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“Clinician Resilience After Traumatic Childbirth Exposure” The aims of this study were to 1) describe and explore the frequency and severity of TCE experiences in OB clinicians, 2) assess associations between TCEs and levels of resilience, and 3) determine if TCE exposure and resilience are associated with OB clinician burnout. The proposal for this three-manuscript dissertation was defended (March 2020). IRB approval. This study received federal Funding and surveyed 160 OB clinicians in the Baltimore, Metropolitan area. Resulting in one journal publication and two additional manuscripts pending journal submission.

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Abstract

Project Title: Clinician Resilience after Traumatic Child Birth Exposure

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Background: Traumatic Childbirths (TCE) involving actual or threatened serious injury or death to a mother or child are documented sources of occupational stressors. Maternity care is a profession often perceived as filled with joy. However, TCEs may affect both professional practice and personal life and can contribute to burnout. Clinician resilience may play an important role in coping with TCEs.

Purpose: The aims of this study were to describe and explore the frequency and severity of TCE experiences in OB clinicians, assess associations between TCEs and levels of resilience, and determine if TCE exposure and resilience are associated with OB clinician burnout.

Methods: An anonymous survey was administered via a web link to obstetrical clinicians in five Maryland hospitals. The survey had four sections: demographics, TCE (frequency, severity, and influence on personal and professional practice), resilience (25-item Connor-Davidson Resilience Scale), and burnout (Maslach Burnout–Human Services Survey for Medical Personnel). Multi-level modeling explored factors influencing resilience and burnout nested within hospitals.

Results: The 160 usable surveys included registered nurses (N=104), certified nurse-midwives (N=17), attending physicians (N=28), and resident physicians (N=11). Nearly all had experienced at least one TCE during their careers, with shoulder dystocia and stillbirth being the most frequent. The frequency of TCE exposure was associated with influencing the

OB clinician's professional practice ($r=.415, p<.001$) and personal life ($r=.386, p<.001$).

Perception of severity strongly influenced professional practice ($\beta=.52, p<.001$) and personal life ($\beta=.46, p<.001$). Resilience scores were significantly lower in clinicians aged 35-54 years compared to the 55 or older group ($B=-7.60, p=.011$). TCE exposure was not associated with burnout. However, nearly a third (31%) of the convenience sample reported high emotional exhaustion, and 13% reported high depersonalization.

Conclusion: TCE exposure can affect the professional practice and personal life of maternity care clinicians. While TCE did not have a strong relationship with resilience and burnout, a third of the respondents reported high emotional exhaustion, a dimension of burnout.

Longitudinal research is needed to understand the short and long-term effects of TCEs and the role of resilience in helping clinicians cope with occupational stress.

Clinician Resilience after Traumatic Child Birth Exposure

by
Keisha A. Robinson CNM, MSN

A dissertation submitted to the Faculty of the Graduate School of the
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of the requirements for the degree of
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List of Abbreviations

ACNM	American College of Nurse-Midwives
ACOG	American College of Obstetrics and Gynecology
CD-RISC	Connor-Davidson Resilience 25-item Scale
CNM	Certified Nurse-midwife
COVID-19	Coronavirus Disease 2019
DP	Depersonalization
EE	Emotional Exhaustion
HCO	HealthCare organization
NAM	National Academy of Medicine
NB	Newborn
OB	Obstetrics
PA	Personal Accomplishment
RN	Registered Nurse
TCE	Traumatic Childbirth Event

Chapter 1: Background and Significance

Occupational Trauma

A resilient healthcare workforce is the underpinning of a healthcare system that delivers quality, competent patient care. Healthcare is steadily evolving; patient acuity has risen, especially within the specialty of obstetrics. In the United States (US), the current maternal death rate is 23.8 per 100,000 live births,¹ and the fetal death rate is 5.4 deaths per 1,000 live births.² Although there have been consistent annual decreases in the annual fetal death rate,² the US has witnessed a gradual increase in maternal morbidity and mortality during and after birth, especially among Non-Hispanic Black women.^{2,3} Comorbidities in pregnancy and increasing patient acuity have become commonplace, including an increased prevalence of gestational diabetes,⁴ hypertension,⁵ advanced maternal age,⁶ and other chronic health conditions,⁷ which make the frequency of exposure to adverse maternal and fetal outcomes more likely. Frequent exposures to adverse patient outcomes are forms of occupational trauma that have the ability to induce stress and disrupt clinician well-being.⁸

Exposure to occupational trauma can occur when emergency and healthcare workers are exposed to and care for individuals who experience trauma. Traumatic events include exposure to actual or threatened death and serious injury.^{9,10} Exposure may occur directly when an individual witnesses an event or indirectly when an individual learns about the event secondhand or experiences repeated reminders of such events.^{9,10} Exposure to physical and mental trauma has been observed in a variety of healthcare fields, including maternity care.¹¹⁻¹⁵ When occupational traumas occur in the maternity unit, it is often in the form of a traumatic childbirth event.

Traumatic Childbirth Events

A traumatic childbirth event (TCE) is an obstetrical event involving actual or threatened serious injury or death to either the mother or child or both.¹² Based on a literature review, a TCE is conceptually defined as obstetrical outcomes that provoke psychological distress and defensive practice behaviors. Eight of the most common TCEs identified in the literature include shoulder dystocia, stillbirth/infant death, maternal death, uterine rupture, and injury to either mother or baby during the birth process.^{11-12, 16,17} TCE is a known source of occupational stress and litigation for physicians, midwives, and obstetrical nurses (OB clinicians).¹¹⁻¹⁴ Among obstetrical clinicians that experience TCEs, some experience psychological distress, burnout, and even premature withdrawal from professional practice.¹¹⁻¹⁴ However, little is known about the frequency at which OB clinicians are exposed to multiple TCEs and what influence cumulative TCE exposure has on OB clinicians, both professionally and personally. It is also unknown why some OB clinicians are adversely impacted by TCE exposure while other OB clinicians adapt after exposure.

Resilience

An individual's ability to adapt and withstand hardship is known as resilience.^{18,19} Resilience is a dynamic process that allows a person to maintain normal functioning in stressful situations.^{20,21} Researchers have characterized resilience as adaptability, recovery, and sustainability.^{21,22} Resilience is characterized by other researchers as tenacity, perseverance, hardiness, adaptability, and personal competence.^{20, 23-26} These qualities have the potential to assist OB clinicians with successfully navigating adversities encountered in the maternity unit.

Resilience in healthcare workers has been shown to be associated with individual personal factors as well as external factors within the healthcare organization HCO.²⁷ Healthcare workers with sufficient resilience via personal protective factors and organizational resilience-building resources are better equipped to navigate and absorb high levels of disruptive changes while displaying minimally dysfunctional behaviors.^{27, 28} However, when levels of resilience are insufficient, healthcare workers have been shown to experience burnout, and HCOs began to experience issues with staff retention.^{27, 28}

In both midwives and obstetrical resident physicians, low levels of resiliency were associated with poor mental health and thoughts of withdrawing from obstetrical and gynecology practice.^{29,30} Whereas high levels of resilience were significantly associated with increased self-confidence and problem-solving skill of midwifery students.³¹ Past resiliency researchers in other specialties of medicine suggested that resiliency plays an intricate role in the ability to mentally and emotionally recover after healthcare workers are exposed to workplace trauma, and that resilience can moderate burnout.^{23, 26-28} Yet, before the moderating abilities of resilience can be tested in OB clinicians exposed to TCE, an assessment of resilience and the prevalence of burnout is necessary.

Burnout

Burnout among healthcare workers in the U.S. has been deemed a crisis by the Surgeon General.³² Burnout is defined as work-related stress caused by job requirements that do not match the capabilities, resources, and needs of the employee.^{33,34} Interpersonal conflict, workload, low morale within the organization culture, bad management practices, stressful relationships with colleagues, changes within management, lack of support, role

conflict, and trauma in the work environment are the antecedents of burnout.^{33,35, 36} Burnout manifests itself in the clinical environment via counterproductive work behaviors.^{32, 37-39} Clinicians can internalize their burnout or externalize it by engaging in counterproductive work behaviors, such as excessively long breaks, absenteeism due to fictitious illness, and frequent turnover. These behaviors are harmful to healthcare organizations and harmful to patient care.^{34,38 37}

Nurses and physicians that are exposed to traumatic childbirth events have a great potential for developing psychological distress, including secondary traumatic stress syndrome, and as a result of these events, are likely to develop behaviors consistent with burnout.^{12-15, 34} Although specialties within maternity care, such as midwifery, obstetrics, and gynecology have been shown to experience burnout at high rates, little is known about TCE exposure acting as a catalyst for burnout.^{40,41} It is plausible that TCE events or repeated exposure to TCE events could act as a catalyst for burnout in OB clinicians. Therefore, this study tested the hypothesis that exposure to TCEs influences burnout in OB clinicians and resiliency can moderate the relationship.

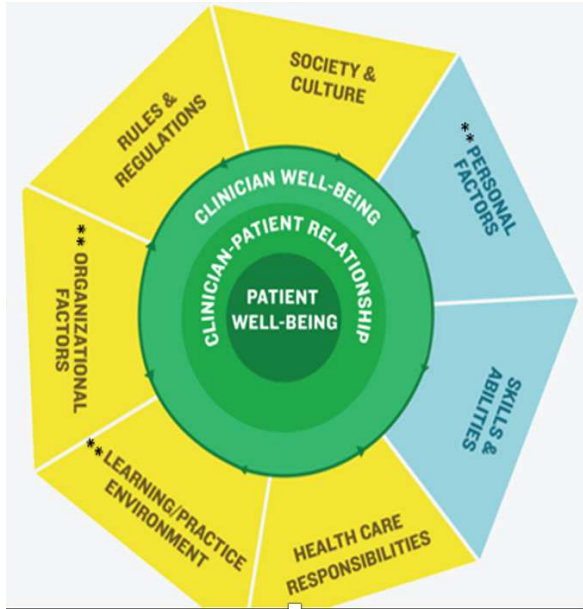
The following aims were examined: 1) Describe the frequency and severity of TCEs and how they affect the professional practice and personal lives of maternity care clinicians, including RNs, CNMs, attending physicians, and resident physicians; 2) Describe personal (e.g., demographic, personal demands), and work organization factors (e.g., hospital-based employee support services, maternity unit volume, and the presence of high-risk patients) associated with OB clinician resilience; and 3) Describe TCE exposure and burnout in OB

clinicians; explore the relationship between TCE exposure and burnout, and test the moderating ability of resilience.

Conceptual Model

The National Academy of Medicine's Factors Effecting Clinician Wellbeing and Resilience model served as the framework for this study (Figure 1.1).⁴² The model is appropriate because the objective of the model is to "identify methods for addressing an individual or systems-level barrier to well-being; and recommends pathways to prevent or treat burnout."⁴² The model shows how an individual's personal factors, skills, healthcare responsibilities, learning practice environment, work organizational factors, rules and regulations, and society and culture all influence clinician wellbeing, ultimately affecting patient wellbeing. The model is broad, but for the purpose of this study, two condensed conceptual models were created to show how similar concepts influence clinician well-being. Personal factors include gender, ethnicity, and tenure of participants. Work organizational factors focus on the maternity unit's availability of organizational-based employee support programs, unit acuity, and the number of deliveries each year.

Figure 1.1. Factors Affecting Clinician Well-Being and Resilience Model Adapted by the National Academy of Medicine



Methods

Study Design

This descriptive cross-sectional study collected data via a survey from obstetrical clinicians practicing in five Baltimore hospital labor and delivery units. All five hospitals have registered nurses, residents, physicians, certified nurse-midwives (CNM), and an onsite Level 2 or higher neonatal intensive care unit. Maternity units with a Level 2 or higher neonatal intensive care unit are more likely to care for both high and low-risk maternity patients, thereby increasing the likelihood of clinician exposure to TCE events. The sample consists of midwives, obstetrical nurses, resident physicians, and attending physicians, referred to as OB clinicians.

Sample and Setting

Across the five hospitals, the potential sample size was estimated to be 325+ OB clinicians. An a priori power analysis of simple effects between TCB exposure level and burnout, assuming a small to medium effect size ($F=.09$) and five covariates, required a sample size of 150 participants to achieve a beta of 0.80 and an alpha of 0.05. Assuming a 50% response rate, the sample would be large enough. This assumed response rate aligns with traditional response rates of 35% for physicians, 36.4% for resident physicians, 56% for specialized nurses, and 57% for nurses.⁴²⁻⁴⁴

Measures

Two surveys were developed, one at the organizational and one at the individual participant level. The first survey was used to assess the learning/practice environment factors that might influence TCE exposure, resilience, and burnout. This questionnaire was completed by the study unit nurse administrators, an approach utilized in other organizational studies. Factors that were assessed included available emotional support programs, collateral pathways, and the annual number of deliveries and high-risk maternity patients on the unit.

The second survey was for OB clinicians and consisted of four parts: 1) personal-demographic information, 2) TCE exposure assessment, 3) a resilience self-assessment, and 4) a burnout self-assessment.

- a. Personal-demographic assessments. Participants' professional roles (e.g., nurse, midwife, or physician), years in practice, age, ethnicity, and gender were assessed.

- b. TCE exposure assessment. The most commonly litigated obstetrical events were identified for study: fetal death, shoulder dystocia, maternal death, ruptured uterus during a trial of labor, and operative vaginal delivery that results in maternal or injury to the newborn.¹¹⁻¹⁷ The survey assessed four dimensions: the type, frequency of exposure, the perceived severity, and the impact on the practice and personal life of OB clinicians.
- c. Resilience self-assessment. The Connor-Davidson Resilience Scale, a 25-item assessment, was used to measure resilience. Scores in the 1st quartile indicated low resilience, the 2nd and 3rd quartiles indicated intermediate resilience, whereas the 4th quartile indicated high resilience.^{19,45} The psychometrics of the Connor-Davidson resilience scale include a Cronbach alpha of 0.8 and demonstrate test and retest reliability even in the presence of pre-existing mental health conditions.^{19,47}
- d. Burnout self-assessment. The Maslach Burnout–Human Services Survey for Medical Personnel was used to measure burnout. The questionnaire consisted of three subscales: emotional exhaustion, depersonalization, and personal accomplishments. The Cronbach’s alpha for all three subscales is above 0.7.⁴⁶ Low levels of perceived personal accomplishment and high levels of emotional exhaustion and depersonalization are indicators of overall burnout.

Procedures

Before initiating the study, letters of support were acquired from each of the five hospital sites. These letters of support served as agreements that ensured that sponsors would

allow advertisements regarding the study to be posted on the maternity unit and facilitate the distribution of the survey link via the departmental mass email list. One week after the advertisement flyers were hung, an introductory email containing a secure link to the anonymous survey was sent to all the OB clinicians on the department's mass email list. The introductory email was followed by two reminder emails 30 days apart. The advertisement flyers and the introductory email both described the study's purpose, inclusion criteria (clinician role type), what the participant was being asked to do, and that participation was voluntary. A \$20 e-gift card was offered to each participant to compensate participants for their time and expertise.

Statistical Analysis

Data were exported from Qualtrics into SPSS. Data quality and completeness checks for all collected data were assessed and cleaned. An explanatory data analysis (EDA) was conducted to test assumptions and identify missing data. TCE dimensions with variables with 100% missing values were excluded from the analysis. Otherwise, missing data were handled according to the developers' instructions of the Connor-Davidson Resilience Scale and Maslach Burnout–Human Services Survey for Medical Personnel. The descriptive analysis provided the characteristics of the participants. Data were explored for normal distributions, means, and standard deviations (SD). Bivariate analysis was used to explore relationships and to identify variables that would serve as predictors in a linear regression.

An intraclass correlation coefficient (ICC) was calculated to determine if there was a clustering effect for resiliency and burnout at the hospital level. Both ICCs were identified as being >5%; therefore, multilevel analysis was used to account for the clustering of resilience

and burnout within the hospital recruitment site. Although each recruitment site had a maternity unit, the organizational culture, organizational policies, organizational procedures, and frequency of encounters with TCEs may differ. Clustering is a form of hierarchical modeling that accounts for variations in resilience and burnout scores within each specific recruitment site. Whereas, not clustering would combine each recruitment site's resilience and burnout scores and mask any differences that may exist.

For Aim 1, the TCE exposures were described by type, frequency, severity, and impact. Levels of TCE exposure were determined from these responses and categorized as low, medium, or high. Frequencies and proportions were used to describe participant characteristics and types of TCEs. Chi-square analysis was used to compare levels of TCE exposure by clinician type. Pearson's correlations examined the relationships among the variables of age, years of practice, influence on professional practice, and influence on personal life. Based on the correlation, a linear regression was then used to identify the influence of TCE frequency, perception of severity, and years in practice on the participants' professional practice and personal life.

For Aim 2, frequency and proportions were used to describe participants and characteristics. ANOVA was used to compare mean resilience scores across recruitment sites. General linear multilevel modeling examined associations with resilience clustered by recruitment site.

For Aim 3, descriptive and bivariate statistics were used to describe relationships. Bivariate analyses were performed to identify associations among demographics, occupational characteristics, and burnout. ANOVA was used to identify the mean differences

across groups in MBI-MP subscale scores. Finally, the PROCESS-macro extension for SPSS was used to test the ability of resilience to moderate the relationship between the aspects of TCE exposure and burnout.

Summary

This dissertation includes three manuscripts (Chapters 2 to 4). Chapter 2 (Aim 1) describes the frequency and severity of TCEs and how they affect the professional practice and personal lives of maternity care clinicians, including RNs, CNMs, attending physicians, and resident physicians. Chapter 3 (Aim 2) describes personal (e.g., demographic, personal demands), and work organization factors (e.g., hospital-based employee support services, maternity unit volume, and the presence of high-risk patients) associated with OB clinician resilience. Chapter 4 (Aim 3) measures TCE exposure and burnout in OB clinicians, explores the relationship between TCE exposure and burnout, and tests the moderating ability of resilience.

These manuscripts contribute evidence to occupational research science by generating new knowledge regarding the impact of TCE event exposure on OB clinicians. It will also expand knowledge and understanding related to the associations between TCE exposure, burnout, and resilience in an understudied population of clinicians. These manuscripts have the potential to identify modifiable factors within the work organizations that could be used to develop a blueprint for building resilience in OB clinicians.

Chapter 2: Cross-Sectional Study of the Frequency and Severity of Traumatic Childbirth

Background

Occupational trauma is a known stressor in the workplace that can disrupt clinician well-being.⁸ Exposure to occupational trauma can occur when emergency and health care workers are exposed to and care for individuals who experience trauma. Traumatic events include exposure to actual or threatened death, serious injury, or sexual violence.^{9,10} Exposure may occur directly when an individual witnesses an event or indirectly when an individual learns about the event secondhand or experiences repeated reminders of such events.^{9,10} Exposure to physical and mental trauma has been observed in a variety of healthcare fields, including maternity care.¹¹⁻¹⁴ The careers of maternity care clinicians (RNs, CNMs, attending physicians, and resident physicians) are often perceived as filled with continuous joy and instant gratification. However, these clinicians experience occupational trauma related to adverse maternal and newborn events.

A TCE is defined as the “perception or actual threat to the life of the mother, the newborn, or both.”¹⁵ Although TCEs are usually described from the patient’s perspective, maternity care clinicians also experience these events. Accurate measurement of the frequency of TCEs among maternity care clinicians has been challenging, partially because of the inconsistent use of terms and measures to describe TCEs. Research is needed to accurately describe the types of TCEs experienced on maternity units, and consistency should be used to identify their severity. Findings related to the frequency, type, and severity of TCEs have the potential to increase understanding of maternity care clinicians’ exposure to trauma and whether this exposure influences their professional and personal well-being.

In the United States, the current maternal death rate is 23.8 per 100,000 live births¹ and the fetal death rate is 5.4 deaths per 1,000 live births.^{2,3} Although there have been consistent annual decreases in the annual fetal death rate³ the United States has witnessed a gradual increase in maternal morbidity and mortality during and after birth, especially among non-Hispanic Black women^{2,3} Comorbidities in pregnancy and increasing patient acuity have become commonplace, including an increased prevalence of gestational diabetes, hypertension, advanced maternal age, and other chronic health conditions, which makes the frequency of exposure to TCEs by maternity care clinicians more likely.⁴⁻⁷

Maternity care clinicians most frequently experience TCEs that involve the death or threatened death of a newborn as a result of preterm birth being the second leading cause of death in neonates.⁴⁷ In the United States, there are 500,000 premature neonates born each year.⁴⁸ Births of neonates at less than 32 weeks gestation represent approximately 1.6% of all births in the United States.⁴⁹ Less than 50% of premature neonates born before 24 weeks gestation survive.⁵⁰ Furthermore, maternity care clinicians attend the births of approximately 24,000 stillborn fetuses each year.⁵¹ The most common causes of premature birth and stillbirth are multiple gestations, diabetes, and hypertension.⁴⁷ Maternity care clinicians also experience TCEs related to birth injuries, which are estimated to occur in 1.9 per 1,000 births in the United States.⁵² Scalp injuries related to instrument-assisted births and injuries to the fetal skeleton are two of the most common birth injuries.^{52,53} The threatened loss of a woman's life is a TCE also experienced by maternity care clinicians. Maternal deaths occur in the United States at a rate of 28.3 per 100,000 live births of all maternal deaths, 13% are

attributable to postpartum hemorrhage, and 15.5% are attributable to maternal cardiovascular conditions.^{3,54}

Earlier cross-sectional, retrospective research findings provided evidence that when a TCE occurs, the event may trigger psychological distress in the clinician.^{12,14} Kerkman et al. found that 17% of 691 Dutch midwives screened positive for posttraumatic stress disorder (PTSD) after experiencing work-related TCEs: 14% reported anxiety symptoms, and 7% reported symptoms of depression.⁵⁵ In a study conducted in Sweden, researchers found that 15% of 1,628 maternity care clinicians had some degree of psychological distress, and midwives experienced PTSD more frequently than their obstetrician colleagues.¹⁴ In a study of 1,301 Japanese obstetricians and gynecologists, the K-6 distress scale was used and found psychological distress at almost identical rates by sex for obstetricians and gynecologists: 8.9% of male and 7.7% of female obstetricians and gynecologist respondents suffered from depression or anxiety related to TCEs at work.⁵⁶ Using a mixed-methods approach, Beck et al. reported that 29% of 473 CNMs who were members of the American College of Nurse-Midwives reported high to severe secondary stress and that 36% screened positive for PTSD.⁵⁷ Similarly, a mixed-methods study of 1,095 physicians and reported that 31% of 728 respondents who reported a work-related trauma exposure had experienced symptoms of PTSD.¹⁷

Of 464 maternity RNs in the United States, 26% met the diagnostic criteria for PTSD, and 35% experienced secondary traumatic stress.¹¹ In mixed-methods studies, researchers were able to identify the presence of symptoms of PTSD and secondary traumatic stress in

CNMs and labor and delivery RNs more distinctly than with the use of quantitative methods alone.^{11,12}

Although these studies primarily focused on the effects of experiencing TCEs on maternity care clinicians' personal lives, including their mental health, it is our intent to also focus on how TCEs may affect the professional practice of maternity care clinicians. Researchers described the effect of exposure to TCEs as potentially career-altering.^{12,17} For example, CNMs reported that after exposure to TCEs, they engaged in defensive practices in their professional practice, including moving to hospitals where backup physicians were readily available to assist with emergencies, returning to nursing roles, withdrawing from full-scope midwifery practice, and no longer providing intrapartum care.¹² Physicians also reported defensive practices in their professional practice after exposure to TCEs, including distancing themselves from patients, approaching procedures with increased anxiety, and withdrawing from obstetric practice.¹⁷ Staff RNs reported a strong desire to leave their careers on maternity units after exposure to TCEs.¹¹

While conducting this study, we discovered that accurately measuring the frequency of TCEs in maternity care is challenging, partially because of the inconsistency of terms used to define TCEs, which are also referred to as birth injuries and adverse pregnancy outcomes. A birth injury is the structural destruction or functional deterioration of the body of the neonate because of a traumatic event at birth.⁵² Birth injuries can be related to forceps and vacuum extraction procedures and also include shoulder dystocia.^{53,58,59} Adverse pregnancy outcomes are defined as chromosomal abnormalities, congenital malformations, miscarriage,

stillbirth, or birth before 34 weeks gestation.⁶⁰ By definition, adverse pregnancy outcomes focus only on fetal outcomes and exclude maternal outcomes.

