**	.53**	.53**
Evoking Beh. (PMP S-E)	.09	.04	.08	-.01	.44**	-	.69**	.54**
Reading Beh. (PMP S-E)	.16	.05	.18*	.08	.53**	.69**	-	.60**
Situational Beh. (PMP S-E)	.11	.09	.07	.08	.53***	.54**	.60**	-

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)
*** Correlation is significant at the 0.001 level (2-tailed)

Further analysis was run to examine the correlations between mother's age, infant's gestational age at birth, length of NICU stay, and the subscales of both study measures (Table 9). A negative correlation was found between the variables of re-experiencing (subscale of the PCL-5) and infant's gestational age at birth, which suggested that mothers of children who had greater gestational age at birth scored lower on re-experiencing the trauma. Similarly, a negative correlation was found between the variable of avoidance (subscale of the PCL-5) and infant's gestational age at birth, suggesting that mothers of children who had greater gestational age at birth scored lower on avoidance. These results were expected because many mothers who have younger (more preterm) infants experience higher levels of trauma associated with complications related to low gestational age at birth (Loewenstein, 2018).

Table 9

Correlation of Study Instrument Subscales and Continuous Variables

Variable	Re-exper. (PCL-5)	Avoidance (PCL-5)	Neg. Alt. (PCL-5)	Hyper-arousal (PCL-5)	Care-taking (PMP S-E)	Evoking Beh. (PMP S-E)	Reading Beh. (PMP S-E)	Situational Beh. (PMP S-E)
Mother's Age	.06	.09	.05	.10	.07	.04	.04	-.03
Gest. Age of infant at birth	-.21*	-.20*	-.12	-.12	.09	.07	.05	.12
Length of NICU Stay	.09	.01	.03	-.07	.09	.05	.01	.01

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

Test of Hypotheses

Research Question 1

RQ#1: Does mothers' trauma post-NICU discharge predict maternal parenting self-efficacy for childcare? Research question one was answered by performing a simple regression analysis in SPSS to assess the predictive role of mothers' trauma of having an infant in the NICU on maternal parenting self-efficacy post-NICU discharge. Mothers' trauma of having an infant in the NICU was not a statistically significant predictor of maternal parenting self-efficacy, $F(1, 134) = 1.978$, $p = .162$, $R^2 = .015$. Therefore, the null hypothesis for RQ#1 was not rejected.

Research Question 2

RQ#2: Does length of NICU stay moderate the relationship between mothers' trauma and maternal parenting self-efficacy for childcare? Research question two was answered by performing a moderation analysis using Andrew F. Hayes' PROCESS macro version 4.1, Model 1(Hayes, 2022), using the full participant sample. The outcome variable was maternal parenting self-efficacy post-NICU discharge. The predictor variable was mothers' trauma of having an infant in the NICU. The moderator variable was length of NICU stay. The overall regression model explained a non-significant and very small proportion of the variability in maternal parenting self-efficacy ($R^2 = 0.019$, $F(3, 130) = 0.869$, $p = 0.459$) due to the R^2 value being so low. The analysis showed mothers' trauma as a non-significant inverse predictor of maternal parenting self-efficacy ($\beta = -0.033$, $p = 0.814$) and length of NICU stay also as a non-significant and inverse predictor of maternal parenting self-efficacy ($\beta = -1.701$, $p = 0.725$). The interaction

between mothers' trauma of having an infant in the NICU and length of NICU stay was also found to not be statistically significant ($\beta = 0.070$, $p = 0.532$). Therefore, length of NICU stay does not significantly moderate the relationship between mothers' trauma of having an infant in the NICU and maternal parenting self-efficacy for childcare post-NICU discharge. Thus, the null hypothesis for RQ#2 was not rejected (see Table 10).

