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Exploring the Relationship Between Chronic Stressors and Protective Factors and Preterm Risk in an African American Pregnant Population

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EXPLORING THE RELATIONSHIP BETWEEN CHRONIC STRESSORS AND PROTECTIVE FACTORS AND PRETERM BIRTH RISK IN AN AFRICAN AMERICAN PREGNANT POPULATION

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ABSTRACT

BACKGROUND: In the United States, infant mortality is a serious public health issue, particularly for the African American (AA) population. Despite ample research investigating explanations for the significantly higher infant mortality rate (IMR) for AA infants in the United States, the reason for the racial disparity remains unknown. Reports suggest that chronic, life-course stressors may increase risk of preterm birth (PTB), the leading contributor to the high IMR for AA infants. Adverse childhood experiences and perceived racial discrimination, experienced over the life course, have the potential to increase a stress response in AA women, leading to PTB. Psychosocial resources may modify the risk of PTB.

METHODS: An explanatory sequential quan → QUAL mixed methods research (MMR) study was conducted to explore the relationships among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women. The quantitative strand of the study involved surveying participants (n= 98) for levels of exposure to adverse childhood experiences and experiences of discrimination. The qualitative strand of the study utilized in-depth, semi-structured interviews to explore psychosocial resources and coping strategies of high-scoring participants (n = 12). The overall MMR question, "What psychosocial resources provide a protective effect against PTB and/or shortened

length of gestation among ‘high-scoring’ pregnant AA women living in Jefferson County, Alabama?” was answered by integrating the quantitative and qualitative data.

RESULTS: For the quantitative strand, there was no significant relationship between adverse childhood experiences, experiences of racial discrimination, and length of gestation at birth. Participants who were eligible for the qualitative strand of the study had birth outcomes that were equivalent to those participants who were not eligible for the qualitative strand. The qualitative findings included themes and subthemes that revealed active coping skills, strong social support, and resilience.

CONCLUSION: Grounded in the integrated results of MMR, this study found that an individual’s ability to cope with stressful life experiences may modify the effect of experiences of racism and/or adverse childhood experiences and adverse birth outcomes such as PTB. Findings from the study can be used to inform clinical practice, future research, and policy.

Keywords: preterm birth, African American, perceived racial discrimination, adverse childhood experiences, mixed methods research

DEDICATION

I would like to dedicate this dissertation to my husband, Chris Mileski, who has been supportive of everything I have ever wanted to achieve. Without his love, support, encouragement, and prayers, I would not have been able to achieve this educational milestone. To my children, Reeves, Lucy, and Greer who have been so patient and understanding when my time working toward this goal took me away from them. They have been my light and my inspiration to finish this strong. To my parents, Rick and Charlotte Rutland, who have been there to support me through every step of every journey throughout my life. While my dad is not still here with me physically, I felt his love and support throughout this long journey. And finally, to the women who participated in my study. Their strength and resilience inspire me to continue searching for answers to improve birth outcomes for African American women and their babies.

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CHAPTER 1

INTRODUCTION

In the United States, infant mortality is a serious public health issue, particularly for the African American (AA) population. In 2020, the national infant mortality rate (IMR) of 5.58 (calculated per 1,000 live births) was higher than that of 51 other countries in the world. In addition, the national AA IMR was 10.62, compared to the IMR of 4.49 for non-Hispanic White infants (CDC, 2022). That is, for every non-Hispanic White infant who dies before their first birthday, two AA infants will die. In Alabama, the rates are significantly higher than the national averages for both the overall and AA IMR. The IMR for all infants born in Alabama in 2016 was the highest in the country at 9.1, with an AA IMR of 15.1. Even more concerning for women living in the state of Alabama is that while rates of infant death have been declining steadily for non-Hispanic White infants since 2009, they have been rising in the AA population. In 2020, the all-ethnicity IMR in Alabama dropped to 7.0 (with an AA IMR of 10.9); however, these numbers are still well above the national average (Alabama Department of Public Health [ADPH], 2022). In December 2017, Alabama Governor Kay Ivey convened a committee to address the issue of high IMR in Alabama. One of the recommendations in the "Alabama Infant Mortality Reduction Plan" was that more research be conducted to better understand why the rates of infant mortality are so much higher in Alabama as compared to the national averages, particularly for the AA population.

Despite significant research investigating explanations for the notably higher IMR for AA infants in the United States, the reason for the racial disparity remains unknown (Alhusen et al., 2016; Giurgescu et al., 2011). While the IMR is only one marker of birth outcomes, it is regarded as one of the most important indicators of the health of a nation as it encompasses several health indicators such as maternal health, access to health care, and public health practices (Alhusen et al., 2016). Preterm birth (PTB) (< 37 weeks' gestation at delivery) is second only to birth defects as the leading contributor to the high rates of infant mortality and morbidity in the United States (National Institute of Child Health and Human Development [NICHD], 2019); however, the consequences of PTB are the leading cause of infant mortality for AA infants (CDC, 2021). The purpose of this chapter is to introduce the problem, background and significance, study aims and research questions, theoretical framework, design, and definitions for the study.

Problem Statement

While most AA women deliver at term (> 37 weeks), AA women are 60% times more likely to deliver a preterm infant than non-Hispanic White women (Mohamed et al., 2014). Research on the racial disparities in PTB has largely focused on various levels of exposure to protective and risk factors, including health behaviors of the mother, prenatal care utilization, and access to care; however, the mechanisms by which these factors contribute to PTB are not well understood and the problem persists (Alhusen et al., 2016; Schetter & Tanner, 2012).

Background and Significance

Preterm birth is associated with an intrauterine inflammatory state and represents the second leading cause of infant mortality and morbidity (NICHD, 2019). In 2019, the national PTB rate for AA women was 14.39%, while the rate for non-Hispanic White women was 9.26%. In Alabama, the PTB rate for AA women was 15.96%, the third highest rate in the United States behind Louisiana and Mississippi (CDC, 2021). The implications of PTB are the most critical causal factors for disease later in life (Olson et al., 2015). Complications include, but are not limited to, acute respiratory, gastrointestinal, immunologic, central nervous system, hearing, and vision problems. Chronic health conditions may also arise as a consequence of PTB, impacting growth and development into adulthood. In addition, families face considerable costs both economically and emotionally (Behrman & Butler, 2007).

Reports suggest that chronic, life-course stressors may increase risk of PTB (Hobel, 2004; Latendresse, 2009). Studies have found that racial and ethnic minority women experience higher lifetime exposure to chronic stressors (Alhusen et al., 2016; Giurgescu et al., 2011; Schetter & Tanner, 2012). There is sparse literature investigating how psychosocial resources and psychosocial stress might work together to impact length of gestation, and to the best of the primary investigator's (PI) knowledge, there is no literature examining psychosocial resources and PTB risk in the pregnant AA population. Adverse childhood experiences and perceived racial discrimination, experienced over the life course, have the potential to increase a stress response in AA women, leading to PTB. Psychosocial resources (i.e., active coping strategies, social support) may modify the risk of PTB. Understanding how women with high rates of these chronic stressors cope with

stress has the potential to inform interventions to mediate the problem.

Purpose Statement

The purpose of this explanatory sequential quantitative to qualitative (quan → QUAL) mixed methods research (MMR) study was to explore the relationships among adverse childhood experiences (ACEs), perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. Mixed methods research begins with sound and complementary quantitative and qualitative design elements (Creswell & Plano Clark, 2018). The mixed methods notations for this study were purposefully selected to specify which strand of the overall MMR study was the priority. The quan → QUAL notation choice indicates that the qualitative data were the priority strand in this study. The "→" indicates that the quantitative data were collected prior to the collection of the qualitative data. The qualitative data served to explain the quantitative data making it the priority strand for the overall MMR study.

The purpose of the quantitative strand of the study was to survey participants (n = 98) using the Experiences of Discrimination (EOD) and Adverse Childhood Experiences (ACE) survey tools and to collect length of gestation from the electronic health record following delivery. The purpose of the qualitative strand of the study was to utilize in-depth, semi-structured interviews to explore psychosocial resources and coping strategies of participants (n = 12) who scored ≥ to 2 on the ACE survey (range 0-10) and/or ≥ to 3 on the EOD survey (range 0-9). The purpose of the mixed methods strand was to integrate survey data and interview themes to explain the relationships among the specific chronic

stressors, psychosocial resources, and length of gestation at birth. Length of gestation will be the primary outcome measure (< 37 weeks = PTB).

Specific Aims and Research Questions

The specific aims of this explanatory sequential quan → QUAL MMR study were:

Quantitative Aim and Research Questions

Aim 1 (Quantitative): Examine the relationship between levels of adverse childhood experiences and perceived racial discrimination over the life course with length of gestation at birth.

Hypothesis: African American women with higher rates of adverse childhood experiences and/or experiences of perceived racial discrimination over the life course will have shorter lengths of gestation than African American women with low-range rates of exposure to the stressors.

The quantitative research questions were:

1.1 What is the association between adverse childhood experiences and length of gestation for pregnant AA women living in Jefferson County, Alabama?

1.2 What is the association between experiences of perceived racial discrimination over the life course and length of gestation for pregnant AA women living in Jefferson County, Alabama?

Qualitative Aim and Research Question

Aim 2 (Qualitative): Explore psychosocial resources and coping strategies of "high-scoring" participants through in-depth, semi-structured interviews.

Assumption: African American women with high-range scores of adverse childhood experiences and/or perceived racial discrimination will share information about the personal psychosocial resources that represent their "truth space" (Onwuegbuzie & Johnson, 2006).

The qualitative research question was:

> What personal psychosocial resources do high-risk pregnant AA women living in Jefferson County, Alabama, describe as meaningful in their lives?

Mixed Methods Aim and Research Question

Aim 3 (Mixed Methods): Integrate survey data and interview themes to explain the relationships among the specific chronic stressors, psychosocial resources, and length of gestation at birth. Length of gestation will be the primary outcome measure (< 37 weeks = PTB).

The mixed methods research question was:

> What psychosocial resources provide a protective effect against PTB and/or shortened length of gestation among "high-scoring" pregnant AA women living in Jefferson County, Alabama?

Theoretical Framework

In 2010, the U.S. Health Resources and Services Administration Maternal and Child Health (MCH) Bureau published a concept paper entitled "Rethinking MCH: The Life Course Model as an Organizing Framework" in hopes that life-course theory (LCT) might be the guiding framework for future studies aimed at explaining health and disease patterns, especially health disparities, across populations and over time in the maternal and child population (Fine & Kotelchuck, 2010). It has been suggested in the literature that the wear and tear on the body, known as allostatic load, caused by chronic stress over the life course, and even generation to generation, is related to a risk of PTB (Olson et al., 2015). The LCT is a theoretical framework that consists of four interrelated concepts that emphasize the consequences of cumulative impact. Those concepts are timeline, timing, environment, and equity. Timeline explains how what we experience today influences our health in the future. Timing refers to critical time periods that might particularly influence health outcomes later in life (childhood, pregnancy, etc.). Environment involves the biological, physical, and social entities that affect health, and equity is the most vital concept related to this area of research. Equity, as a concept of LCT, explains how inequality, despite protective and risk factors for disease conditions, can adversely impact health outcomes and contribute to racial disparities (Fine & Kotelchuck, 2010). The theoretical framework will be discussed in detail in Chapter 2.

Study Design and Methods

Sample and Setting

Participants were recruited from two obstetrical clinics in Jefferson County,

Alabama. Patients receiving care at Site A (a public health department) were primarily insured by Medicaid, while the patients receiving care at Site B (a private OB/GYN office) were primarily privately insured. Recruiting participants from both settings allowed for more sociodemographic diversity among the participants, and having two sites improved the odds of obtaining an adequate sample size. The rationale for including participants of varied sociodemographic backgrounds was that even college-educated AA women have higher rates of PTB than non-Hispanic White women with less than a high-school education (Grady et al., 1992).

All participants planned to deliver their infants at the same facility. Participants were enrolled in the overall study if they (a) were at least 18 years of age; (b) were AA, born and raised in the United States; and (c) had a medically low-risk, singleton pregnancy. The rationale for the inclusion criterion of being born and raised in the United States was that previous studies have found that being born Black in the United States uniquely puts a woman at greater risk for PTB (Muglia & Katz, 2010). Howard et al. (2006) found that rates of PTB in New York City were significantly lower for Black women born outside of the United States as compared with non-Hispanic Black women born and raised in the United States. Participants with obstetrical complications at the time of recruitment (i.e., preeclampsia, preterm labor, placenta previa, preterm premature rupture of membranes) were excluded from the study. The justification for these exclusions is that certain chronic conditions and obstetrical complications pose stressors that naturally place participants at risk for PTB and psychological distress (Giurgescu et al., 2017).

Once enrolled in the study, participants completed two surveys during one of their prenatal visits. As previously mentioned, the overall design of the study was mixed methods, so the qualitative interviews aiming to explore psychosocial resources were conducted by telephone prior to delivery. While convenience sampling was used for the quantitative strand of the study, purposive, criterion sampling was used to select the sample of participants for the qualitative strand. All participants with "high-range" scores on the quantitative surveys were approached to participate in the qualitative strand of the study because they could purposefully inform an understanding of the research problem and central phenomenon of interest (Creswell & Poth, 2017). Following delivery, birth outcome data were extracted from participants' electronic medical records. Survey results were integrated with qualitative interview data to jointly explain the relationships among length of gestation (dependent variable) and adverse childhood experiences, perceived racial discrimination over the life course, and psychosocial resources (independent variables).

Design

The overall design was an explanatory sequential quan → QUAL MMR study. A prospective cohort design was used for the quantitative strand of the study. Participant perceptions of their instances of adverse childhood experiences and perceived racial discrimination over the life course were measured using valid and reliable survey tools. Adverse childhood experiences were measured using the "Adverse Childhood Experiences" questionnaire (ACE) (Felitti et al., 1998) and perceived racial discrimination was measured using the "Experiences of Discrimination" tool (EOD)

(Krieger, 1999; Krieger & Sidney, 1996; Krieger et al., 2005). Survey data were collected between 11.6 and 39.4 weeks' gestation, face-to-face, during a routine prenatal visit. Following each participant's delivery, length of gestation in days was extracted from the electronic health record. The primary outcome data were length of gestation measured in days (< 258 days = preterm).

The method for the qualitative strand of this study was a qualitative descriptive design, which provided rich descriptive content regarding psychosocial resources from the participant's perspective (Sandelowski, 2000). According to Sandelowski (2000), this design method offers a comprehensive summary of experiences in the everyday terms of those experiences. It is, in essence, scientific inquiry in the natural setting of the participant with the goal of producing rich descriptions and in-depth understanding of the phenomena of interest (Magilvy & Thomas, 2009).

Data Collection

Survey data were collected at the point-of-care at the study sites using the previously mentioned self-report survey tools (ACE and EOD). Participants were recruited at a prenatal visit, and data were collected after informed consent was obtained. Since prenatal visits tend to involve intermittent wait times, surveys were completed before, during, or after a scheduled appointment in a private area of the clinic. This strategy was intended to decrease burden by providing flexibility for the participant. The primary outcome measure for the study was length of gestation. These data were extracted by the primary investigator (PI) from the electronic health record after delivery of the infant.

The qualitative data were collected over the telephone via semi-structured interviews with the purposively selected participants. Face-to-face interviews were not feasible, due to COVID-19 restrictions that were in place at the time of data collection. Telephone interviews were chosen as opposed to web-conferencing or FaceTime calls to provide more anonymity to each participant and decrease technology burden. The interviews lasted between 11 and 56 minutes (mean was 27.25 minutes), and follow-up interviews were not necessary. Creswell and Poth (2017) outline a logical approach to interview data collection that begins with determining the research questions that will be answered in the interviews. The questions were open-ended and focused on the phenomenon of interest. It was important that the type of interview was practical and provided the most useful information to answer the research questions but was flexible enough to allow the participants to freely express their feelings and perceptions. An interview guide was a helpful tool for the PI to ensure that all participants were approached and interviewed in the same fashion, using the same questions (Creswell & Poth, 2017).

Data Analysis

Data were entered, cleaned, and organized for analysis using SPSS (Version 28) predictive analytic software. Data analysis began by running descriptive statistics. Missing value for length of gestation at birth was substituted with the mean value for all other participants (269 days) to maintain consistency of the data and preserve statistical power (Polit & Beck, 2017). Next, Pearson *r* correlation coefficient was used to examine the relationship between the EOD and ACE scores individually with gestational length at

birth. Multiple linear regression models were then fitted to analyze the variables together to determine the relationships among adverse childhood experiences, perceived racial discrimination, and length of gestation at birth. R^2 was used to show the strength of the relationship between the EOD and ACE scores with gestational length at birth. R^2 provides a way to evaluate the accuracy of the prediction equation (Polit & Beck, 2017). *F*-statistic was then computed to test the significance of *R*. The computed value of the *F*-statistic helped to determine the probability that the computed *R* resulted from chance. Multiple linear regression data analysis strategies are the best fit for data analysis for a study attempting to measure multivariate correlation for the research question (Polit & Beck, 2017).

Qualitative data analysis involved a process of preparing and organizing the textual data into transcripts, reducing the transcript data into themes through a process of coding, interpreting the data, and finally presenting the data in the form of figures, tables, and discussion (Creswell & Poth, 2017). A variety of strategies were used during and following the data collection process that helped facilitate data analysis. A script for each participant was kept for field notes, which were helpful for reference during the transcription process. Prior to analysis, the audio recordings were transcribed verbatim by the PI, and the field notes were organized. NVivo (Version 12) was used to aid in the analysis and representation of data as a means of storing, organizing files, and searching for themes. Bracketing was used throughout the qualitative data analysis, with careful consideration taken to limit preconceived notions regarding the themes. Enrollment in the qualitative strand of the study was completed at the point of saturation of the collected data.

Findings from the individual strands were integrated to jointly answer the MMR question. The PI created visual joint displays that bring data together visually to draw out new insights. Joint displays provide a structure to discuss the integrated analysis and provide insights and inferences for this explanatory sequential quan → QUAL MMR study (Guetterman et al., 2015).

Definitions

Adverse Childhood Experiences

According to the CDC (2019), adverse childhood experiences (ACEs) is the term used to describe all types of abuse, neglect, and other potentially traumatic experiences that occur to individuals up until the age of 18. These early life exposures to trauma have been linked to alterations in brain structure and the neurobiological stress-systems impacting future health and emotional well-being (Anda et al., 2006). ACEs have been found to be associated with risky health behaviors, chronic health conditions, low life potential, and early death (Danese et al., 2009; Felitti & Anda, 2010; Springer et al., 2007). As the number of ACEs increases, so does the risk for these outcomes (CDC, 2019), suggesting a dose-response effect.