We decided that TCE is the preferred term for our study because the definition is inclusive of the perceptions of threat to the life of the mother, the newborn, or both, thereby capturing maternal and newborn adverse outcomes. Beyond conceptual definitions, a cohesive approach to identify, measure the frequency of, and assess perceptions of occupational stressors such as TCEs is essential. We used an objective measure of TCEs to contribute to strengthening the consistent measurement of occupational trauma exposures in maternity care clinicians. The purpose of our study was to describe the frequency and severity of TCEs and how they affect the professional practice and personal lives of maternity care clinicians, including RNs, CNMs, attending physicians, and resident physicians.

Methods

Design

We conducted a descriptive cross-sectional study using an anonymous online survey. We distributed the survey as an electronic link in an e-mail from each participating hospital's maternity unit's departmental mass e-mail list. The University of Maryland institutional review board approved our study and granted exempt status. We maintained participants' confidentiality using password-protected encrypted data collection software and by not permitting research team members to access the recruitment sites' departmental mass e-mail lists. In addition, personal identifiers were not collected.

Setting

We recruited participants from five hospital maternity units in the Baltimore Metropolitan area. Three of these recruitment sites were teaching institutions. The recruitment sites provided care to populations of women seeking maternity care with similar risk factors. Clinicians at these five units cared for women in the intrapartum period with similar high-risk challenges, including hypertension, diabetes, multiple gestations, substance abuse, and morbid obesity. All recruitment sites had an onsite Level 2 or greater NICU. Level 2 or greater NICUs treat neonates with mild to severe health problems and are more likely to care for high- and low-risk births, thereby increasing the likelihood of clinician exposure to a TCE event.⁶¹ Recruitment site A was a 22-bed maternity unit with an estimated 1,700 births annually, staffed by RNs, CNMs, physician assistants, attending physicians, and obstetrics and family medicine resident physicians (resident physicians). Recruitment site B was a 14-bed maternity unit with an estimated 2,500 births annually that is also staffed by RNs, CNMs, physician assistants, attending physicians, and resident physicians. Recruitment site C was a 10-bed maternity unit with 1,500 annual births staffed only by attending physicians and RNs. Recruitment site D was a 15-bed maternity unit with an estimated 3,000 annual births staffed by RNs, CNMs, physician assistants, attending physicians, and resident physicians. Recruitment site E was a 12-bed maternity unit with an estimated 1,770 annual births staffed by attending physicians, CNMs, and RNs.

Sample

Study participants consisted of maternity care clinicians, including RNs, resident physicians (obstetrics or family medicine), attending obstetrician physicians, and CNMs.

Participant inclusion criteria consisted of maternity care clinicians employed at any of the recruiting hospitals who provided direct care for women during the intrapartum period.

Measures

We defined TCEs based on our review of the literature as events that may provoke psychological distress and defensive practice behaviors, specifically, shoulder dystocia, uncontrolled postpartum hemorrhage, stillbirth/infant death, unsuccessful newborn resuscitation, maternal death, uterine rupture, and instrument injury to mother or newborn during the birth process. We developed survey items to assess the frequency of exposure to these eight TCEs, perceptions of the severity of the TCEs, and their perceived influence on participants' professional practice and personal life.

Before implementing the research study, we pilot-tested the TCE survey items to validate the eight birth outcomes as TCEs. The pilot test also allowed us to perfect the questions in our study by identifying ambiguous questions or wording, unclear instructions, or other problems with the TCE measurement before widespread dissemination of our survey. The pilot sample consisted of a convenience sample (N= 15) of maternity care RNs, CNMs, and obstetrics physicians. We asked the pilot study recipients to complete a paper survey that would gauge their exposure to TCEs and the severity of those TCEs. Respondents were asked to indicate a "yes" or "no" response for a history of exposure to each individual TCE. The respondents were then asked to use a scale of 0 to 10 to separately rate the severity of the TCE and the influence the TCE had on their professional practice and personal life. These respondents endorsed the eight specific birth outcomes as TCE events. The pilot study findings were congruent with those birth outcomes identified in the literature as TCEs,

suggesting content validity. As a result of the pilot study, we revised one survey item. Instead of respondents indicating “yes” or “no” to having experienced a particular TCE, respondents were asked to indicate the frequency with which they experienced each individual TCE, with never offered as a valid response.

The revised TCE survey questionnaire measured the frequency of exposure, perception of severity, and perceived influence on the participant’s professional practice and personal life for each of the eight TCEs. The frequency of exposure was measured with the question, “How many times have you experienced the following?” The five response options included never, 1–3 times, 4–6 times, 7–9 times, and 10 times or more and were coded as 1 through 5, respectively. We summed the frequency categories across the eight TCEs and used tertiles to create low, medium, and high levels of TCE exposure. TCE severity categories consisted of none (1), very mild (2), mild (3), moderate (4), or severe (5). We also summed the severity categories and used tertiles to create low, medium, and high levels of severity. The two survey items, influence on professional practice and influence on personal life, were measured independently with 5-point Likert responses (none, very mild, mild, moderate, and major) and also coded as 1 through 5, respectively. Both items were summed independently of each other to create two separate variables, total influence on professional practice and total influence on personal life.

Multiple-choice items consisted of demographic variables including age (21–34, 35–54, 55–64, 65–75 years), sex (male or female), race (White, Black Asian/Pacific Islander, Hispanic/other), and relationship status (married, single in a relationship, single, divorced). Participants also provided multiple-choice responses to describe their professional

characteristics, including employment status (full-time, part-time, self-employed, or pro re nata), occupational title (RN, CNM, attending physician, or resident physician), and years in practice (1 or less, 2–3, 4–5, 6–10, 11–15, 16–20, 21 or more). The four subscales (Frequency, Severity, Effect on Professional Life, Effect on Personal Life) of the TCE measure had Cronbach's alpha coefficients of internal consistency reliability of .824 for Frequency, .774 for Severity, .783 for Effect on Professional Practice, and .821 for Effect on Personal Life.

Procedure

We acquired letters of support from the five hospitals that served as data collection sites. These letters of support served as agreements that ensured the sites would post a flyer about the study on the maternity unit and distribute the survey link via the departmental mass e-mail list. One week after the flyers were posted, we sent out an introductory e-mail to maternity care clinicians on each hospital's mass e-mail list that included a secure link to our anonymous survey. The introductory e-mail included a paragraph describing the study's purpose, inclusion criteria (clinician role type), what the participant was being asked to do, and an indication that participation was voluntary. The introductory paragraph also explained that completion or partial completion of the survey implied consent. After we sent this initial introductory e-mail, we sent two reminder e-mails 30 days apart. At the end of the survey, participants were given the option to provide their e-mail addresses to receive a \$20 e-gift card as compensation for their time and expertise.

Analysis

We were unable to estimate an effect size from the literature because previous researchers did not measure multiple TCEs and their effects on maternity care clinicians' professional practices and personal lives. Therefore, we assumed a conservative small to medium effect. An a priori power analysis with G*Power indicated that a sample of 126 was needed to achieve a small to medium effect size ($F= 0.09$) as well as a power of .80 and an alpha of .05 for linear regression with three explanatory variables (TCE frequency, TCE severity, and years in practice) and the association of these variables with two outcome variables (influence on professional practice and influence on personal life).⁶²

We analyzed our data using SPSS, Version 27 and used frequency and proportions to describe participant characteristics and types of TCEs. Chi-square analysis was used to compare levels of TCE exposure stratified by clinician type and score means to describe the perceived severity of TCEs. We confirmed significant findings via the Fisher exact test for cells less than five. Finally, after parametric assumptions were met, we used Pearson's correlation to examine the relationships among the variable age, years of practice, influence on professional practice, and influence on personal life. Based on the correlation, a linear regression was then used to identify the influence of TCE frequency, perception of severity, and years in practice on the participants' professional practice and personal life.

Results

Characteristics of Participants

A total of 167 participants accessed our TCE survey. Although surveys with missing data were included in the analysis, we removed seven participants' files during the data

cleaning process because of missing values on all variables, resulting in a final sample of 160 participants. Each of the five hospitals had some respondents, but we could not determine the return rate by hospital because the total number of maternity care clinicians to serve as the denominator was not available for each hospital. As depicted in Table 1, most participants were women (92.5%), White (62.5%), between the ages of 21 and 54 years (89.4%), RNs (65.0%), and employed full-time (79.2%). Only 16.3% reported having 21 years or more of work experience. The work experience question was generalized and not specific to work in maternity care. Four RN participants reported not experiencing a TCE event; three of these participants had less than 5 years of work experience, and another had 21 years or more of nursing experience. In addition, one RN participant chose not to answer any TCE frequency items but answered all other items within the survey, whereas others chose not to answer severity items as well as items for influence on their professional practice and personal life. All were included in the analysis.

Frequency of TCE

Most (97.5%) participants had experienced at least one TCE during their careers (see Table 2). The most common TCEs were shoulder dystocia (90.6%), stillbirth (80.4%), and uncontrolled postpartum hemorrhage (73.6%). More than half of the participants reported being exposed at least once to a TCE during their careers, including maternal death (53.5%), unsuccessful newborn resuscitation (52.2%), and uterine rupture (55.1%). Only a few participants had experienced a birth that involved a maternal or newborn instrument injury (25.8% and 42.8%, respectively).

Mean Perception of Severity of TCEs

We assessed TCE severity with a range of 1 through 5, with higher scores indicating greater perceived severity (see Table 2.1). Maternal death had the greatest severity ($M = 4.82$, $SD = 0.54$), followed by unsuccessful newborn resuscitation ($M = 4.65$, $SD = 0.59$). Beyond death of mothers and their newborns, uterine rupture ($M = 4.24$, $SD = 0.84$), postpartum hemorrhage ($M = 4.22$, $SD = 0.73$), and stillbirths ($M = 4.10$, $SD = 0.95$) all ranked high in severity with means greater than 4.0. Participants scored shoulder dystocia ($M = 3.72$, $SD = 0.98$), maternal instrument injury ($M = 3.64$, $SD = 0.99$), and newborn instrument injury ($M = 3.10$, $SD = 1.07$) lowest in severity.

Table 2.1. Characteristics of Participants (N=160).

	<i>n</i> (%)
Gender	
Male	12 (7.5)
Female	148 (92.5)
Race	
White	100 (62.5)
Black	37 (23.1)
Asian/Pacific Islander	11 (6.9)
Hispanic/Other	12 (7.5)
Age	
21-34 years old	74 (46.2)
35-54 years old	69 (43.1)
55-64 years old	14 (8.8)
65-75 years old	3 (1.9)
Relationship Status	
Married or Civil Union	92 (57.5)
Single in a Relationship	29 (18.1)
Single	28 (17.5)
Divorced	11 (6.9)
Employment Status	
Full-time	126 (79.2)
Part-time	19 (11.9)
Self-employed/Pro re nata	14 (8.8)
Occupational Title	
Registered Nurse	104 (65.0)
Certified Nurse-Midwife	17 (10.6)
Attending Physician	28 (17.5)
Resident Physician	11 (6.9)
Years in Practice	
1 year or less	21 (13.2)
2 years to 3 years	29 *18.2)
4 years to 5 years	12 (7.5)
6 to 10 years	32 (20.1)
11 to 15 years	27 (16.9)
16 to 20 years	12 (7.5)
21 years or more	26 (16.3)

Note: Data are missing from employment status and years in practice

Frequency of Exposure to TCEs, Severity, and Influence on Professional Practice and Personal Life by Occupation

We stratified TCE frequency by occupation to explore variations in experiences. There was a significant difference in the frequency of TCEs across occupational categories, $X^2(6) = 23.8$ ($n = 159$), $p < .001$, yet no difference in the perceptions of severity (see Table 2.2). Fifty percent of the 28 attending physician participants reported the greatest frequency of TCEs. The 17 CNM participants reported the greatest proportion of TCE effect on their professional practice (43.7%) and personal life (53.0%) compared to the other occupational groups. There was a significant difference in the effect of TCEs on personal life by occupation, $X^2(6) = 13.0$ ($n = 159$), $p = .04$; however, there was no difference in the effect of TCEs on professional practice.

Table 2.2. Mean Severity and Frequency Rating of Traumatic Childbirth Events

Traumatic Childbirth Events	Severity				Frequency of Experience Percentages					
	<i>n</i>	<i>M</i>	<i>SD</i>	Range	Never	<i>n</i> %	1-3x	<i>n</i> %	4-6x	<i>n</i> %
Maternal death	159	4.82	.54	1-5	74	46.5	73	45.9	7	4.4
Unsuccessful Newborn resuscitation	159	4.65	.59	1-5	76	47.8	59	37.1	17	10.7
Uterine rupture	158	4.24	.84	1-5	71	44.9	69	43.7	12	7.6
Postpartum hemorrhage	159	4.22	.73	1-5	42	26.4	83	52.2	20	12.6
Stillbirth	158	4.10	.95	1-5	31	19.6	41	25.9	30	19.0
Shoulder dystocia	159	3.72	.98	1-5	15	9.4	58	36.5	31	19.5
Maternal instrument injury	159	3.64	.99	1-5	118	74.2	38	23.9	1	0.6
Newborn instrument injury	159	3.10	1.07	1-5	91	57.2	55	34.6	11	6.9

Note. Mean severity is calculated only for those having any frequency of the experience)

Despite the findings indicating a significant difference in the proportion of TCE levels of exposures and influence on personal life stratified by occupation, the chi-square statistics must be interpreted cautiously because of violations of the lowest expected cell frequency assumption. Therefore, two-sided Fisher exact tests were performed and confirmed

that significant differences existed among maternity care clinician provider types and levels of TCE frequency ($p < .001$, Fisher exact test) and influence on personal life ($p = .041$, Fisher exact test).

Associations Among TCE Variables

We used Pearson's correlations to examine the relationships among the four TCE dimensions (frequency, severity, effect on professional practice, effect on personal life) and participants' characteristics (see Table 2.3). TCE frequency scores had significant positive correlations with age $r(157) = 0.440$, $p < .001$, and years in practice $r(154) = 0.509$, $p < .001$. Significant correlations were observed between TCE frequency and perceived severity, $r(157) = 0.570$, $p < .001$, and between TCE frequency and perceived effect on professional practice, $r(154) = 0.415$, $p < .001$ and personal life, $r(155) = 0.386$, $p < .001$.

Table 2.3. Frequency, Severity, and Effect of Traumatic Childbirth Events on Participants

Traumatic Childbirth Subscales	Registered Nurses <i>n</i> (%)	Certified Nurse-Midwives <i>n</i> (%)	Attending Physicians <i>n</i> (%)	Resident Physicians <i>n</i> (%)	Statistic <i>p</i> value
Frequency					
Low	50 (49.0)	4 (23.5)	2 (7.1)	6 (54.5)	$X^2=23.8$ $p < .001$
Medium	20 (19.0)	9 (53.0)	12 (42.9)	3 (27.3)	
High	33 (32.0)	4 (23.5)	14 (50.0)	2 (18.2)	
Severity					
Low	38(36.9)	6 (35.3)	4 (14.2)	4 (36.3)	$X^2= 6.29$ $p=.391$
Medium	36 (34.9)	6 (35.3)	12 (42.9)	5 (45.5)	
High	29 (28.2)	5 (29.4)	12 (42.9)	2 (18.2)	
Influence on Practice					
Low	34 (33.7)	3 (18.7)	8 (28.6)	7 (63.6)	$X^2=6.48$ $p=.380$
Medium	34 (33.7)	6 (37.5)	10 (35.7)	2 (18.2)	
High	33 (32.6)	7 (43.8)	10(35.7)	2 (18.2)	
Influence on Personal Life					
Low	40 (39.6)	4 (23.5)	5 (17.9)	6 (54.5)	$X^2=13.0$ $p=.04$
Medium	34 (33.7)	4 (23.5)	9 (32.1)	4 (36.4)	
High	27(26.7)	9 (53.0)	14 (50.0)	1 (9.1)	

Influence of TCEs on Professional Practice and Personal Life

We used linear regression in two models to quantify the strength of relationships between the frequency of TCE, the severity of TCE, participants' years in practice, and their occupation with the dependent variables of influence on participants' professional practice and personal life. We excluded age because of collinearity with years in practice. Attending physicians were the referent group because they experienced TCEs in a greater proportion than all other maternity care clinicians. As depicted in Table 2.4, although the frequency of TCE exposure and perceived severity of TCEs shared significant relationships with influence on professional practice and personal life in bivariate analysis, only perception of TCE severity was strongly associated with an effect on professional practice ($B = 0.52, p < .001$) and personal life ($B = 0.46, p < .001$). Years in practice had no effect on influence on professional practice yet had a modest relationship with effect on personal life ($b = 0.19, p < .05$). Also, despite the chi-square analysis indicating a significant relationship between occupation and influence on personal life, the regression model did not support this relationship.

Table 2.4. Linear Regression of TCE Effect on Professional Practice and Effect on Personal Life

Variables	Effect on Professional Practice			Effect on Personal Life		
	Stdz beta	SE	95% CI LL UL	Stdz beta	SE	95% CI LL UL
Constant		2.04	2.41 – 5.67	.	2.01	-4.18 - 3.78
Frequency	.06	.126	.139 - .359	.02	.124	-.199 - .291
Severity	.52***	.076	.352 - .653	.46***	.075	.277 - .573
Years in Practice	.11	.309	-.305 - .917	.19*	.305	.052 - 1.52
Registered Nurse	.011	1.39	-2.58 – 2.93	-.078	1.38	-3.904 - 1.53
Certified Nurse- Midwife	.042	1.99	-2.86 – 5.01	-.015	1.93	-4.17 – 3.44
Resident Physician	-.087	2.40	-7.33 – 2.16	.109	2.36	7.75 – 1.59

* $p < .05$. ** $p < .01$. *** $p < .001$. Stdz= Standardized Beta

Discussion

Despite their varying roles on maternity units, participants in all occupational categories reported experiencing at least one TCE during their careers. The most frequently encountered TCE was shoulder dystocia, with a large majority (90.6%) of participants experiencing at least one. This is not surprising, because the incidence of shoulder dystocia ranges from 0.1% to 3.0% of all births in the United States.⁶³ Most (80.4%) participants also reported exposure to stillbirth. Although not the most frequent TCE experienced, maternal death (53.5%) and unsuccessful newborn resuscitation (52.2%) were perceived as the most severe by participants. With TCE frequency stratified by occupation, attending physicians had the greatest frequency of exposure, followed by RNs, CNMs, and resident physicians, which aligns with traditional patient care responsibilities established by many professional organizations and their scope of practice guidelines. Many CNMs, family medicine residents, and first-year obstetrics residents have limited roles with or engage in co-management of the

care of women with high-risk pregnancies, and others are required to transfer the care of these women to attending physicians.⁶⁴⁶⁵⁻⁶⁷ The practice guidelines for CNMs and resident physicians requiring the transfer of care or co-management of the care of women with high-risk pregnancies may explain why the frequency of exposure to TCEs among CNMs and resident physicians was lower than among attending physicians. Despite their ability to transfer the care of women to attending physicians, CNM participants reported that TCE exposure had a strong effect on their professional practice in comparison to the effect experienced by attending and resident physicians.