Table 10

PROCESS Analyses Testing Length of NICU Stay as a Moderator Between Mothers' Trauma AND Maternal Parenting Self-Efficacy

Variable	*B*	*SE*	*t*	*p*	*95% CI*
Constant	5.962	11.889	11.889	.000	[59.1, 82.7]
Mothers' Trauma (PCL-5)	-.033	.138	-.235	.814	[-.31, .24]
Length of NICU Stay	-1.70	4.839	-.352	.725	[-11.3, 7.9]
Interaction	.070	.112	.627	.532	[-.15, .29]

Note. $N = 134$, p < .05

Summary

This chapter described the findings of the study in which I tested the hypotheses that mothers' trauma of having an infant in the NICU predicts maternal parenting self-efficacy for childcare post-NICU discharge (RQ1) and that length of NICU stay was a statistically significant moderator of the relationship between those two variables (RQ2). The study findings did not support either of these hypotheses and the analyses were not significant, therefore the null hypotheses were not rejected for either research questions. Chapter 5 summarizes the findings, limitations to the study, implications for social change and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quantitative study was to address the gap in the literature by examining the relationship between the level of mothers' trauma of having had a child in the NICU and maternal parenting self-efficacy related to childcare post-NICU discharge, with length of NICU stay as a moderator. Data were collected using an online survey that was sent to participants within Qualtrics' participant database. To meet study criteria, mothers had to be first time mothers who had a single infant in the NICU for at least 1 week within the last 2 years. A total of 134 participants were included in this study; most participants were White mothers in their mid-20s.

The findings from the study did not support the hypotheses that mothers' trauma of having an infant in the NICU predicts maternal parenting self-efficacy for childcare post-NICU discharge, or that the length of NICU stay was a statistically significant moderator of the relationship between those two variables. Therefore, I was unable to reject the null hypotheses. However, other useful information was gathered from the study results, such as the presence of ongoing trauma symptoms that many mothers who have had an infant in the NICU still experience. Many mothers also reported relatively high levels of perceived maternal parenting self-efficacy. This chapter includes an analysis and interpretation of the study findings, limitations, implications for social change, recommendations for future research and practice, and conclusions of the research findings.

Interpretation of the Findings

Mothers' Trauma

Participants completed the PCL-5. Though the purpose of the PCL-5 in this research was not provide clinical diagnoses, a cut-off raw score of 38 indicates a provisional diagnosis of PTSD (Weathers, et al., 2013). The mean for this measure was higher than the cutoff score. Within the PCL-5, there are four domains consistent with the four criteria of PTSD in the DSM-5: re-experiencing, avoidance, negative alterations in cognition and mood, and hyper-arousal items. The highest scores were seen in the negative alterations in cognition and mood and the hyper-arousal domains.

Negative alterations in cognition and mood are associated with negative thoughts or feelings about oneself and others through maladaptive thoughts, errors in thinking, cognitive distortions, or irrational and exaggerated thoughts, associated with the trauma (American Psychiatric Association, 2013). Results from the PCL-5 suggest that many of the mothers in the study were still experiencing PTSD symptoms within this domain related to having had an infant in the NICU. Results also indicated that many participants continued to experience heighten physical responses, were watchful or on guard, and careful not to take risks.

Hyper-arousal is a common symptom of trauma that continues even after the initial threat is gone. It is a means of self-protection after trauma and the body's way of remaining prepared (Center for Substance Abuse Treatment, 2014). This can interfere with an individual's ability to respond appropriately to certain stimuli. Hyper-arousal can also produce overreactions to situations that are actually safe but perceived as dangerous.

There was only one mother who provided a response of "not at all" to all 20 items listed on the PCL-5.

These results are consistent with prior research on PTSD in mothers of infants who have been hospitalized in the NICU. It is suggested that 18%–78% of mothers experience at least one symptom of PTSD (Malin et al., 2020). Some mothers also blame themselves for their infant's NICU admission and dwell on how they are still "inadequate" parents (Sharp et al., 2021), which only intensifies their PTSD symptoms (Ehlers & Clark, 2000). The physical and emotional challenges of a NICU admission may negatively affect parental well-being, and maternal PTSD postpartum is associated with lower rates of breast feeding (Brockway et al., 2020), as well as increased patterns of controlling behaviors, poorer infant-parent bond, debilitating psychological symptoms, and disrupted sleep patterns in the infant (Malin et al., 2020; Schecter et al., 2020). First time mothers hold strong expectations about how their childbirth experience should go (Preis et al., 2019). When there was greater difference between the planned and actual birth, including medical emergencies, mothers showed lower levels of satisfaction and feelings of guilt (Preis et al., 2019). When the experience of childbirth is not satisfactory, it may affect women's long-term psychological well-being and overall health.