Full-term Birth

Full-term birth is any birth after 37 weeks' gestation (ACOG, 2017).

Further defined as:

Early term: 37 weeks through 38 weeks and 6 days

Full term: 39 weeks through 40 weeks and 6 days

Late term: 41 weeks through 41 weeks and 6 days

Post-term: 42 weeks and beyond

Infant Mortality

Infant mortality is defined as the death of an infant, for any reason, within the first year of life. The rate is calculated per every 1,000 live births.

Length of Gestation at Birth (i.e., gestational age)

The week and day at which the pregnancy ends with the birth of the infant (ACOG, 2017). The human gestational period lasts an average of 40 weeks, or 280 days. Due dates are established based on this length of gestation.

Mixed Methods Research

The "collection and analysis of both qualitative and quantitative data (based on research questions), mixing (or integrating or linking) the two forms of data giving priority to one or to both (in terms of what the research emphasizes), using procedures in a single study or in multiple phases of a program of study, framing these procedures within philosophical worldviews and theoretical lenses, and combining the procedures into specific research designs that direct the plan for conducting the study" (Creswell and Plano Clark, 2018, p. 410-411).

Perceived Racial Discrimination

Perceived racial discrimination involves perceptions by the individual of prejudiced attitudes and discriminatory behavior that may seem subtle, but still impact the individual (e.g., being passed over for a job, followed in a store), potentially causing stress (McConahay & Hough, 1976).

Preterm Birth

Preterm birth is any birth before 37 weeks' gestation (American College of Obstetricians and Gynecologists [ACOG], 2017).

Further defined as:

Moderate to late preterm: 32 weeks through 36 weeks and 6 days

Very preterm: 28 weeks through 31 weeks and 6 days

Extremely preterm: 20 weeks through 27 weeks and 6 days

Psychosocial Resources

Psychosocial resources have been defined as beliefs, skills, and individual personality traits that influence how a person manages stressful life events (Taylor & Broffman, 2011). In addition to active coping strategies, they include optimism, self-esteem, self-worth, and social support (Taylor & Broffman, 2011).

Psychosocial Stress

Stress is defined as the psycho-physiological outcome of any event that challenges an individual's capacity to cope (Shapiro et al., 2013). Psychosocial stress can be defined as an imbalance between demands placed on an individual and their ability to manage those demands, as perceived by the individual (Cohen et al., 1995).

Racial Discrimination

Racism has been defined by many, but a few examples are presented here. Clark, Anderson, Clark, and Williams (1999, p. 805) refer to racism as "beliefs, attitudes, institutional arrangements, and acts that tend to denigrate individuals or groups because of phenotypic characteristic (e.g., skin color, hair texture, width of nose, size of lips) or ethnic group affiliation." Krieger defines racism as a "multidimensional construct that

involves the oppression, domination, and denigration of individuals by other individuals and by social institutions on the basis of skin color and/or membership in a particular ethnic group" (as cited in Dominguez et al., 2008, p. 196) and as "being hassled or made to feel inferior due to one's race, ethnicity or color" (as cited in Giurgescu et al., 2012, p. 54). This last definition is the definition of racism that was used for this study.

Conclusion

The racial disparity in PTB rates in the United States persists despite decades of research investigating the problem (ADPH, 2018; CDC, 2019). Recent studies have found associations between experiences of perceived racial discrimination during pregnancy and adverse birth outcomes; however, life-course experiences with perceived racism and other early impact stressors, such as adverse childhood experiences, have not been well studied. In addition, psychosocial resources that might better explain the racial disparity warrant further investigation. This chapter presented the background and significance of the problem, outlined specific aims and research questions, introduced a theoretical framework, introduced the methods, and defined terms for a MMR study relating the effects of adverse childhood experiences, perceived racial discrimination over the life course, and psychosocial resources with length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. Chapter 2 presents what is currently known and not known about the problem and also provides a detailed explanation of the guiding theoretical framework, Life Course Health Development model.

CHAPTER 2

REVIEW OF THE LITERATURE

Preterm birth (PTB) is second only to birth defects as the leading contributor to the high rates of infant mortality and morbidity in the United States (NICHD, 2019); however, the consequences of PTB are the leading cause of infant mortality for AA infants (CDC, 2019). Survivors of PTB are at risk for developmental delays and adverse health outcomes in infancy, childhood, and into adulthood (Matthews & MacDorman, 2011; Rosenthal & Lobel, 2011). Common complications of PTB are respiratory distress syndrome, bronchopulmonary dysplasia, necrotizing enterocolitis, sepsis, seizures, intraventricular hemorrhage, cerebral palsy, infections, feeding difficulties, hypoxic ischemic encephalopathy, and visual and hearing problems (Platt, 2014; Saigal & Doyle, 2008). The average cost of a PTB is $60,000; more than $26 billion is spent annually to care for premature infants born in the United States (March of Dimes [MOD], 2019).

In the United States, PTB disproportionately affects AA families. African American infants are 49% more likely to be born preterm than non-Hispanic White infants. In 2018, 13.6% of AA infants were born preterm (< 37 weeks) versus just 8.7% of non-Hispanic White infants (MOD, 2019). These racial disparities exist independently of maternal education, adequacy of prenatal care utilization, and behavioral characteristics of mothers (Colen et al., 2006; Schoendorf et al., 1992). Research on the racial disparities in PTB has largely focused on various levels of exposure to protective

and risk factors including health behaviors of the mother, prenatal care utilization, and access to care; however, the mechanisms by which these factors contribute to PTB are not well understood (Alhusen et al., 2016; Schetter & Tanner, 2012).

Preterm birth is defined as a delivery of an infant that occurs between 20 and 37 weeks of gestation (a delivery prior to 20 weeks is classified as a spontaneous or elective abortion). Spontaneous PTB accounts for 70% – 80% of cases, while the other 20% – 30% are secondary to complications either with the mother, the fetus, or both (e.g., preeclampsia, placenta previa, fetal growth restriction, multiple gestation, placental abruption) (Institute of Medicine [IOM], 2017). Some risk factors for spontaneous PTB include having a history of PTB, being African American, periodontal disease, and low maternal body mass index (NICHD, 2019). While the exact cause of spontaneous PTB is unknown, the consensus is that it results from multiple factors, including infection and inflammation, vascular disease, uterine over-distension, and stress (Goldenberg et al., 2008; NICHD, 2019).

Psychosocial stress, particularly stress experienced over the life course, has been proposed as a possible explanation for the racial disparities in adverse birth outcomes such as PTB, yet little is known about this relationship. Racial and ethnic minority women experience higher lifetime exposure to chronic stressors, which may lead to a greater risk for adverse birth outcomes such as PTB (Latendresse, 2009). The purpose of this explanatory sequential quan → QUAL MMR study was to explain the relationships among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. The purpose of Chapter 2 is to present the

current state of the science of life-course stressors and PTB in AA women by way of an integrative review of literature. This review first presents the Life Course Health Development (LCHD) model as an organizing framework (Lu & Halfon, 2003). The chapter also presents (a) epidemiology of PTB, (b) concepts of interest, (c) analysis of the literature relative to the concepts, (d) study design and methods, and (e) ethical issues related to the population/sample of the study.

Theoretical Framework

Stress is a common human experience that is frequently viewed as a contributor to disease. Allostasis occurs when the physiologic systems within the body fluctuate to meet demands from external stressors. Systems of allostasis that promote adaptation include the autonomic nervous system, metabolic system, hypothalamic-pituitary-adrenal (HPA) axis, gastrointestinal, kidney, and immune systems. Biological mediators of these systems (e.g., cortisol, cytokines, sympathetic and parasympathetic transmitters) operate iteratively in an interactive network to maintain allostasis (McEwen & Tucker, 2011). In 1993, McEwen and Stellar presented a new theory of the relationship between stress and the processes leading to disease, defined as allostatic load. The authors proposed that allostatic load is the cost of chronic exposure to fluctuating or heightened neural or neuroendocrine response resulting from a repeated or chronic environmental challenge that an individual finds particularly stressful.

Allostatic load is essentially carryover stress (McEwen & Stellar, 1993). Instead of returning to a healthy baseline of homeostasis, the altered chemical state caused by chronic exposure to stressors accumulates and creates wear and tear on many organ

systems, or "weathering." In the 1993 publication, McEwen and Stellar presented evidence for stress effects on a number of pathophysiological conditions, including asthma, gastrointestinal disorders, myocardial infarction, diabetes, cancer, viral infections, and autoimmune disorders. Preterm birth, also a pathophysiological condition, is the leading cause of death for children under the age of 1, and African Americans in Alabama have a preterm birth rate that is almost 4 times that of non-Hispanic Whites (CDC, 2019).

In 2015, Olson et al. published a review exploring the evidence that chronic stress contributes to PTB and other adverse birth outcomes in both animal models and in women. The authors developed a novel conceptual framework implicating the phenomenon of allostatic load as a predictive model to assess relative risk among women in early pregnancy. When a woman is exposed to chronic stress, the allostatic load increases as the body attempts to cope with stressors. Resiliency can be overcome, and an inflammatory process begins, resulting in numerous allostatic load disease processes, including PTB. The idea was that once providers knew who was in the high-risk group, interventions could be developed and implemented to mitigate risks for adverse birth outcomes such as PTB.

It is important that providers consider reproductive health from the life-course perspective because a pregnancy may be compromised before it even begins. The studies relating allostatic load and PTB risk have found that the cumulative effects of stress seem to be of significance. Lifetime exposure to experiences of perceived racial discrimination acting as a chronic stressor have been found to contribute to PTB in the AA population. In the 2011 integrative review published by Giurgescu et al., the authors pointed out that

McEwen and Stellars' (1993) theory of allostatic load described acute stress as an adaptive process; however, chronic stress is described as a maladaptive process.

The theory of allostatic load was initially considered the guiding theoretical framework for this study, but to truly test the theory, specific stress-related biomarkers would need to be collected from participants. This would have incurred a significant financial burden and would involve invasive procedures needing more oversight and approval than is feasible for a dissertation study. Learning about the theory of allostatic load and reading recommendations guiding future theoretical frameworks for research meant to better explain the racial gap in birth outcomes in the United States made it clear that a life-course approach was a better fit for this study.

Life-course theory, which is also often termed life-course perspective, involves a multidisciplinary approach for the study of individual lives, structural contexts, and social change over time (Halfon & Hochstein, 2002; Lu & Halfon, 2003). The origins of life-course theory date back to the late 1920s when researchers at The University of California, Berkeley, launched three longitudinal studies to investigate how children develop over time and into adulthood. These seminal studies laid the foundation for future research centered on human development over the life course (Elder, 1998). As a concept, a life course is defined as "a sequence of socially defined events and roles that the individual enacts over time" (Giele & Elder, 1998, p. 22). The Life Course Health Development (LCHD) model was created to explain how health trajectories develop over an individual's life course (Halfon & Hochstein, 2002). LCHD helps to explain the cumulative effect of everyday experiences and how an individual adapts to those experiences. The underpinnings of the LCHD model have been applied in several

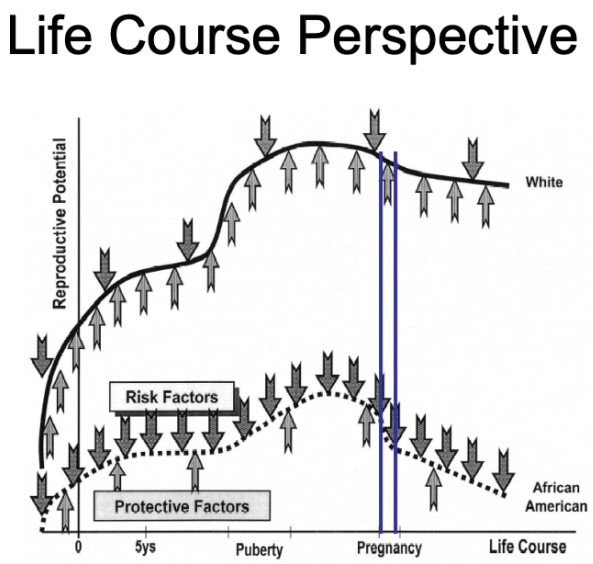
disciplines to better explain how optimal health and development can evolve over a lifetime and across generations (Fine & Kotelchuck, 2010; Lu & Halfon, 2003).

The LCHD model, based on the tenets of evolving life-course theories, was formulated to explain racial disparities in adverse birth outcomes from a life-course perspective (Lu & Halfon, 2003; Russ et al., 2014). Through an integrative review of the literature, Lu and Halfon (2003) found that the majority of the research on risk and protective factors for adverse birth outcomes was focusing only on those experienced during pregnancy and did not adequately explain the racial disparities in adverse birth outcomes such as PTB. The researchers expanded their review to focus on longitudinal models of birth outcomes and health disparities and identified two leading theoretical models used in this field that each had supportive empirical evidence: (a) early programming and (b) allostatic load, also termed weathering, which is a cumulative pathway theory discussed previously.

The early programming model emphasizes the importance of sensitive developmental periods during pregnancy or early life which impact future reproductive potential; however, the model does not adequately address development and decline beyond the early years of life (Davies & Norman, 2002). The cumulative pathways model (also termed allostatic load or weathering) describes a gradual decline from cumulative wear and tear on the body over the life course, but does not acknowledge potential critical or more sensitive periods of vulnerability (Geronimus, 2001; McEwen & Stellar, 1993). Lu and Halfon (2003) synthesized these two theoretical approaches to offer a comprehensive model to help explain how risk and protective factors impact women's reproductive health potential. The theory is that women who experience more risk

factors and fewer protective factors over their life course may be at greater risk for adverse birth outcomes such as PTB. The racial disparities may be explained because of differential developmental trajectories over the life course during sensitive periods (i.e., childhood, puberty, pregnancy) as well as cumulative exposures to risk and protective factors over the life course. They posit that risk factors "push down" on the health trajectory while protective factors "push up" in an attempt to overcome the "push down" effects of the risk factors. The idea is that a woman's reproductive potential is a result of her trajectory of risk and protective factors, particularly during periods of vulnerability, over the life course.

Figure 1



Note. From "Racial and Ethnic Disparities in Birth Outcomes: A Life-Course Perspective," by M.C. Lu and N. Halfon, 2003, *Maternal and Child Health Journal, 7*(1), pp. 13-30.

In 2010, the United States Health Resources and Services Administration Maternal and Child Health (MCH) Bureau published a concept paper entitled "Rethinking MCH: The Life Course Model as an Organizing Framework" in hopes that LCHD might be the guiding framework for future studies aimed at explaining health and disease patterns, especially racial disparities, across populations and over time in the maternal-child population. In an effort to address these broad questions, the Life Course Model (LCM) proposes five concepts: (a) pathways or trajectories, (b) early programming, (c) critical or sensitive periods (i.e., childhood, adolescence, pregnancy), (d) cumulative impact, and (e) risk and protective factors (Fine & Kotelchuck, 2010). This MMR study addresses each of these five concepts in an effort to better explain the relationships among two specific life-course stressors, psychosocial resources, and PTB in an AA population.

Summary of the Theoretical Framework

It is vital to consider reproductive health from the life-course perspective as there is overwhelming evidence that a pregnancy may be compromised before it even begins (Christaens et al., 2015; Geronimus, 2001; Ickovics et al., 2007). The physical and mental consequences of adverse childhood experiences (ACEs) and experiences of perceived racial discrimination should be carefully considered by health care providers when developing individualized care plans. Insights into the processes through which chronic stress over the life course leads to adverse birth outcomes may help to inform interventions such as home visiting programs, more comprehensive preconception screening, and support for the group prenatal care model (Ickovics et al., 2007; Tanner-

Smith et al., 2014). More comprehensive education and health screenings for high-risk individuals should be considered, particularly for AA women. There is growing support in the literature that these actions have the potential to mitigate the negative effects of ACEs and experiences of perceived racial discrimination Tanner-Smith et al., 2014). Understanding what psychosocial resources may provide a protective effect against the chronic stressors may better inform the interventions and lead to fewer racial disparities in birth outcomes. Life-course theory emphasizes life span and health trajectory and is an ideal theoretical framework for investigating problems associated with chronic, life-course stressors and adverse birth outcomes (Fine & Kotelchuck, 2010).

Epidemiology of Preterm Birth

The all-race/ethnicity PTB rate in the United States in 2019 was 10.23% (a 0.33% increase from the 2016 rate of 9.9%) (CDC, 2019; Hamilton et al., 2021). This was the highest PTB rate since 2013, and the numbers had been steadily climbing for the past 5 years (CDC, 2019). The World Health Organization conducted a systematic review to estimate the global, regional, and national rates of PTB for 2014, and found that the United States had one of the highest rates of PTB in the world (Chawanpaiboon et al., 2019). The nation ranked in the top 10 countries for PTB, with rates higher than both China (6.9%) and Pakistan (8.4%) (Chawanpaiboon et al., 2019). In fact, the United States is one of 15 countries that account for two thirds of the world's preterm births, and in 2010, 53 nations (both developed and developing) had lower rates of PTB than the United States (MOD, 2018). The PTB rate declined to 10.09% in 2020 from 10.23% in 2019, the first decline in the all-race PTB rate since 2014 (Hamilton et al., 2021). While

this is a step in the right direction, there are still many unanswered questions, and the rate in 2020 was still higher than that of most other developed countries. While the PTB rate for non-Hispanic White women in 2020 was lower than the national average at 9.1%, the national PTB rate for AA women was 14.35% (Hamilton et al., 2021). In Alabama, the PTB rate among AA women in 2021 was 52% higher than the rate among all other women, at 16.5%, up 0.5% from 2019 (MOD, 2021). These rates are considerably higher than the Healthy People 2020 goal of 9.4% (United States Department of Health and Human Services [USDHHS], n.d.).

The consequences of PTB are the leading contributing factor to the racial disparities in infant mortality rates in the United States. In 2020, the national infant mortality rate (IMR) of 5.8 (calculated per 1,000 live births) was higher than in 51 other countries in the world. In addition, the national AA IMR was 11.4, compared to the IMR of 4.9 for non-Hispanic White infants (CDC, 2022). More research is needed to better understand why AA infants die at 2 times the rate of non-Hispanic White infants; a problem that has persisted as the racial gap continues to widen (CDC, 2019).

Preterm Birth Pathophysiology and Stress

The biological mechanisms that trigger PTB are not well understood, but the consensus is that it results via one or more of the following pathways: (a) activation of the HPA axis, (b) intrauterine infection(s) or inflammation, and (c) premature uterine distension (Goldenberg et al., 2008; IOM, 2007). These pathways are believed to initiate the release of prostaglandins and enzymes which trigger cervical ripening, premature rupture of membranes, and/or uterine contractions (Goldenberg et al., 2008; IOM, 2007).