The second greatest frequency of exposure to TCEs occurred among RN participants. This finding is consistent with the responsibilities on most maternity units in that RNs provide maternity care to all women despite the presence of high-risk factors.⁶⁸ Staffing guidelines typically require the presence of two RNs at birth: an RN to provide care for the mother and an RN for the neonate.⁶⁸ These staffing ratios increase the likelihood of RNs' TCE exposure. We also identified a strong association between participants' perceptions of TCE severity and the effect on their professional practice. This finding aligns with previous reports of RNs describing a strong desire to leave the maternity unit and pursue careers in other areas of nursing after exposure to TCEs.¹¹ In earlier studies, CNMs reported returning to RN roles or withdrawing from full-scope midwifery practice and no longer providing intrapartum, and physicians reported withdrawing from obstetric practice because of TCE exposures.^{12,17}

Implications

Participants' perceptions of the severity of TCEs were associated with influence on their personal lives, which may be due to the psychological distress associated with TCEs.¹¹⁻¹⁴ Prior researchers identified an association between TCE exposures and psychological disorders such as depression, PTSD, and anxiety. It is possible that behaviors associated with psychological disorders, including avoidance, sadness, and engagement in self-destructive behaviors such as alcohol and drug abuse, may result in difficulties within relationships and enjoyment in activities of daily life.⁸ Measuring TCEs can help identify maternity care clinicians who are most at risk for developing psychological distress, burnout, or early withdrawal from practice. The ability to identify vulnerable or at-risk maternity care clinicians can facilitate the development and implementation of strategies to mitigate the negative effects of TCEs and promote clinician well-being. Potential mitigating strategies consist of debriefing tools, educational modules, and simulated drills of the most frequent and perceptually severe TCEs.⁶⁹

Limitations

There were several limitations to our study, including the design, sampling approach, and measurement. First, the cross-sectional design represents one point in time of clinicians' experiences. As a result, only associations between variables could be explored and not temporal sequences, predictions, or causal relationships. The second limitation was our sampling approach. We sampled only five hospitals with Level 2 or higher NICUs in one metropolitan region, which limits the generalizability of our results. Furthermore, we did not use the "prevent multiple submissions" feature in the software we used because this feature

may have hindered multiple participants from using a shared computer within a shared workspace. However, it is possible that an individual may have responded to the survey more than once. Finally, our sample was a convenience sample with e-mails sent to potential participants by administrators in the five hospitals. To remain compliant with the University of Maryland institutional review board's requirements, we did not have access to each hospital's mass e-mail list, so we could not verify the accuracy of the list or calculate a response rate. In addition, selection bias may have occurred because maternity care clinicians who perceived their TCE exposure as severe may have been more likely to complete the survey. Also, maternity care clinicians may not recall every TCE they experienced in their career, or they may only recall the most severe or stressful events. The limited participation of individuals in some professional roles resulted in an underrepresentation of some maternity care clinician occupations. Our data may have measurement limitations in that we did not specify the temporal aspect of TCE exposure. The absence of a temporal specification (e.g., within the last year) may have influenced participants' responses regarding the frequency, perceived severity, effect on practice, and effect on personal life as a result of exposure to TCEs. On reflection, the item "years in practice" should have been worded "years of practice in maternity care," which may have provided more information about participants who reported they had not experienced a TCE.

Conclusion

Maternity care clinicians' occupational exposures to TCEs have been understudied. Our findings contribute to the literature by strengthening the measurement of TCEs to include their perceived severity and effect on the professional practice and personal lives of

maternity care clinicians. We found that maternity care clinicians working in hospitals in one metropolitan area with Level 2 or higher NICUs are frequently exposed to TCEs and that if severe, these events are associated with effects on their professional practice and personal life. We demonstrated a modest association of occupational trauma with professional practice and personal life effects. Longitudinal studies with larger sample sizes, a larger array of obstetric care occupations, and more diverse practice settings can strengthen TCE measurement and provide opportunities to better understand the influence of TCE exposure on clinician well-being over time

Chapter 3: Factors Associated with OB Clinician Resilience

Background

Occupational Trauma

Hospitals are environments where change occurs regularly, and often times change is unpredictable. Hospitals are also environments where some members of the healthcare team face routine exposure to traumas such as adverse patient outcomes and deaths.³⁴

Occupational trauma is a known stressor, and its influence within the workplace can disrupt clinician wellbeing.⁸ Strengthening healthcare worker resilience has been proposed as a pathway to mitigate adverse provider outcomes that may be associated with overcoming exposures to trauma. Many hospitals began conducting studies to evaluate resilience levels and their influence on clinician wellbeing and patient care in areas of high-acuity medicine.²⁵⁻²⁷ The mitigating capabilities of resilience have been studied in an array of healthcare specialties, including transplant medicine, emergency medicine, the operating room, and intensive care units, yet it has been understudied in the specialty of maternity care within the United States (U.S).^{25-27, 70-72} Obstetrical nurses, nurse-midwives, residents, and attending physicians (OB clinicians) often experience occupational trauma exposures related to maternal and newborn adverse outcomes and deaths.^{13,14,73,74} Occupational exposure to trauma in the specialty of maternity care is shown to influence the OB clinician's, mental health, personal life, and professional practice.⁹⁻¹⁴ Now that the potential implications of trauma exposure in OB clinicians are known, the focus should now turn to modifiable pathways that enhance the OB clinician's ability to adapt and withstand the occupational stressors associated with work on the maternity unit.^{13,14,17,73-75}

Resilience

The quality that gives individuals the ability to adapt and withstand hardship is known as resilience.^{19,76} Resilience is a dynamic process that allows a person to maintain normal functioning in stressful situations.^{20,21} This dynamic process involves the processes of adaptability, recovery, and sustainability.^{21,22} Resilience is characterized by its critical attribute's tenacity, perseverance, hardiness, adaptability, and personal competence.^{20,23,24,26,77} It is these qualities that have the potential to assist OB clinicians with successfully navigating adversities encountered on the maternity unit.

Personal Factors

Initially, researchers suggested that resilience is preset, innate, and an inflexible trait. Personal factors such as gender, race, and age were thought to be dominant determinants of a person's level of resilience. Although inconsistent findings exist, it was proposed that men are more resilient than women.⁷⁸ Contributing factors identified in the literature include socially and culturally constructed gender roles resulting in women having higher rates of exposure to stressful events, and a higher willingness to report stress, which is often stigmatized as a sign of weakness.^{79,80} For example, women are traditionally responsible for themselves, their spouses, children, elderly parents, and the majority of daily household chores, coupled with responsibilities and obligations associated with employment outside the home.^{79,80} Whereas, men's roles are predominantly linked to external work and decision-making and are less likely to shoulder the burden of family stressors.^{79,80} These findings are supported by observational studies showing women scoring lower on resilience measures in

contrast to their male counterparts.^{79,80} Despite these findings, most resilience research suggests ambiguity in findings that proposes one gender is more resilient than the other.⁷⁹⁻⁸¹

Race is another personal factor that has the potential to influence levels of resilience.⁸¹⁻⁸⁵ It is suggested that minority groups such as African Americans and Hispanics are more resilient than other ethnic groups, having consistently lived under economic and social adversity; these exposures to adversity are thought to give them more experience with adapting to stressors.⁸³⁻⁸⁵ Minorities tend to be more externally and psychologically resilient than their Caucasian counterparts.⁸³⁻⁸⁷ This is demonstrated in African American children and youth who had faced major adversities and trauma, yet excelled academically, and adjusted psychologically, and psychosocially while successfully negotiating their adversities.^{86,87} Minority psychological and psychosocial resilience has been described in the literature as “mental vigor” or as “John Henryism;” both terms are used to describe a high-effort coping style characterized by a determination to succeed by working hard even in the face of adversity.^{87,88}

Resilience has been studied in a cross-sectional manner in a variety of age groups, ranging from children to the elderly populations however, scarcely studied in a longitudinal design. As a result, data regarding the relationship between age and level of resilience is fragmented. Children tend to be more resilient than adults and that children cope and rebound after traumatic stressors faster without functional psychopathology or impairment more successfully than adults.^{81,89,90} Levels of resilience do not steadily decline with increasing age, instead high levels of resilience have been observed in elderly populations with strong family networks and good mental and physical health.⁷⁸

Historically, higher levels of education are known to be protective and associated with more fulfilling jobs, better working conditions, and higher income that can support better health.⁹¹ Despite these findings, higher levels of education do not translate into an individual developing high levels of resilience.²² Instead, it is the preexistent presence of resilience that is thought to predict the student's ability to progress and transition into higher education.^{92,93} It is suggested that other factors within the student's environment, such as supportive relationships enhance the student's resilience; the student's resilience then drives their educational success and not vice versa.^{92,93}

Just as higher education is not a predictor of resilience, higher socioeconomic status also is not a predictor of resilience. Earning a medium or higher U.S. income does not correlate with high levels of resilience.⁹⁴ However, being of an impoverished to low social-economic status has been shown to correlate with high levels of resilience.^{35,81,90,94}

Despite popular belief, married couples and those in relationships are no more resilient than single people.^{95,96} Instead, a comparison study showed that single people actually have similar or higher levels of resilience when compared to married couples.⁹⁵ Married couples and those in relationships engage in a growth-fostering connection, which cultivates resilience via relational resilience.^{86,96,97} Single individuals are also capable of engaging in relational resilience via connections with friends and family members.⁹⁷ Relational resilience is described as a mutually empathic and responsive relationship that promotes resilience through bidirectional support.⁹⁷

Relational resilience should not be mistaken with the unidirectional resilience-building method of social support, in which one person is supported by another.^{86,95,96} Both

relational resilience and social support are effective means of resilience building; however, unlike social support, relational resilience is not influenced by gender or race.^{86,95-97}

Organizational Factors

Despite having innate properties, resilience is now understood to be a skill that is learned, practiced, and developed overtime.⁷⁸⁻⁸⁰²⁶ The findings of a systematic review captured the attention of healthcare organizations (HCO), which are environments where members of the healthcare team experience frequent changes, occupational trauma, and crises, yet must adapt and continue to face the challenges.⁹⁸ Most HCO research within a systematic review of the literature echoed parallel findings suggesting that human resources and human capital are critical contributors to maintaining a resilient organization. Suggesting that in order for an organization to be resilient, the organization must have resilient individuals and resilience-building resources in the workplace.⁹⁸ In response, researchers launched a multitude of studies examining organizational resilience theories, including the resource-based approach.^{47,48} The resource-based approach focuses on creating a positive social environment staff are free to express emotions and share information.⁹⁹ Within a resource-based approach environment, psychological support is provided for staff, resources adequately match the staffs work demands/loads, and training programs strengthen weak policies.⁹⁹

Collateral pathways are another resource HCO may employ in order to build resiliency in their employees. Collateral pathways refer to the HCOs providing alternative routes to achieve a desired goal, such as utilizing non-physician or mid-level providers to alleviate physician work burden.⁹⁹ When used consistently, the resource-based approach was

shown to promote clinician wellbeing, alleviated clinician burnout, and increase organizational resilience without unintended negative consequences while delivering desirable patient outcomes.^{98–100}

Resilience in Healthcare Workers

Working in a healthcare setting entail having a great capacity to face extreme situations. Resilience in healthcare workers has been shown to be associated with individual personal factors as well as external factors within the HCO.²⁷ Healthcare workers with sufficient resilience via personal protective factors, and organizational resilience-building resources are better equipped to navigate and absorb high levels of disruptive changes while displaying minimally dysfunctional behaviors.¹⁰¹ However, when levels of resilience are insufficient, healthcare workers have been shown to experience burnout, and HCO began to experience issues with staff retention.^{27,101}

These findings were demonstrated in a study of new graduate nurses, where high levels of resilience had the ability to mediate the effects of work environment stress and assist nurses with averting burnout and prevent the organization from experiencing turnover.¹⁰² A cross-sectional, correlational study of 175 emergency room nurses identified that resilience reduces moral distress and is also the strongest predictor of workplace engagement.¹⁰³ High levels of resilience were also shown to assist a group of 182 pediatric intensive care nurses and physicians with averting moral distress and thoughts of resigning.¹⁰⁴ Burnout, turnover, and psychosocial distress, including anxiety and depression, were common themes associated with healthcare workers and low levels of resilience.^{26,27,70,77}

With regard to obstetrical clinicians, low levels of resiliency were associated with poor mental health and thoughts of withdrawing from obstetrical and gynecology practice in a group of 231 Australian and New Zealand obstetrical and gynecology trainees.⁷¹ Similar findings were observed in a study of 150 United Kingdom midwifery students; low levels of resilience were associated with intentions to quit midwifery training.¹⁰⁵ High levels of resilience were significantly associated with increased self-confidence and problem-solving skill in Turkish midwifery students.¹⁰⁶ Despite the contribution of these three articles, the study of resilience in OB clinicians is extremely limited.

Healthcare workers experience the usual environmental stressors of such as grief, loss, and ethical decision-making, all while maintaining professional boundaries. However, the onset of COVID-19 exacerbated the work environment and personal stressors experienced by all healthcare workers. It was suggested in a scoping review of the literature that COVID-19's exacerbation of workplace stressors in the maternity unit could potentially result in early withdrawal from the practice of nursing, midwifery, and medicine; and affect the quality of care provided to pregnant women seeking care.⁷² Research studies during the pandemic again showed that resilience is still a protective factor against HCO environmental stressors. Resilient healthcare workers were able to evoke mindfulness, emotion regulation, and stress management techniques, which increased their capacity to manage and adapt to stressful circumstances.¹⁰⁷ Among 227 healthcare workers in a COVID-19 referral hospital in Indonesia, lower levels of resilience correlated with healthcare workers experiencing high levels of anxiety.¹⁰⁸ Identical findings were observed in a brief online resilience survey of 3045 healthcare professionals (1,607 from the United States and 1,197 from Israel), showing

that higher resilience scores were associated with less COVID-19-related worries and a lower likelihood of meeting generalized anxiety disorder or depression screening thresholds.¹⁰⁹

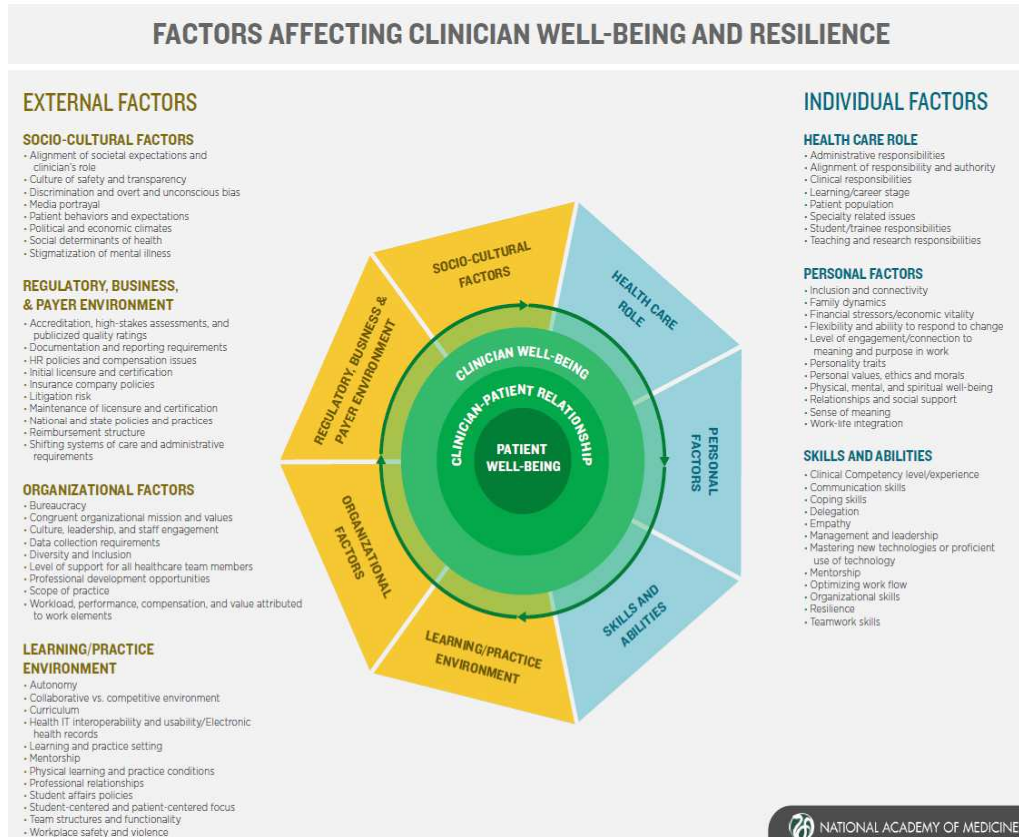
The personal and HCO factors that are associated with enhancing resilience. Research has also explained the intricate role resilience plays in mental and emotional recovery after trauma exposure.^{103,104,107,109} Yet, few studies quantitatively measured levels of resilience in OB clinicians, a specialty in healthcare that also experiences environmental stressors such as grief, loss, and ethical decision-making. The purpose of this paper is to measure levels of resilience in OB clinicians in five metropolitan area maternity units, as well as identify associations between resilience at the personal and organizational levels.

Methods

Framework

The National Academy of Medicine's Factors Effecting Clinician Well-being and Resilience model served as the conceptual framework for this study. Developed by a multidisciplinary working group, the model identifies external and individual domains and factors associated with clinician well-being, with patient well-being at the center (Figure 3.1).⁴²

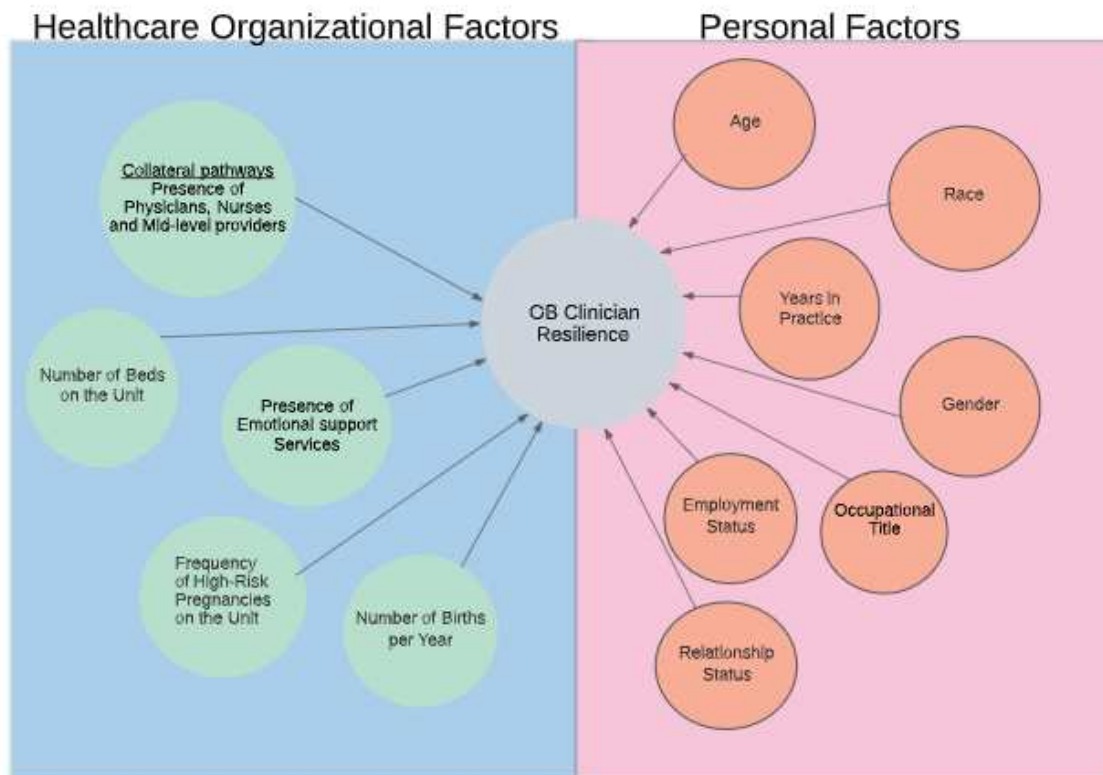
Figure 3.1. Factors Affecting Clinician Well-being and Resilience Model Adapted by the National Academy of Medicine (NAM)



National Academy of Medicine. Reproduced with permission from the National Academy of Science. Courtesy of the National Academies Press, Washington, D.C

This study aimed to use this model to describe personal (e.g., demographic, personal demands), and work organization factors (e.g., hospital-based employee support services, maternity unit volume, and the presence of high-risk patients) associated with OB clinician resilience (Figure 3.2).

Figure 3.2. Organizational and Personal Factors That Influence Resilience



Design

This descriptive cross-sectional study reported here is part of a larger study that examined OB Clinician experiences with traumatic childbirth, resilience, burnout, and how COVID influenced their work experience.⁷⁵ An anonymous online survey was distributed as an electronic link in an email to each hospital's maternity units' departmental mass email list during the COVID-19 pandemic in December 2020 through June 2021. Ethical approval for this study was received from the University of Maryland's Institutional Review Board and granted exempt status. In the survey, participants received information about this study, including the purpose, potential risk, and being able to withdraw at any time if they decided

they did not want to participate. Confidentiality was maintained via the use of password-protected, encrypted data collection software, and no personal identifiers were collected.

Setting

Participants were recruited from five hospital maternity units in the Baltimore Metropolitan Area. All recruitment sites provided care to a similar population of birthing persons seeking maternity care, including high-risk challenges, hypertension, diabetes, multiple gestations, substance abuse, and morbid obesity. All recruitment sites had an onsite level two or higher neonatal intensive care unit (NICU). Level 2 or higher NICUs treat neonates with mild to severe health problems and are more likely to care for both high- and low-risk births.

Sample

The target population consisted of a convenience sample of registered nurses, obstetrical residents, family medicine residents, attending obstetrician physicians, and certified nurse-midwives (CNM), referred to collectively as *OB clinicians*. Participant inclusion criteria consisted of OB clinicians that were employed at any of the recruiting hospitals and provided direct intrapartum care.

Measures

Two surveys were used for the study, an organizational survey and an OB Clinician participant survey. The organizational level survey utilized eight items to assess the learning/practice environment and factors that might influence the OB clinicians' level of resilience, including the availability of employee emotional support services (clergy services, employee health program (EHP), debriefing, and peer support programs), numbers of beds

on the unit, the annual number of deliveries, and presence of high-risk obstetrical patients on the unit. The availability of collateral pathways was also accessed via accounting for the presence of (physicians, nurses, and midlevel providers) on the unit to assist with workloads. The organizational level survey was completed by the nurse administrator of each recruiting hospital and/or the department chair. Most survey items were free text, while others allowed the respondent to select multiple responses. For analyses, the total number of employee support services was summed separately for each recruiting hospital, thereby resulting in each site having a variable named “employee support services total.” A similar procedure was collateral pathways, resulting in each recruiting hospital having a variable named “collateral pathways total.”