Maternal Parenting Self-Efficacy

The participant level of maternal parenting self-efficacy in childcare post-NICU discharge was evaluated with the PMP S-E. The maximum possible score on this scale is 80. The mean score value of participants in this study was 70.91, suggesting that the many participants reported relatively high levels of perceived maternal self-efficacy

overall. The PMP S-E form also consists of four subfactors, which includes care-taking procedures, evoking behaviors, reading behavior, and situational beliefs (Barnes & Adamson-Macedo, 2007). Comparisons between the different domains were conducted by dividing the maximum score by the mean score. The maximum possible score for reading behavior is 28 and the mean score of the participants was 21.758. This was the parenting self-efficacy domain with the highest score. The maximum possible score for situational beliefs was 12 and the average score of the participants was 8.248. This was the parenting self-efficacy domain with the lowest score. Review of the four self-efficacy domains showed little variation across them probably because the mothers in this study consistently reported relatively high levels of maternal parenting self-efficacy overall.

Length of NICU Stay

Each participant was asked about the length of NICU stay their infant experienced as part of the demographic questionnaire. Responses varied between a minimum of 7 days and a maximum of 240 days, although the highest number was one of 10 outliers in the data. Research has found that the average NICU stay is 13.2 days (OakBend Medical Center, 2021), though there is a significant difference in length of stay for infants who are born prematurely or with complications to their health; many requiring NICU stays lasting weeks to months.

Test of Hypotheses

My first research question asked whether mothers' trauma post-NICU discharge predict maternal parenting self-efficacy for childcare. I found that mothers' trauma does not explain much of the variability in maternal parenting self-efficacy. Other factors

beyond mothers' trauma may influence maternal parenting self-efficacy instead and should be examined in future research. These factors might include marital status of the mother, outside support of family and/or friends, socioeconomic status, or access to quality resources (rural vs. urban environments). These findings suggest mother's trauma may have no relationship with caregiving. My hypothesis was based on research that shows that trauma usually results in the interruption of effective behaviors. Having an infant in the NICU is a frightening experience for mothers due to the threat of death often associated with NICU admission (Jones, 2021). A mother's psychological stress in response to trauma is associated with the birth and development of a high-risk infant (Bonacquisti et al., 2020; Kim et al., 2015). A birth that requires NICU hospitalization can affect a mother's self-belief and confidence, because the mother may feel helpless in her immediate maternal role (Molloy et al., 2021). This can lead to struggles with coping and inability to care for the infant (Molloy et al., 2021). However, if my findings are supported by other studies going forward, this can reduce the concern that parents, family members, and providers may have when sending mothers home with their babies after NICU stay.

My second research question asked whether length of NICU stay moderates the relationship between mothers' trauma and maternal parenting self-efficacy for childcare. The moderating variable (length of NICU stay) was not found to significantly affect the relationship between the predictor variable (mothers' trauma) and the outcome variable (maternal parenting self-efficacy for childcare). It is possible that length of stay did not have a significant moderating effect on the study variables because the period in the

NICU was not long enough to be impactful to mothers. Throughout the NICU stay, participants may not have experienced challenges in parenting roles and caretaking tasks. Prior research has found that extended NICU hospitalizations are often associated with very preterm births, complex medical conditions, and serious illnesses. In these cases, mothers may feel uncertainty and concern about their ability to care for their infant properly and meet all their specialized needs (White et al., 2017). An extended length of NICU stay might result in the reliance on the NICU staff and leave mothers even more ill-equipped to deal with the challenges of childcare once home. On the other hand, longer NICU stays could allow mothers more time to become proficient and comfortable in the care required. Though this study did not yield results to suggest either, it did show that length of NICU stays of 3 weeks, on average, was not long enough to show any moderating effects on mothers' trauma and parenting self-efficacy, even if they did exist. Samples with more participants with longer stay might be able to determine whether this factor plays a role and if so, at which length of stay it begins to have an impact.