The relationship between the activation of the HPA axis and the placenta plays a crucial role in both the timing of onset of labor and fetal growth (Wadhwa et al., 2004). Sandman et al. (2006) found that stress-induced HPA activation accelerates the pregnancy-associated rise in maternal cortisol which activates the release of corticotropin-releasing hormone (CRH) production. This premature activation and resulting circulation of CRH, which promotes labor, is of great interest in the incidence of spontaneous PTB (Sandman et al., 2006; Wadhwa et al., 2004). Gillespie et al. (2022) investigated the role of lifetime stressor exposure, perceived stressor severity, and systemic inflammatory markers in a sample of 92 pregnant AA women. Inflammatory marker levels were compared between women who did versus did not deliver their infant preterm. Controlling for relevant covariates, there were significant positive associations between average levels of a specific inflammatory marker (plasma IL-1β levels). Mediation models revealed that exposure to more chronic stressors was related to higher plasma IL-1β levels, as mediated by higher average levels of overall perceived stressor severity. Women who went on to give birth preterm had higher levels of plasma IL-6.

Concepts of Interest

Psychosocial Stressors

The adverse effects of stress on health outcomes have been well documented in a variety of populations for chronic conditions such as cardiovascular disease and diabetes, yet the relationship between stress and adverse birth outcomes is not well understood (Hobel et al., 2008). Stress is defined as the psycho-physiological outcome of any event that challenges an individual's capacity to cope, whereas perceived stress is defined as

the degree to which events in an individual's life are believed to be stressful (Berto, 2014; Shapiro et al., 2013). Studies suggest that adverse perinatal programming by stress may contribute to PTB risk (Hobel et al., 2008; Zhu et al., 2010). Specifically, the way in which the body responds to stress involves the same biological mechanisms that are believed to initiate labor. Life-course stressors, such as ACEs and experiences of perceived racial discrimination, have been proposed as explanations for the racial disparities in PTB, but results to date have been inconclusive and warrant further investigation (Almeida et al., 2018; Misra et al., 2010; Sealy-Jefferson et al., 2019; Wheeler et al., 2018).

Adverse Childhood Experiences

Adverse childhood experiences involve three categories of experiences occurring over the course of a person's life up until the age of 18. They include (a) abuse (e.g., emotional, physical, sexual), (b) neglect (e.g., emotional, physical), and (c) household dysfunction (e.g., parental separation or divorce, incarceration of a household member, interpersonal violence, substance abuse) (Smith et al., 2016).

African American children are more likely to experience ACEs compared to non-Hispanic White children (Slopen et al., 2016). In a sample of 84,837 children, the 2011-2012 National Survey of Children's Health included a 9-item scale to capture risks that affect children based on the Adverse Childhood Experiences (ACE) Study measure. Slopen et al. (2016) found that AA children were 33% more likely than non-Hispanic White children to experience parental divorce/separation, parental death, parental imprisonment, witness domestic violence and/or neighborhood violence, live with

mentally ill persons or those with substance abuse issues, or report being treated unfairly because of race/ethnicity. Despite knowing the potential impact of ACEs on an individual's health and well-being, there is a scarcity of literature investigating the relationship between ACEs and adverse birth outcomes.

Perceived Racial Discrimination Over the Life Course

Perceived racial discrimination experienced over the life course has the potential to induce a stress response in AA women, leading to PTB (Krieger, 1999; Simon et al., 2016). Discrimination, in general, has been defined as being hassled or made to feel inferior due to one's race, ethnicity, or color (Giurgescu, Engeland, Templin, Zenk, Koenig, & Garfield, 2016). More specifically, perceived (i.e., self-reported) racial discrimination has been defined as a behavioral manifestation of the everyday negative attitudes, judgments, or unfair treatment toward individuals or members of a group by a discriminator (Pascoe & Smart Richman, 2009), and that perception is paramount to the theoretical foundation of racism as a stressor (Black et al., 2015). It is hypothesized that race may be a good predictor of health outcomes in race-conscious societies, like the United States. In the United States, race is a social category that is assigned to a person based on physical attributes. This classification system has the potential to impact a person's opportunities and experiences, for better or for worse (Slaughter-Acey et al., 2013).

Psychosocial Resources

Psychosocial resources have been defined as beliefs, skills, and individual personality traits that influence how a person manages stressful life events (Taylor & Broffman, 2011). In addition to active coping strategies, they include optimism, self-esteem, self-worth, and social support (Taylor & Broffman, 2011). High rates of ACEs and perceived racial discrimination over the life course have the potential to increase a stress response, leading to a higher risk of PTB or shortened gestation (Giurgescu et al., 2012). Understanding how pregnant AA women with high-level ratings for these specific chronic stressors perceive their own psychosocial resources has the potential to inform interventions to foster resiliency that may lead to fewer adverse birth outcomes.

Summary of the Concepts of Interest

Preterm birth is a national health crisis in the United States, and efforts to improve rates of PTB have been the focus of research for decades. While the overall PTB rates have remained stable and even declined in some racial/ethnic groups, they continue to rise in the AA population, and the racial gap continues to widen (CDC, 2019). Although studies have examined whether factors such as maternal age, lifestyle, socioeconomic status, or education can explain the racial gap in PTB rates in the United States, little explanation has been found. Even when accounting for all of those factors, there is not a significant link, and the problem persists. This evidence demands exploration of other causative factors for the racial gap in both PTB rates and IMR.

Studies suggest that a life-course approach should be used as a conceptual framework for future studies aimed at investigating the racial disparities in adverse birth

outcomes (Fine & Kotelchuck, 2010; Lu & Halfon, 2003). Adverse childhood experiences and perceived racial discrimination as chronic, life-course stressors may increase odds of PTB in AA women, and meaningful psychosocial resources (i.e., coping strategies, optimism, self-esteem, self-worth, and social support) may modify that risk. The overall purpose of this MMR study is to explore the associations among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. To the best of the PI's knowledge, this is the first MMR study investigating how adverse childhood experiences, perceived racial discrimination, and psychosocial resources might work together to impact length of gestation at birth.

Search Strategy

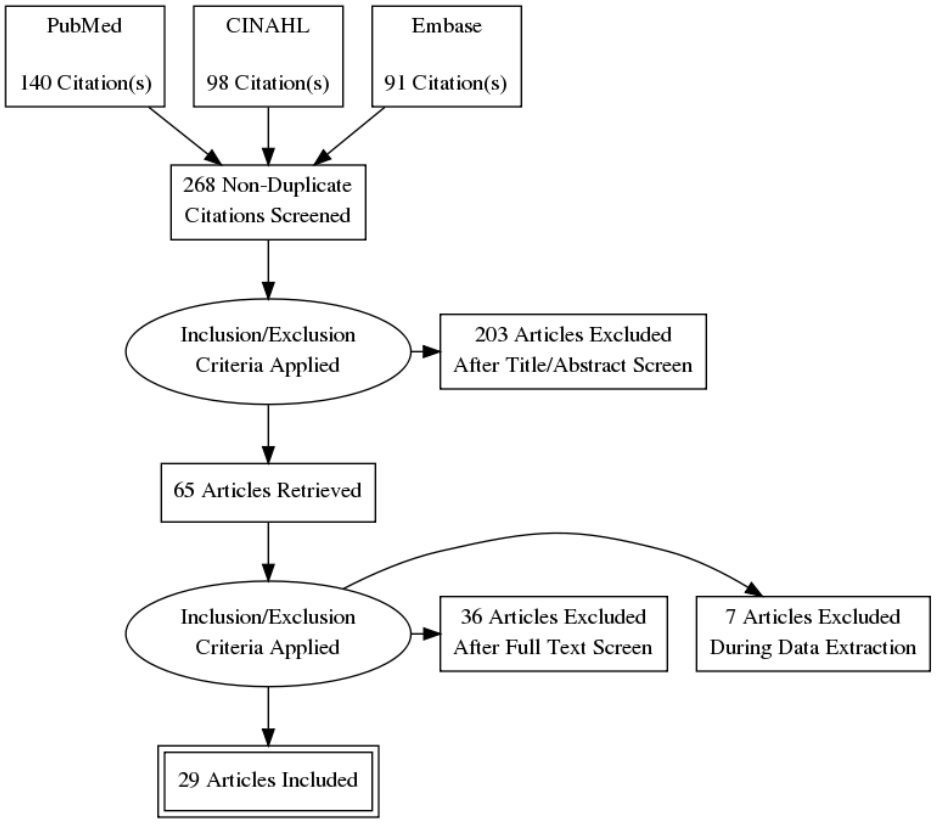
The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach was used for this literature review. This approach uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review. The PRISMA statement consists of a 27-item checklist and a four-phase flow diagram (Moher et al., 2009). PRISMA focuses on the reporting of reviews evaluating randomized controlled trials, but can also be used as a basis for reporting systematic and integrative reviews of other types of research (Moher et al., 2015)

PubMed, CINAHL, and Embase were searched using combinations of keywords pertinent to the variables of interest. The keywords included *perceived racial discrimination, racial discrimination, discrimination, adverse childhood experiences,*

child sexual abuse, child abuse, psychosocial stress, psychosocial resources, African American, black, and preterm birth. PubMed produced 140 articles, CINAHL produced 98 articles, and Embase produced 91 articles. After removing duplicates (n = 61), 268 articles remained. Because of the limited number of studies and the nature of the problem, time frame since publication was not an exclusion criterion. However, because the problem of interest is high rates of infant mortality for AA women, only studies conducted in the United States that were written in English were included. Following a review of titles and abstracts based on inclusion and exclusion criteria, 203 articles were excluded. Of the 65 remaining studies, 59 were available for full-text review. Following full-text review, 29 studies were selected for critical analysis (see Figure 2). Presented below are the findings from the literature review for studies relating the effects of psychosocial stressors, including adverse childhood experiences and perceived racial discrimination over the life course, and adverse birth outcomes.

Figure 2

PRISMA Flow Diagram



Analysis of Literature Relative to the Concepts

This integrative review of the literature presents what is known and not known about the relationship between two specific psychosocial stressors (ACEs and perceived racial discrimination) and adverse birth outcomes. Most, if not all, studies included PTB as the outcome of interest, but some included low birth weight (< 2500g) or very low birth weight (< 1500g), which often overlap with PTB incidence since most infants that are born preterm are also low birth weight. The current gaps in knowledge are also

presented, placing emphasis on components that were included in the study. While the concepts are discussed separately, many of the studies share common themes, and the variables of interest often intertwine. The ACEs literature is presented in the context of three critical components: type, timing, and severity. Literature about perceived racial discrimination is presented chronologically, providing a historical perspective on the problem.

Adverse Childhood Experiences

In 1998, the first study investigating the relationship between ACEs and adverse health outcomes was published. Felitti et al. (1998) examined the relationship of health risk behavior and disease in adulthood and childhood exposures to emotional, physical, or sexual abuse, and household dysfunction. In a sample of 9,508 adults, seven categories of ACEs were studied: psychological, physical, or sexual abuse; violence against mother; or living with household members who were substance abusers, mentally ill or suicidal, or ever imprisoned. These categories of risk were then compared to measures of adult risk behavior, health status, and disease. After adjusting for effects of demographic factors on the association between the cumulative number of categories of childhood exposure and risk factors for the leading causes of death in adults (i.e., ischemic heart disease, cancer, chronic lung disease), the researchers found that ACEs were strongly interrelated with multiple health risk factors later in life (Felitti et al., 1998).

Little is known about the relationship between maternal exposure to many of the ACEs risk categories and the incidence of PTB. Several studies relating single categories of maternal risk (i.e., child abuse, child sexual abuse) with adverse birth outcomes were

found, but only two studies investigated multiple categories of maternal risk in a single study. Findings from the literature investigating the relationship between maternal exposure to ACEs and adverse birth outcomes have had mixed results; however, the consensus is that three critical factors may influence the relationship: (a) type, (b) timing, and (c) severity. The studies selected for the review of literature include one or more of the items included on the original ACEs survey tool (Felitti et al., 1998), which was used to measure maternal exposure to ACEs for this study.

Type

The most common type of ACEs found to have a relationship with adverse birth outcomes, such as PTB, were childhood and/or adolescent experiences of sexual abuse (Leeners et al., 2010; Noll et al., 2007; Selk et al., 2016). A case-control cohort study investigating pregnancy complications in women with childhood sexual abuse found that case participants (n = 85) were significantly more often hospitalized during pregnancy with complications such as preterm contractions, cervical insufficiency, and PTB (Leeners et al., 2010). In the study, PTB rates for women with childhood sexual abuse were 18.8%, compared to only 8.2% of non-abuse victims. While not a statistically significant finding (p = 0.2), further investigation of the relationship between these variables is warranted. A similar case-control study found that sexually abused females (n = 67) were more likely to have a PTB compared to non-abused comparison mothers (n = 56) (OR = 2.80±1.44, $p < 0.05$) (Noll et al., 2007).

An observational cohort study with a large sample of pregnant women (n = 51,434) investigated type, timing, and severity of abuse and found that victims of forced

childhood sexual abuse were at 22% increased odds of PTB compared to pregnant women who had not experienced forced childhood sexual abuse (*OR* = 1.22, 95% CI [1.10, 1.35]) (Selk et al., 2016). The findings from this study contribute to the literature providing evidence that sexual abuse in childhood is associated with an increased risk for PTB and provide insight into multiple factors associated with the relationship. Other types of ACEs may also be associated with a risk of PTB and warrant a more comprehensive approach to an investigation of multiple ACEs risk categories.

Timing

Cammack et al. (2019) found that the relationship between maternal exposure to multiple forms of childhood abuse (emotional, physical, and sexual) and risk of PTB may be limited to the timing of the abuse. The authors suggest that resiliency and other psychosocial resources may have served as effect modifiers that should be measured in future studies aimed at investigating the relationship between ACE and length of gestation. The timing and severity of the abuse also appear to have been critical to the association of maternal exposure to multiple forms of childhood abuse (emotional, physical, and sexual) and risk of PTB. Findings from Margerison-Zilko et al. (2017) also support the importance of using a life-course approach to investigate the association between ACEs and PTB. In a study assessing stressors in multiple domains at multiple points in the life course and their relation to PTB, they found that stressors experienced in the past 6 months did not have an association with PTB. However, women who reported experiences of sexual abuse during childhood (across all racial/ethnic group participants) had increased odds of PTB (*OR* = 1.9, 95% CI [1.0, 3.5]). The findings suggest that

experiences of abuse, particularly sexual abuse across the life course, should be considered when assessing PTB risk.

Severity

Smith et al. (2016) conducted a prospective cohort study to examine the association between ACEs and pregnancy outcomes (specifically length of gestation and birth weight) and to explore mediators of the association including psychiatric illness and health habits. Of note, 76% of the participants were Caucasian (n = 1,754) and only 7% were AA (n = 153); the remaining participants were Hispanic/other (n = 395). The study found that for every ACE experienced by the pregnant participant prior to the age of 18, there was a decrease in birth weight by 16.33 grams and a decrease in gestational age of 0.063 days, after accounting for multiple potential mediating factors and suggesting a dose-response effect. These findings point to the lifelong impact that ACEs may have on reproductive health, particularly birth weight and length of gestation.

Cammack et al. (2019) also found that the relationship between maternal exposure to multiple forms of childhood abuse (emotional, physical, and sexual) and risk of PTB was impacted by the severity of the abuse. In a sample of over 4,000 participants, the history of forced sexual abuse after the age of 9 by a non-parent/caregiver was the only form of abuse related to an increased risk of PTB (OR = 1.94, 95% CI [1.10, 3.44]). The conclusion was that the relationship between maternal exposure to child abuse and PTB may be limited to specific abuse subtypes, namely non-parent/caregiver perpetrated sexual abuse by force and PTB. The authors suggest that future studies should also examine effect modifiers such as resilience, which may inform interventions to mitigate

the effects of maternal life-course adversity.

A case-control study was conducted in a Canadian population with the aim of retrospectively exploring the association between chronic, lifelong stressors and protective factors and spontaneous PTB (Christiaens et al., 2015). ACEs was only one of several chronic stressors being studied, yet it was the only variable that showed a significant relationship with PTB. Exposure to two or more ACEs was associated with two-fold risk of PTB, regardless of maternal age, smoking status, educational status, and history of miscarriage (*OR* = 2.09, 95% CI [1.10, 3.98]). The adjusted odds ratio for the ACE score was 1.18 (95% CI [0.99, 1.40]), suggesting that for every increase in ACEs reported, the risk for PTB increased by 18%. This study also found that lifetime physical and emotional abuse was also associated with PTB (*OR* = 1.30, 95% CI [1.02, 1.65]). Like the Smith et al. (2016) study, Christieans et al. (2015) found that there was a relationship between ACEs and PTB, even after accounting for factors such as maternal age, smoking, education, and history of miscarriage. Participants reporting two or more ACEs had a two-fold risk of PTB compared to participants reporting less than two ACEs. Miller et al. (2021) conducted a cohort study which included 209 participants with an ACE score of 3 or more. The purpose of the study was to examine the association between ACEs and pregnancy outcomes. While there was no significant association between ACE scores and incidence of diabetes or gestational weight, there was a relationship between hypertension and PTB incidence for these participants. For each additional point on the ACE survey tool, there were increased odds of preterm birth (*OR* 1.13, 95% CI [1.05, 1.22]).

Perceived Racial Discrimination

Racial discrimination affects minority groups all around the world and has been found to have a negative impact on both mental and physical health (Krieger, 1999). Research on the relationship between various forms of racial discrimination (e.g., perceived, structural, interpersonal) and adverse birth outcomes began in the late 1990s as studies in other populations were finding links between discrimination and adverse health outcomes. Over the past two decades, several studies have found that the negative consequences of racial discrimination are associated with adverse birth outcomes such as PTB and low birth weight or very low birth weight, which may help to explain the racial disparities in infant mortality rates in the United States (Bower et al., 2018; Braveman et al., 2017; Collins, David, Symons, Handler, Wall, & Dwyer, 2000; Dole et al., 2004 Dominguez, Dunkel-Schetter, Glynn, Hobel, & Sandman, 2008; Mustillo et al., 2004; Rankin et al., 2011). Other studies have had mixed results, and their limitations warrant further investigation (Misra et al., 2010; Rosenberg et al., 2002; Slaughter-Acey et al., 2016).