The OB clinician survey assessed demographic/individual characteristics (age, gender, race, relationship status, employment status, occupational title, and years in practice) and the 25-item Connor-Davidson Resilience Scale (CD-RISC) to measure resilience in participants. The tool is designed to measure adult psychological resilience. Construct validation of the CD-RISC during testing using factor analysis identified five sub-scale variables (eigenvalues >1) that characterized the concept of resilience (personal competence, strength in adversity, acceptance, control, and belief in mystical influences).⁴⁵ In the general population, CD-RISC has an (M = 80.4, SD =12.8) and demonstrates internal consistency with a Cronbach alpha of 0.89.^{19,45} Yet, when the 25-item scale CD-RISC scale was used in a population of high-acuity healthcare workers, as shown in a group of 772 Australian operating room (OR) nurses, the mean resilience score was lower (M= 75.9, SD=11.0) but maintained strong internal consistency with a coronach alpha of 0.9.¹⁰¹ The CD-RISC is

validated for use in several languages and cultures, including, Korean, Chinese, German, and Spanish. CD-RISC responses are measured on a Likert-type scale with five response options: 1) Strongly Disagree, 2) Disagree, 3) Slightly Agree, 4) Agree, and 5) Strongly Agree. Responses are scored on a scale of 0–4 with a minimum total value of zero and a maximum of 100. Per scoring recommendations, all items were summed. A four-level ordinal measure of resilience was created based on quartiles with scores in the 1st quartile indicating low resilience, the 2nd low/intermediate resilience, and the 3rd quartile high/intermediate resilience.^{19,45} Finally, the 4th quartile indicates high resilience.^{19,45}

Procedures

Prior to initiating the study, letters of support were acquired from the five recruiting hospital sites. These letters of support served as agreements that ensured that sponsors would allow advertisements regarding the study to be posted on the maternity unit and facilitate the distribution of the survey link via the departmental mass email list. One week after the advertisement flyers were hung, an introductory email that included a secure link to the anonymous survey was sent to all the OB clinicians listed on the department’s mass email list. The introductory email was followed by two reminder emails 30 days apart. The advertisement flyers and the introductory email both described the study’s purpose, inclusion criteria (clinician role type), what the participant was being asked to do, and that participation was voluntary. A \$20 e-gift card was offered to each participant to compensate participants for their time and expertise.

Analysis

An a priori power analysis was conducted with G-power to determine the sample size needed for linear regression with three explanatory variables and their association with the outcome variable, the level of resilience.⁶² Based on the G-power's linear multiple regression calculation, a sample size of 126 participants was necessary to achieve a small to medium effect size ($F=.09$) and a power of 0.80 and an alpha of 0.05.⁶³ Data were analyzed using the Statistical Package for Social Science for Windows, version 27 (IBM Corp, 2020).¹¹⁰ According to the scoring instructions for the CD RISC, in order for the scale to be valid, at least 75% (19 items) should have been completed.^{60,61} Anything less than that is considered an invalid assessment. Three CD-RISC surveys had more than 19 missing values and thus were excluded from analyses. For the six surveys with two or less missing values, the item mean for those who did respond was substituted.

Frequency and proportions were used to describe participants and characteristics. An analysis of variance (ANOVA) was used to compare mean resilience scores across recruitment sites. An unconditional intraclass correlational coefficient (ICC) calculation determined how much variation in resilience is attributed to the hospital recruitment site. General linear multilevel modeling examined associations with resilience clustered by recruitment site.

Results

Participants' Demographics

Across the five hospital sites, a total of 167 participants accessed the OB Clinician Resilience survey. Seven cases were removed during the data cleaning process due to

missing values on all variables and an additional three cases were removed as a result of having less than 19 items completed on their CD RISC-25 surveys. This resulted in a final sample size of 157 participants. Each of the five hospitals had some respondents, but it was impossible to determine the return rate since the total number of OB clinicians necessary to serve as a denominator was not available for each hospital.

As depicted in Table 3.1, most participants were women (92.4%), with men accounting for a small percentage of respondents (7.6%). In regard to race, 63.1% identified as Caucasian, African American (22.9%), 7% identified as either Asian/Pacific Islander and 7% as Hispanic. Respondent's ages ranged from 21 thru 75 years of age, with (89.2%) being between the ages of 21-54. Years of work experience ranged from 1 year or less thru 21 years or more; only 16.7% reported having 21 years or more of work experience. Most OB clinicians (58%) reported being married; an almost identical percentage were either single and, in a relationship, (17.8%), or single and not in a relationship (17.2%). Most OB clinicians were employed full-time (79.2%), part-time employment (11.5%), and self-employment (9.0%) comprised the rest of the sample Registered nurses made up the largest occupational group surveyed (65%), followed by attending physicians (17.2%), CNM (10.8%), resident physicians (7.0%).

Table 3.1. Characteristics of the OB Clinicians Participating in the Resilience Study (N=157)

	N (%)
Gender	
Male	12 (7.6)
Female	145 (92.4)
Race	
Caucasian	99 (63.1)
African American	36 (22.9)
Asian/ Pacific Islander	11 (7.0)
Hispanic/Other	11 (7.0)
Age	
21-34 years old	72 (45.9)
35-54 years old	68 (43.3)
55-64 years old	14 (8.9)
65- 75 years old	3 (1.9)
Years of Experience	
<= 1	20 (12.8)
2-3	28 (17.9)
4-5	12 (7.7)
6-10.	32 (20.5)
11-15	26 (16.7)
16-20 yrs.	12 (7.7)
21+	26 (16.7)
Relationship Status	
Married or civil union	91 (58.0)
Single in a relationship	28 (17.8)
Single	27 (17.2)
Divorced	11 (7.0)
Employment Status	
Full-time	123 (79.5)
Part-time	18 (11.5)
Self-employed/ PRN	14 (9.0)
Occupational Title	
Registered Nurse	102 (65.0)
Attending Physician	27 (17.2)
Certified Nurse-	17 (10.8)
Midwife	11(7.0)
Resident Physician	

Note: Data are missing on employment status

Resilience Scores

Despite having outlier resilience scores from respondents in all occupational groups [RN (3), midwives (1), attending physicians (3), and residents (1)], a large sample size (N=157) contributed to resilience scores being relatively normally distributed (skewness =.137; Figure 3). A few low resilience scores were shown to be outliers and were observed in all occupational groups. High resilience outliers were only observed within the attending physician occupation (N=2). Resilience scores ranged from 40-99 (M= 73.95, SD= 11.4), with Cronbach's alpha=.90, Table 3.2.

Table 3.2. Levels of Resilience (N= 157)

	n (%)	Mean (SD)	Theoretical Range	Observed Range	Cronbach's Alpha
Resilience Scores		73.95 (11.4)	0-100	40-99	.901
Resilience Quartiles					
1 st Quartile	39 (24.8)			0-67.5	
2 nd Quartile	48 (30.6)			67.6-75	
3 rd Quartile	31 (19.7)			75.1-81.5	
4 th Quartile	39 (24.8)			81.6-100	

Note: Missing survey item responses were imputed at the mean.

Recruitment Site Description

Table 3.3 summarizes resilience scores and descriptive characteristics by hospital sites. Each recruiting hospital has some participants, but hospital A recruited the most participants (n=52), and Hospital E the fewest (n=14). Resilience scores by hospital sites ranged from 69.8 representing Hospital A to 78.8 representing Hospital D. An ANOVA showed a significant difference in mean resilience scores across the 5 hospitals (F=3.75,

P=.006), while meeting the homogeneity of variance of assumptions. Post hoc Tukey testing showed that only Hospital A and Hospital D had significant differences in means (p=.002).

The organizational characteristics across the 5-hospital sites showed variation in the number of births, Table 3.3. Hospital C reported the lowest number of births per year (1500) and the fewest number of maternity unit beds. Hospital D had the highest number of births per year (3000) but is not the largest maternity unit, reporting 15 beds on their maternity unit. When considering collateral pathways and support services, there was not much variation between hospital sites. Hospital C had the fewest number of collateral pathways, the fewest number of support services, and the least amount of exposure to high-risk laboring women. Hospitals A and B had the same number of collateral pathways, six, and support services, four, respectively. Hospital D reported five collateral pathways and three support services and always had high-risk laboring women in the maternity unit.

Table 3.3. Resilience Scores and Descriptive Characteristics of Hospital Sites

Hospital	Participants n (%)	Resilience Score M (SD)	Births/yr.	# Beds on the unit	#Collateral Pathways	# Employee Support Services	High-risk births
A	52 (33.1)	69.81 (11.44) *	1700	22	6	4	Most of the time
B	37 (23.6)	74.49 (11.48)	2500	14	6	4	Most of the time
C	17 (10.8)	73.82 (11.12)	1500	10	2	1	Half of the time
D	37 (23.6)	78.84 (10.41) *	3000	15	5	3	Always
E	14 (8.9)	75.96 (8.76)	1770	12	3	5	Sometimes

Note: Collateral pathways are: attending physicians, resident physicians, nurses, and midlevel providers.

Note: Employee support services are clergy, employee health program (EHP), debriefing, and peer support programs.

Note: * Indicated a significant difference in resilience scores was observed between Hospital A and D in an ANOVA.

Factors Associated with Resilience

An ICC was calculated to determine how much variance existed in resilience scores due to the recruitment site and if hierarchal structuring was necessary. The ICC calculation showed that hospital recruitment sites accounted for 7.08% of the variance in resilience scores. Table 3.4 summarizes the unadjusted bivariate analysis of individual and organizational factors influencing resilience. This statistical analysis allowed for a classification OB clinicians' resilience grouped together in clusters. Only age, African American race, and years of experience were shown to have a significant influence on resilience scores. Clinicians aged 35-54 years had significantly lower scores than the 55 or older group ($B=-7.60$, $p=.011$). African American clinicians had significantly higher resilience scores in comparison to Caucasian (-5.0 , $p=.021$) and Asians ($B=-10.6$, $p=3.86$) OB clinicians. Recognizing that age and years of experience are correlated ($r=.828$, $p<.001$), nearly all of the experience groups had significantly lower resilience than the OB clinicians with 21 or more years of experience, except those clinicians with 4-5 years of experience ($B= -3.7$, $p=.336$). With regard to the hospital characteristics, none were significantly related to resilience. Since no other factors were significant, multivariable analyses were not conducted.

Table 3.4. Personal and Organizational Associations with Resilience with Hospital Cluster (N=157)

	n	Raw Mean (SD)	B (SE)	Sig
Age				
21-34	72	73.76 (12.55)	-5.00 (2.92)	.077
35-54	68	72.80 (9.80)	-7.60 (2.96)	.011*
55 or older	17	79.40 (10.90)	Ref	
Gender				
Female	145	73.84 (11.4)	Ref	
Male	12	75.33 (10.8)	1.773 (3.32)	.594
Race				
Caucasian	99	73.01 (11.0)	-5.01 (1.82)	.021*
Asians/Pacific	11	66.0 (15.2)	-10.6 (3.86)	<.007*
Islanders	11	74.73 (11.3)	-3.29 (3.74)	.298
Hispanic	36	78.7 (9.3)	Ref	
African Americans				
Marital Status				
Single	27	72.41 (11.08)	-1.69 (2.47)	.496
Single in relationship	28	72.69 (14.57)	-1.28 (2.42)	.598
Widow/divorced	11	73.44 (8.84)	-2.09(3.55)	.557
Married	91	74.86 (10.66)	Ref	
Occupation				
Registered Nurse	102	74.42 (11.38)	2.42 (3.70)	.514
Certified nurse midwife	17	73.18 (11.27)	.50 (4.53)	.911
Physician	27	74.70 (11.20)	2.48(4.23)	.558
Resident	11	68.91 (11.90)		
Years of Experience				
=< 1 year	20	72.75 (12.48)	-6.73 (3.24)	.040*
2-3	28	71.48 (13.98)	-7.79 (3.02)	.011*
4-5	12	74.85 (10.69)	-3.70 (3.84)	.336
6-10	32	71.75 (11.84)	-7.94 (2.85)	.006*
11-15	26	75.00 (9.05)	-6.01 (3.03)	.049*
16-20	12	71.58 (6.32)	-9.99 (3.82)	.010*
21 or more	26	79.76 (9.89)	Ref	
Annual births	157		.004 (.002)	.135
Number support services	157		-.36 (1.42)	.811
Hi-risk always or most of the time	157		-.18 (3.89)	.964
Collateral Pathways			.116 (1.5)	.943

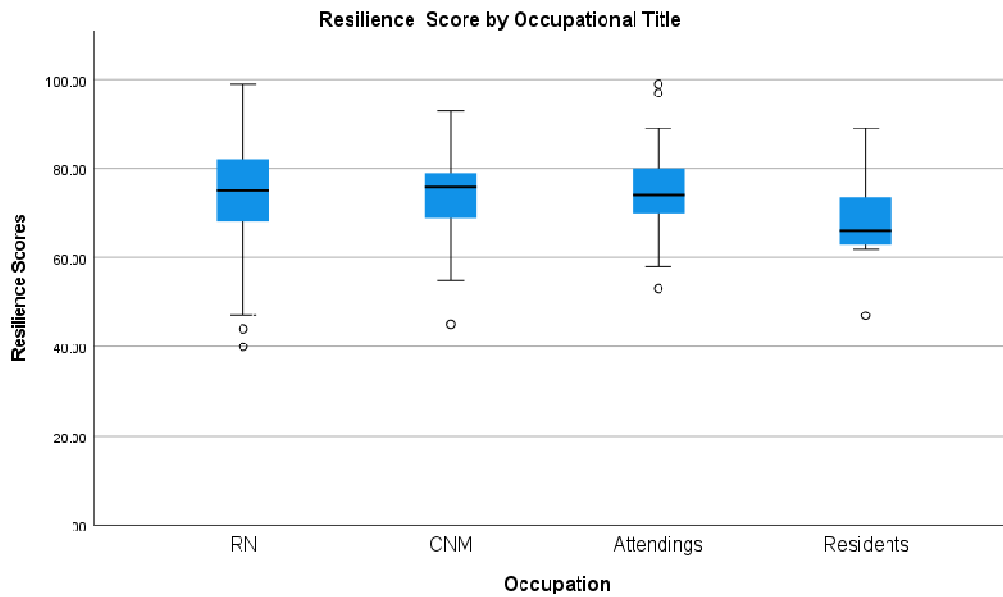
Note: * Indicated a significant difference in resilience scores was observed.

Discussion

The sample population consisted predominately of Caucasians, women, and RNs. Although this would appear to be a non-inclusive or biased sample, it is actually an accurate representation of the demographics of healthcare workers in the U.S.¹¹¹ Traditionally, there is more nursing staff on the maternity unit in comparison to all other OB clinicians. Typically, two nurses are present at a birth.¹¹² This includes a nurse for the mother and a nurse for the baby.¹¹² Whereas only one physician or midwife, may attend a birth. The average age of respondents is also an accurate representation of OB clinicians on the maternity unit. In a study of 757 Labor and delivery unit RNs across the US, the majority of respondents were Caucasian women between the ages of 25 and 54 years (71.3%).¹¹¹

The mean CD-RISC scores for this study is lower than the CD-RISC measure established by the developers for the general population (M=80.7).⁴⁵ It was also lower than the mean resilience scores for an Australian OR nurse study (M=75.9)¹⁰¹ OB Clinicians (M=73.95) were two points lower than the Australian study and six points lower than the general population means. Both the developer of the CD-RISC tool and the researchers of the OR nurse study established the mean resilience scores for their respective sample population pre-COVID-19. Because the OB clinician resilience study was conducted during the COVID-19 pandemic, lower scores may be expected. When comparing resilience scores to other healthcare professionals who were surveyed during the pandemic, OB clinicians scored higher.

Figure 3.3. Resilience Scores & Outliers by Occupational Title



A national electronic survey of 442 French attending physicians in anesthesia, emergency medicine, and intensive care medicine had an average 25-item CD-RISC score of 69 (IQR 62-75).¹¹³ Lower CD-RISC scores were observed in 387 nurses working with COVID-19 patients in Ahvaz, Iran (mean=61.8).¹¹⁴ These findings would suggest that during the pandemic CD-RISC scores were lower in healthcare professionals.

The descriptive characteristics of the five hospitals provide insight into the work environment of the OB clinicians sampled. Of the five recruitment sites, two sites reported that high-risk maternity patients were on the unit “most of the time,” and a third site reported “always” having high-risk maternity patients on the unit. While the other remaining sites reported the presence of high-risk maternity patients as “half of the time” or “sometimes.” It could be assumed that the frequent presence of high-risk maternity patients would translate into a potentially stressful work environment and the need for resilience. However, Table 3.4

does not show a relationship between the frequent or infrequent presence of high-risk maternity patients and resilience scores. A relationship was also not established between the presence of collateral pathways, employee support services, and resilience. Hospital “C” had only two collateral pathways and one employee support program, yet hospital “C” had a higher resilience score than Hospital “A” which had six collateral pathways and four employee support programs. It is plausible that there are additional factors driving levels of resilience in this study that were not measured. For example, studies have shown that communication and a positive teamwork climate can positively feedback with resilience through affirmative interactions.¹¹⁵

The associations between OB clinicians’ personal factors and resilience scores clustered by recruitment sites also align with findings in the literature. This study reaffirmed that levels of resilience do not steadily decline with age.⁷⁸ This was demonstrated when OB clinicians 55 years of age and older were observed to be the most resilient OB clinicians sampled. Another important observation was that 21 years or more of work experience was shown to be significantly associated with resilience. This finding is also supported in the literature. In a study of 423 athletic trainers, individuals with 10 or more years of work experience had higher hardiness which in turn translated into being more resilient.¹¹⁶ However, it is unknown if career longevity enhances resiliency or if high levels of resiliency are a prerequisite for career longevity. African Americans scored significantly higher on the resilience measure than respondents from other races. This finding is consistent with past studies where African Americans scored significantly higher on resilience measures in comparison to other races.^{81,82,91}

Limitations

Several limitations must be acknowledged regarding the sample, measure, and design. First, the study sample was a convenience sample with emails being used by the organization to communicate with potential participants. In order to remain compliant with the IRB, the study team members did not have access to each hospital's mass email list, and the accuracy of the list could not be evaluated, nor could a response rate be calculated. The sparse participation of some of the professional roles resulted in the underrepresentation of some OB clinicians.

Additional organizational measures such as staff satisfaction scores, patient acuity measures, staffing ratio, and maternity unit volume measures would have provided more detail related to other factors that may impact resilience in hospitals. Other measures like communication and organizational climate at the unit level may have been more clearly linked to resilience. The major challenges COVID-19 imposed upon the work environment influenced resilience scores, and it was not adequately measured.

Finally, the cross-sectional study design only represents one point in time and only five hospitals in one metropolitan region. As a result of the cross-sectional design, only associations between variables could be explored and not temporal sequences, predictions, or causal relationships. The "prevent multiple submission" feature was not used during data collection, which would have prevented respondents from completing the survey more than once. However, we surveyed multiple nurses per site. The "prevent multiple submissions" feature may have interfered with OB clinicians utilizing a computer within a shared workspace such as the nurses' station.

Conclusion

Resilience has been studied in a multitude of populations and professions, including those who have experienced trauma. However, the study of resilience in U.S OB clinicians is sparse yet necessary. OB clinicians are a unique group of healthcare workers that are susceptible to occupational stressors as a result of exposure to traumas such as adverse patient outcomes and deaths. These occupational stressors have been associated with psychological distress and burnout.

Resilience research in this specialized group of healthcare workers would assist in developing an understanding of the particular workplace stressors that diminish resilience as well as those organizational factors that enhance resilience. If this knowledge gap remains, healthcare organization programs aimed at preventing burnout and promoting clinician wellbeing are left to employ a one size fits all approach instead of employing resilience-enhancing programs tailored to the specific needs of its workforce. Understanding resilience in OB clinicians has the potential to act as a blueprint for developing mitigating strategies and enhancing current resources that assist OB clinicians with adapting and adjusting during turbulent times and averting burnout within the maternity unit.