Theoretical Frameworks

The findings from this study align with some of the features of Bandura's (1997) self-efficacy theory and Ehlers and Clark's (2000) cognitive model of posttraumatic stress, the two theoretical frameworks that grounded this study. For example, many mothers in this study reported that they believed they could execute courses of action required to deal with prospective situations (see Bandura, 1977) to fulfill their parenting role responsibilities. Individuals with high levels of self-efficacy may benefit in various ways that affect their daily lives, such as more resilience to adversity and stress (Bandura,

1989). Though some mothers within this study also indicated that they still experienced symptoms of trauma, the fact that most also report good parenting self-efficacy may indicate that they may also be more resilient. According to Ehlers and Clark, memories, appraisals, and behaviors surrounding a previous traumatic event and can result in emotional symptoms such as fear, shame, guilt, or anger, and physiological symptoms. Study results showed that some mothers continue to blame themselves for their infant's NICU admission and dwell on the negative believes about themselves and others. Mothers also reported continuing to experience physiological responses to the trauma such as of heightened alertness and being on guard.

Results from this study suggested that mothers reported relatively high levels of parenting self-efficacy across all domains. In contrast to some prior research (Malin et al., 2020; Schecter et al., 2020), study results did not yield negative associations between emotional challenges and trauma of a NICU admission and factors associated with poor parenting self-efficacy, such as maladaptive or controlling behaviors, poorer infant-parent bond, debilitating psychological symptoms, and disrupted sleep patterns in the infant. However, it is possible that the positive association found between certain trauma symptoms and specific parenting self-efficacy domains could relate to adverse behaviors and negative outcomes between mother and infant, though further research would need to examine this further. Additionally, there was no significant relationship found between maternal trauma of having an infant in the NICU and maternal parenting self-efficacy, moderated by the length of NICU stay.

Additional Findings

Study results showed a small positive correlation between negative alterations and cognition and mood (PCL-5) and reading behavior (PMP S-E). That is, as one's negative beliefs of themselves and others and self-blame increases, so does their ability to understand and read what their baby wants and needs. Though this association may seem odd, it could be due to the idea of compensation. Compensation is a term used to explain a type of defensive mechanism in which individuals overachieve in certain areas to make up for failures in another area (Shen et al., 2018). This strategy allows individuals to mask inadequacies, stresses, or frustrations and redirect that energy into excelling in other areas (Eisenberg & Fabes, 1998). Research has found that some individuals who feel guilt and blame themselves for negative things that have happened are more inclined to perform prosocial behavior to compensate for the harm to they have brought onto others (Shen et al., 2018). Prosocial behaviors relate to behaviors which benefit others, including helping, cooperating, comforting, and sharing (Eisenberg & Fabes, 1998). In this case, some mothers may be hyperaware and perceptive to their baby's needs as a way to compensate for their feelings of guilt and shame.

Study results also showed a positive correlation between re-experiencing trauma (PCL-5) and caretaking procedures (PMP S-E). Prior research suggests that trauma symptoms may be associated with greater sensitivity to adverse effects of perceiving that one lacks control over negative outcomes (Hancock & Bryant, 2018). Caretaking and control are also found to be associated with one another because caretaking can often mimic feelings and behaviors evoked with control (Sussman & Sussman, 2011). Mothers

who may feel a lack of control over their own emotional and physical experience, can engage in caretaking responsibilities of their child. Some mothers may act on intense urges to do something (in this case, caretaking duties of their child) as a way to accomplish a temporary removal of their own anxiety and feelings of not being in control of themselves. However, this can become problematic if mothers do not take into consideration the negative consequences (Sussman & Sussman, 2011).

Limitations of the Study

There were several limitations to this research study. Overall, this study used online surveys which were voluntary in nature, included a relatively small sample size, only mothers within the United State, and mostly White. Therefore, study results were not generalizable to fathers or mothers in other countries (Creswell & Creswell, 2018). Another limitation was the use of surveys only in English, so participants who did not speak English well may have been excluded. The online survey was also a self-report design which could have resulted in participant biases, responding in ways they thought presented them in a good light or was more socially acceptable (Creswell & Creswell, 2018). Last, by using quantitative research, I did not have the opportunity to add follow-up questions or clarify any ambiguities that participants might have perceived.