The terms racism and racial discrimination are often used interchangeably in the literature; both refer to an unequal distribution of power among individuals or societies due to a notion of dominance (Berger & Sarnyai, 2015). Everyday experiences of perceived racial discrimination may act as a chronic stressor that elicits distress (Rosenberg et al., 2002). Perceived racial discrimination involves perceptions by the individual of prejudiced attitudes and discriminatory behavior that may seem subtle but still impact the individual (e.g., being passed over for a job, followed in a store), potentially causing stress (McConahay & Hough, 1976). Interpersonal racism is another

term in the literature that is frequently used to describe perceived racial discrimination. Interpersonal racism, or racial discrimination, is a component of individual-level racism and has been defined as "directly perceived discriminatory interactions between individuals whether in their institutional roles or as public or private individuals" (Krieger, 1999, p. 301). For this review, studies examining the relationship between adverse birth outcomes and experiences of both perceived racial discrimination and interpersonal racial discrimination were analyzed. It is important to critically analyze the racial discrimination and adverse birth outcomes literature from a historical perspective in order to understand the evolution of the relationship in terms of type and timing. The literature related to experiences of perceived racial discrimination and adverse birth outcomes will be presented chronologically since the research is relatively limited and has evolved over the past two decades, with recommendations to fill the gaps in the literature.

Collins et al. (2000) conducted the first study exploring the relationship between maternal perceptions of racial discrimination and adverse birth outcomes. The researchers performed a case (AA mothers of infants born weighing < 1500 grams; n = 25) control (AA mothers of infants born weighing > 2500 grams; n = 60) study to explore the relationship between perceived racial discrimination during pregnancy and very low birth weight. Their hypothesis was that impoverished AA women are vulnerable to the psycho-physiologic impact of acute and chronic stress on pregnancy outcomes. The unadjusted and adjusted odds ratios of very low birth weight for maternal exposure to racial discrimination were 1.9 (0.5-6.6) and 3.2 (0.9-11.3), respectively. These findings provide evidence that higher rates of exposure to racial discrimination

among AA women contribute to the racial disparity in numbers of very low birth weight infants (Collins et al., 2000). While the dependent variable for this study was very low birth weight and not PTB or length of gestation, the findings were of great importance to the problem of adverse birth outcomes disproportionately impacting AA women. As mentioned previously, babies who are born small are often also born preterm, so low birth weight (< 2500 grams) and very low birth weight (< 1500 grams) are often used as a proxy for PTB in the literature. This seminal study provided novel evidence that experiences of racial discrimination may lead to adverse birth outcomes (Collins et al., 2000). The authors recommended further research to determine if experiences of racial discrimination may lead to adverse maternal outcomes as well as a greater risk for preterm birth.

Over the next few years, several studies relating the effects of perceived racial discrimination and adverse birth outcomes, including PTB, were published with mixed findings. One case-control study compared AA mothers of 422 babies born preterm (< 37 weeks' gestation) with mothers of 4,544 babies born at term (> 37 weeks' gestation). Mothers answered nine questions about experiences of racism, and the researchers used generalized estimating equation models to estimate odds ratios for PTB, controlling for potential confounders. Each of the nine racial discrimination variables was analyzed individually. The only items that were significantly associated with PTB were "unfair treatment on the job" (adjusted *OR* for PTB was 1.3 with CI [1.1, 1.6]) and feelings that "people acted afraid of them at least once a week" (adjusted *OR* 1.4 with CI [1.0, 1.9]). Overall, the findings from this study were equivocal; however, there were limitations (Rosenberg et al., 2002). The time frame for recall of experiences of perceived racial

discrimination was not specified (i.e., life course versus past year or during pregnancy). Also, participants' ability to cope with experiences of perceived racial discrimination was not measured. An individual's ability to cope with experiences of perceived racial discrimination could modify an effect of racism on adverse birth outcomes.

Dole et al. (2004) performed one of the first studies to examine the association between several psychosocial stressors (including perceived racial discrimination) and PTB in a sample of pregnant women. The researchers considered differing levels of stress and differing associations between stress and PTB across racial groups. The overall sample of 1,898 pregnant women included 724 AA participants. The risk for PTB was 40% higher among AA women (*OR* 1.4, 95% CI [1.0, 2.0]) who had ever experienced racial discrimination during the pregnancy as compared to AA who reported not having experienced it (Dole et al., 2004). While the findings from this study suggest a relationship between experiences of perceived racial discrimination and PTB, there were limitations. The timing of the exposure to the experiences of discrimination was limited to the time since becoming pregnant. Life-course experiences with chronic stressors may have an even stronger correlation and warrant further exploration. A strength of this study was that, unlike the Rosenberg et al. (2002) study, a measure of coping was included as a variable. African American participants were at higher risk for PTB if they reported "distancing from the problem" as a coping mechanism (Dole et al., 2004).

A study with aims similar to the Dole et al. (2004) study was published in 2008. Dominguez et al. (2008) prospectively examined the role of three forms of psychosocial stress (general stress, pregnancy stress, and perceived racism) in a small sample of AA (*n*

= 51) and non-Hispanic White (n = 73) pregnant women with the incidence of PTB and/or low birth weight. At three time points during the pregnancy, participants completed scales measuring stressful life events (including perceived racial discrimination), general perceived stress, and pregnancy-related stress. Racial differences were examined using one-way analyses of variance and chi-squares. The groups (AA vs. non-Hispanic White) differed on indicators of all three types of stress, particularly experiences of perceived racial discrimination. While the groups did not differ significantly in gestational age at delivery, birth weights for infants born to AA participants with high rates of perceived racial discrimination stress were significantly lower than for non-Hispanic White infants. Each unit increase in lifetime perceived racism was associated with a 39.59-gram decrease in birth weight. One interesting finding was that childhood experiences of racism, most often via a parent or guardian, were the only significant independent predictor of birth weight, even after controlling for socioeconomic factors (Dominguez et al., 2008). Of note, this was one of the first studies to include a sample of AA participants with higher-than-average socioeconomic status (63% of AA participants), suggesting that even with higher levels of advantage, AA women are still at a greater risk of adverse birth outcomes compared to non-Hispanic White women.

The first study to examine the effects of self-reported experiences of racial discrimination and racial disparities in preterm and low birth weight infants was published in 2004. Mustillo et al. (2004) analyzed data on 352 births among women enrolled in the Coronary Artery Risk Development in Young Adults Study (CARDIA study). The researchers found that among AA women, 50% with PTB and 61% with low

birth weight infants reported having experienced perceived racial discrimination in at least three situations over the life course, compared to non-Hispanic White women, whose percentages of PTB were 5% and low birth weight infants were 0%. The unadjusted odds ratios for PTB among AA versus non-Hispanic White women was 2.54 (95% CI [1.33, 4.85]), but after adjusting for experiences of racial discrimination, this value decreased to 1.88 (95% CI [0.85, 4.12]). The researchers concluded that self-reported experiences of racial discrimination were associated with preterm and low birth weight infants. While limitations of the study include the relatively small sample size as well as potential for recall bias, as the length of gestation was self-reported by participants, the findings lend plausibility to a relationship between experiences of perceived racial discrimination and PTB risk, especially when measured over the life course.

Misra et al. (2010) conducted a hybrid retrospective and prospective study with a sample of AA women (n = 384) to examine how social and psychosocial factors may influence the risk of PTB and found a three-way interaction between racial discrimination (experienced over the life course), depressive symptoms during pregnancy, and stress during pregnancy. Higher racism scores were associated with an increased risk of PTB, but rates were moderated by both depressive symptoms and stress. This study was the first to examine racial discrimination and birth outcomes beyond the prenatal period and measure exposures across a participant's lifetime. It was also the first study to consider that a woman's response to experiences of perceived racial discrimination could have a modifying effect on birth outcomes; however, the findings did not suggest a strong relationship. The findings may have been limited by the exclusively quantitative

measurement of psychosocial factors and support the need for qualitative data that could provide rich details regarding psychosocial resources that may mediate and/or moderate the risk for PTB associated with perceived racial discrimination over the life course.

By the mid-2000s, researchers were building on the recommendations and findings from published studies to carefully consider measures to better explain the relationship between perceived racial discrimination and adverse birth outcomes. The recommendation in the middle to late 2000s to use a life-course perspective to investigate the relationship was beginning to take hold. In addition, the importance of measuring psychosocial resources such as social support and coping strategies began to influence the design of some studies, yet there were no qualitative data to explain the association.

Rankin, David, and Collins (2011) conducted a case-control study with an exclusively AA sample (n = 277) measured experiences of perceived racial discrimination in public settings and found that a greater percentage of AA mothers of preterm infants had higher lifetime as well as past-year exposure to racism than those who delivered term infants (> 37 weeks' gestation). This study also measured coping behaviors and, like Dole et al. (2004), found that participants with passive coping behaviors in the absence of any active coping strategies had seven-fold increased odds of PTB when exposed to high levels of perceived racial discrimination. This was the second study to investigate the problem using a life-course perspective. Like findings from the Misra et al. (2010) study, these findings suggest that the strength of the association between AA mothers' perceptions of racial discrimination and PTB may be influenced by psychosocial resources such as active coping behaviors. More research is needed to better understand what coping strategies may be most effective in reducing PTB risk.

Rankin et al. (2011) suggest that prospective studies are needed to better capture measures of racism over the life course as well as how women cope with those experiences to better explain the relationship.

Slaughter-Acey et al. (2016) used the Daily Life Experiences of Racism and Bother (DLE-B) Scale to examine whether perceived interpersonal racism in the form of microaggressions was associated with PTB. The DLE-B has been shown to be a valid and reliable instrument for use with historically oppressed racial and/or ethnic groups, with a Cronbach alpha of 0.92. Using a 6-point Likert-type scale, participants use the DLE-B to report how often they experienced up to 20 racial microaggressions in their daily life over the past year and how much those experiences bothered them. Examples of microaggressions due to racial discrimination include being ignored or overlooked, being treated rudely or disrespectfully, being mistaken for a server, and overhearing an offensive joke. The sample included AA women (n = 1,410) who retrospectively completed the survey along with surveys to measure depression and perceived stress. Analyses demonstrated that for participants with mild to moderate depressive symptoms, perceived racism in the form of microaggressions was significantly associated with PTB; however, those with severe depressive symptoms did not show an association (Slaughter-Acey et al., 2016). Findings from this study also illustrate the need for more studies with the aim of measuring psychosocial resources such as social support and coping behaviors in an effort to see what is meaningful in reducing the risk of PTB for patients with complex psychosocial risk factors.

A study published in 2016 offered insight into the relationship between chronic worry about experiencing racial discrimination (Braveman et al., 2017) and the racial

disparities in adverse birth outcomes, particularly PTB. Instead of measuring actual experiences of perceived racial discrimination, Braveman et al. (2017) surveyed AA (n = 2,201) and non-Hispanic White (n = 8,122) postpartum women with a single question: "Overall during your life until now, how often have you worried that you might be treated or viewed unfairly because of your race or ethnic group?" Chronic worry was assigned if responses of "very often" or "somewhat often" were chosen by participants (vs. "not very often" or "never"). After adjusting for multiple factors (i.e., social, demographic, behavioral, medical), they found that for AA participants, chronic worry was significantly associated with PTB before (*OR* 1.73, 95% CI [1.12, 2.67]) and after (*OR* 2.00, 95% CI [1.33, 3.01]) adjusting for covariates. While there are several limitations to a study of this type, most notably the single-item measurement, the findings add to the evidence that racial discrimination, whether perceived or imagined, places a burden on AA women and may help to explain the racial disparities in PTB rates in the United States.

A more recent finding in the literature was a larger scale study conducted by Bower et al. (2018) examining the relationship between experiences of perceived racism and PTB in a population-based sample. A secondary data analysis was conducted with a sample of non-Hispanic Black mothers (n = 11,582) using data from the 2004-2012 Pregnancy Risk Assessment Monitoring System (PRAMS). The independent variable was a single-item, "yes/no" question included on the PRAMS survey, which asked participants "During the 12 months before your new baby was born, did you feel emotionally upset (for example angry, sad, or frustrated) as a result of how you were treated based on race?" They found that feeling upset by experiences of perceived racism

in the past year was significantly associated with greater odds of PTB (adjusted *OR* 1.29, 95% CI [1.04, 1.59]). While the large sample size of AA participants across 11 states and New York City was a strength of this study, the measure of racism used on the PRAMS study was a significant limitation. The single-item question makes it difficult to distinguish between acute major experiences versus chronic exposure. One of the authors' recommendations for future research was to conduct prospective studies to better understand the association between coping behaviors, experiences of racism, and birth outcomes, measured over the life course instead of just during the year preceding pregnancy.

More recent studies found in the literature include a MMR design which examined pregnant AA women's perceptions of neighborhood disorder, racial discrimination, and psychological distress and whether these concepts were viewed as influences on birth outcomes (Dove-Medows et al., 2020). While the timing and weight of data collected were not specified, it is apparent that the qualitative data were the priority in the study. Due to the small sample size (n = 7) and the minimal reporting of the quantitative data analysis and findings, a relationship between the variables was not well described; however, the three women who delivered preterm infants described alarming experiences of perceived racial discrimination. The limitations of this study support further exploration of the relationship between perceived racial discrimination and adverse birth outcomes (Dove-Medows et al., 2020). Another study published in 2020 (Chambers et al.) found that 92.9% of participants in a sample of 42 recently postpartum AA women experienced racial discrimination in at least one situational domain, which is significantly higher than proportions reported in previous studies. This

finding further supports exploration of the relationship between experiences of racial discrimination and birth outcomes.

Summary of Literature Analysis

This integrative review of the literature presented what is known and not known about the relationship between two specific psychosocial stressors (adverse childhood experiences and perceived racial discrimination) and adverse birth outcomes, including PTB and low birth weight. The ACEs literature was presented in the context of three critical components relative to the problem (i.e., type, timing, severity), while the perceived racial discrimination literature was presented chronologically to provide a historical perspective, as research on the relationship is still emerging and much is left to explore. The consensus was that a relationship exists between these psychosocial stressors and PTB and that the ability of individuals to adapt to, or better cope with, life-course stressors could modify their negative effects on birth outcomes.

All but one of the studies were quantitative by design, and while associations between the variables were found in many of the studies, gaps in the literature exist and the problem persists. The literature suggests that new and ongoing studies on PTB and racial disparities should move beyond statistical descriptions of the prevalence of conditions in different populations to a more comprehensive approach that would explain the disparities and identify areas in need of improvement (Bryant et al., 2010). In addition, studying the problem using a life-course perspective was well supported.

Identified Gaps

After reviewing the literature, several gaps were identified. As mentioned previously, to the PI's knowledge, there have been no qualitative studies investigating the concepts of interest. Qualitative data would provide rich descriptions of meaningful psychosocial resources that may help to better explain the relationship between life-course stressors and adverse birth outcomes. While a qualitative study alone would not answer all of the proposed research questions, a MMR approach is an ideal way to achieve this goal. The advantages of integrating quantitative and qualitative data to examine various aspects of the phenomena are that it provides more in-depth information on the participants' experiences and feelings in addition to the statistical findings (Ivankova, 2015). To the PI's knowledge there have been no MMR studies investigating the relationships among ACEs, perceived racial discrimination, psychosocial resources, and risk for PTB.

There is a glaring lack of literature relating the effects of multiple categories of ACEs and adverse birth outcomes. While there were several studies examining the relationship between categories of child abuse (sexual abuse in particular) and PTB risk, other categories of risk warrant investigation (i.e., violence against mother, living with household members who were substance abusers, mentally ill or suicidal, or ever imprisoned, witnessing violent crime). This dissertation study used a tool measuring multiple categories of risk related to ACEs which may help to better explain the relationship.

Finally, none of the studies measured psychosocial resources in relationship to ACEs and adverse birth outcomes. Psychosocial resources have been defined as beliefs,

skills, and individual personality traits that influence how a person manages stressful life events (Taylor & Broffman, 2011). In addition to active coping strategies, they include optimism, self-esteem, self-worth, and social support (Taylor & Broffman, 2011). The studies that measured psychosocial resources in the perceived racial discrimination literature only did so with quantitative methods. Resiliency and other psychosocial resources may serve as effect modifiers and should be measured in future studies aimed at investigating the relationship between ACEs and/or perceived racial discrimination and length of gestation. An individual's ability to cope with stressful life experiences may modify the effect of racism and/or ACEs on adverse birth outcomes such as PTB.

Design and Methods

Design

Quantitative, qualitative, and MMR approaches were considered for investigating the research problem. The specific design approaches that were selected include: (a) prospective cohort design (quantitative strand), (b) descriptive design (qualitative strand), and (c) an explanatory sequential quan → QUAL MMR design (mixed methods strand).

Quantitative Research Approach

A prospective cohort design approach was selected for the quantitative strand of this study. The design is longitudinal and follows individuals over a period of time to determine relationships between certain characteristics (independent variables) and a specific outcome (dependent variable) (Polit & Beck, 2017). This design is observational and involves collecting baseline exposure data before the participants have developed the

outcome of interest. The researcher starts with a presumed cause and then moves forward in time to investigate whether or not participants experience the presumed effect (Polit & Beck, 2017). In quantitative research, numerical data is used to answer the research question. A single-strand prospective cohort design might be appropriate for answering the quantitative research questions for this study; however, this design alone would not meet all the aims of the study. More research is needed to better explain the relationship between life-course stressors and adverse birth outcomes; therefore, a quantitative design alone was not adequate. Limiting the study to a single-strand, quantitative design would not have provided insight into the psychosocial resources that participants find meaningful in dealing with psychosocial stressors.

Qualitative Research Approach

A qualitative descriptive design approach was selected for the qualitative strand of this study. According to Sandelowski (2000), this design method offers a comprehensive summary of experiences in the everyday terms of those experiences. It is, in essence, scientific inquiry in the natural setting of the participant with the goal of producing rich descriptions and in-depth understanding of the phenomena of interest (Magilvy & Thomas, 2009). This qualitative design is particularly well suited for the novice researcher, as it allows for the use of multiple qualitative methodological approaches that draw from the tenets of phenomenology, ethnography, and even grounded theory (Magilvy & Thomas, 2009). Qualitative descriptive designs allow for a variety and combination of sampling, data collection, analysis, and representational

techniques and are especially useful in obtaining answers to questions of interest to clinical practice (Sandelowski, 2000).

While qualitative data are strongly needed to better explain the relationship between life-course stressors and adverse birth outcomes such as PTB, a qualitative approach alone would not meet the overall aims of the study. Collecting quantitative along with qualitative data strengthens the study findings by integrating numerical data measuring life-course psychosocial stressors with rich descriptions of meaningful psychosocial resources in the lives of high-scoring participants to better explain length of gestation at birth.

Mixed Methods Research Approach

Creswell and Plano Clark (2018) define MMR as the "collection and analysis of both qualitative and quantitative data (based on research questions), mixing (or integrating or linking) the two forms of data giving priority to one or to both (in terms of what the research emphasizes), using procedures in a single study or in multiple phases of a program of study, framing these procedures within philosophical worldviews and theoretical lenses, and combining the procedures into specific research designs that direct the plan for conducting the study" (p. 410-411). The way this process unfolds in a given study is shaped by MMR content considerations and the researchers' personal, interpersonal, and social contexts. This is just one example of a definition for MMR; there are many more available in the literature from experts in MMR design logic. While the definitions have broad similarities, the differences are based on discipline-specific needs (Ivankova, 2015; Plano Clark & Ivankova, 2016).