Chapter 4: The Role of TCE Exposure on Burnout and Resilience in OB Clinicians

Background

Burnout among healthcare workers in the US has been deemed a crisis by the U.S. Surgeon General.³² In the US, it is estimated that 45% of nurses, 54% of physicians, and up to 60% of medical students and residents, suffer from burnout.³⁷ Conceptually, burnout is defined as work-related stress caused by job requirements that do not match the capabilities, resources, and needs of the employee.^{33,34} Organizational factors are often associated with burnout among healthcare professionals.^{33,117,118} Antecedents of burnout include interpersonal conflict, high workload, long work hours, loss of autonomy, low morale within the organization culture, bad management practices, frequent changes in management, stressful relationships with colleagues, lack of resources, role conflict, and trauma within the work environment.^{33,35,36,117,118}

Healthcare professionals are vulnerable to experiencing burnout.^{32,37,119–121} Burnout affects healthcare professionals personally and professionally, and the consequences have the ability to manifest themselves in the clinical environment.^{32,37,38,122} Internalized burnout may result in mental health ailments such as depression and or anxiety, whereas externalized burnout traditionally results in counterproductive work behaviors.^{119,123} Counterproductive behaviors, including excessively long breaks, absenteeism, and frequent turnover, interfere with the professional performance of the healthcare professional and other members of the healthcare team.^{37,38,120} Both internalized and externalized burnout have the potential to result in diminished patient care.^{32,37,120,122,123} There is limited national data on burnout among US clinician groups, and methodologic variations in sample designs and how burnout

was assessed limits serious synthesis of the data. The Coronavirus (COVID-19) pandemic exacerbated workplace stressors, thereby accelerating the prevalence of burnout in more recent studies.³²

Prior to the pandemic, a 2006 survey of nurses sampled from four states found a burnout prevalence rate of approximately 36% among hospital nurses.¹²⁴ A more recent national U.S. study inclusive of both registered nurses and advanced practice nurses conducted in 2021 found burnout rates to be around 54%.¹²¹ Burnout is also high among physicians. A 2011 survey reported a 46% burnout rate in physicians.¹²⁵ Slightly higher rates (54%) were noted during the COVID-19 pandemic.^{32,37,121} Burnout is also quite common among medical students and resident physicians.¹²⁶ Pre-pandemic burnout rates in medical students ranged from 28% to 45% and are thought to increase steadily as medical students transition into resident physicians.¹²⁶⁻¹²⁸ Half (50%) of residents/fellows sampled from various specialties from a single large institution in direct care contact with COVID-19 patients had mean burnout scores that exceeded the criteria for burnout.¹²⁹

Elevated levels of burnout have been shown to be associated with specific specialties within healthcare. The 2022 Physician Stress and Burnout Report surveyed 13,069 physicians in 29 specialties using Medscape from June 29-Sept. 26, 2021. The report revealed that emergency medicine physicians had the highest rates of burnout among all specialties (60%), followed by critical care physicians (56%), OBGYN physicians (53%), and infectious disease and family medicine physicians ranked 4th, having an identical burnout rate of (51%).⁴⁰ Rates of burnout in OBGYN physicians spiked in 2021 in comparison to past years.⁴⁰ Similar to OBGYN physicians, 41% of U.S. certified nurse-midwives and

midwives sampled in an online survey met the criteria for burnout.⁵⁵ Burnout is thought to be more prominent in medical specialties like these due to the long work hours, frequent on-call shifts, patient load, and too many bureaucratic tasks.^{37,130-132} Another suggested cause for the spike in OBGYN burnout is gender.⁴⁰ Unlike other medical specialties, OBGYN comprises a higher percentage of female physicians who are more likely to report burnout than male physicians.⁴⁰

High levels of burnout in healthcare professionals have been associated with sociodemographic factors such as the female gender and being of a minority race.^{40,133} Although not one of the most prominent causes of burnout, exposure to occupational trauma is a known predictor of burnout in healthcare professionals.^{131,134} Health workers in the specialty of obstetrics are vulnerable to burnout, despite the misconception that obstetrics is an occupation filled with continuous joy and instant gratification. Healthcare workers on maternity units do experience occupational trauma, and the loss of life contributes to an increased risk of burnout.^{13,14,73,74}

Studies have shown that OB clinicians (RNs, CNMs, resident physicians, and attending physicians) experience both personal and professional consequences after occupational exposure to a traumatic childbirth event.^{13,14,71,73,74} A traumatic childbirth event (TCE) is defined as the perception or actual threat to the life of the mother, the newborn, or both.¹⁴ Several studies have found significant associations between OB clinicians that experience TCE and anxiety, depression, and even post-traumatic stress disorder.^{14,17,55,135} Professional consequences include having a strong desire to leave their career on the maternity unit after TCE exposure.¹¹ Midwives reported engaging in career-altering

behaviors such as returning to staff nursing, or withdrawing from full-scope practice, thus, no longer providing intrapartum care.⁷⁴ Physicians also reported behaviors such as distancing from engagement with patients and approaching procedures with increased anxiety after TCE exposure.¹⁷ Physicians also reported career-altering behaviors, including withdrawing from obstetrical practice.⁵⁵ Coincidentally, the professional consequences of occupational trauma mirror behaviors associated with burnout in other healthcare professionals.³⁷ Yet, there is very limited research that has evaluated both burnout and occupational trauma exposure simultaneously in OB clinicians.

On the other hand, high levels of resilience have been shown to moderate the effects of burnout.⁴¹ The moderating effect of resilience was observed in 537 nursing professionals from three public hospitals in Murcia, Spain.¹⁰³ In this study, nurses with high resilience had a greater capacity to adapt to work adversities.¹⁰³ Similar findings were observed in new graduate Japanese nurses.¹⁰² High levels of resilience had the ability to absorb the effects of work environment stress and assist new graduate nurses with averting burnout and prevent turnover.¹⁰² Emergency room nurses were able to use high levels of resilience to avert moral distress.¹⁰³ In contrast, low levels of resiliency were associated with poor mental health and thoughts of withdrawing from obstetrical and gynecology practice in a group of 231 Australian and New Zealand obstetrical and gynecology trainees.⁷¹ Parallel findings were observed in a study of 150 United Kingdom midwifery students; low levels of resilience were associated with intentions to quit midwifery training.¹⁰⁵

Although there are numerous burnout studies examining healthcare professionals from various specialties enduring extraordinary work-related circumstances, the examination

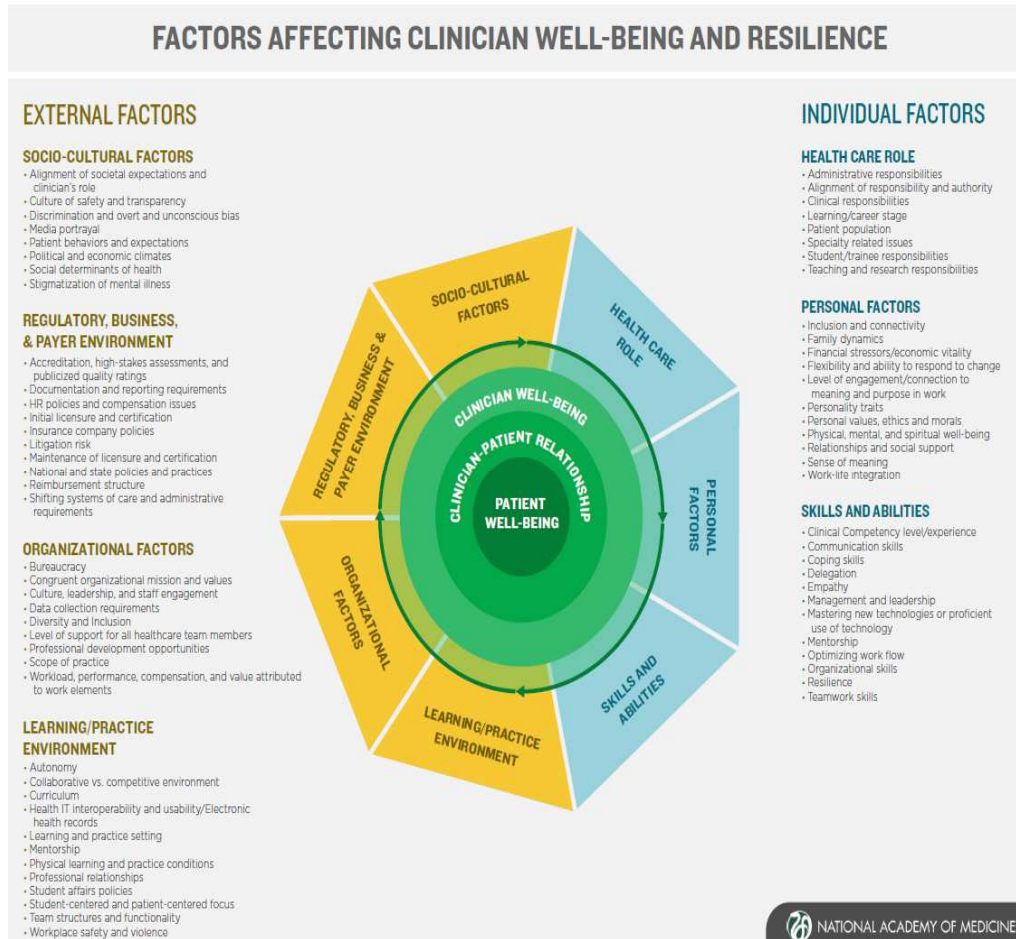
of burnout in OB clinicians in relation to TCE exposure is sparse. There is also very limited knowledge regarding the moderating effect of resilience on burnout and TCE exposure in OB clinicians. Therefore, the aims of this study were to describe the relationship between TCE exposure and burnout and test the moderating ability of resilience.

Methods

Framework

The National Academy of Medicine's Factors Effecting Clinician Well-being and Resilience model served as the conceptual framework for this study. Developed by a multidisciplinary working group, the model identifies external and individual domains and factors associated with clinician well-being, with patient well-being at the center (Figure 4.1).⁴² This study uses a portion of NAM's model to evaluate external factors such as healthcare role (occupational role), personal factors (age, race, relationship status), and practice environment (TCE frequency, severity, and influence) on clinician wellbeing (burnout).

Figure 4.1. Factors Affecting Clinician Well-being and Resilience Model Adapted by the National Academy of Medicine (NAM)



Design

The descriptive cross-sectional study reported here is part of a larger study that examined OB clinicians' experiences with traumatic childbirth, resilience, burnout, and how COVID influenced their work experience.⁷⁵ An anonymous online survey was distributed as an electronic link in an email from each of the five-hospital maternity unit's departmental mass email list during the COVID-19 pandemic from December 2020 through June 2021. Ethical approval for this study was received from the University of Maryland's Institutional Review Board and granted exempt status. In the survey, participants received information including the purpose, potential risk, and being able to withdraw at any time if they decided they did not want to participate. Confidentiality was maintained via the use of password-protected, encrypted data collection software, and no personal identifiers were collected.

Setting

Participants were recruited from five hospital maternity units in the Baltimore Metropolitan Area. All hospitals provided care to a similar population of birthing persons seeking maternity care, including high-risk challenges such as hypertension, diabetes, multiple gestations, substance abuse, and morbid obesity. All recruitment sites had an onsite level two or higher neonatal intensive care unit (NICU). Level 2 or higher NICUs treat neonates with mild to severe health problems and are more likely to care for both high- and low-risk births.

Sample

The convenience sample consisted of registered nurses, obstetrical residents, family medicine residents, attending obstetrician physicians, and CNM, referred to collectively as

OB clinicians. Participant inclusion criteria consisted of OB clinicians that were employed at any of the recruiting hospitals and provided direct intrapartum care.

Measure

The OB clinician survey consisted of four sections: demographic, a TCE questionnaire, the Connor-Davidson Resilience Scale (CD-RISC), and the Maslach Burnout Inventory for Medical Personnel (MBI-MP). Multiple-choice items were used to assess demographic variables such as age (21-34, 35-54, 55-64, 65-75 years), gender (male or female), race (White, Black Asian/Pacific Islander, Hispanic/Other), and relationship status (married or in a civil union, single in a relationship, single, divorced). Participants also provided multiple-choice responses to describe their professional characteristics, including employment status (full-time, part-time, self-employed, or pro re nata [PRN]), occupational title (RN, CNM, attending physician, or resident physician), and years in practice (1 year or less, 2-3 years, 4-5 years, 6-10 years, 11-15 years, 16-20years, 21 or more years). Data for the TCE measure was collected in the published parent study.^{75,136} The TCE questionnaire measured the frequency of exposure, perception of severity, and perceived influence on the participant's professional practice and personal life for eight TCEs. TCEs were based on a review of the literature as events that may provoke psychological distress and defensive practice behaviors, specifically: shoulder dystocia, uncontrolled postpartum hemorrhage, stillbirth/infant death, an unsuccessful newborn resuscitation, maternal death, uterine rupture, and instrument injury to mother or baby during the birth process.^{75,136} The eight specific events within the TCE measure also demonstrated content validity when pilot-tested in a group of OB clinicians (N=15).

For each TCE, the frequency of exposure was measured with the question, “How many times have you experienced the following?”¹³⁶ The five response options were *never*, *1-3 times*, *4-6 times*, *7-9 times*, and *10 times or more* and were coded 1-5, respectively.¹³⁶ Summing the frequency categories across the eight TCEs was used to create tertiles of the low, medium, and high levels of TCE exposure. For each TCE, perceived severity was measured with the question, “Please rate your perceived severity of the following?” The five response options were *none* (1) *very mild*, (2) *mild*, (3) *moderate*, (4) *or severe*, (5) and were coded 1-5. The severity responses were also summed in order to create tertiles of a low, medium, and high level of severity. The two remaining TCE survey items, “Did the event influence your professional practice and “Did the event influence your personal life” were measured with 5-point Likert responses (none, very mild, mild, moderate, and major), coded 1-5, respectively. Both items were summed independently of each other to create two separate variables, total influence on professional practice and total influence on personal life. The four subscales (frequency, severity, effect on professional life, effect on personal life) of the TCE measure had Cronbach’s alpha coefficients of .82 for frequency, .77 for severity, .78 for effect on professional practice, and .82 for effect on personal life.⁷⁵ A large sample size (N=160) contributed to all four TCE scales being fairly normally distributed (skewness= .20).

OB clinician resilience was measured via the 25-item Connor-Davidson Resilience Scale (CD-RISC).⁴⁵ The CD-RISC tool is designed to measure adult psychological resilience. Construct validation of the CD-RISC using factor analysis identified five subscale variables (eigenvalues >1) that characterized the concept of resilience (personal

competence, strength in adversity, acceptance, control, and belief in mystical influences).⁴⁵ In the general population, the CD-RISC has a mean of 80.4 (SD =12.8), and a demonstrated internal consistency with a Cronbach alpha of 0.89.^{19,45} Yet, when the 25-item CD-RISC scale was used in a population of high acuity healthcare workers (772 Australian operating room [OR] nurses), the mean resilience score was lower (M= 75.9, SD=11.0) but maintained strong internal consistency with a Cronbach alpha of 0.9.¹⁹ CD-RISC responses are measured on a Likert-type scale with five response options: 1) Strongly Disagree, 2) Disagree, 3) Slightly Agree, 4) Agree, and 5) Strongly Agree. Responses are scored on a scale of 0–4. Per scoring recommendations, all items were summed, resulting in a possible range of 0 to 100. In this study, resilience scores were normally distributed (skewness =.14) and ranged from 40-99 (M= 73.9, SD= 11.4), with Cronbach’s alpha=.90.¹³⁷ A four-level ordinal measure of resilience was created based on quartiles with scores in the 1st quartile indicating low resilience, the 2nd low/intermediate resilience, the 3rd quartile intermediate/high resilience, and the 4th quartile indicating high resilience.^{19,45}

The MBI-MP was used to measure burnout.^{138,139} It assesses three independent constructs of burnout, including emotional exhaustion, depersonalization, and low personal accomplishment, identified to be associated with stress experienced within the context of the work environment.^{137,138,140,141} Emotional exhaustion (EE) describes the healthcare professional’s feelings of being emotionally overextended. Depersonalization (DP) reflects an unfeeling and impersonal response to patients. Personal accomplishments (PA) measure feelings of competence and successful achievement in one's work.^{138,139} The MBI-MP is the most commonly used validated method for measuring burnout among healthcare

professionals; Cronbach's alpha for all three subscales is greater than 0.7^{138,139} The MBI contains 22 seven-point items distributed across the three dimensions: emotional exhaustion (nine items), depersonalization (five items), and personal accomplishment (eight items).^{138,139} The frequency response scales are defined as 0 = never, 1 = a few times a year or less, 2 = once a month or less, 3 = a few times a month, 4 = once a week, 5 = a few times a week, and 6 = every day.^{138,139} Each of the three dimensions of the MBI is summed and averaged independently of each other rather than creating a single burnout score.¹³⁸

In the past, the MBI scale used cut-off scores within each subscale to specify the high, medium, and low classification of burnout; however, the 4th edition of the MBI manual has removed cut-off scores due to not having “diagnostic validity.”⁵⁴ Instead, the developer of the MBI now recommends Z values to calculate high exhaustion (Emotional Exhaustion) $z = \text{Mean} + (\text{SD} \times 0.5)$, High Cynicism (Depersonalization) $z = \text{Mean} + (\text{SD} \times 1.25)$, and high professional efficacy (Personal Accomplishment) $z = \text{Mean} + (\text{SD} \times 0.10)$.¹⁴² This method of calculating critical boundaries has proven to be valid within the MBI general survey (GS) scale, which highly correlates with the MBI-MP.¹⁴²

Procedure

Prior to initiating the study, letters of support were acquired from the five recruiting hospital sites. These letters of support confirmed that sponsors at recruitment hospitals would allow advertisements regarding the study to be posted on the maternity unit and distribute the survey link via the departmental mass email list. One week after the advertisement flyers were hung, an introductory email that included a secure link to the anonymous survey was sent to all the OB clinicians listed on the department's mass email list. Two reminder emails

followed 30 and 60 days after the introductory email. The advertisement flyers and the introductory email both described the study's purpose, inclusion criteria (clinician role type), what the participant was being asked to do, and that participation was voluntary. A \$20 e-gift card was offered to each participant to compensate participants for their time and expertise.

Analysis

An a priori power analysis was conducted with G-power to determine the sample size needed for linear regression with three explanatory variables and their association with the outcome variables, emotional exhaustion, depersonalization, and personal accomplishments.⁶² Since an established effect size for the relationship between TCE exposure and burnout does not exist, a small to medium effect size was assumed. Based on a G-power's linear multiple regression calculation, a sample size of 126 participants was necessary to achieve a small to medium effect size ($F=.09$), with a power of 0.80 and an alpha of 0.05.⁶² Data were analyzed using the Statistical Package for Social Science for Windows (SPSS), version 27.⁵⁶ According to the scoring instructions for the CD-RISC, in order for the scale to be valid, at least 75% (19/25 items) should have been completed.^{19,45} Anything less than that is considered an invalid assessment. For surveys with two or fewer missing values, the item mean for those who did respond was substituted. Individual MBI items with missing data were handled according to the developers' instructions; the scale containing the missing item was not calculated.¹³⁸

As this is one of the first studies attempting to link TCE to clinician burnout, descriptive and bivariate statistics were used to describe relationships. Internal consistency (Cronbach's alpha) was measured for the four dimensions of the TCE measure, the CD-RISC

scale, and the MBI sub-scales. Bivariate analyses were then performed to identify associations among demographics, occupational characteristics, and burnout. ANOVA was used to identify MBI-MP subscale score mean differences across demographic and practice characteristics. A linear mixed model was used to determine how much variation in burnout subscale scores was attributed to recruitment sites. Finally, the PROCESS-macro extension for SPSS statistical software was used to test the ability of resilience to moderate the relationship between the aspects of TCE exposure and burnout.¹⁴³

Results

Demographics and Characteristics

A total of 167 participants across five hospitals accessed the survey. Data were removed for 17 participants even due to missing values on all variables, three due to less than 19 items completed on their CD RISC-25 questionnaire, and seven due to missing items within the MBI scale. The total sample size analyzed was 150. Each of the five hospitals had some respondents, but it was impossible to determine the return rate since the total number of OB clinicians necessary to serve as a denominator was not available for each hospital.

As depicted in Table 4.1, most participants were women (92.7%). In regards to race, 62.7 % identified as Caucasian, 22.7% as African American, 7.3% as Asian/Pacific Islander, and 7.3% as Hispanic or other. Respondent's ages ranged from 21 to 75 years of age, with (90%) being between the ages of 21-54. Most OB clinicians (58%) reported being married. The majority of OB clinicians were employed full-time (79.2%). Registered nurses made up the largest occupational group surveyed (66%), followed by attending physicians (16.7 %), CNM (10%), and resident physicians (7.3 %). Years of work experience ranged from 1 year

or less to 21 years or more; only 15.3 % reported having 21 years or more of work experience.

Table 4.1. Characteristics of Participants (N=150)

Demographic Descriptor	N (%)
Gender	
Male	11 (7.3)
Female	139 (92.7)
Race	
White	94 (62.7)
Black	34 (22.7)
Asian/ Pacific Islander	11 (7.3)
Hispanic/Other	11 (7.3)
Age	
21-34 years old	70 (46.7)
35-54 years old	65 (43.3)
55-64 years old	12 (8.0)
65- 75 years old	3 (2.0)
Relationship Status	
Married or civil union	87 (58.0)
Single in a relationship	28 (18.7)
Single	25 (16.7)
Divorced	9 (6.0)
Employment Status	
Full-time	118 (79.2)
Part-time	17 (11.4)
Self-employed/Pro re nata	14 (9.4)
Occupational Title	
Registered Nurse	99 (66.0)
Certified Nurse-Midwife	15 (10.0)
Attending Physician	25 (16.7)
Resident Physician	11 (7.3)
Years in Practice	
1 year or less	20 (13.2)
2 years to 3 years	28 (18.7)
4 years to 5 years	11 (7.3)
6 years to 10 years	31 (20.7)
11 years to 15 years	26 (17.3)
16 years to 20 years	11 (7.3)
21 years or more	23 (15.3)

Description of Measure

Table 4.2 summarizes the description of all three measures used in the study. The four dimensions encompassing the TCE measure have varying ranges of potential scores as they were summed from items. The TCE frequency dimension had a mean of 8.1 (SD=5.4) and observed scores ranging from 0-26. The perceived severity of TCE dimension had a mean of 15.3 (SD= 7.9) and an observed range of scores from 0-32. Influence on practice had a mean of 11.4 (SD= 7.5), while the influence on personal life had a mean of 7.7 (SD=7.2). All four dimensions were fairly normally distributed (skewness=< 1) with Cronbach alphas greater than 0.75. Given the large number of participants that completed the CD RISC-25 (n= 150), scores were also relatively normally distributed (skewness= -.23). Resilience scores ranged from 40-99 (M= 73.9, SD= 11.4), with Cronbach's alpha=.903.

Table 4.2. Study Measures of Traumatic Childbirth, Resilience, and Burnout

	N (%)	Mean Summed Score (SD)	Average Item Score (SD)	Cronbach Alpha
Traumatic Childbirth				
Frequency	150	8.1 (5.4)		.827
Severity	150	15.3 (7.9)		.773
Influence on Practice	147 (98)	11.4 (7.5)		.782
Influence on Personal Life	148 (98.6)	7.7 (7.2)		.815
Connor Davidson Resilience	150	73.9 (11.5)		.903
1 st Quartile (Low)	36 (24.0)			
2 nd Quartile (Low/Intermediate)	35 (23.3)			
3 rd Quartile (Intermediate/High)	41 (27.3)			
4 th Quartile (High)	38 (25.3)			
Maslach Burnout				
Emotional Exhaustion	150	23.6 ^a (11.5)	2.62 (1.3)	.924
Depersonalization	150	5.7 ^b (5.4)	1.14 (1.0)	.758
Personal Accomplishments	150	38.1 ^c (6.3)	4.76 (0.8)	.768
High Emotional Exhaustion	47 (31.3)			
High Depersonalization	20 (13.3)			
High Personal Accomplishments	82 (54.7)			

Note: ^a high EE \geq 29.35; ^b high DP \geq 12.45; ^c high PA \geq 38.73

A large sample size also contributed to the three MBI-MP subscale scores being relatively normally distributed: EE skewness=.17, DP skewness=1.3, and PA .76. For each subscale, the mean of the summed score and mean of the averaged item are reported in Table 4.2. The average item EE score was 2.62 (SD= 1.3), with summed scores greater than or equal to 29.35, indicating high emotional exhaustion; 31% of the sample reported high EE. Depersonalization had an average score of 1.14 (SD=1.0) with summed scores greater than or equal to 12.45, translating into high depersonalization; 13% of the sample reported high DP. The average item personal accomplishment score was 4.76 (SD= 0.8), with summed scores greater than or equal to 38.73, indicating participants feel highly personally accomplished;

more than half (54.7) reported high PA. The MBI and its three subscales show strong internal consistency with Cronbach alpha of EE= .924, Cronbach alpha of DP= .758, and Cronbach alpha of PA= .768.