Moreover, unintended social, political, or historical factors may have influenced participant responses or decisions to participate in the survey. For example, the study's inclusion criteria required that mothers had an infant in the NICU within the last 2 years. This was during the COVID-19 pandemic where stress levels were already high and hospital protocols much stricter. The COVID-19 caused disruption to regular hospital

procedures. There may have been a sense of added danger if their infant was experiencing respiratory distress, knowing that the COVID-19 virus was highly contagious and could trigger respiratory infections. This may have affected who volunteered for the study and who did not. In addition, sociopolitical issues may have influenced results such as increased awareness and conversation about women's rights and reproductive healthcare (Pabayo et al., 2020). Shortly before the survey's offering, Roe v. Wade was overturned, controversially ending women's federal Constitutional protections for abortions, and likely limiting access to reproductive care. Research suggests that restricting access to abortion is a risk factor for adverse maternal and infant care (Pabayo et al., 2020). Women of color are disproportionally impacted by these factors and overturning Roe v. Wade may exacerbate the issues. Together, these factors may have been impactful for mothers completing the survey, as well as the deterrent for mothers who opted not to participate.

Recommendations

Recommendations for Research

Results from this study highlighted various areas that may benefit from further research. Overall, study results showed that most mothers were continuing to experience trauma from having an infant in the NICU, even months to years after discharge. Despite the presence of trauma symptoms, most mothers also reported relatively high levels of perceived maternal parenting self-efficacy. It could help professionals working with new mothers identify those whose overall trauma symptoms may go under the radar due to reports of high levels of parenting abilities, and thus, unrecognized additional supports.

It may be beneficial for professionals to understand more about possible relationships between certain trauma symptoms and certain domains of parenting self-efficacy to target those issues and provide meaningful treatment and appropriate supports to new mothers. From the surface, relatively high levels of reported parenting self-efficacy may seem positive. However, if the reasons which underlie the heightened sensitivity to their child's need and increased self-perception that they are good at all care taking tasks are unhealthy, then they may lead to adverse outcomes. Using a larger sample and including mothers who have had an infant in the NICU beyond the last 2 years may provide more robust and meaningful results. It may also be important to include mothers who have more than one child and whether the birth order of having an infant in the NICU differs in level and type of trauma experienced, and mothers whose infants had long versus short stays in the NICU.

Some research (Bandura, 1989; Monteiro et al., 2022) suggests that resilience is a key factor in improved parenting self-efficacy and overall wellbeing. Resilience may not mean that one is not experiencing trauma, but rather that the experience of trauma does not necessarily affect what one needs to do because they are resilient in the face of trauma. Perhaps, this is why study findings showed a lack of relationships and statistical significance in the moderation analysis and may suggest that future work. This would be an area worthy of further research, incorporating a measure of resilience into future study to examine how the relationship between overcoming the trauma of having an infant in the NICU, and the capacity to *recover* from the experience, and parenting self-efficacy for childcare.

Last, though lifesaving, NICU care can be a very expensive process and longer stays can also cause harm (Braun et al., 2020; Sahiledengle et al., 2020; Welch et al., 2017). Braun et al. (2020) conducted a longitudinal study which examined NICU admission rates and NICU length of stay, especially those with higher gestational ages and birth weights. Results indicated that changes in decision-making around NICU admission and NICU care, decreased NICU admission rates and NICU length of stay, especially within the high gestational age and birth weight infants. By implementing systemwide quality improvement initiatives, overall rates of NICU admissions and length of NICU stays decreased (Braun et al., 2020). Further research on length of NICU stay would be beneficial as it is associated with trauma in mothers.