The PI applied an explanatory sequential quan → QUAL MMR design for this study to better understand the impact that experiences of perceived racial discrimination and/or ACEs may have on AA women and to investigate how those experiences are associated with a higher incidence of PTB (quantitative strand). A carefully constructed, methodologically rigorous MMR study design allowed for collection of quantitative data via valid and reliable tools that measured experiences of perceived racial discrimination and ACEs as life-course stressors. Quantitative data included collection of length of gestation for the participants following delivery of their infant. The aim of the qualitative strand was to explore psychosocial resources and coping strategies of "high-scoring" participants through in-depth, semi-structured interviews. Purposefully collected data helped to better explain what psychosocial resources participants find meaningful in coping with psychosocial stress. Integrating quantitative and qualitative data provided a more comprehensive picture of how experiences of perceived racial discrimination and/or ACEs relate to length of gestation in the study sample.

Ethical Considerations

The most important aspect of any research study is the protection of the participants (Shamoo & Resnik, 2015). Institutional review boards (IRBs) require specific criteria for the inclusion of pregnant women in research because of the potential of harm to the fetus and/or threat of liability, and because of this, there are strict federal regulations that categorize pregnant women as a vulnerable population (45 CFR Part 46 Subpart B). Despite these regulations, fair inclusion of pregnant women in clinical research has become more widely accepted in recent decades as scientists attempt to

produce evidence-based knowledge concerning treatments and medications that are prescribed to women during pregnancy (van der Zande et al., 2017).

The informed consent process is of particular importance in order to minimize undue influence on the subjects' decision to participate in the study. The language must be clear and at a low enough reading level to ensure that the participants fully understand what the study entails and to make clear that it is for their protection (Shamoo & Resnik, 2015). Unique challenges also arise in a study of this nature due to the sensitive nature of racial disparities, racial discrimination, and the history of mistrust with research in the AA population (Shamoo & Resnik, 2015). It was emphasized that participation in the study was completely voluntary and that the participants were free to leave the study at any time. In addition, particular care was taken to maintain participants' privacy and protect confidentiality. Participants provided consent and were surveyed in a private space at each of the sites, and all collected data were stored in a secure location only available to the PI. All identifying information was redacted from the files, and pseudonyms will be used in all publications, including this dissertation (Creswell & Poth, 2017).

Due to the sensitive nature of the problem of interest, several measures were taken to minimize risk or harm to the subjects' rights and welfare. Perceived racial discrimination and adverse childhood experiences are both charged topics that have the potential to cause the participant physical or emotional distress during the data collection process. It is possible that recalling experiences of discrimination or adverse childhood experiences could elicit an emotional response requiring professional support. The quantitative surveys have the potential to invoke feelings of sadness, anger, and/or stress,

and the qualitative interviews may also evoke these same feelings. Careful measures to protect participants were taken and plans were in place if participants needed further support such as counseling or medical attention. Measures to address these concerns were outlined in the IRB application (Creswell & Poth, 2017). Fortunately, none of the participants in either strand of the study needed counseling or medical attention.

Ethical Considerations Related to MMR

Mixed methods research requires more time, personnel, and money than most single-strand studies (Creswell, 2014). Time required of the participants eligible for both study strands place a unique burden in a MMR study. Clearly explaining this risk and potential during the informed consent process was crucial. Participants were informed that withdrawal from the study was acceptable at any time if they saw this as an unreasonable burden. Despite this, the interview protocol was designed to be short and open-ended in nature. These considerations helped to deter participants from withdrawing from the study.

Ethical considerations in MMR can be intensified as designs (a) may differ in the number of data collection and integration points, (b) may use more intensive data collection methods, (c) may be more intensive over a brief period, and (d) may differ in participant expectations. In addition, justice is a central concern (Creswell & Poth, 2017; Mertens, 2010). Transparency in MMR is imperative for the continued growth and legitimation of MMR as a field (Collins et al., 2013).

Conclusion

One of the most predictive risk factors for PTB in the United States is being AA

(CDC, 2019). Studies have examined numerous covariates to help explain this adverse birth outcome, yet the problem persists (Giurgescu et al., 2011). Psychosocial stress and PTB are complex entities with numerous environmental and behavioral components (Christiaens et al., 2015). Investigating the relationships among adverse childhood experiences, perceived racial discrimination over the life course, and psychosocial resources may help to explain the impact they have on length of gestation and provide insight for interventions to reduce the risks associated with PTB.

The purpose of this chapter was to gain an understanding of the state of the science of life-course stressors and PTB in AA women. This review presented the Life Course Health Development (LCHD) model as an organizing framework (Lu & Halfon, 2003). Additionally, the chapter presented (a) epidemiology of PTB, (b) concepts of interest, (c) analysis of the literature relative to the concepts, (d) study design and methods, and (e) ethical issues related to the population/sample of this study.

Understanding AA women's interpersonal interactions and social and structural contexts is a crucial step towards the development of policies and programs designed to reduce infant mortality and morbidity and the disproportionate racial gap in PTB that exists in the United States (Wallace, Green, Richardson, Theall, & Crear-Perry, 2017). This study explored the relationship between ACEs and perceived racial discrimination and length of gestation in an AA pregnant population in Jefferson County, Alabama. A secondary aim of the study was to qualitatively measure what protective factors mediate the effects of these chronic, life-course stressors. The findings were integrated to better explain how chronic, life-course stressors and coping behaviors work together to impact length of gestation. Chapter 3 presents the methods for the explanatory sequential quan

→ QUAL MMR study, including: (a) sampling, (b) informed consent, (c) data collection procedures, (d) instruments, (e) reliability and validity, and (f) data analysis plan.

CHAPTER 3

METHODS

The purpose of Chapter 3 is to discuss the methodological aspects of this explanatory sequential quan → QUAL MMR study, including: (a) design, (b) purpose, (c) specific aims and research questions, (d) population and sampling, (e) informed consent, (f) data collection, (g) data analysis, and (h) methodological ethical considerations. Details related to reliability and validity of the study will also be discussed throughout the chapter.

Mixed Methods Research

Mixed methods research designs integrate quantitative and qualitative data in a single study with careful consideration for timing and priority of data collected (Creswell & Plano Clark, 2018; Creswell & Poth, 2017). Greene et al. (1989) proposed the first definition of mixed method designs as "those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of method is inherently linked to any particular inquiry paradigm" (p. 296). Since that time, several other scholars have proposed definitions of MMR as the design elements have evolved. After thoroughly synthesizing the multiple definitions of MMR, Creswell and Plano Clark (2018) developed a definition of core characteristics of MMR that they recommend. The central premise of the definition and core characteristics is that the use "of quantitative and qualitative approaches, in

combination, provides a better understanding of research problems than either approach alone" (p. 5).

The complexity of the overall research question for this study would have been difficult to answer with a single-strand design. The question seeks both objective and subjective points of view in order to more fully explain the problem of interest. The quantitative data numerically calculate who is at most risk for PTB; however, the qualitative data help to explain how protective factors may lower that risk. For this reason, an MMR design was the most appropriate design in order to explain the MMR question.

Philosophical Assumptions

Greene and Caracelli (1997) assert that multiple paradigms may be used in MMR, but it is vital for the PI to be explicit in their use. For this study, the paradigm most aligned with the research question and design methods was the pragmatic paradigm. Pragmatism, which is most often associated with MMR, "focuses on the consequences of research, on the primary importance of the question asked rather than the methods, and on the use of multiple methods of data collection to inform the problems under study" (Creswell & Plano Clark, 2018, p. 415). The basic characteristics of the pragmatist worldview are that (a) it considers consequences of actions, (b) it is problem centered, (c) it is pluralistic, and (d) it is real-world practice oriented (Creswell & Plano Clark, 2018). According to Tashakkori and Teddlie (2003), many authors embrace pragmatism as the most widely utilized worldview in MMR. Pragmatism draws on a diverse approach that values both objective and subjective knowledge, which made it ideal for this study. The

approach focuses on the research problem, understanding that there is value in integrating the quantitative and qualitative data to find an explanation for the problem (Creswell & Plano Clark, 2018).

Despite its popularity among mixed methods researchers, pragmatism has been criticized as a philosophy for not addressing the differing assumptions of the quantitative and qualitative paradigms (Maarouf, 2019). It is critical to present pragmatism as a cohesive, integrated paradigm by conceptualizing its ontological, epistemological, axiological, methodological, and rhetorical stances. Ontologically, this study tested the hypothesis that life-course stressors and psychosocial resources impact length of gestation at birth. Multiple perspectives obtained from quantitative and qualitative data collection were triangulated to support the theory. Epistemologically, the data were collected using a "what works" approach to address the research questions. Convenience sampling for the quantitative strand and purposive sampling for the qualitative strand supported the pragmatic approach. Axiologically, the PI included both biased and unbiased perspectives. Methodologically, the PI combined the quantitative and qualitative data in the final phase to best explain the overall research question. Finally, the rhetoric, or the language of the research, is both formal (with the use of surveys and birth outcome data) and informal (with semi-structured interviews that allowed participants to express their "truth space" regarding psychosocial resources) (Creswell & Plano Clark, 2018).

Mixed Methods Research Design

Certain considerations must be made when determining which type of MMR design to use in an effort to best answer the research questions. This mixed methods study used an explanatory sequential quan → QUAL MMR design. This two-strand design starts with collection and analysis of the quantitative data and follows with collection of the qualitative data to help explain the quantitative results (Creswell & Plano Clark, 2018). For this study, the arrow connecting quantitative to qualitative means that the data collected in the quantitative strand determined which participants were eligible for inclusion in the qualitative strand. The QUAL notation means that priority was given to the qualitative strand (Creswell & Plano Clark, 2018). The rationale for prioritizing the qualitative strand is that the themes generated from the interviews helped to explain the main outcome of the study (length of gestation at birth), adding meaning to the quantitative data. At the point of integration of the data, the qualitative data helped to explain what psychosocial resources (i.e., coping strategies, social support) provided a protective effect against PTB in high-risk individuals. A procedural diagram helps to illustrate the sequential nature of the specific study design (Appendix A).

Feasibility and Advantages/Disadvantages

The explanatory sequential MMR design is considered to be the most straightforward MMR design approach and has several advantages (Creswell & Plano Clark, 2018). Because the design is divided into two separate phases, the points at which integration occurs are prescribed and distinct (Creswell & Plano Clark, 2018; Onwuegbuzie & Teddlie, 2003). This design approach is ideal for the novice PI working

alone because it does not require a research team. The straightforward nature allows for presentation of quantitative and qualitative methods, data, and findings in separate sections, making it easy for the reader to understand all the elements of each strand of the study (Creswell & Plano Clark, 2018).

The primary advantage of MMR is that it is ideal for pragmatic researchers who want to find answers to real-world problems. The essence of the advantage is that there is immense value in the added data collected through two different methods, and the combining of the data resulted in richer findings. Essentially, using both quantitative and qualitative approaches in combination provided a better understanding of the research problem than either approach alone. There were, however, some disadvantages related to the specific methodology used in this study. The primary disadvantage was time. Collection of the data took place over several months, and the primary outcome data (length of gestation at birth) were not available until up to 24 weeks after survey data collection. The limitations due to the COVID-19 pandemic also compounded this problem, as access to the participants was delayed by several months. While this might not be a problem for a fully funded, longitudinal cohort study, it did pose challenges for the graduate student working on a dissertation.

Purpose Statement

The purpose of this explanatory sequential quan → QUAL MMR study was to explore the relationships among adverse childhood experiences (ACEs), perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. The goal of the

quantitative strand of the study was to survey participants (n = 98) using the Experiences of Discrimination (EOD) and Adverse Childhood Experiences (ACE) survey tools and to collect length of gestation from the electronic health record following delivery. The goal of the qualitative strand of the study was to utilize in-depth, semi-structured interviews to explore psychosocial resources and coping strategies of participants (n = 12) who scored ≥ to 2 on the ACE survey (range 0-10) and/or ≥ to 3 on the EOD survey (range 0-9). The overall goal of this MMR study was to integrate survey data and interview themes to explain the relationships among the specific chronic stressors, psychosocial resources, and length of gestation at birth.

Specific Aims and Research Questions

Quantitative Aim and Research Questions

Aim 1 (Quantitative): Examine the relationship between levels of adverse childhood experiences (using the ACE tool) and perceived racial discrimination over the life course (using the EOD tool) with length of gestation at birth.

Hypothesis: African American women with higher rates of adverse childhood experiences and/or experiences of perceived racial discrimination over the life course will have shorter lengths of gestation than African American women with low-range rates of exposure to the stressors.

The quantitative research questions were:

1.1 What is the association between adverse childhood experiences and length of gestation for pregnant AA women living in Jefferson County, Alabama?

1.2 What is the association between experiences of perceived racial discrimination over the life course and length of gestation for pregnant AA women living in Jefferson County, Alabama?

Qualitative Aim and Research Question

Aim 2 (Qualitative): Explore psychosocial resources and coping strategies of "high-scoring" participants through in-depth, semi-structured interviews.

Assumption: African American women with high-range scores of adverse childhood experiences and/or perceived racial discrimination will share information about the personal psychosocial resources that represent their "truth space" (Onwuegbuzie & Johnson, 2003).

The qualitative research question was:

What personal psychosocial resources do high-risk pregnant AA women living in Jefferson County, Alabama, describe as meaningful in their lives?

Mixed Methods Aim and Research Question

Aim 3 (Mixed Methods): Integrate survey data and interview themes to explain the relationships among the specific chronic stressors, psychosocial resources, and length of gestation at birth. Length of gestation will be the primary outcome measure (< 37 weeks = PTB).

The mixed methods research question was:

What psychosocial resources provide a protective effect against PTB and/or shortened length of gestation among "high-scoring" pregnant AA women living in Jefferson County, Alabama?

Population and Sample

Population

Following institutional review board (IRB) approval, participants were recruited from two obstetric clinic sites in Jefferson County, Alabama. A sample of AA pregnant women (n = 98) were enrolled during pregnancy (11.6-39.4 weeks at time of enrollment). Women were eligible for enrollment in the study if they: (a) were at least 18 years of age; (b) AA born and raised in the U.S.; and (c) had a medically low-risk, singleton pregnancy. The rationale for the inclusion criteria of being born and raised in the United States was that previous studies have found that being born black in the United States uniquely puts a woman at greater risk for PTB (Muglia & Katz, 2010).

Sample

Participants with obstetrical complications at the time of recruitment (i.e., preeclampsia, placenta previa, preterm premature rupture of membranes) were excluded from the study. The justification for these exclusions is that certain chronic health conditions and obstetrical complications pose stressors that naturally place participants at risk for PTB and psychological distress (Giurgescu et al., 2017; OBG Project, 2020). If women developed complications following recruitment, they were not excluded. The rationale for this was that AA women are at higher risk for developing certain obstetrical

complications that necessitate indicated preterm delivery, which contributes to the racial gap in PTB rates in the United States (CDC, 2020; OBG Project, 2020).

Patients receiving care at Site A (public health department) were primarily insured by Medicaid, while the patients receiving care at Site B (private OB/GYN clinic) were primarily privately insured. Recruiting participants from both settings allowed for more sociodemographic diversity among the participants. Based on the estimated number of participants receiving care at the two sites, it was estimated that 70% of the participants would come from Site A and 30% of participants would come from Site B. Eligible participants were identified through prenatal record review 1 day to 1 week prior to a routine prenatal visit. At the point-of-care, eligible participants were approached by the primary investigator (PI) and given a brief introduction to the study to see if they might be interested in participating. It was emphasized that participation was completely voluntary and that they would be compensated with a modest incentive ($5) for completing the surveys. Potential participants were also informed about the possibility that they might be eligible for a follow-up interview for an additional $20 cash compensation, but if they chose not to participate in that interview, the information gathered from the surveys would still be valuable to the study. Willing participants were then provided with complete informed consent and enrolled in the study if they still agreed to participate. The surveys were completed in a private office or exam room without the PI present. The average time to complete both surveys was 5 minutes. All enrolled participants were eligible for and included in the quantitative strand of the study. Participants with higher scores (2 or more on the ACE survey and/or 3 or more on the EOD survey) were purposefully selected for participation in the qualitative strand. The

rationale for this was that the purpose of the overall study was to determine what psychosocial resources have a protective effect against shortened length of gestation in high-risk individuals.

Quantitative Sampling

Non-probability, convenience sampling was used for the quantitative strand of this study, meaning that the most readily available participants were recruited and consented for participation (Polit & Beck, 2017). Feasibility was the primary determinant of sample size and was carefully considered due to the time constraints of the doctoral dissertation process. Since this study involved primary data collection, it was important to think about what should be conceptually included in the models and to use that information to determine the sample size (Harrell, 2015). For this study, the sample size was calculated based on three primary independent variables: level of education, overall EOD score, and overall ACE score. Using the recommendation of Tabachnick and Fidell (2001), the rule of thumb for testing R^2 is $N \geq 50 + 8m$, with N denoting the sample size and m denoting the number of independent variables. Using this formula, the sample size for the quantitative strand would be 74. The rationale for using this formula and recommendation was that if the model is too complex, the worth of the model (indicated by R^2) would be exaggerated and future observed values would not correlate with the predicted values (Harrell, 2015).

Additionally, the sample size was estimated by performing a power analysis in G*Power 3 (Faul et al., 2007). A sample size of 130 would be needed working under baseline assumptions of 95% confidence, 90% response, a population of 2,000, and a

margin of error of 5% (Tabachnick & Fidell, 2001). The population size was estimated using the vital statistic data for AA infant birth numbers in Jefferson County in the year 2017. There were approximately 4,000 AA infants born in Jefferson County in 2017 (ADPH, 2018). It was estimated that about 50%–75% of those infants were born to eligible participants based on inclusion and exclusion criteria. Considering both of these calculations, the optimal sample size would be in the range of 74 to 130 participants, with a goal of enrolling 100 participants in the quantitative strand. The final sample size for the quantitative strand of this study was 98.

Qualitative Sample

Participants with higher scores following quantitative data analysis were purposefully selected for participation in the qualitative strand. The rationale for this was that the purpose of the overall study was to determine what coping behaviors have a protective effect against shortened length of gestation in high-risk individuals. The sample size needed to be large enough to yield enough data to sufficiently describe the phenomenon of interest and address the research question (Polit & Beck, 2017). The goal was saturation, which occurs when the addition of more participants does not result in additional information or perspectives (Creswell & Poth, 2017). Saturation was met with a final sample size of 12 participants for the qualitative strand.