Burnout by Demographics and Occupational Characteristics

Table 4.3 examines mean summed MBI-MP subscale scores by OB clinician characteristics. Within gender there were no significant differences observed in EE scores, DP scores, or PA scores. However, male OB clinicians did exceed the criteria for high PA (M= 41.09, SD= 4.1).

Table 4.3. Mean Burnout Scores by OB Clinician Characteristics

	N	F-Statistic	Emotional Exhaustion M (SD)	Depersonalization M (SD)	Personal Accomplishments M (SD)
Gender					
Male	11		24.18 (14.1)	7.09 (7.5)	41.09 (4.1)
Female	139		23.64 (11.6)	5.62 (5.1)	37.87 (6.3)
		F	.03	0.8	2.4
Race					
White	94		24.0 (11.4)	5.9 (5.6)	38.88 (5.9)
Black	34		21.83 (11.8)	4.7 (4.4)	37.00 (6.7)
Asian/Pacific	11		30.45 (11.3)	10.1 (6.0)	35.00 (6.7)
Islander Hispanic	11		19.36 (10.5)	2.9 (2.5)	38.00 (7.1)
Other		F	2.1	4.2**	1.7
Age					
21-34 years old	70		24.71 (11.7)	6.5 (6.4)	38.82 (6.0)
35-54 years old	65		23.87 (11.3)	5.4 (4.5)	37.03 (6.3)
55-64 years old	12		19.08 (11.3)	3.5 (2.6)	38.08 (6.9)
65-75 years old	3		12.00 (9.5)	3.6 (3.0)	44.67 (1.2)
		F	1.9	1.4	2.1
Relationship Status					
Married or civil union	87		21.83 (10.9)	4.3 (3.4)	38.91 (6.3)
Single in a relationship	28		26.50 (12.1)	8.3 (7.2)	37.96 (6.7)
Single	25		28.52 (12.0)	8.2 ((7.3)	36.56 (5.79)
Divorced	10		19.20 (10.4)	4.9 (3.7)	35.30 (5.03)
		F	3.4*	4.4***	1.7
Employment Status					
Full-time	118		24.19 (11.5)	6.03 (5.7)	38.33 (6.1)
Part-time	17		20.35 (11.0)	4.82 (5.0)	35.35 (6.5)
Self-employed/PRN	14		23.42 (13.8)	4.14 (3.1)	40.00 (6.4)
		F	.81	1.02	2.37
Occupational Title					
Registered Nurse	99		22.87 (11.4)	4.61 (4.3)	37.86 (6.4)
Certified Nurse	15		20.67 (12.6)	5.53 (4.0)	37.73 (6.2)
Midwife	25		23.68 (10.5)	5.88 (5.1)	39.48 (5.7)
Attending Physicians	11		34.63 (8.8)	15.7 (6.6)	37.63 (5.7)
Resident physicians		F	4.0**	19.1***	0.5

Note: *Sig p<.05; ** Sig p<.01; *** Sig p<.001

In regard to race, a significant difference in mean scores was identified in the DP subscale ($F= 4.2, p=.01$). Asian/Pacific Islanders had mean DP scores of 10.1 ($SD=6.0$), followed by Whites ($M=5.9, SD=5.6$), Blacks ($M=4.7, SD=4.4$), and Hispanics ($M= 2.9, SD=2.5$). Post-hoc comparison using Tukey indicated that Asian/Pacific Islanders had significantly higher DP scores than Blacks and Hispanics. No other significant differences were observed in scores by race in the remaining 2 MBI subscales, EE and PA. Yet, Asian/Pacific Islander OB clinicians met the criteria for high EE ($M= 30.45, SD=11.3$) while having the lowest scores for PA ($M=35.0, SD= 6.7$).

There were also no significant differences by age for all 3 of the MBI subscales. Yet, participants aged 21-34 and 65-75 both met the criteria for high PA. However, unlike the age group of 21-34, which also met the criteria for high EE, OB clinicians 65-75 years of age had the lowest EE scores ($M=12.0, SD=9.5$). A significant mean difference in EE scores was also observed in relationship status ($F=3.4, p=.02$), post-hoc testing identified a significant difference between EE scores of single and married participants. Although no group within the relationship status variable met the criteria for high EE, single OB clinicians had the highest EE scores ($M=28.52, SD= 12.0$) in comparison to those OB clinicians that were married or civil union ($M=21.83, SD= 10.9$), and divorced ($M= 19.2, SD= 10.4$), who had the lowest. Also, a significant difference in mean DP scores and relationship status was observed ($F=4.4, p= <.001$). Post hoc testing using a Tukey showed that the significant difference in OB clinicians that were either single ($M=8.2, SD= 7.3$) or single in a relationship ($M=8.3, SD= 7.2$) had almost identical DP scores in comparison to married OB clinicians ($M=4.3, SD=3.4$). Despite being non-significant across the four relationship levels, married OB

clinicians were the only relationship status to meet the criteria for high PA (M= 38.9, SD=6.3).

With regard to occupational characteristics, there were no significant differences in MBI subscale scores by employment status. Full-time employee EE scores (M= 24.19, SD= 11.5) and self-employed/ pro re nata EE scores (M=23.42, SD=13.8) were similar, while OB clinicians employed part-time had only slightly lower EE scores (M=20.35, SD=13.8). Similar DP scores were seen for OB clinicians employed part-time (M=4.82, SD=5.0) and self-employed/ pro re nata (M=4.14, SD=3.1), while full-time OB clinicians had higher DP scores (M= 6.03, SD= 5.7). Although non-significant, in comparison to full-time and part-time work status, only self-employed/ pro re nata OB clinicians met the criteria for feelings of high PA (M=40.0, SD=6.4).

There was a significant difference observed in EE scores and occupational titles of OB clinicians (F= 4.0, p=.009). Post hoc testing confirmed that EE scores of resident physicians (M=34.63, SD=8.8) were significantly higher than attending physicians (M=23.68, SD= 10.5), CNM (M= 20.67, SD= 12.6), and RNs (M=22.87, SD= 11.4). DP also significantly varied across occupational levels (F=19.1, p<.001). Tukey post hoc test showed that resident physicians had significantly higher DP scores (M=15.7, SD=6.6) compared to all other occupational titles. Resident physicians exceeded the criteria for high DP (M=15.7, SD= 6.6) and nearly tripled the DP scores of attending physicians (M=5.88, SD= 5.1), CNMs (M=5.53, SD=4.0), and RNs (M=4.61, SD=4.3). Among all occupational titles, only attending physicians met the criteria for the feeling of high PA (M=39.48, SD= 5.7).

Mean Burnout Scores by TCE Dimensions and Occupational Role

Sample participants were recruited from five different hospitals; it was crucial to determine if the recruitment site contributes to variations in burnout subscale scores and if multi-level modeling would be necessary. An intraclass correlation was calculated and revealed that although the Wald Z statistic was non-significant for all three subscales of the MBI-MP, EE ($p=.29$), DP ($p=.25$), and PA ($p=.67$), the proportion of variance within MBI-MP subscales scores accounted for by the recruitment site cannot be ignored. Recruitment sites account for 7.5% of the variance in EE scores, 11.1% in DP scores, and 1.3% in PA scores. Therefore, linear mixed modeling was necessary and performed on all four dimensions of the TCE and the OB clinician's occupational role. This type of cluster analysis was used to evaluate burnout in OB Clinicians that share similarities with regard to TCE exposure.

A series of unadjusted linear mixed models were conducted to determine if TCE dimensions were associated with burnout. Mean differences in summed MBI-MP subscale scores by TCE frequency of exposure, perceived severity of TCE, and perceived influence of TCE on professional practice and personal life are reported in Table 4.4. The only significant relationship was observed in TCE influence on the practice and PA ($F=4.1, p=.02$). OB clinicians who reported TCE exposure had a high influence on their professional practice had the highest PA scores ($M=40.18, SD=5.1$).

Table 4.4. Mean Burnout Scores by Occupational title and TCE Dimensions with Hospital Cluster

	N	F Statistic	Emotional Exhaustion M (SD)	Depersonalization M (SD)	Personal Accomplishment M (SD)
TCE					
Frequency					
Low	58		24.67 (11.9)	5.74 (5.8)	37.24 (6.9)
Medium	41		21.21 (11.2)	5.09 (5.1)	39.22 (6.4)
High	51		24.43 (11.4)	6.23 (5.2)	38.19 (5.2)
		F	1.0	0.4	1.2
TCE Severity					
Low	49		23.04 (10.1)	5.51 (4.9)	36.44 (6.4)
Medium	56		23.16 (12.8)	5.41 (5.3)	39.05 (6.4)
High	45		24.91 (11.4)	6.37 (6.0)	38.73 (5.6)
		F	0.4	0.5	2.6
TCE					
Influence on Practice					
Low	51		24.09 (4.5)	6.35 (6.3)	36.98 (6.3)
Medium	47		25.08 (11.8)	5.57 (4.2)	37.08 (7.0)
High	49		22.18 (11.5)	5.34 (5.5)	40.18 (5.1)
		F	0.6	.03	4.1*
TCE					
Influence on Personal Life					
Low	133		23.09 (11.7)	5.61 (5.5)	37.96 (6.4)
Medium	15		29.60 (7.8)	6.86 (3.7)	39.20 (4.8)
High	0				
		F	3.6	0.3	0.7

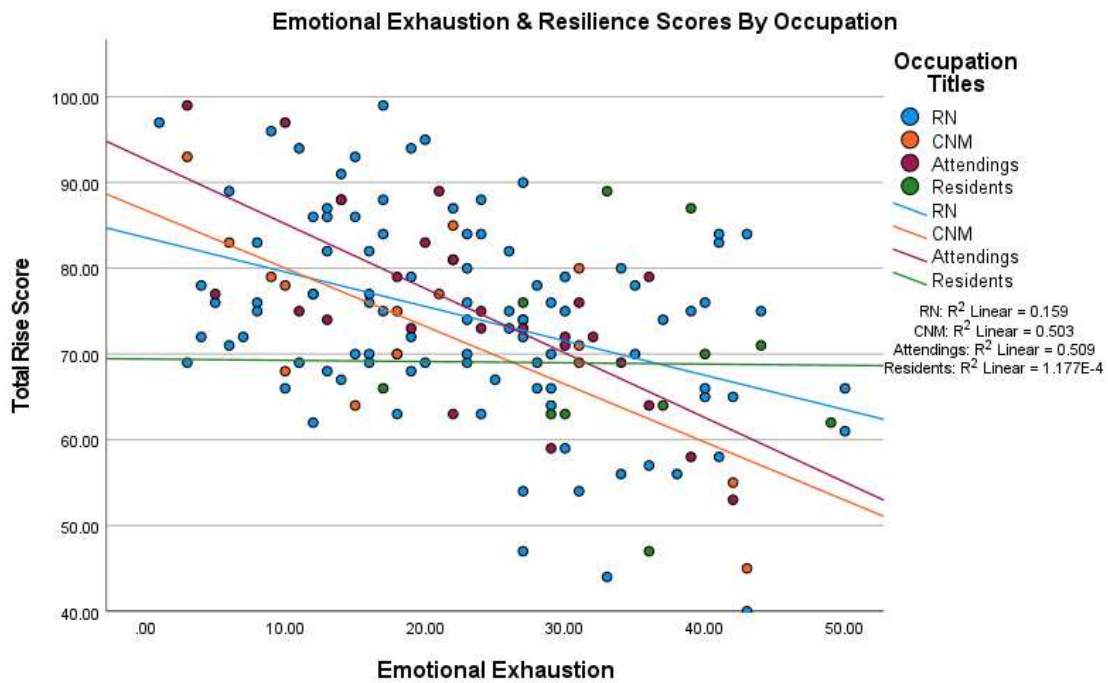
Note: *p<.05, two-tailed

Moderator Affect

A moderator analysis was used to determine if the level of resilience might change the relationship between TCE influence on professional practice and PA scores since that was the only significant relationship. Although the overall model was significant ($F= 22.3, p <.001$) and explained 32% of the variance within personal accomplishment scores, no moderation was demonstrated as indicated by a non-significant interaction term ($p=.74$).

Although resilience did not moderate the relationship between TCE and burnout, the relationship between resilience and EE was explored since EE often is perceived as being a fundamental aspect of burnout. Figure 4.2 illustrates the relationship stratified by OB clinician type. A strong negative relationship exists with resilience for all clinicians except residents, indicating that moderate levels of resilience and emotional exhaustion may coexist simultaneously.

Figure 4.2. Emotional Exhaustion and Resilience Association by Occupational Title



Discussion

Overall high emotional exhaustion was observed in 31.3% of the sampled population. The rate of high EE in this study is considerably lower than the 53% burnout rate observed in OBGYN physicians that participated in the 2022 Physician Stress and Burnout Report and the 40.6% burnout rate observed in U.S-certified nurse-midwives and midwives sampled in an online study.^{40,41}

In this descriptive study, the significant differences in mean EE and DP scores by occupational role are noteworthy. Even though the sample of residents was limited (N=11), their EE scores were considerably higher than the other three occupation groups. This finding is concerning when considering that high EE and DP are key indicators of burnout.^{37,138,139}

Having both high EE and DP has been shown to impact the quality of care given by

healthcare professionals, including increased risk for medical errors.^{37,124,125} It has also been shown that resident physicians with burnout are at increased risk for occupational injuries, including needle sticks, bodily fluid exposures, and personal injury via a motor vehicle accident.¹⁴⁴ Burnout in resident physicians is a continuum of burnout from medical school.^{126,127} This cross-sectional study could not examine this continuum but showed that attending physicians have approximately 10 points lower EE and DP scores in comparison to resident physicians.

OB clinicians that identified as being married or in a civil union had significantly lower DP scores in comparison to OB clinicians that were single. This finding aligns with data from a study consisting of 96 trauma nurses.¹⁴⁵ Being married or having children was associated with lower DP scores and compared with being single or having no children.¹⁴⁵ Social support systems from family have shown to be a coping mechanism for those in healthcare professions experiencing a stressful work environment.¹⁴⁶ In addition, this study showed that married or participants in a civil union also met the criteria for high PA. High levels of PA have been shown to serve as a coping mechanism that reduces burnout and maintains effectiveness for 6 months to 1 year.¹⁴⁷ This is another example of social support influencing coping abilities.

OB clinicians that perceived TCE to have highly influenced their professional practice had significantly higher personal accomplishments mean scores as compared to those that perceived TCE exposure to have had a low influence on their professional practice. Although this finding may seem confusing at first glance, those in behavioral research would recognize this finding as post-trauma growth.¹⁴⁸ Post traumatic growth refers to a person's

perceived capability to manage one's personal functioning and environmental demands of the aftermath occasioned by a traumatic event.¹⁴⁸ It is plausible that OB clinicians may seek additional training, implement policies, or alter their scope of practice in an effort to control their environment after TCE exposure, thereby feeling personally accomplished in regard to their professional practice.

Despite resilience not being identified as a moderator for the relationship between TCE influence on practice and PA burnout, past trauma research has identified resilience as a moderator and mediator against compassion fatigue, burnout, psychological distress, and turnover.^{101,149} Further research is needed to understand whether post-traumatic growth moderates the relationships between TCE and its influence on OB clinicians personally and professionally.

Strengths and Limitations

Survey respondents consisted predominately of Caucasians, women, and RNs. Although this might appear to be a non-inclusive or biased sample, it is actually an accurate representation of the demographics of healthcare workers in the U.S.¹⁴¹ The average age of respondents is also an accurate representation of OB clinicians on the maternity unit. In a study of 757 labor and delivery unit RNs across the US, the majority of respondents were Caucasian women between the ages of 25 and 54 years (71.3%).¹⁴¹

There were several limitations within our study, the first being our cross-sectional design. The cross-sectional design represents one point in time; as result, only associations between variables could be explored and not temporal sequences, predictions, or causal

relationships. Yet, since there is little research linking TCE exposure to clinician burnout, the descriptive statistics provide some needed foundation.

The second limitation was the use of convenience sampling. It is plausible that response bias may have occurred, meaning only OB clinicians with strong feelings or opinions regarding TCEs may have participated. With emails being used by the organizations to communicate with potential participants, the study team members did not have access to each hospital's mass email list, and the accuracy of the list could not be evaluated, nor could a response rate be calculated. Furthermore, the study was conducted in larger hospitals in one city, which may influence generalizability.

Our study may also have measurement limitations in that we did not specify the temporal aspect of TCE exposure. The absence of a temporal specification (e.g., within the last year) may have influenced the responses to the frequency, perceived severity, effect on practice, and effect on personal life as a result of participant(s) exposure to TCEs. On reflection, adding a temporal component to the TCE measure may have offered more insight into why there was no observed relationship between frequency and severity of TCE exposure with MBI subscales. Finally, our study commenced during the COVID-19 pandemic, which likely influenced both resilience and burnout scores in our sample population.

Conclusion

Burnout has been studied for decades in various healthcare professionals and specialties. Burnout and its well-established associations with poor mental health and reduced quality of patient care are undisputable. Yet, researchers have failed to identify a

consistent and effective means for interceding and preventing burnout in healthcare professionals. The U.S. Surgeon General has called attention to the epidemic of burnout plaguing healthcare professionals. The COVID-19 pandemic has sparked recent interest and awareness in healthcare workers experiencing burnout. The misconception of the maternity unit being an environment of perpetual has silenced and overshadowed the voices of emotionally exhausted OB clinicians who experience burnout. This study showed that OB clinicians experience EE and DP, the precursors for burnout and diminished patient care outcomes. Yet, research on this population of healthcare professionals is limited. This study also showed that although resilience moderates burnout in other populations of healthcare professionals, similar results could not be demonstrated in OB clinicians in relation to TCE exposure. More burnout research is necessary for this clinician population to provide evidence that can support strategies to promote both clinician and patient well-being.

Chapter 5: Summary and Implications of the Research

Overview

A known source of litigation, liability and OB clinicians' premature withdrawal from practice are exposures to TCEs, which are occupational stressors involving actual or threatened serious injury or death to either the mother or child or both. Accurately measuring the frequency and perceptions of TCEs encountered by OB and maternity care clinicians provides insight into clinician wellbeing after exposure to environmental stressors within the maternity unit. Because these occupational stressors have been associated with psychological distress and behaviors compatible with burnout, this research contributes to understanding how levels of resilience levels and burnout may either be diminished or enhanced based on personal factors, occupational factors, or organizational factors.

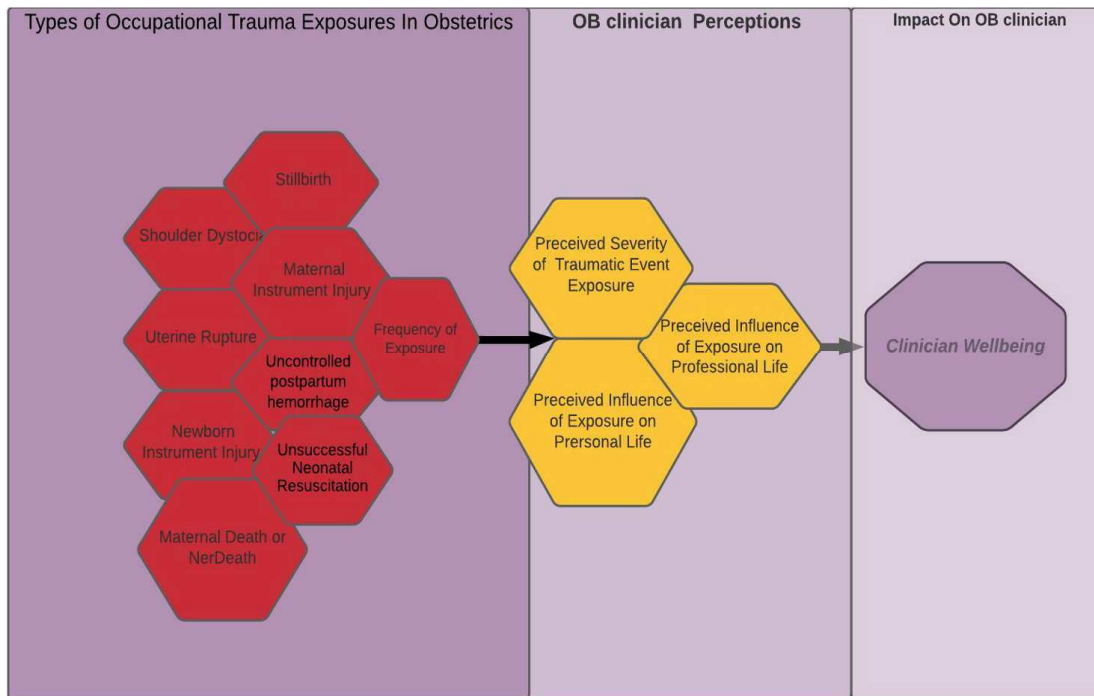
Summary of Findings

Aim 1. Describe the frequency and severity of TCEs and how they affect the professional practice and personal lives of maternity care clinicians, including RNs, CNMs, attending physicians, and resident physicians.

Based on a review of the literature, TCE was conceptually defined as obstetrical outcomes that provoke psychological distress and operationalized as eight individual events: shoulder dystocia, stillbirth, unsuccessful newborn resuscitation, maternal death, uterine rupture, uncontrollable postpartum hemorrhage, instrument injury to either mother or baby during the birth process.^{11,16,17,74} A TCE questionnaire was developed that resulted in a comprehensive measure of adverse maternal and fetal outcomes experienced by OB and maternity care clinicians.⁷⁵ This study was guided by a descriptive model, as depicted in

Figure 5.1. that describes the types of occupational trauma exposures that traditionally occur in OB practice that may trigger OB clinician perceptions of severity and influence the clinician’s wellbeing personally and professionally.