Recommendations for Practice

When either or both parents experience PTSD, parenting behaviors and child health outcomes have been shown to be affected. Fathers, though less studied, have also been found to be at risk for and suffer from PTSD after having an infant in the NICU (Malin et al., 2020; Shahkolahi et al., 2018). Shahkolahi et al. (2018) found that fathers tend to be the first to enter the NICU, communicate with medical staff, and visit the premature infant. They are also responsible for the emotional support of the mother and any extended family, while managing their own emotional needs and obtaining accurate information from the healthcare providers. Fathers expressed a sense of accountability for their spouse's emotional well-being and concerns about the physical conditions of both mother and infant (Shahkolahi et al., 2018). Furthermore, due to lack of training and information, fathers felt increased stress and anxiety having to make decisions for their

children in critical care. If the baby is premature, Stefana et al. (2018) found that fathers do not always feel confident in their ability to care for and interact with their children, and are, thus, less inclined to do so. Consequently, fathers tended to be an "assistant" to the mothers, following her directions and providing support after discharge (Adama et al., 2016). It will be important for medical staff, professionals, and even therapists to understand that the experiences of mothers and fathers of NICU infants can be different, and various factors play into their experiences.

<p align="center">**Implications of Positive Social Change**</p>

Maternal parenting self-efficacy is an important topic because of the implications it has on parenting practices, infant development, and women's psychological health (Monteiro et al., 2022). Research suggests that maternal parenting self-efficacy is a key variable in infant development and has direct influence on how a child behaves, as well as an indirect influence through the mother-infant relationship. Mothers with lower self-efficacy beliefs tend to be much more inhibited to acquire new skills and knowledge and more likely to give up when challenges arise (Monteiro et al., 2022). These mothers are also at higher risk for developing psychopathological symptoms, postpartum depression, parenting dissatisfaction, and maternal stress.

This study may impact social change in the way that medical staff, social services, and even policy makers view the experience of having an infant in the NICU in the United States and whether the length of NICU stay affects mothers' parenting self-efficacy once home post-discharge. Understanding the relationship between mothers' trauma of having an infant in the NICU and their parenting self-efficacy at home, while

also considering length of NICU stay, may provide knowledge used to inform medical staff and professionals, ultimately improving knowledge and training. This would be beneficial to help mothers who need support during and after their infant's transition.

Conclusion

For this study, I used the data gathered from an online survey and the theoretical frameworks of Bandura's theory of self-efficacy and Ehlers and Clark's cognitive model of posttraumatic stress disorder. I first examined whether mothers' trauma of having an infant in the NICU predicted maternal parenting self-efficacy in childcare after discharge, and whether the length of an infant's NICU stay moderated the relationship between the two variables. My study findings did not support my hypotheses, though additional valuable information emerged from the study. From the data, it appeared many mothers who had an infant in the NICU may still experience ongoing trauma symptoms. Additionally, many mothers also reported relatively high levels of perceived maternal parenting self-efficacy; however, it was not clear how many of these mothers reported both. With 3,605,201 babies born in 2022 in the United States (Hamilton et al., 2021), and roughly 10 percent of them admitted to the NICU (Harrison & Goodman, 2015; OakBend Medical Center, 2021), it is important to understand that having an infant in the NICU is a traumatic experience for mothers (Adama et al., 2016; Baía et al., 2016; Sabnis et al., 2019) and these trauma symptoms can range from mild to severe. In addition, current events such as the COVID-19 pandemic and Roe v. Wade decision have affected changes in healthcare procedures and hospital regulations, possibly resulting in amplified feelings of anxiousness, stress, and worry in new mothers (Mayo Clinic, 2022).

Therefore, addressing the effect that these issues may have on current and future mothers will be important, looking also at how they affect their emotional and psychological health, and subsequently how they affect their parenting roles. Maladaptive thinking and behaviors (e.g., control, compensation) may underlie a mother's care of her child, even if it appears that she is doing a good job. Additional research will be beneficial for the overall well-being of mothers, their families, and the way they are able to bond, care for, and parent their NICU infants.