Recruitment Strategies

One of the first obstacles faced in recruitment is gaining access to the population (Polit & Beck, 2017). Participants were recruited from two obstetrical clinics (one

private and one public) in Jefferson County, Alabama. Having a close working relationship with the providers at these clinics was helpful in gaining access. However, it was anticipated that office managers would be gatekeepers with whom trust would have to be built prior to gaining access to the potential study participants. Letters of support from providers were helpful in gaining that trust (Heller et al., 2014). In addition, several of the staff in both clinics (including providers, nurses, and support staff) already had an established relationship with the PI.

The next challenge in recruitment involved gaining the cooperation of the potential study participants. According to Polit and Beck (2017), "There is considerable evidence that the percentage of people willing to cooperate in clinical trials and surveys is declining, so it is critical to have an effective recruitment strategy" (p. 261). Potential participants are more likely to participate when they are recruited face-to-face and assured of their anonymity (Polit & Beck, 2017). One study found that building rapport with participants was a crucial part of the recruitment and retention process. The researchers found that when participants felt the recruiter was competent, personable, and experienced, they were more likely to participate in the research (Felsen et al., 2010). Building on a clear understanding of the population through many years of caring for this population was instrumental in the rapport-building process. Having provider and nursing staff support for the study that was clearly articulated to the participants also helped to build their trust.

Fortunately, the program of research at the facility where the women delivered their infants is robust, and they are accustomed to being approached to participate in a variety of research studies. This presented both opportunities and challenges. While it

helped that they were familiar with the idea of study participation, this could have contributed to participant burden. Providing a monetary incentive for participation had the potential to offset that burden and was an additional recruitment strategy (Singer & Ye, 2013). The PI provided $5 for participation in the quantitative strand and an additional $20 for participation in the qualitative strand (for eligible participants). Another strategy to decrease burden involved the brevity of the surveys that were chosen to measure the constructs of interest. The Experiences of Discrimination" tool (EOD) (Krieger, 1999; Krieger & Sidney, 1996; Krieger et al., 2005) is a 9-item survey, and the Adverse Childhood Experiences scale (ACE) (Felitti et al., 1998) is a 10-item survey. As mentioned previously, completion of both surveys at the point-of-care took approximately 5 minutes.

Informed Consent

The informed consent process was of particular importance in order to minimize undue influence on the subjects' decision to participate in the study. The language had to be clear and at a sixth-grade reading level to ensure that the participants fully understood what the study entailed and to make clear that it was for their protection (Shamoo & Resnik, 2015). Unique challenges also arise in a study of this nature due to the sensitive nature of racial disparities, racial discrimination, ACEs, and the history of mistrust with research in the AA population. It was emphasized that participation in the study was completely voluntary and that participants were free to leave the study at any time or to decline participation all together. Even if they initially agreed to participate in the qualitative interview later, they were given the option to decline an interview.

Due to the sensitive nature of the problem of interest, several measures were taken to minimize risk or harm to the subjects' rights and welfare. Perceived racial discrimination and ACEs are both charged topics with the potential to cause the participant physical or emotional distress during the data collection process. The EOD and ACE surveys have the potential to invoke feelings of sadness, anger, and/or stress. Careful measures to protect participants were taken and plans were in place if participants needed further support. Counseling services were available to all patients in the clinic setting with a social worker on site. The IRB-approved consent form was explained and discussed with the participant, and any questions were clarified (Appendix B). A hard copy of the consent form was also provided to the participant.

Summary

The introduction described the design of the study and reviewed the purpose, specific aims, and research questions. Population and sampling strategies, as well as considerations for the protection of human subjects relating specifically to the informed consent process, were also discussed. The research questions were answered by employing strategic recruitment strategies and special considerations to protect vulnerable participants. Strategies for participant recruitment were specifically selected to address the unique aspects of a study investigating a sensitive topic. Careful consideration was given to protect participant rights, reduce participant burden, and uphold the integrity of the research process.

Data Collection

Quantitative Data Collection

The quantitative strand of the study involved surveying participants (n = 98) using the Experiences of Discrimination (EOD) (Appendix C) and Adverse Childhood Experiences (ACE) (Appendix D) tools to compare findings with length of gestation at birth. Survey data were collected at the point-of-care in a private office setting at each of the study sites. The short length of each survey decreased participant burden, and participants were able to complete the surveys while they waited for their appointment or immediately following the appointment. The surveys were distributed in the form of paper and pencil and scored by the PI. Surveys were secured by the PI in a locked briefcase and transported to an office where they were placed in individual participant folders and subsequently destroyed via secure shredding. The PI used a password-protected computer to store research data. Data were also backed up on an encrypted, password-protected computer. Participants were assigned a unique identifier to protect their identity. That identifier (1-98) was on each survey. Participants were purposively selected for the qualitative strand of the study based on the survey results and assigned a pseudonym that would serve to identify them in the reporting of the findings. This was the first point of integration of quantitative and qualitative data.

Instruments

Two instruments were used to measure the independent variables in the quantitative strand of the study. The EOD instrument (Krieger, 1999; Krieger & Sidney, 1996; Krieger et al., 2005) was used to measure experiences of discrimination over the

life course. The ACE questionnaire (Felitti et al., 1998) was used to measure adverse childhood experiences.

Experiences of Discrimination (EOD) Tool. The EOD is one of the most widely utilized measures of self-reported discrimination and has been used with a variety of populations (Davis & Engel, 2011). The original scale was introduced in a study examining racial discrimination and blood pressure in young Black and White adults (Krieger & Sidney, 1996). The revised EOD was published by Krieger et al. (2005) for wider use as a measure for population health research on racism and health. On the EOD, participants are asked if they have ever experienced discrimination because of race, ethnicity, or color and the frequency of these occurrences in nine situations (school; getting hired or getting a job; work; getting housing; getting medical care; getting service in a store or restaurant; getting credit, bank loans, or a mortgage; on the street or in a public setting; from the police or in the courts). For each situation, respondents can reply "yes" = 1 or "no" = 0. The sum of the nine situations ranges from 0 to 9. In addition, a frequency for each situation can be calculated with 0 (never), 1 (once), 2.5 (2–3 times), and 5 (4 or more times). The sum of frequency score for the nine situations can range from 0 to 45. Higher scores indicate more exposure to experiences of discrimination. The instrument has been reliable in pregnant AA women (Cronbach's alpha = 0.79) (Giurgescu et al., 2017).

Adverse Childhood Experiences (ACE) Questionnaire. The ACE questionnaire is a 10-item, self-report measure that was developed by Felitti et al. (1998) to identify childhood experiences of abuse and neglect and their relationship with the

leading causes of death in adults. The original and largest ongoing ACE study is a collaboration between Kaiser Permanente's Health Appraisal Clinic in San Diego and the Centers for Disease Control and Prevention (Dube et al., 2001). The instrument was designed to measure the association between multiple types of abuse and diverse types of health outcomes. The questionnaire measures 10 types of childhood adversity among 3 domains of childhood abuse: emotional and physical abuse, physical neglect, and abuse associated with living in a dysfunctional household. Respondents are asked questions that specify how frequently the experience occurred (e.g., often, rarely, never) in order to reply "yes" to any question. As with the EOD, for each situation, respondents can reply "yes" = 1 or "no" = 0. A total score is then computed with a possible range of 0 to 10. Higher scores indicate more experiences with experiences of adverse situations in childhood.

Psychometrics of the Instruments

The EOD has been validated as a reliable tool in a population of AA, Latino, and White individuals (Krieger et al., 2005). The authors reported that scale reliability was found to be high, as demonstrated by test-retest coefficients (0.69 or higher for each EOD item) and Cronbach's alpha (0.82 or greater for each 9-item EOD measure). In addition, all of the EOD items for frequency of discrimination were positively correlated, with inter-item correlations ranging from 0.14 to 0.53. The authors compared the test-retest coefficients for the EOD items with "single-item" questions not included in the EOD, and there was a notable difference. The test-retest coefficients for the single items ranged from 0.30 to 0.50, whereas the EOD items ranged from 0.69 to 0.72. The same was true

of the measures of internal consistency. The 9-item EOD Cronbach alpha ranged from 0.82 to 0.83.

Murphy et al. (2013) published a study exploring the validity of the ACE questionnaire compared to Adult Attachment Interview (AAI) classifications in a population of urban and community mothers. The population of AA mothers in this study made up 29% of the sample, and they were all childbearing age. ACE responses were internally consistent (Cronbach's alpha = 0.88). This is indicative of a high level of internal consistency, particularly when the occurrence of any one ACE was cross tabulated with the likelihood of experiencing four or more other ACEs. Previous studies have found that the retrospective report measures of ACEs had good to excellent test-retest reliability (Dube et al., 2003). Using these valid and reliable tools (see Table 1) for a study relating the effects of chronic stressors on adverse birth outcomes has the potential to better explain the racial disparities in PTB rates in the United States.

Table 1

Validity/Reliability of the Survey Tools

Concept	Definitions	Measurement	Validity/Reliability
Self-reported experiences of discrimination	Experiences of discrimination because of race, ethnicity, or color and the frequency of these occurrences in nine situations (school; getting hired or getting a job; work; getting housing; getting medical care; getting service in a store or restaurant; getting credit, bank loans, or a mortgage; on the street or in a public setting; from the police or in the courts)	EOD	Cronbach's alpha = 0.82 or greater for each 9-item EOD measure
Self-reported experiences of adverse childhood experiences	10 types of childhood adversity among 3 domains of childhood abuse: emotional and physical abuse, physical neglect, and abuse associated with living in a dysfunctional household	ACE	Cronbach's alpha = 0.88

Qualitative Data Collection

The qualitative strand of the study utilized in-depth, semi-structured interviews to explore psychosocial resources and coping strategies of participants (n = 12) who scored greater than or equal to 2 on the ACE (range 0–10) and/or greater than or equal to 3 on the EOD (range 0–9) (Felitti et al., 1998; Krieger, 1999; Krieger & Sidney, 1996; Krieger et al., 2005). Eligible participants were contacted via text 1 to 3 weeks after completing the surveys to determine whether they were still interested in participating in the qualitative strand of the study.

Interview Guide

The interview guide (Appendix E) consisted of open-ended questions with prompts designed to address a wide range of responses. Participants were asked to describe their own personal meaning of the word stress and how they manage stress in their day-to-day life. Participants were then asked to describe their perception of their childhood, social support, and mental health. Some examples of questions include: "When I say the word stress, what does that mean to you?" "What are the most effective strategies you use to deal with a stressful situation?" "Think about a stressful time in your life, as far back as childhood. Do you remember how you coped with that experience?" and "How do you feel about bringing a new baby into your life right now?" The interviews were conducted over the telephone, 1 to 4 weeks after completion of the surveys. Participants were informed that the interview was being recorded and given the opportunity to refuse recording, but none refused. The interviews were expected to last 30 to 60 minutes, and follow-up interviews were not necessary. Interview lengths were an average of 26 minutes per interview. A script served as a guide for the PI to ensure that

all participants were approached and interviewed in the same fashion (Creswell & Poth, 2017). The script included 11 open-ended questions to guide the individual interviews (Appendix E). During the interviews, the PI had the freedom to ask for clarification, which enhances validity (Creswell & Poth, 2017). Participants were allowed to stop the interview at any point, if desired. A printed copy of the interview was included in each participant folder to allow the PI to take field notes along with the recording of the interview.

Data Analysis

Data analysis in this explanatory sequential quan → QUAL study occurred in two phases. First, the quantitative survey data were scored and analyzed, and the participants were purposively selected for the qualitative strand; second, the qualitative interview data were analyzed, and the quantitative and qualitative data were integrated to answer the overall MMR question (Creswell & Plano Clark, 2018; Onwuegbuzie & Teddlie, 2003).

Quantitative Data Analysis

Data analysis for the first phase began by running descriptive statistics. Missing values for individual item scores on the EOD and ACE surveys and/or the length of gestation at delivery were substituted with mean values in order to maintain consistency of the data and preserve statistical power. None of the individual item scores were missing from the surveys; however, five of the participants did not deliver their infant at the planned facility. Mean scores for length of gestation were substituted for these participants. Once length of gestation was known, the second phase of quantitative data

analysis occurred. First, Pearson *r* correlation coefficient was used to examine the relationship between each of the variables individually with length of gestation at birth in days. Multiple linear regression models were then fitted to analyze the variables together. R^2 was used to show the strength of the relationship between the independent variables and the dependent variable (Polit & Beck, 2017). Both simultaneous and hierarchical regression strategies were used for a comparison of results.

Qualitative Data Analysis

Analysis of the qualitative data involved a process of preparing and organizing the textual data into transcripts, categorizing the transcript data into themes through a process of coding, interpreting the data, and finally presenting the data in the form of figures, tables, and discussion (Creswell & Poth, 2017). A variety of strategies were used during and following the data collection process that helped to facilitate data analysis to reduce validity issues. A journal was kept with field notes, which helped for reference during the transcription process. Prior to analysis, the audio recordings were transcribed by the PI verbatim, and the field notes were reviewed and organized. NVivo (Version 12) was used to aid in the analysis and representation of data as a means of storing, organizing files, and searching for themes. Bracketing was used throughout the data analysis with careful consideration taken to limit preconceived notions regarding the themes. This allowed the PI to remain neutral in relation to the phenomenon being studied, therefore reducing bias. Identifying codes and categorizing them into themes, as well as keeping track of their frequency, helped to determine when saturation had been reached (Creswell & Poth, 2017; Merriam, 2015). Thematic analysis was used to systematically identify,

organize, and categorize themes across the data set. The PI focused on meaning across the data set, allowing for a collective understanding and interpretation of the shared meanings and experiences of the participants (Braun & Clarke, 2012).

Mixed Methods Data Analysis

The PI interpreted, integrated, and reported the findings of the study using a joint display and narrative strategies (Fetters et al., 2013). Specifically, the PI visually displayed the quantitative and qualitative results using a statistics-by-themes joint display to provide a visual comparison of participants to enhance interpretation of the findings. Integration through narrative occurred using a weaving narrative by theme. This involved writing the findings of the quantitative data and qualitative data together by theme to answer the research questions (Guetterman et al., 2015).

The use of mixed methods yielded complementary results (Greene et al., 1989). In the quantitative phase, statistical data were used to identify "high-risk" participants based on their survey results on the EOD and ACE tools as well as length of gestation at birth for all study participants. Quantitative results identified which participants were eligible for the qualitative phase. The interview protocol served as a means for collecting narrative relevant to their individual psychosocial resources to better explain the quantitative findings. In the qualitative phase, the themes were meant to complement the quantitative results. When used in combination, quantitative and qualitative methods complement each other and allow for a more complete understanding of the research problem (Greene et al., 1989; Tashakkori & Teddlie, 2003).

Quality Assurance and Meta-Inferences

For the quantitative strand of the study, the PI tested for reliability and validity of the quantitative results using a variety of methods. Criterion sampling was used for participant selection to reduce selection bias, valid and reliable tools were used to survey the participants, and appropriate statistical models were fitted to accurately test the relationships among the variables. For the qualitative strand, trustworthiness was established by ensuring participant privacy and by giving ample time for interviews along with the opportunity for clarification and follow-up interviews as needed. Also, participants were allowed to leave the study at any time if they felt they could not continue. Credibility was established by paying attention to alternate explanations for the findings. Finally, confirmability was addressed by allowing the findings to be shaped by the participants and not by the PI's bias or interests (Polit & Beck, 2017).

Curry & Nunez-Smith (2014) endorse the alignment of quantitative and qualitative methods in order to focus on the essential elements of quality in scientific inquiry. Their critical appraisal framework provides an opportunity for researchers to present the shared view of the core standards from each strand in a unified manner unique to MMR. "Veracity" describes the combined criteria standards for credibility (qual) and internal validity (quan). The findings from the qualitative strand helped to describe the degree to which the findings represent a causal relationship between the variables in the quantitative strand. In addition, the standard "neutrality" describes the combined criteria standards of confirmability (qual) and objectivity (quan) in that bias is removed to such a degree that the findings reflect the nature of what is being studied (Curry & Nunez-Smith, 2014). These are two examples of ways used to ensure the quality of the meta-

inferences produced in this study.

To address threats to validity of mixed methods inferences, the PI assessed validity by means of "legitimation" (Onwuegbuzie & Johnson, 2006). Legitimation is a novel nomenclature describing the validity of the combined strengths and non-overlapping weaknesses of quantitative and qualitative research, which tend to be complex but should be complementary (Onwuegbuzie & Johnson, 2006). This nomenclature is built upon the recommendations of Teddlie & Tashakkori (2003), in which they first suggested inference quality. This form of validity is associated with design quality and interpretive rigor (Onwuegbuzie & Johnson, 2006). There are various types of legitimation, all seeking to describe distinct aspects of the legitimacy of the MMR findings. For this study, "sample integration" was used to describe the extent to which the relationship between the quantitative and qualitative sampling designs yields quality meta-inferences. "Inside-outside" was addressed to determine how accurately the insider's view and the observer's view describe and explain the relationships. "Weakness minimization" was evidenced using qualitative findings to compensate for the weaknesses of the quantitative findings. Finally, "sequential" legitimation type was addressed by justification for the sequence of data collection and analysis strands to best answer the research questions (Onwuegbuzie & Johnson, 2006).

Integrating quantitative and qualitative approaches has the potential to produce validity issues beyond those that can arise when using a single-strand method alone. Validity issues in MMR emerge when data collection, analysis, and/or interpretation are compromised (Creswell & Plano Clark, 2018). This can be particularly challenging when implementing a sequential quan → QUAL MMR design because drawing quality meta-

inferences may be difficult due to a cumulative effect of inferences from each strand of the study (Ivankova, 2015). This makes it imperative for the quantitative strand to produce quality inferences so that the qualitative strand is built upon a rigorous foundation of quantitative inferences.

Conclusion

Despite years of research, the reasons for the racial disparities in PTB in the United States are not well understood. An explanatory sequential quan → QUAL MMR design was an ideal fit to answer the overall study question: "What are the relationships among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama?" The purpose of this chapter was to discuss the methodological aspects of this study including: (a) design, (b) purpose, (c) specific aims and research questions, (d) population and sampling, (e) informed consent, (f) data collection, and (g) data analysis. Details related to reliability and validity of the study were discussed throughout the chapter. Findings from this study add to the sparse literature investigating how life-course stressors and psychosocial resources work together to impact length of gestation in the AA pregnant population and support future research for interventions to ameliorate the problem.