Figure 5.1. TCE Perceptions and Wellbeing Model



Among all the OB clinicians surveyed, 97.5% had experienced at least one TCEs during their career.⁷⁵ Shoulder dystocia was the most frequently occurring occupational trauma exposure (90.6%).⁷⁵ Exposure to a maternal death was perceived with the highest severity ($M=4.82$, $SD=.54$). Registered nurses (RNs) were found to have a significantly higher frequency of TCE exposure [$X^2(6, n= 159,)$ 22.2, $p<. 001$] in comparison to all clinician groups surveyed.⁷⁵ Most importantly, findings from the study showed that perception of severity significantly influenced the OB clinician’s professional practice ($Beta=.52$, $p<.001$) and personal life ($Beta=.46$, $p=<.001$).⁷⁵ Although, these findings have generated new knowledge is not surprising that shoulder dystocia was the most frequently

encountered TCE. Shoulder dystocia is reported in the literature as having an occurrence rate of 0.2% to 3.0% of all vaginal deliveries.⁵³ Just as RNs would be expected to have a higher frequency of TCE exposure, being that there are typically two RNs for every birth, one for the mother and one for the newborn.¹¹²

Aim 2. Describe personal (e.g., demographic, personal demands), and work organization factors (e.g., hospital-based employee support services, maternity unit volume, and the presence of high-risk patients) associated with OB clinician resilience.

Resilience scores by hospital sites ranged from 69.8 to 78.8.¹⁵⁰ An ANOVA showed a significant difference in mean resilience scores across the five hospitals ($F=3.75$, $P=.006$) while meeting the homogeneity of variance of assumptions.¹⁵⁰ Post hoc Tukey testing showed that only the lowest and highest hospitals had significant differences in means ($p=.002$).¹⁵⁰ The organizational characteristics across the 5-hospital sites showed variation in the number of births. Little to no variation was shown in the presence of high-risk laboring women on the maternity unit or within the availability of collateral pathways and support services offered by each organization to their OB clinicians.

An ICC calculation showed that 7% of the variance in resilience scores was attributed to the hospital where the OB clinician was employed. Yet, there were no associations identified between organizational characteristics and resilience scores. Personal factors (consisting of age, African American race, and years of experience) were shown to have a significant influence on resilience scores. Clinicians aged 35-54 years had significantly lower resilience than the 55 or older group ($B=-7.60$, $p=.011$).¹⁵⁰ African American clinicians had significantly higher resilience in comparison to Caucasian and other non-African American

or non-Caucasian races ($B= 5.16, p=.015$).¹⁵⁰ Recognizing that age and years of experience are correlated ($r=.828, p<.001$), nearly all of the experience groups had significantly lower resilience than the OB clinicians with 21 or more years of experience, except those clinicians with 4-5 years of experience.

Findings that African Americans' and clinicians' ages were significantly associated with levels of resilience were consistent with findings from previous studies.^{78,87,88} With regards to overall resilience, the mean resilience scores for OB Clinicians in this study ($M=73.95$) are within 2-points of the Australian OR nurse study ($M=75.9$)¹⁰¹ Considering that our study was during the Covid-19 pandemic, variation in resilience scores are to be expected. Although there were international resilience studies during the pandemic, most were within other healthcare specialties. There are very few research studies that describe levels of resilience in a U.S sample of OB clinicians, especially during the covid- 19 pandemic. Therefore, the finding in this study may not consistently align with international healthcare worker resilience studies due to differences in medical models, resources, and personal factors of the workforce, including age and ethnicity.

Aim 3. Describe the relationship between TCE exposure and burnout and test the moderating ability of resilience.

High levels of emotional exhaustion were observed in 31.3% of OB clinicians sampled.¹⁵¹ Post hoc comparison using Tukey indicated that Asian/Pacific Islanders had significantly higher depersonalization scores than Black and Hispanic OB clinicians. OB clinicians that were married or in a civil union had significantly lower emotional exhaustion scores in comparison to single OB clinicians ($F=3.4, p=.02$).¹⁵¹ Post hoc testing revealed that

resident physicians had significantly higher emotional exhaustion ($F= 4.01, p=.009$) and depersonalization scores ($F=19.1, p<.001$) than all other occupational roles within the study.

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Recruitment sites accounted for 7.5% of the variance in EE scores, 11.1% in DP scores, and 1.3% in PA scores (1.3%). A linear mixed model was conducted and determined that only one TCE dimension had a significant relationship with a burnout subscale. A relationship was observed between TCE's influence on practice and feeling personally accomplished ($F= 4.12, p=.02$).¹⁵¹ Being that no other significant relationships were observed, the moderating effect of resilience was tested only on TCE's influence on practice and feeling personally accomplished; resilience was not shown to act as a moderator ($p=.74$).¹⁵¹

The finding of this study is consistent with prior studies that identify resident physicians as a vulnerable population with regard to burnout.¹²⁶¹³⁵ However, this study was unable to identify resilience as a moderator of burnout, as demonstrated in other healthcare worker burnout research. Instead, the concept of post traumatic growth emerged as a possible explanation for why OB clinicians feel a sense of personal accomplishment after TCE exposure. As with Aim.1 and Aim. 2, Aim 3 generates new knowledge that attempts to fill a gap in what is known about the prevalence of burnout in U.S OB clinicians.

Limitations

Several limitations must be acknowledged regarding the sample, measure, and design. The study sample was a convenience sample with emails being used by the organization to communicate with potential participants. Selection bias may have occurred. OB clinicians

that perceived their TCE exposure to be severe may have been more likely to complete the survey. Likewise, recall bias may be a concern as clinicians may not recall every TCE or may only recall the most severe or impactful events. Also, in order to remain compliant with the IRB, the study team members did not have access to each hospital's mass email list, and the accuracy of the list could not be evaluated, nor could a response rate be calculated. A fewer number of responses of some professional roles resulted in the underrepresentation of some OB clinicians. There is a possibility that respondents could have completed more than one survey as the "prevent multiple submission" feature was not used during data collection. This feature was not used because it could have interfered with OB clinicians utilizing a computer within a shared workspace such as the nurses' station.

Regarding the measurement, the TCE measure is new, and unfortunately, the temporal aspect of TCE exposure was not specified. The absence of a temporal specification (e.g., within the last year) may have influenced the responses to the frequency, perceived severity, influence on practice, and personal life. Temporal aspects of the TCE items may have explained why there was no observed relationship between frequency and severity of TCE exposure with MBI subscales. While some unit-level measures were collected, additional organizational measures such as staff satisfaction scores, and organizational culture could have been captured via the use of Press Ganey data. Patient acuity measures, staffing ratio, and maternity unit volume measures may have provided more insight as to the factors that may impact resilience in hospitals. Also, the major challenges COVID-19 imposed upon the work environment may have influenced staff participation in the survey, as well as influenced resilience and burnout scores.

Finally, the cross-sectional study design only represents one point in time and only five hospitals in one metropolitan region. As a result of the cross-sectional design, only associations between variables could be explored and not temporal sequences, predictions, or causal relationships.

Strengths

Despite having many limitations, this study also has several strengths. This study is one of the first to quantify several traumatic childbirth events and measure the impact of TCE exposure on several professional roles within U.S. labor and delivery units. Unlike past obstetrical studies that examined the impact of one specific birth event or trauma exposure on one specific type of obstetrical clinician, this study clearly demonstrates that all OB clinicians experience exposure to some TCEs. RNs reported a higher proportion. It has also been identified that if severe, TCE exposures do impact OB clinicians professionally and personally. This study highlights the importance utilizing a cohort study design approach this may produce a more accurate representation of the frequency and severity of TCE. Thereby resulting in a better understand the effects TCE exposure has on the professional practice and personal lives of OB clinicians. Lastly, while burnout in healthcare workers is frequently studied, this study is also among the very few to measure resilience and burnout in U.S. OB clinicians.

Implications for Research, Clinical Practice, and Public Health

Research

The TCE questionnaire is one of the first comprehensive measures of traumatic childbirth frequency, severity, and influence on personal and professional life. Consistently

measuring TCE frequency and accounting for both neonatal and maternal birth outcomes allow for a more accurate representation of TCE exposures and facilitate assessing the influence on OB clinicians. Future research will need to enhance recruitment in order to capture a larger sample size. A larger sample size will allow for stratification of finding by clinician type as well as allow for subset analysis. For example, how do burnout and resilience scores differ for those OB clinicians that experienced TCE 10 or more times. Resilience and burnout research in U.S. OB clinicians is under-represented in the literature. A large subset analysis of resilience in African American OB clinician is necessary in order to better understand why African American OB clinicians were most resilient in this study. Future research will also need to refine the TCE measure to include a temporal aspect and consider capturing OB clinicians' responses in real-time via the use of an app. Also, in an effort to improve generalizability, future research should expand enrollment to other hospitals in other cities. Future studies may also survey medical students since past research has identified medical students as a group that experiences high levels of burnout.

Clinical Practice

Accurate representation of TCE exposures, levels of resilience, and burnout can assist in identifying those OB clinicians who are most at risk for developing psychological distress or early withdrawal from practice. This study can serve as a blueprint for healthcare organizations to develop mitigating strategies and programs tailored to the specific needs of OB clinicians. For example, debriefing tools can address the clinical skills necessary to navigate a TCE, but more importantly incorporate peer comradery and counseling that is specifically designed to address the psychological distress associated with the TCE events.

For example, counseling sessions, should be mandatory for TCE perceived as most severe and optional for those perceived least severe. Whereas engagement in peer comradery has been shown to reduce the likelihood of PTSD symptom development in soldiers, thus it is plausible that the same effect may be achieved in OB clinicians after TCE.¹⁵² Healthcare organizations may also use the measurement of TCE frequencies within their institutions to gauge if the number of collateral pathways adequately matches the demands of their healthcare workers and make adjustments as necessary.

Public Health

Researchers have already established a relationship between occupational trauma exposures and clinician psychological distress and premature withdrawal from practice. Clinicians who experience psychological distress and those clinicians that work in an environment plagued with turnover are twice as likely to make a major medical error and be involved in a malpractice litigation suit.⁶ These observed outcomes pose a serious concern to public health via weakening the stability of healthcare organizations to provide maternity care services to women in the community. Women need access to quality maternity care services, especially in urban areas where maternal morbidity and mortality occur at disproportionate rates. However, in order to improve accessibility and quality, the OB clinicians' wellbeing and their environment must be improved upon first.

Conclusion

As part of an OB clinician's practice, they routinely participate in the birthing process. The profession is often perceived as filled with continuous joy and instant gratification. Yet, maternity healthcare clinicians frequently experience occupational

exposure related to traumatic maternal and newborn adverse events. This study has shown that OB clinicians are frequently exposed to occupational traumas in the form of TCEs and if these exposures are perceived as severe, the event can impact the personal and professional life of the clinician. This study has also shown that the maternity unit can impose demands on OB clinicians that may influence their level of resilience or burnout. Future researchers should investigate mitigating strategies that enhance resilience and reduce emotional exhaustion and depersonalization in OB clinicians.

References

1. Hoyert D. Maternal Mortality Rates in the United States, 2020.; 2022.
doi:10.15620/cdc:113967
2. Driscoll AK, Hamilton BE, Valenzuela CP. Quarterly provisional estimates for selected birth indicators, 2019—Quarter 4, 2021. National Center for Health Statistics. Accessed December 14, 2022. <https://www.cdc.gov/nchs/nvss/vsrr/infantmortality-dashboard.htm>
3. Center for Disease Control. Reproductive health: Pregnancy mortality surveillance systems.
4. Center for Disease Control. Gestational diabetes. Published August 10, 2021. Accessed December 14, 2022. <https://www.cdc.gov/diabetes/basics/gestational.html>
5. Center for Disease Control. High blood pressure during pregnancy.
6. Frederiksen LE, Ernst A, Brix N, et al. Risk of Adverse Pregnancy Outcomes at Advanced Maternal Age. *Obstetrics & Gynecology*. 2018;131(3):457-463.
doi:10.1097/AOG.0000000000002504
7. Lassi ZS, Imam AM, Dean S v, Bhutta ZA. Preconception care: screening and management of chronic disease and promoting psychological health. *Reprod Health*. 2014;11(S3): S5. doi:10.1186/1742-4755-11-S3-S5
8. Cocker F, Joss N. Compassion Fatigue among Healthcare, Emergency and Community Service Workers: A Systematic Review. *Int J Environ Res Public Health*. 2016;13(6):618.
doi:10.3390/ijerph13060618

9. Benjet C, Bromet E, Karam EG, et al. The epidemiology of traumatic event exposure worldwide: results from the World Mental Health Survey Consortium. *Psychol Med*. 2016;46(2):327-343. doi:10.1017/S0033291715001981
10. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. American Psychiatric Association; 2013. doi:10.1176/appi.books.9780890425596
11. Beck CT, Gable RK. A Mixed Methods Study of Secondary Traumatic Stress in Labor and Delivery Nurses. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2012;41(6):747-760. doi:10.1111/j.1552-6909.2012.01386.x
12. Beck CT, LoGiudice J, Gable RK. A Mixed-Methods Study of Secondary Traumatic Stress in Certified Nurse-Midwives: Shaken Belief in the Birth Process. *J Midwifery Womens Health*. 2015;60(1):16-23. doi:10.1111/jmwh.12221
13. Simpson M, Catling C. Understanding psychological traumatic birth experiences: A literature review. *Women and Birth*. 2016;29(3):203-207. doi:10.1016/j.wombi.2015.10.009
14. Wahlberg Å, Andreen Sachs M, Johannesson K, et al. Post-traumatic stress symptoms in Swedish obstetricians and midwives after severe obstetric events: a cross-sectional retrospective survey. *BJOG*. 2017;124(8):1264-1271. doi:10.1111/1471-0528.14259
15. Beck CT, Watson S. Subsequent Childbirth After a Previous Traumatic Birth. *Nurs Res*. 2010;59(4):241-249. doi:10.1097/NNR.0b013e3181e501fd
16. Cankaya S, Erkal Aksoy Y, Dereli Yılmaz S. Midwives' experiences of witnessing traumatic hospital birth events: A qualitative study. *J Eval Clin Pract*. 2021;27(4):847-857. doi:10.1111/jep.13487

17. Slade P, Balling K, Sheen K, et al. Work-related post-traumatic stress symptoms in obstetricians and gynaecologists: findings from INDIGO, a mixed-methods study with a cross-sectional survey and in-depth interviews. *BJOG*. 2020;127(5):600-608.
doi:10.1111/1471-0528.16076
18. Bozdağ F, Ergün N. Psychological Resilience of Healthcare Professionals During COVID-19 Pandemic. *Psychol Rep*. 2021;124(6):2567-2586.
doi:10.1177/0033294120965477
19. Wagnild GM, Young. H.M. Development and psychometric evaluation of the Resilience Scale. *J Nurs Meas*. 1993;1(2):165-178.
20. Southwick SM, Charney DS. The science of resilience: implications for the prevention and treatment of depression. *Science* . 2012;338:79-82.
21. Rutter M. Annual Research Review: Resilience--Clinical Implications. *Journal of Child Psychology and Psychiatry*. 2013;54:474-487.
22. Smith-Osborne A, Bolton K.W. Assessing resilience: a review of measures across the life course. *Journal of Evidence- Based Social Work* . 2013;10:111-126.
23. McKinley N, Karayiannis PN, Convie L. Resilience in medical doctors: A systematic review. *Postgrad Med J*. 2019;.95(1121):140-147.
24. Herbert MS, Leung DW, Pittman J, Floto E, Afari N. Race/ethnicity, psychological resilience, and social support among OEF/OIF combat veterans. *J Psychiatry*. 2018;265:265-270.

25. Yang G, Liu J, Liu L, Wu X, Ding S, Xie J. Burnout and Resilience Among Transplant Nurses in 22 Hospitals in China. *Transplant Proc.* 2018;50(10):2905-2910.
doi:10.1016/j.transproceed.2018.04.033
26. Mealer M, Jones J, Meek P. Factors Affecting Resilience and Development of Posttraumatic Stress Disorder in Critical Care Nurses. *American Journal of Critical Care.* 2017;26(3):184-192.
27. Sánchez-Zaballos M, Mosteiro-Díaz MP. Resilience Among Professional Health Workers in Emergency Services. *J Emerg Nurs.* 2021;47(6):925-932.e2.
doi:10.1016/j.jen.2020.07.007
28. Gillespie BM, Chaboyer W, Wallis M, Grimbeek P. Resilience in the operating room: developing and testing of a resilience model. *J Adv Nurs.* 2007;59(4):427-438.
doi:10.1111/j.1365-2648.2007.04340.x
29. Ryder R, Kearney L, Kynn M, Weaver E. Resilience and workplace stress in Australian and New Zealand obstetrics and gynaecology trainees: A cross-sectional survey. *Australian and New Zealand Journal of Obstetrics and Gynaecology.* 2020;60(2):225-230.
doi:10.1111/ajo.13098
30. McGowan JE, Murray K. Exploring resilience in nursing and midwifery students: a literature review. *J Adv Nurs.* 2016;72(10):2272-2283. doi:10.1111/jan.12960
31. Ertekin Pinar S, Yildirim G, Sayin N. Investigating the psychological resilience, self-confidence and problem-solving skills of midwife candidates. *Nurse Educ Today.* 2018;64:144-149. doi:10.1016/j.nedt.2018.02.014

32. U.S Department of Health and Human Services. New Surgeon General Advisory Sounds Alarm on Health Worker Burnout and Resignation.; 2022. Accessed November 18, 2022. <https://www.hhs.gov/about/news/2022/05/23/new-surgeon-general-advisory-sounds-alarm-on-health-worker-burnout-and-resignation.html>
33. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors related to physician burnout and its consequences: A review. *Behavioral Science*. 2018;8(11):98.
34. Garrett C. The effect of nurse staffing patterns on medical errors and nurse burnout. *AORN J*. 2008;87(6):1191-1204.
35. Shatte A, Perlman A, Lynch W. The positive effects of resilience on stress and business outcomes in difficult work environments. *Journal of Occupational and Environmental Medicine*. 2016;59(2):135-140.
36. Health Recourses & Services Administration. National and Regional Projection of Supply and Demand of Women's Health Service Providers 2013-2015.; 2016. Accessed November 18, 2022. <https://bhw.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/womens-health-report.pdf>
37. National Academies of Sciences E and M. Taking Action Against Clinician Burnout. National Academies Press; 2019. doi:10.17226/25521
38. Fida R, Laschinger HKS, Leiter MP. The protective role of self-efficacy against workplace incivility and burnout in nursing. *Health Care Manage Rev*. 2018;43(1):21-29. doi:10.1097/HMR.000000000000126

39. Shanafelt TD, Gradishar WJ, Kosty M, et al. Burnout and Career Satisfaction Among US Oncologists. *Journal of Clinical Oncology*. 2014;32(7):678-686.
doi:10.1200/JCO.2013.51.8480
40. Kane L. Physician Burnout & Depression Report 2022: Stress, Anxiety, and Anger. Medscape. Published 2022. Accessed November 18, 2022.
<https://www.medscape.com/slideshow/2022-lifestyle-burnout-6014664?reg=1>
41. Thumm EB, Smith DC, Squires AP, Breedlove G, Meek PM. Burnout of the <sc>US</sc> midwifery workforce and the role of practice environment. *Health Serv Res*. 2022;57(2):351-363. doi:10.1111/1475-6773.13922
42. Brigham T, Barden C, Dopp AL, et al. A Journey to Construct an All-Encompassing Conceptual Model of Factors Affecting Clinician Well-Being and Resilience.; 2018.
43. Cunningham CT, Quan H, Hemmelgarn B, et al. Exploring physician specialist response rates to web-based surveys. *BMC Med Res Methodol*. 2015;15(1):32. doi:10.1186/s12874-015-0016-z
44. Corner B, Lemonde M. Survey techniques for nursing studies. *Can Oncol Nurs J*. 2019;29(1):58-60.
45. Davidson JRT. Connor-Davidson Resilience Scale (CDRISC) Manual. Unpublished. Published online 2018:8-18.
46. Poghosyan L, Aiken LH, Sloane DM. Factor structure of the Maslach burnout inventory: An analysis of data from large scale cross-sectional surveys of nurses from eight countries. *Int J Nurs Stud*. 2009;46(7):894-902. doi:10.1016/j.ijnurstu.2009.03.004

47. Hamilton BE, Martin JA, Osterman JK. Births: Provisional data for 2020. National Vital Statistics Rapid Release. 2021;12:1-11.
48. Centers for Disease Control and Prevention. Reproductive health: Preterm birth. Reproductive health: Preterm birth.
49. Barfield WD. Public health implications of very preterm birth. Clin Perinatol. 2018;45(3):565-577.
50. Fanczal E, Berecz B, Szijártó A, Gasparics Á, Varga P. The Prognosis of Preterm Infants Born at the Threshold of Viability: Fog Over the Gray Zone – Population-Based Studies of Extremely Preterm Infants. Medical Science Monitor. 2020;26. doi:10.12659/MSM.926947
51. Centers for Disease Control and Prevention. What is stillbirth?
52. Dumpa V, Kamity R. Birth Trauma. StatPearls Publishing.
53. Ojumah N, Ramdhan RC, Wilson C, Loukas M, Oskouian RJ, Tubbs RS. Neurological Neonatal Birth Injuries: A Literature Review. Cureus. Published online December 12, 2017. doi:10.7759/cureus.1938
54. Zheutlin AB, Vieira L, Shewcraft RA, et al. Improving postpartum hemorrhage risk prediction using longitudinal electronic medical records. Journal of the American Medical Informatics Association. 2022;29(2):296-305. doi:10.1093/jamia/ocab161
55. Kerkman T, Dijkman LM, Baas MAM, Evers R, Pampus MG, Stramrood CAI. Traumatic Experiences and the Midwifery Profession: A Cross-Sectional Study Among Dutch Midwives. J Midwifery Womens Health. 2019;64(4):435-442. doi:10.1111/jmwh.12946

56. Sugiura-Ogasawara M, Suzuki S, Kitazawa M, et al. Career satisfaction level, mental distress, and gender differences in working conditions among Japanese obstetricians and gynecologists. *Journal of Obstetrics and Gynaecology Research*. 2012;38(3):550-558. doi:10.1111/j.1447-0756.2011.01765.x
57. Beck CT, Gable RK. A Mixed Methods Study of Secondary Traumatic Stress in Labor and Delivery Nurses. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2012;41(6):747-760. doi:10.1111/j.1552-6909.2012.01386.x
58. Akangire G, Carter B. Birth Injuries in Neonates. *Pediatr Rev*. 2016;37(11):451-462. doi:10.1542/pir.2015-0125
59. Collins KA, Popek E. Birth Injury: Birth Asphyxia and Birth Trauma. *Acad Forensic Pathol*. 2018;8(4):788-864. doi:10.1177/1925362118821468
60. Centers for Disease Control and Prevention. Reproductive outcomes: Picture of America repor.
61. American College of Obstetrics and Gynecology. Levels of maternal care. *Obstetric Care Consensus No. 9. Obstetrics and Gynecology* . 2018;134:e41-55. https://www.aafp.org/dam/AAFP/documents/medical_education_residency/program_directors/Reprint261_Maternity.pdf
62. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods*. 2007;39(2):175-191. doi:10.3758/BF03193146
63. OUZOUNIAN JG. Shoulder Dystocia: Incidence and Risk Factors. *Clin Obstet Gynecol*. 2016;59(4):791-794. doi:10.1097/GRF.0000000000000227

64. American Academy of Family Medicine Physicians. Recommended guidelines for Family medicine residents: Maternity care.
https://www.aafp.org/dam/AAFP/documents/medical_education_residency/program_directors/Reprint261_Maternity.pdf.
65. Council on Resident Education in Obstetrics and Gynecology. CREOG educational objectives.
66. American College of Obstetricians and Gynecologists. Joint statement of practice relations between obstetrician gynecologists and certified nurse-midwives/certified midwives.
67. American College of Nurse Midwives. Collaborative management in midwifery practice for medical, gynecologic and obstetric conditions. Published December 2014. Accessed December 14, 2022. <https://www.midwife.org/acnm/files/ACNMLibraryData/UPLOADFILENAME/000000000058/Collaborative-Mgmt-in-Midwifery-PracticeSept-2014.pdf>
68. Simpson KR, Lyndon A, Spetz J, Gay CL, Landstrom GL. Adherence to the AWHONN Staffing Guidelines as Perceived by Labor Nurses. *Nurs Womens Health*. 2019;23(3):217-223. doi:10.1016/j.nwh.2019.03.003
69. Pettker CM. Systematic approaches to adverse events in obstetrics, Part II: Event analysis and response. *Semin Perinatol*. 2017;41(3):156-160. doi:10.1053/j.semperi.2017.03.004
70. Arrogante O, Aparicio-Zaldivar E. Burnout and health among critical care professionals: The mediational role of resilience. *Intensive Critical Care Nursing*. 2017;42:110-115.