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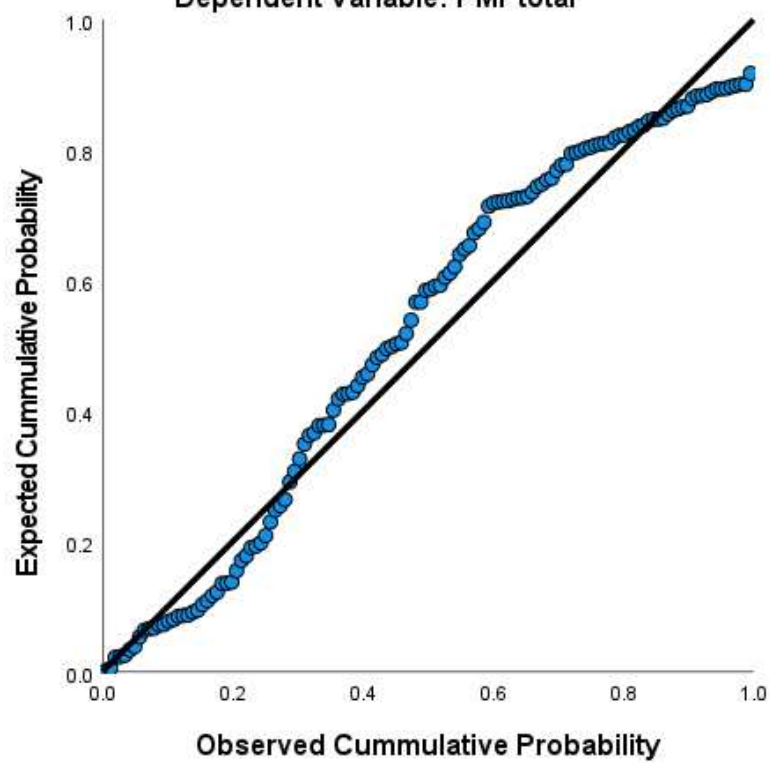https://doi.org/10.1016/j.jrurstud.2021.09.029

Appendix A: Scatterplot for Outliers

Length of infant's NICU stay (in days)
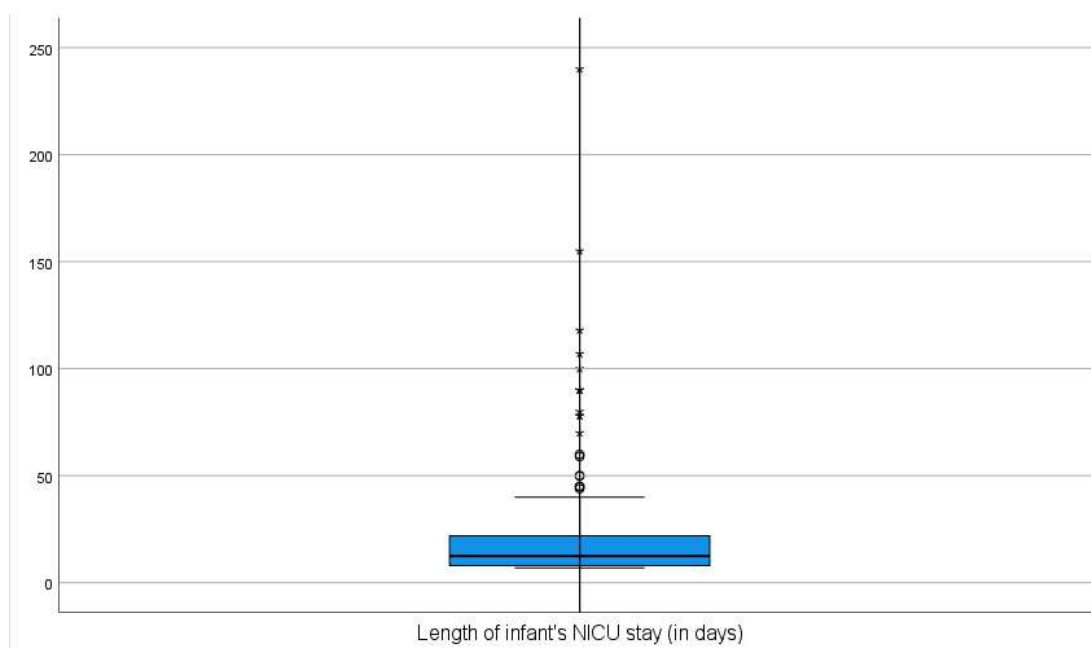
Appendix B: P-P Plots

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: PMPtotal

Appendix C: Scatterplots for Homoscedasticity

Scatterplot

Dependent Variable: PMPtotal