CHAPTER 4

STUDY FINDINGS

The purpose of this explanatory sequential quan → QUAL MMR study was to explore the relationship among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. The goal of the quantitative strand of the study was to survey participants (n = 98) prior to delivery. The goal of the qualitative strand of the study was to utilize in-depth, semi-structured interviews to explore psychosocial resources and coping strategies of participants (n = 12) scoring ≥ 2 on the ACE (range 0–10) and/or ≥ 3 on the EOD (range 0–9). In this chapter, the results of the study are reported in sections. The first section presents the findings for the quantitative strand of the study, which included 98 participants. The second section presents five themes with the corresponding subthemes that emerged from the interviews conducted for the qualitative strand. Four of the five themes have corresponding subthemes. The last section presents the MMR findings for the overall explanatory sequential quan → QUAL MMR study. Integration of the major findings is presented in a joint display and narratively. The quantitative data were analyzed using IBM SPSS Statistics (Version 28). The qualitative data included 12 individual interviews that were analyzed using thematic data analysis supported by NVivo 12.

Quantitative Findings

This section presents results for the quantitative strand of this sequential quan → QUAL MMR study.

Quantitative Aim and Research Questions

Aim 1 (Quantitative): Examine the relationship between levels of adverse childhood experiences (using the ACE tool) and perceived racial discrimination over the life course (using the EOD tool) with length of gestation at birth.

Hypothesis: African American women with higher rates of adverse childhood experiences and/or experiences of perceived racial discrimination over the life course will have shorter lengths of gestation than African American women with low-range rates of exposure to the stressors.

The quantitative phase of this study was guided by the research questions:

1.1 What is the association between adverse childhood experiences and length of gestation for pregnant AA women living in Jefferson County, Alabama?

1.2 What is the association between experiences of perceived racial discrimination over the life course and length of gestation for pregnant AA women living in Jefferson County, Alabama?

Sample Characteristics

The quantitative sample included 98 pregnant AA women. The sample was comprised of 69 (70.4%) women receiving prenatal care in a public health department (Site A) and 29 (29.6%) women receiving prenatal care in a private clinic (Site B). All

participants were pregnant AA women (self-reported), with an average age of 26 years. In terms of number of pregnancies, this was the first pregnancy for 33 participants, the second pregnancy for 26 participants, and the third or more for 39 participants.

Table 2

Sociodemographic Characteristics of the Sample

Characteristic	*n*	%
African American	98	100
Clinic		
Health department	69	70.4
Private	29	29.6
Age		
18-24	43	42.1
25-30	35	34.3
31-36	16	15.8
37-41	4	3.9
Pregnancy		
First	33	32.3
Second	26	25.5
Third or more	39	38.2

ACE and EOD Scores

The average ACE score (range 0–10) was 2.96 (≥ 2 being high). To be eligible for the qualitative strand of the study, an ACE score of ≥ 2 and/or an EOD score of ≥ 3 was required. Fifty-eight percent of participants scored ≥ 2 on the ACE survey tool. The average EOD score (range 0–9) was 2.08 (≥ 3 being high). Thirty-eight percent of participants scored ≥ 3 on the EOD survey tool. While eligibility for the qualitative strand

did not require eligibility based on both an ACE survey score of ≥ 2 and an EOD survey score of ≥ 3, 37 participants met the criteria based on eligible scores on both survey tools.

Table 3

ACE and EOD Scores

Survey Scores	*n*	%
ACE		
0	13	13.3
1	28	28.6
2	14	14.3
3	9	9.2
4	8	8.2
5	7	7.1
6	6	6.1
7	5	5.1
8	5	5.1
9	1	1.0
10	2	2.0
EOD		
0	34	34.7
1	18	18.4
2	9	9.2
3	9	9.2
4	12	12.2
5	6	6.1
6	7	7.1
7	3	3.1
8	0	0
9	0	0

Length of Gestation at Birth

Length of gestation at birth was recorded in days (280 days equals 40 weeks). Data were missing for 5 participants; therefore, mean scores for length of gestation at

birth in days were substituted for the missing data. The average gestational age at birth for all participants (n = 98) was 268.6 days or 38 weeks and 3 days (full term is ≥ 37 weeks). The average length of gestation for participants who scored ≥ 2 on the ACE scale (n = 57) was 270.14 days. The average length of gestation for participants who scored ≥ 3 on the EOD scale (n = 28) was 268.5 days. The average length of gestation for participants eligible based on both an ACE score ≥ 2 and an EOD score ≥ 3 (n = 37) was 270.9 days.

Results

To test the hypothesis that AA women with higher rates of ACEs and/or experiences of perceived racial discrimination over the life course will have shorter lengths of gestation than AA women with low-range rates of exposure to the stressors, Pearson r correlation coefficient was computed to examine the relationship between the ACE and EOD scores with length of gestation at birth, individually. First, a Pearson r correlation coefficient was computed to assess the relationship between ACE scores and length of gestation at birth for the 98 participants. There was no correlation between the two variables, r (96) = -.01, (p = .909); 95% CI [-0.129, 0.266]. Next, a Pearson r correlation coefficient was computed to assess the relationship between EOD scores and length of gestation at birth for 98 participants. There was a very small positive correlation between these two variables, r (96) =. 07, (p = .489); 95% CI [-0.21, 0.187].

Figure 3

Scatterplot for ACE Score Versus Gestational Age at Birth in Days

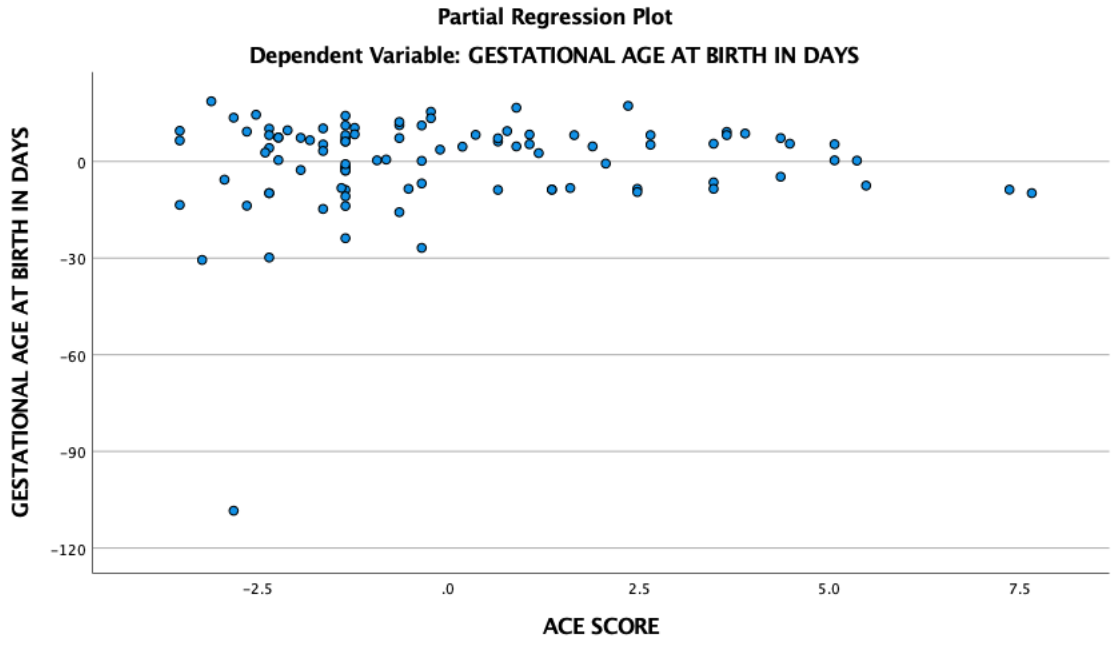
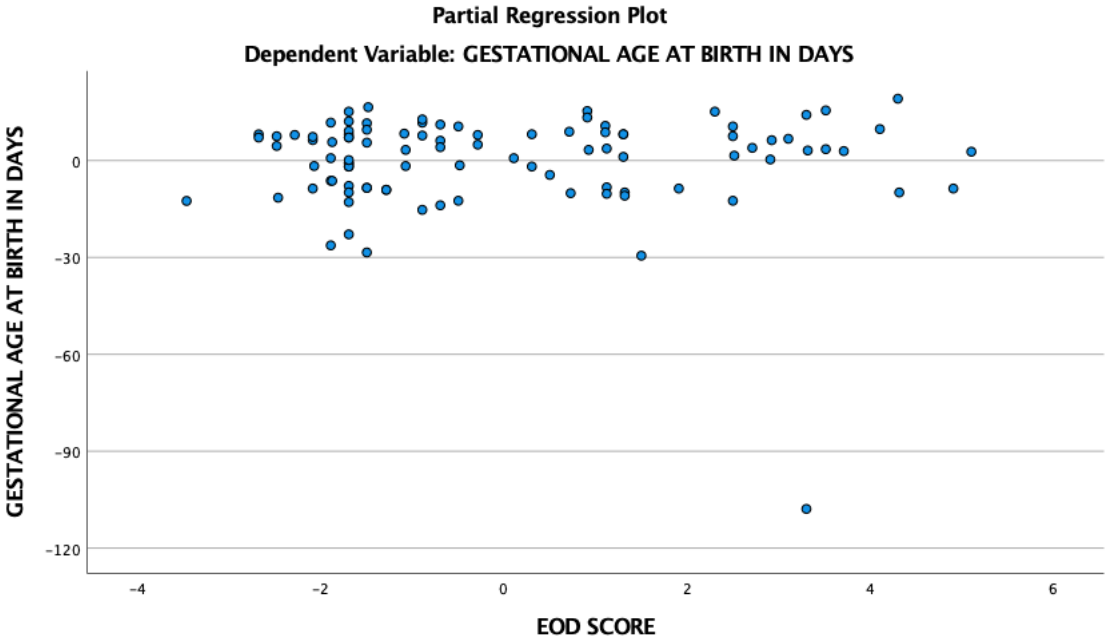


Figure 4

Scatterplot for EOD Score Versus Gestational Age at Birth in Days



Next, multiple linear regression model analysis was used to develop a model for predicting length of gestation at birth based on ACE and EOD scores collectively. R^2 was used to show the strength of the relationship between the predictors with length of gestation at birth. The two-predictor model was only able to account for .06% (R^2 = .006) of the variance in length of gestation at birth, which is considered a trivial effect size (Cohen, 1988). The interaction effect was nonsignificant, F (2, 95) = .281, p = .755. Looking at the unique individual contributions of the predictors, the results show that neither EOD score (β = -0.031, t = -.290, p = .773) nor ACE score (β = .078, t = .041, p = .460) accounts for the variance in length of gestation.

Summary of the Quantitative Findings

These findings reject the hypothesis that participants with higher rates of ACEs and/or experiences of perceived racial discrimination over the life course would have shorter lengths of gestation than participants with low-range rates of exposure to the stressors. In terms of the total sample (n = 98), there was no significant relationship between ACE and EOD scores and length of gestation at birth, either individually or collectively.

Qualitative Findings

This section presents results for the qualitative strand of this sequential quan → QUAL MMR study.

Qualitative Aim and Research Question

Aim 2 (Qualitative): Explore psychosocial resources and coping strategies of "high-scoring" participants through in-depth, semi-structured interviews.

Assumption: African American women with high-range scores of adverse childhood experiences and/or perceived racial discrimination will share information about the personal psychosocial resources that represent their "truth space" (Onwuegbuzie & Johnson, 2003).

The qualitative strand of this study was guided by the research question:

> What personal psychosocial resources do high-risk pregnant AA women living in Jefferson County, Alabama, describe as meaningful in their lives?

The qualitative strand of the study involved interviewing a sample of individuals based on eligibility as "high-scoring" on the ACE and/or EOD scales. Overall, 57 of 98 participants scored ≥ 2 on the ACE scale, 28 scored ≥ 3 on the EOD scale, and 37 were eligible based on both an ACE score ≥ 2 and an EOD score ≥ 3. Twelve eligible participants agreed to an interview.

Pseudonyms were assigned to each participant to maintain anonymity and confidentiality. Participant enrollment number, pseudonym, and pertinent descriptive characteristics gathered at enrollment are displayed in the table below. Age of the participant at enrollment, marital status, gravida (total number of pregnancies including current pregnancy, represented by "G" followed by the number), para (living children at time of enrollment, represented by "P" followed by the number), insurance type, and prenatal care site ("A" being the health department and "B" being the private clinic) are included in the descriptive characteristics.

Table 4

Participant Pseudonyms and Characteristics

Participant	Pseudonym	Descriptive Characteristics
9	Ashley	23-year-old, single, G3P1, Medicaid, Site A
16	Diedre	23-year-old, single, G2P1, Medicaid, Site A
20	Noelle	35-year-old, single, G6P5, Medicaid, Site A
24	Jasmine	25-year-old, single, G5P3, Medicaid, Site A
25	Renae	27-year-old, single, G3P2, Medicaid, Site A
29	Shay	30-year-old, married, G2P1, Private Insurance, Site B
30	Audra	28-year-old, single, G6P4, Private Insurance, Site A
43	Celeste	28-year-old, single, G1P0, Private Insurance, Site A
58	Cristin	22-year-old, single, G2P1, Private Insurance, Site A
74	Kyla	23-year-old, single, G3P2, Medicaid, Site A
94	Tara	20-year-old, single, G1P0, Private Insurance, Site B
97	Maggie	25-year-old, single, G1P0, Private Insurance, Site B

Themes and Subthemes

The 12 interviews of high-scoring participants (eligibility required ACE score ≥ 2 and/or EOD score ≥ 3) were recorded, transcribed, and analyzed. Seven participants met the criteria based on both an ACE score of ≥ 2 and an EOD score ≥ 3. Three participants met the criteria based on an EOD score ≥ 3, and two participants met the criteria based on an ACE score of ≥ 2. The qualitative analysis resulted in four overarching themes and eight subthemes reflecting the collective perspectives of the individuals (Table 5). The first theme, "childhood," was an overall impression of their childhood in their own words. Subthemes for "childhood" include "good" and "mixed." The second theme, "new baby," includes perceptions on personal feelings about bringing a new baby into the world and their family. Corresponding subthemes include "excitement" and "hesitancy." The third theme, "stress," was related to participants' personal definition and meaning of stress in their lived experience. There were no subthemes identified for this theme as it was simply an explanation of what the word "stress" means to them personally. The

fourth theme, “psychosocial resources,” relates to beliefs, skills, outside influences, and individual personality traits that influence how the participants manage stressful life events. Subthemes that emerged include “active coping,” “social support,” “nobody is 100% mentally ok,” and “resilience.” The themes and subthemes are presented here as select, direct quotes that represent participants’ lived experience based on specific questions related to childhood, having a new baby, stress, and psychosocial resources.

Table 5

Themes and Corresponding Subthemes

Themes	Descriptions	Subthemes
1. Childhood	General impression of childhood	Good Mixed
2. New Baby	Personal feelings about bringing a new baby into the world and their family	Excitement Hesitancy
3. Stress	Personal definition and meaning of the word in their lived experience	
4. Psychosocial Resources	Beliefs, skills, outside influences, and individual personality traits that influence how participants manage stressful life events	Active Coping Social Support Nobody Is 100% Mentally OK Resilience

Childhood

One of the first topics of discussion in each interview included a series of questions related to childhood. Participants were asked, “How would you describe your childhood, early adulthood?” and “Who did you live with growing up?” The participants provided rich descriptions of childhood that were, in their words, mostly “good.” Some participants described childhood as challenging; however, they recalled mostly fond

memories or had learned something from their struggles that they believed would help them in the future. The two subthemes that emerged from the overall theme of childhood, "good" and "mixed," represent the truth space of the participants.

Good. The responses that were good included recollections of good memories, that participants recalled as happy and fun. Jasmine shared that her mother and father provided an ideal example of what she wanted for her life with a partner:

> My mama and dad they did everything they want. My mom always been there with him, and they just always taught me all the things I really want in life like with a husband and how I would want my husband to be or how I should be towards my husband like how my mama would be for my dad, my grandparents.

Shay and Celeste described their childhoods as happy and fun. Shay said, "Very much so happy. I had a happy childhood. I was fortunate, um I didn't have any issues like that. I had a very good childhood." Celeste recalled fond memories of times before technology and other advances in the world that have changed the picture of childhood for kids today:

> Would say that it was pretty fun. I feel like I had a normal childhood. I always just compared how things are now compared to when I was younger. It's like we would go outside and play, and we would play with toys and maybe a little bit of video games, but not so much online...it was pretty fun. I felt like I had a good childhood, I did.

Mixed. The responses that were mixed included recollections of both challenging and good memories, even in situations of abuse, neglect, or parental substance abuse. Renae recalled:

> You know, the times my mom was on track and doing good we were living with my mom, she never just left us in the system. She always try to get better, take treatments, try to get her kids back. She did a couple times and then she fell back off track and we ended back up in it, so it was like a back-and-forth thing all of my life. I can remember times when we were living with my mom, and we were left in the house by ourselves for days and my aunt found out and called DHR and the police came, and they were questioning us about everything. I was so young. I remember quoting off my social security number and birthday and address and everything at a young age. You know like maybe 2nd and 3rd grade. My mom made sure, you know, even though she wasn't the best mom, she wasn't always there, she was a great mom. She made sure we, you know, knew about those type of things.

Audra and Kyla similarly described dark times, but overall expressed positive feelings and stories. Audra said, “It was ok, it was definitely stressful. I had to grow up early.” Kyla experienced the trauma of sexual abuse, but overall felt like she had a good childhood and learned a lot to help her in life:

> It was good, I think. I learned a lot, experienced a lot, but it was overall good. I feel I learned a lot throughout my life. Good things, well, I do want to add something to that, my childhood at home was good but I met my biological dad around the age of 12 or 13 and he did sexually assault me.

Diedre reflected on her childhood and recounted the tough times she experienced growing up with parents who were addicted to drugs and faced legal trouble. She expressed that seeing that and experiencing that made her want to do better for her own children.

> It has made me a way better parent. I think it made me way more cautious to being a parent. It made me not take things for granted, take moments for granted...to not waste time and to not be selfish. You know, I saw a lot of that when I was growing up, the selfishness of everything my parents were doing, and I just knew, I kept telling myself, when I am old enough to have kids, I'm not going to be that type of parent. I am going to learn from their mistakes and I'm going to be better.

New Baby

Participants were asked a series of questions related to bringing a new baby into the world. They were specifically asked, "How do you feel about bringing a new baby into your life right now?" "What challenges do you anticipate?" and "Do you have specific plans about how you will manage the adjustment?" The responses not only provided details about their feelings about the new baby, but also about the psychosocial and practical impacts this change would bring to their life and the life of their family. The subthemes that emerged from the major theme were "excitement" and "hesitancy."