71. Ryder R, Kearney L, Kynn M, Weaver E. Resilience and workplace stress in Australian and New Zealand obstetrics and gynaecology trainees: A cross-sectional survey. *Australian and New Zealand Journal of Obstetrics and Gynaecology*. 2020;60(2):225-230.
doi:10.1111/ajo.13098
72. Wright EM, Carson AM, Kriebs J. Cultivating Resilience Among Perinatal Care Providers During the Covid-19 Pandemic. *Journal of Perinatal & Neonatal Nursing*. 2021;35(2):105-109. doi:10.1097/JPN.0000000000000558
73. Beck CT, Gable RK. A Mixed Methods Study of Secondary Traumatic Stress in Labor and Delivery Nurses. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2012;41(6):747-760. doi:10.1111/j.1552-6909.2012.01386.x
74. Beck CT, LoGiudice J, Gable RK. A Mixed-Methods Study of Secondary Traumatic Stress in Certified Nurse-Midwives: Shaken Belief in the Birth Process. *J Midwifery Womens Health*. 2015;60(1):16-23. doi:10.1111/jmwh.12221
75. Robinson KeishaA, Johantgen MaryE, Storr CarlaL, Gaitens JoannaM, Atlas RobertO, Ogbolu Y. Cross-Sectional Study of the Frequency and Severity of Traumatic Childbirth Events and How They Affect Maternity Care Clinicians. *J Obstet Gynecol Neonatal Nurs*. Published online 2022. doi:10.1016/j.jogn.2022.08.006
76. Bozdağ F, Ergün N. Psychological Resilience of Healthcare Professionals During COVID-19 Pandemic. *Psychol Rep*. 2021;124(6):2567-2586.
doi:10.1177/0033294120965477

77. Yang G, Liu J, Liu L, Wu X, Ding S, Xie J. Burnout and Resilience Among Transplant Nurses in 22 Hospitals in China. *Transplant Proc.* 2018;50(10):2905-2910.
doi:10.1016/j.transproceed.2018.04.033
78. Wells M. Resilience in Older Adults Living in Rural, Suburban, and Urban Areas. *Online Journal of Rural Nursing and Health Care.* 2010;10(2):45-54. doi:10.14574/ojrnhc.v10i2.55
79. Bangasser DA, Valentino R.J. Sex differences in stress related psychiatric disorders: neurobiological perspectives. *Frontiers in Neuroendocrinology.* 2014;35:303-319.
80. Hirani S, Lasiuk G, Hegadoren K. The intersection of gender and resilience. *J Psychiatr Ment Health Nurs.* 2016;23(6-7):455-467. doi:10.1111/jpm.12313
81. Lenah JS, Sibusiso M. Age and gender in relation to resilience after the experience of trauma among Internally Displaced Persons (IDPS) in Kiambaa village, Eldoret East Sub-County, Kenya. *Journal of Psychology and Behavioral Science.* 2018;7(1):31-40.
82. Silverstein MW, Mekawi Y, Watson-Singleton NN, et al. Psychometric properties of the Connor-Davidson Resilience Scale 10 in a community sample of African American adults: Exploring the role of gender. *Traumatology (Tallahass Fla).* 2022;28(2):211-222.
doi:10.1037/trm0000316
83. Love MF, Sharrief A, LoBiondo-Wood G, Cron SG, Sanner Beauchamp JE. The Effects of Meditation, Race, and Anxiety on Stroke Survivor Resilience. *Journal of Neuroscience Nursing.* 2020;52(3):96-102.
84. Gumbs A. One benefit of being black: We're more Resilient to stress. *Health Wellness Lifestyle.* Published online 2017.

85. Bailey R, Mokonogho J, Kumar A. Racial and ethnic differences in depression: current perspectives. *Neuropsychiatr Dis Treat*. 2019; Volume 15:603-609.
doi:10.2147/NDT.S128584
86. Jordan J v. Relational Resilience in Girls. In: *Handbook of Resilience in Children*. Springer US; :79-90. doi:10.1007/0-306-48572-9_6
87. Ungar M, Hadfield K. The differential impact of environment and resilience on youth outcomes. *Can J Behav Sci*. 2019;51(2):135-146. doi:10.1037/cbs0000128
88. Brody GH, Yu T, Beach SRH. Resilience to adversity and the early origins of disease. *Dev Psychopathol*. 2016;28(4pt2):1347-1365. doi:10.1017/S0954579416000894
89. Sigal JJ, Weinfeld M. Do Children Cope Better Than Adults with Potentially Traumatic Stress? A 40-Year Follow-Up of Holocaust Survivors. *Psychiatry: Interpersonal and Biological Processes*. 2001;64(1):69-80. doi:10.1521/psyc.64.1.69.18236
90. Mao X, Wang Z, Hu X, Loke AY. A scoping review of resilience scales of adults to develop a prototype disaster resilience tool for healthcare rescuers. *International Journal of Disaster Risk Reduction*. 2020;49:101678. doi:10.1016/j.ijdr.2020.101678
91. Williams DR, González HM, Neighbors H, et al. Prevalence and Distribution of Major Depressive Disorder in African Americans, Caribbean Blacks, and Non-Hispanic Whites. *Arch Gen Psychiatry*. 2007;64(3):305. doi:10.1001/archpsyc.64.3.305
92. Ssekannyo D. Ugandan Immigrant Students' Perceptions of Barriers to Academic Achievement in American High School. University of the Pacific; 2010.

93. Sandín-Esteban MP, Sánchez-Martí A. Resilience and school success of young immigrants / Resiliencia y éxito escolar en jóvenes inmigrantes. *Infancia y Aprendizaje*. 2015;38(1):175-211. doi:10.1080/02103702.2015.1009232
94. Fang CJ, Tong N, Villa RJ, Flores AM, Lim E, Tu A. Adult attachment, stress-coping, and resilience in first-generation immigrants in the United States. *British Journal of Occupational Therapy*. 2022;85(5):332-340. doi:10.1177/03080226211022962
95. Mayordomo-Rodríguez T, García-Massó X, Sales-Galán A, Meléndez-Moral JC, Serra-Añó P. Resilience Patterns. *The International Journal of Aging and Human Development*. 2015;80(4):316-331. doi:10.1177/0091415015603595
96. Aydogan D, Kara E, Kalkan E. Understanding relational resilience of married adults in quarantine days. *Current Psychology*. 2022;41(11):8249-8259. doi:10.1007/s12144-021-02224-2
97. Walsh F. Crisis, trauma, and challenge: A relational resilience approach for healing, transformation, and growth*. *Smith Coll Stud Soc Work*. 2003;74(1):49-71. doi:10.1080/00377310309517704
98. Barasa E, Mbau R, Gilson L. What Is Resilience and How Can It Be Nurtured? A Systematic Review of Empirical Literature on Organizational Resilience. *Int J Health Policy Manag*. 2018;7(6):491-503. doi:10.15171/ijhpm.2018.06
99. Wu C (Jo), Oprescu FI. Applying the <scp>Ottawa Charter</scp> to guide resilience□building programs for health care organizations. *Nurs Health Sci*. 2021;23(3):665-669. doi:10.1111/nhs.12868

100. Behrens DA, Rauner MS, Sommersguter-Reichmann M. Why Resilience in Health Care Systems is More than Coping with Disasters: Implications for Health Care Policy. *Schmalenbach Journal of Business Research*. Published online April 8, 2022. doi:10.1007/s41471-022-00132-0
101. Gillespie BM, Chaboyer W, Wallis M, Grimbeek P. Resilience in the operating room: developing and testing of a resilience model. *J Adv Nurs*. 2007;59(4):427-438. doi:10.1111/j.1365-2648.2007.04340.x
102. Yu M, Lee H. Impact of resilience and job involvement on turnover intention of new graduate nurses using structural equation modeling. *Japan Journal of Nursing Science*. 2018;15(4):351-362. doi:10.1111/jjns.12210
103. Clark P, Crawford TN, Hulse B, Polivka BJ. Resilience, Moral Distress, and Workplace Engagement in Emergency Department Nurses. *West J Nurs Res*. 2021;43(5):442-451. doi:10.1177/0193945920956970
104. Grasso C, Massidda D, Maslak KZ, et al. Moral Distress in Healthcare Providers Who Take Care of Critical Pediatric Patients throughout Italy—Cultural Adaptation and Validation of the Italian Pediatric Instrument. *Int J Environ Res Public Health*. 2022;19(7):3880. doi:10.3390/ijerph19073880
105. McGowan JE, Murray K. Exploring resilience in nursing and midwifery students: a literature review. *J Adv Nurs*. 2016;72(10):2272-2283. doi:10.1111/jan.12960
106. Ertekin Pinar S, Yildirim G, Sayin N. Investigating the psychological resilience, self-confidence and problem-solving skills of midwife candidates. *Nurse Educ Today*. 2018;64:144-149. doi:10.1016/j.nedt.2018.02.014

107. DeTore NR, Sylvia L, Park ER, et al. Promoting resilience in healthcare workers during the COVID-19 pandemic with a brief online intervention. *J Psychiatr Res.* 2022;146:228-233. doi:10.1016/j.jpsychires.2021.11.011
108. Setiawati Y, Wahyuhadi J, Joestandari F, Maramis MM, Atika A. Anxiety and Resilience of Healthcare Workers During COVID-19 Pandemic in Indonesia. *J Multidiscip Healthc.* 2021; Volume 14:1-8. doi:10.2147/JMDH.S276655
109. Barzilay R, Moore TM, Greenberg DM, et al. Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. *Transl Psychiatry.* 2020;10(1):291. doi:10.1038/s41398-020-00982-4
110. IBM Corp. IBM SPSS Statistics for Windows. Published online 2020.
111. George EK, Weiseth A, Edmonds JK. Roles and Experiences of Registered Nurses on Labor and Delivery Units in the United States During the COVID-19 Pandemic. *Journal of Obstetric, Gynecologic & Neonatal Nursing.* 2021;50(6):742-752. doi:10.1016/j.jogn.2021.08.096
112. Simpson KR, Lyndon A, Spetz J, Gay CL, Landstrom GL. Adherence to the AWHONN Staffing Guidelines as Perceived by Labor Nurses. *Nurs Womens Health.* 2019;23(3):217-223. doi:10.1016/j.nwh.2019.03.003
113. Douillet D, Caillaud A, Riou J, et al. Assessment of physicians' resilience level during the COVID-19 pandemic. *Transl Psychiatry.* 2021;11(1):283. doi:10.1038/s41398-021-01395-7

114. Afshari D, Nourollahi-darabad M, Chinisaz N. Demographic predictors of resilience among nurses during the COVID-19 pandemic. *Work*. 2021;68(2):297-303.
doi:10.3233/WOR-203376
115. Tawfik DS, Sexton JB, Adair KC, Kaplan HC, Profit J. Context in Quality of Care. *Clin Perinatol*. 2017;44(3):541-552. doi:10.1016/j.clp.2017.04.004
116. Mazerolle SM, Eason CM, Goodman A. An Examination of Relationships Among Resiliency, Hardiness, Affectivity, and Work-Life Balance in Collegiate Athletic Trainers. *J Athl Train*. 2018;53(8):788-795. doi:10.4085/1062-6050-311-17
117. Becker JL, Milad MP, Klock SC. Burnout, depression, and career satisfaction: Cross-sectional study of obstetrics and gynecology residents. *Am J Obstet Gynecol*. 2006;195(5):1444-1449. doi:10.1016/j.ajog.2006.06.075
118. Newton MS, McLachlan HL, Forster DA, Willis KF. Understanding the 'work' of caseload midwives: A mixed-methods exploration of two caseload midwifery models in Victoria, Australia. *Women and Birth*. 2016;29(3):223-233.
doi:10.1016/j.wombi.2015.10.011
119. Rotenstein LS, Ramos MA, Torre M, et al. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students. *JAMA*. 2016;316(21):2214.
doi:10.1001/jama.2016.17324
120. Ghahramani S, Lankarani KB, Yousefi M, Heydari K, Shahabi S, Azmand S. A Systematic Review and Meta-Analysis of Burnout Among Healthcare Workers During COVID-19. *Front Psychiatry*. 2021;12. doi:10.3389/fpsy.2021.758849

121. Prasad K, McLoughlin C, Stillman M, et al. Prevalence and correlates of stress and burnout among U.S. healthcare workers during the COVID-19 pandemic: A national cross-sectional survey study. *EClinicalMedicine*. 2021;35:100879.
doi:10.1016/j.eclinm.2021.100879
122. Shanafelt TD, Gradishar WJ, Kosty M, et al. Burnout and Career Satisfaction Among US Oncologists. *Journal of Clinical Oncology*. 2014;32(7):678-686.
doi:10.1200/JCO.2013.51.8480
123. Mata DA, Ramos MA, Bansal N, et al. Prevalence of Depression and Depressive Symptoms Among Resident Physicians. *JAMA*. 2015;314(22):2373.
doi:10.1001/jama.2015.15845
124. McHugh MD, Kutney-Lee A, Cimiotti JP, Sloane DM, Aiken LH. Nurses' Widespread Job Dissatisfaction, Burnout, And Frustration with Health Benefits Signal Problems for Patient Care. *Health Aff*. 2011;30(2):202-210. doi:10.1377/hlthaff.2010.0100
125. Shanafelt TD, Boone S, Tan L, et al. Burnout and Satisfaction with Work-Life Balance Among US Physicians Relative to the General US Population. *Arch Intern Med*. 2012;172(18):1377. doi:10.1001/archinternmed.2012.3199
126. IsHak WW, Lederer S, Mandili C, et al. Burnout During Residency Training: A Literature Review. *J Grad Med Educ*. 2009;1(2):236-242. doi:10.4300/JGME-D-09-00054.1
127. Dyrbye LN, Thomas MR, Huntington JL, et al. Personal Life Events and Medical Student Burnout: A Multicenter Study. *Academic Medicine*. 2006;81(4):374-384.
doi:10.1097/00001888-200604000-00010

128. Willcock SM, Daly MG, Tennant CC, Allard BJ. Burnout and psychiatric morbidity in new medical graduates. *Medical Journal of Australia*. 2004;181(7):357-360.
doi:10.5694/j.1326-5377.2004.tb06325.x
129. Ju TR, Mikrut EE, Spinelli A, et al. Factors Associated with Burnout among Resident Physicians Responding to the COVID-19 Pandemic: A 2-Month Longitudinal Observation Study. *Int J Environ Res Public Health*. 2022;19(15). doi:10.3390/ijerph19159714
130. Singh R, Volner K, Marlowe D. Provider Burnout.; 2022. Accessed December 16, 2022. <https://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=30855914&site=eds-live>
131. American College of Obstetricians and Gynecologists. Why Ob-GYNs are burning out. Published October 2019. Accessed December 16, 2022. [https://www.acog.org/news/news-articles/2019/10/why-ob-gyns-are-burning out#:~:text=Physicians%20have%20burnout%20rates%20that,sense%20of%20worth\).%22%20That](https://www.acog.org/news/news-articles/2019/10/why-ob-gyns-are-burning-out#:~:text=Physicians%20have%20burnout%20rates%20that,sense%20of%20worth).%22%20That)
132. Reith TP. Burnout in United States Healthcare Professionals: A Narrative Review. *Cureus*. Published online December 4, 2018. doi:10.7759/cureus.3681
133. Lawrence JA, Davis BA, Corbette T, Hill E v., Williams DR, Reede JY. Racial/Ethnic Differences in Burnout: a Systematic Review. *J Racial Ethn Health Disparities*. 2022;9(1):257-269. doi:10.1007/s40615-020-00950-0
134. Bartholomew AJ, Houk AK, Pulcrano M, et al. Meta-Analysis of Surgeon Burnout Syndrome and Specialty Differences. *J Surg Educ*. 2018;75(5):1256-1263.
doi:10.1016/j.jsurg.2018.02.003

135. Rosen IM, Gimotty PA, Shea JA, Bellini LM. Evolution of Sleep Quantity, Sleep Deprivation, Mood Disturbances, Empathy, and Burnout among Interns. *Academic Medicine*. 2006;81(1):82-85. doi:10.1097/00001888-200601000-00020
136. Robinson K, Johantgen M, Storr C, Gaiten J, Atlas R, Ogbolu Y. Clinician Resilience After Traumatic Childbirth Events. Dissertation. University of Maryland Baltimore; 2023.
137. Maslach C, Jackson S, Leiter M. Maslach Burnout Inventory Manual. 3rd ed. CPP, Inc; 1996.
138. Maslach C, Jackson S, Leiter M, Schaufeli W, Schwab R. Maslach Burnout Inventory: Manual. Fourth ed. Mindgarden INC; 2018.
139. Lin CY, Alimoradi Z, Griffiths MD, Pakpour AH. Psychometric properties of the Maslach Burnout Inventory for Medical Personnel (MBI-HSS-MP). *Heliyon*. 2022;8(2):e08868. doi:10.1016/j.heliyon.2022.e08868
140. Maslach C, Schaufeli WB, Leiter MP. Job Burnout. *Annu Rev Psychol*. 2001;52(1):397-422. doi:10.1146/annurev.psych.52.1.397
141. Schutte N, Toppinen S, Kalimo R, Schaufeli W. The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. *J Occup Organ Psychol*. 2000;73(1):53-66. doi:10.1348/096317900166877
142. Leiter MP, Maslach C. Latent burnout profiles: A new approach to understanding the burnout experience. *Burn Res*. 2016;3(4):89-100. doi:10.1016/j.burn.2016.09.001
143. Hayes A. Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. Published online 2013.

144. West CP, Tan AD, Shanafelt TD. Association of Resident Fatigue and Distress with Occupational Blood and Body Fluid Exposures and Motor Vehicle Incidents. *Mayo Clin Proc.* 2012;87(12):1138-1144. doi:10.1016/j.mayocp.2012.07.021
145. Cook A, Sigler C, Allen L, et al. Burnout and Anxiety Among Trauma Nursing Specialties in a Rural Level I Trauma Center. *Journal of Trauma Nursing.* 2021;28(1):26-36. doi:10.1097/JTN.0000000000000554
146. Eslami Akbar R, Elahi N, Mohammadi E, Fallahi Khoshknab M. What Strategies Do the Nurses Apply to Cope With Job Stress?: A Qualitative Study. *Glob J Health Sci.* 2015;8(6):55. doi:10.5539/gjhs.v8n6p55
147. Lee HF, Kuo CC, Chien TW, Wang YR. A Meta-Analysis of the Effects of Coping Strategies on Reducing Nurse Burnout. *Applied Nursing Research.* 2016;31:100-110. doi:10.1016/j.apnr.2016.01.001
148. Benight CC, Bandura A. Social cognitive theory of posttraumatic recovery: the role of perceived self-efficacy. *Behaviour Research and Therapy.* 2004;42(10):1129-1148. doi:10.1016/j.brat.2003.08.008
149. Labrague LJ, de los Santos JAA. Resilience as a mediator between compassion fatigue, nurses' work outcomes, and quality of care during the COVID-19 pandemic. *Applied Nursing Research.* 2021;61:151476. doi:10.1016/j.apnr.2021.151476
150. Robinson K, Johantgen M, Storr C, Gaiten J, Atlas R, Ogbolu Y. Factors Associated with OB Clinician Resilience. Dissertation. University of Maryland Baltimore; 2023.
151. Robinson K, Johantgen M, Storr C, Gaitens J, Atlas R, Ogbolu Y. The Role of Burnout and Resilience in OB Clinicians. University of Maryland Baltimore; 2023.

152. Nevarez MD, Yee HM, Waldinger RJ. Friendship in War: Camaraderie and Prevention of Posttraumatic Stress Disorder Prevention. *J Trauma Stress*. 2017;30(5):512-520.

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