Excitement. Several of the participants expressed nothing but excitement about bringing a new baby into their life, and they did not hesitate when they were asked about

their feelings. Diedre quickly exclaimed, “I'm so excited! I wanted a girl. I already have a boy and I wanted a girl; I am so excited. I am ready for her to come. I'm super excited!” and Kyla replied very similarly by saying, “I'm just excited! My kids are actually very happy. They been asking about another sibling so they are actually very supportive, and they are telling me we will you know, I will help you.” Both Diedre and Kyla spoke of how excited their other children were to bring a new sibling into their family and how they felt that they would be very helpful and loving. They were not alone in their expectations. Noelle was just as positive about her family’s excitement, especially since the restrictions of the COVID-19 lockdown were lifting:

> I'm ready ‘cause it's gonna be fun ‘cause my little baby that is 4 that goes to [day care] every day I pick him up he say, ‘mama did the baby come out.’ I said ‘no it be like 4 weeks to go’ but all of them is ready. They ready for the new little baby to come into the world, so I'm really excited about that ‘cause that gonna be fun, too, to start all over... baby shopping is so easy, like everybody, I'm getting gifts from everybody still ‘cause a lot a people couldn't come to the baby shower ‘cause a lot of people work and now cause, like, COVID, I'm just being real, like, [not] doing a drive-by baby shower.

Hesitancy. The subtheme of hesitancy emerged for a variety of reasons. The added stress of having more than one child, strained relationships with partners, or being a single parent were some of the threads that emerged. Others focused on the uncertainty of the COVID-19 visitation restrictions that were ever-changing at the time of data collection. Renae said:

> I don't know if imma have somebody to come with me. If I do decide to have somebody to come, I don't know if I want [my baby's daddy] there because he is a very big stress. He's a big stressor in my life and I feel like at a time as sensitive as having a baby and, being in so much pain, and so much emotion, I really don't need that kind of stress around me because I might go off.

She added, "I rather just be up there by myself, but I know having a baby is life and death and I would really hate to be there alone."

Jasmine shared her thoughts this way, "In a way, like 'God, I got another kid,' you know [laughs]. I already look at the other ones and be, like, 'man, why did y'all come and can't I put y'all back in me.' It just makes me wonder how it's going to be." Shay said:

> I think now one of the things that I think about a lot is, you know, that saying that "you don't know what it is like to be a parent until you have 2." It's just the first thought for me is just knowing I'm gonna have 2 babies now... I think what I am dealing with now is wanting to do well for my children figuring out how we gonna get back in the mode with 2 kids and I plan to return to work at some point and so I'm kinda dealing with more of the standard, the normal bringing another new baby home pressure than I am COVID.

While two of the participants were engaged and one was married, the other nine were single and most did not have the support of a partner. This was a stressor that was echoed by several participants. Ashley's response characterized that of several of the other single participants:

> Actually, I don't know because with my son it's kind of hard...as it is with me being a single parent now. Well, actually, I've been a single parent for a while, but

> it just more of less help now that my fiancé actually left, like living in the same house no more. I think it's going to be extremely hard with two kids... I'm in the stage where I'm panicking more now because it's hard for me to take care of my son as is...especially with the little help I'm getting.

Stress

Stress is defined as the psycho-physiological outcome of any event that challenges an individual's capacity to cope (Shapiro, Fraser, Frasch, & Séguin, 2013). Psychosocial stress can be defined as an imbalance between demands placed on an individual and their ability to manage those demands, as perceived by the individual (Cohen, Kessler, & Gordon, 1995). Participants were asked, "When I say the word stress, what does that mean to you?" While there were a variety of responses from the women, the majority described stress as an overwhelming feeling of worry and/or loss of control. They explained that to them stress is an emotional drain that preoccupies their every thought, often disrupting their mental health. They also expressed that stress sometimes causes them physical, emotional, and mental distress. Diedre said, "Stress is like worrying. Stress can mean a lot of things.... worrying, depression, making me feel upset... what is overwhelming to me. That is what it means to me." Audra and Kyla related stress to worry as well. Audra said, "I can probably say, like worry... like, I think I stress myself out when I worry about things too much. I can relate stress with worry." Kyla described it similarly by saying, "Something, like, that you worry about over and over, basically."

Cristin and Ashley spoke about how it can become an overwhelming feeling of loss of control that drains one physically, emotionally, and mentally. Cristin described stress as "Feeling overwhelmed with what you are dealing with or having something going on or just dealing with something that you can't control, you know, like things like that." Ashley went on to describe it as "more like emotional drain, physical tired...it's more, being like a mental health thing." Overall, the participants had similar definitions of what stress means to them and of the emotions and feelings stress evokes.

Psychosocial Resources

Psychosocial resources have been defined as beliefs, skills, and individual personality traits that influence how a person manages stressful life events (Taylor & Broffman, 2011). In addition to active coping strategies, they include optimism, self-esteem, self-worth, and social support (Taylor & Broffman, 2011). Subthemes that emerged from the overall theme of psychosocial resources for the sample include active coping, social support, mental health, and resiliency.

Active Coping. Coping strategies have been defined as proactive or negative responses and/or actions related to the presence of a stressor (Ramachandran, 2012). The coping response may include several categories, including active or confrontive coping, anticipatory coping, avoidance coping, denial, disengagement, distancing, detachment, and/or minimizing. Coping strategies may involve planning steps to ameliorate the problem, framing the problem as an opportunity for growth, or reaching out for social support. Other strategies might involve using substances to dull feelings, turning to

religion, or venting (Ramachandran, 2012). The concept of coping is complex and multifaceted; however, the subtheme emerged in the form of responses to the question, "What do you do to manage stress?" Participants were also asked, "Can you give me specific examples?" The coping strategies that emerged for the participants in this study overwhelmingly fell into the category of "active coping."

Active coping has been defined as strategies to manage stress where an individual employs activities or resources to appropriately control a stressor. This type of coping is aimed at adaptive strategies to change mood or establish habits and is associated with fewer mood disturbances, enhanced self-efficacy, and other favorable outcomes (VandenBos, 2007). Participants provided multiple examples of active coping strategies that they employ in their everyday response to stress management. Some of the activities that were cited by multiple participants included, but were not limited to, spending time with their children, prayer/meditation, talking about it with someone they trust, breathing techniques, going for a drive or a walk, cooking, cleaning, listening to music, or watching a television program that they enjoy.

Diedre said:

> I take a moment to breathe, relax...go do some activities that I like...just sit back and reflect and probably think of positive things to [deal with] the stress, so, just, that's the stuff I do. So, like, breathing and, um, meditation helps out a lot. I like to do yoga so that helps out. I love watching true crime, so I watch true crime all the time, go for walks, taking a drive, go outside and you know kind of soothes the mind. That's what I tend to do, yeah, or I might watch my favorite movie or a

> movie I haven't seen in a while...that always makes me feel happy or makes me feel better.

Noelle responded very similarly to Diedre but added that she spent time in prayer as a first step. "I sit and talk to Jesus and ask him what is it to make it better," Noelle said, "or I just get up and walk around or I just go to the moment of cooking food or anything to keep my mind off me being stressed." She also said, "I relieve my stress by just listening to my music like me and my kids sit around like we do fun activities and stuff like that, and we bake cookies and just a lot of stuff." Other participants also echoed the sentiments of Diedre and Noelle. Shay said:

> I dive deeper into caring and putting my focus on my 1-year-old and just finding things to do to positively keep busy the best I can. So, my first line of defense is decompressing and typically after that I pray and then I kind of engage and find something to do to help alleviate something, you know, just invest in a relationship...something so that I can shift my focus and focus on something else.

Several of the participants described how talking to a trusted support person was one of their first steps in dealing with stress. Kyla said:

> I actually like talking about things that bother me. Like the person I would most likely talk about things to would be my fiancé, a lot of things I just talk to him about and express to him how I feel and actually make me feel better.

Maggie's response was almost identical to Kyla's:

> Talking it out. I talk to [my fiancé] a lot about it and, kind of like, dissect everything and that kind of helps 'cause he can make me realize that ok whatever

I am stressing about is minor or manageable, like there is nothing we can really do about it.

Celeste summed up the strategies of many of the participants with her description of what works best in her life:

> I think a lot of the time it is simple as a clean house, light a candle, play some music. Um, I don't know, just like small things that you don't even have to go outside to do. I dunno, watch your favorite tv show, something like that. Just something to get your mind from it 'cause, like I said, if you think about it too much you are way too consumed in it, and then your mind will take you into think about the next thing and the next thing and even though these things are temporary.

And Cristin said:

> Normally my first thing is to maybe turn on some music and just clean up even if stuff is not like dirty or my house, you know, I just like organize clothes or I feel like that's not working I go over to my mom's house, I take a ride, like me and my son will go to the park...anything but just sitting in the house.

Social Support. Gottlieb and Bergen (2010, p. 512) define social support as "the social resources that persons perceive to be available or that are actually provided to them by nonprofessionals in the context of both formal support groups and informal helping relationships." Participants were asked, "Who do you consider to be your support system?" to explore the helping relationships that the women find meaningful in their life. Examples of individuals providing the participants with social support included

sisters, mothers, partners, and grandparents; however, most of the participants described a network of individuals who provide them with practical and emotional support on a day-to-day basis. Noelle explained, “Me and my sister, we hang together. My mom and dad. We just a ‘family person’ period, and the father of my child. I really have a lot of support.” And she was not alone. Celeste said, “My mom, my sister, my grandma even my dad, uh, my boyfriend, his family, like everybody like I am pretty connected with my side of my family and then my boyfriend and his family as well, it's pretty good.” As one participant, Shay, reflected on the question for a moment, she exclaimed:

> Oh wow! You just made me realize just how much more blessed I am! Of course, my husband, my parents, my in-laws. I have two best friends who I don't see as best friends. I call them “sisters,” actually, I have a lot of support, you know you have it in different tiers, but as far as my parents, my in-laws, of course, my husband, and my “sister” best friends.

Nobody Is 100% Mentally OK. Participants' perception of the state of their mental health was mostly “good” or “great,” but some did express that they recognized times when they have struggled with some aspect of their mental health. Diedre, Noelle, Audra, Kyla, and Tara expressed mostly “good” perceptions of their mental health, while also acknowledging that no one is immune to potential mental health conditions. Noelle, Renae, Shay, and Maggie reported some struggles with depression and anxiety, but overall described their mental health in a positive light. Returning post-partum depression was a concern for Ashley and Renae because they experienced it with a previous pregnancy.

Diedre said, “I feel like it is good. I feel like with anyone you still have things that you still need to work on you are never going to have yourself together 100% mentally ever.” She continued, “Nobody is 100% mentally ok [laughs], but I try each day to make sure I do those positive things that help out with making sure I am not going mentally insane [laughs].” Kyla similarly stated, “No, other than the mood swings that come with this pregnancy. I feel that everything has been good. I feel like I'm in good shape,” and Tara confidently replied, “I feel like it is great!” Several participants admitted to struggling with their mental health from time to time, with worries that past conditions might recur at any time but were mostly positive when describing their perception of their mental health at that time. Noelle said:

> Well, it's better. It is way better than what it was. I am way better, and I be thanking God for that every day that I don't have to take no medicine for being depressed, none of that stuff. Like, I been doing excellent! I feel like if I'm doing good right now, I can continue doing good.

Shay also said that she has struggled at times, but that recently things have improved:

> To be honest with you, I decided to recently, um, a sister of mine and I made a pact that we were going to stop allowing ourselves to get entangled in what was going on so I would say, actually, being realistic as of a couple of weeks ago my mental state has improved a whole lot.

Ashley and Renae both admitted to being diagnosed with post-partum depression in prior pregnancies. However, Renae feels that the fact that she was only 16 at the time may have contributed to that diagnosis:

> I've been trying to, just especially with me not working this past month, I just been in my house and try to relax and get my mind off all the stressful things and, like, and, I did have postpartum depression with my first son because of the fact that I was only 16. I went to my six weeks checkup for birth control and found out I was pregnant again, so I was very depressed, like very, um, I just, I was like "wow"... I couldn't believe it!

Ashley, on the other hand, is more concerned about post-partum depression returning because of its severity when she had her first child. "[Postpartum depression] was bad with my son. I had it extremely bad with him," Ashley responded. "I actually was just starting to come up out of it like a few months ago, but now it's like, 'ok, I'm getting back into that dark place I fought so hard to get out of.' It's like it gets worser as it gets time for her to come."

Resilience. After participants were asked the question, "What do you do to manage stress on a daily basis," they were asked a series of related questions: 1) "What are the most effective strategies you use to deal with a stressful situation?" and 2) "Think about something that has stressed you out in recent days. *Can you describe the experience? What did you do to deal with the stress of that situation?"* The subsequent responses best fit with the subtheme of resilience. Resilience is the ability to successfully adapt to challenging or difficult life experiences through mental, emotional, and behavioral flexibility and adjustment to internal and external challenges (VandenBos, 2007). Psychological research demonstrates that the resources and skills associated with more positive adaptation (i.e., greater resilience) can be cultivated and practiced.

Diedre and Shay both shared a belief in having a positive outlook and finding a way to keep moving forward. Diedre explained:

> I try each day to make sure I do those positive things that help out with making sure I am not going mentally insane [laughs], like getting where it is unbearable to me, like try to find the ways you know, and yoga helps out a lot so that's what I do.

Shay said, “I'm more of the ‘things are going to be ok regardless of the outcome’ like, you are going to find a way to make it, keep pushing regardless, so I try to look at it as half-full instead of half-empty.” She added, “You might have lost your left arm, but you still have your right.”

Renae shared many scenarios which apply to the mentality of resilience. “[My first two kids] were born in the same year in 2010... one in February and one in December,” she explained.

> It was a lot for me ‘cause I was in high school and I tried my best not to be a stereotype because I was already becoming one by being a young mother. So, I just really didn't wanna, you know, go down the wrong path, so I just tried to make sure I finished and graduated high school ‘cause it was very hard because for me, my mom was on drugs at that point.

Her desire to finish high school and not perpetuate the stereotype by dropping out of high school was clearly conveyed in her responses. She matter-of-factly stated:

> I pretty much had to grow up fast, which was not a problem. Actually, it was like a natural instinct. I don't know if it was because I was a mother, it was a natural

instinct to do all those things, it wasn't really hindering me. It was motivating me to do better.

Celeste characterized the sentiment of several of the participants with her response to the questions:

> I kind of just try to think logical about it and realize that a lot of the times we stress over things that are out of our control and eventually it will be all right. It might not be all right in your time or a lot of time you might not be able to figure it out in that moment, but I feel like it's worse if you keep, like forcing yourself to think about it. You can think about it...I am a firm believer in "feeling your feelings" but you can't sit in your feelings for too long because that just makes it worse.... Eventually things work out, it might be a week, a month, sometimes a year, but things work out most of the time. I dunno, you just gotta think about it and let it be.

Summary of the Qualitative Findings

African American women with high-range scores of ACEs and/or perceived racial discrimination shared information about the personal psychosocial resources that represent their "truth space." The themes and subthemes emerged from rich, detailed descriptions provided by the 12 participants. The first theme, "childhood," was an overall impression of their childhood in their own words. Subthemes for "childhood" included "good" and "mixed." The second theme, "new baby" included perceptions on personal feelings about bringing a new baby into the world and their family. Corresponding subthemes included "excitement" and "hesitancy." The third theme,

"stress," was related to participants' personal definition and meaning of stress in their lived experience. There were no subthemes identified for this theme as it was simply an explanation of what the word "stress" means to them personally. The fourth theme, "psychosocial resources," related to beliefs, skills, outside influences, and individual personality traits that influence how the participants manage stressful life events. Subthemes that emerged included "active coping," "social support," "nobody is 100% mentally ok," and "resilience."

Mixed Methods Findings

This section presents the mixed methods findings of this explanatory sequential quan → QUAL mixed methods study.

Mixed Methods Aim and Research Question

Aim 3 (Mixed Methods): Integrate survey data and interview themes to explain the relationships among the specific chronic stressors, psychosocial resources, and length of gestation at birth. Length of gestation will be the primary outcome measure (< 37 weeks = PTB).

The mixed methods research question was:

> What psychosocial resources provide a protective effect against PTB and/or shortened length of gestation among "high-scoring" pregnant AA women living in Jefferson County, Alabama?

The quantitative strand of the study involved collecting ACE and EOD scores for 98 pregnant AA women living in Jefferson County, Alabama. Following delivery of each infant, specific birth outcome data were collected from the electronic health record. The

primary birth outcome variable of interest was length of gestation at birth; however, Apgar scores at 1 and 5 minutes and infant birth weight were also collected as these are vital birth outcome variables for all infants. The qualitative strand of the study involved interviewing a sample of individuals based on eligibility as "high-scoring" on the ACE and/or EOD scales. Overall, 57 of 98 participants scored ≥ 2 on the ACE scale, 28 scored ≥ 3 on the EOD scale, and 37 were eligible based on both an ACE score ≥ 2 and an EOD score ≥ 3. Twelve eligible participants agreed to an interview, and data were collected as described earlier in the chapter. The integrated findings for the study are presented below in a joint display that includes participant pseudonym, ACE score, EOD score, birth outcome data (mode of delivery, length of gestation, sex, Apgar scores at 1 and 5 minutes, and infant birth weight), and select exemplar quotes illustrating the subthemes of the major theme "psychosocial resources." A narrative discussion of the integrated findings is also presented.

Table 6

Joint Display of Integrated Findings

Pseudonym	**ACE**	**EOD**	**Birth Outcome Data**	**Exemplar Quote(s) Illustrating the Subthemes of the Theme Psychosocial Resources**
Ashley	6	4	Cesarean section, 37 weeks 1 day (260 days), female, Apgars 8 and 9, birth weight 2270 grams (about 5 lb.)	***Active Coping:*** "Actually, before I got pregnant, I used to drink alcohol. That was a way of helping me cope. After I had my son, I didn't have the urge for alcohol which was a good thing because it helped me to stay away from the alcohol. Like, I didn't have the urge to drink when I'm feeling down or bad about anything."

Diedre	7	4	Cesarean section, 37 weeks 3 days (262 days), female, Apgars 8 and 9, birth weight 2750 grams (about 6.06 lb.)	***Nobody is 100% Mentally OK:*** "Nobody is 100% mentally ok [laughs], but I try each day to make sure I do those positive things that help out with making sure I am not going mentally insane [laughs], like getting where it is unbearable to me, like try to find the ways...you know, and yoga helps out a lot so that's what I do, that's what I think." ***Resilience:*** "I was going to be the best mother I can be and you know make sure that they had the best father [laughs happily] that there can be so I am glad that I have my fiancé who is a great father, um, great husband cause I didn't' have, like I said, that mother and dad relationship growing up where I got to see a positive relationship or where I got a chance to see anybody in my family married or happily married or happily in a relationship." "[My childhood] has made me a way better parent. I think it made me way more cautious to being a parent. It made me not take things for granted, take moments for granted...to not waste time and to not be selfish. You know, I saw a lot of that when I was growing up, the selfishness of everything my parents were doing, and I just knew, I kept telling myself 'When I am old enough to have kids, I'm not going to be that type of parent. I am going to learn from their mistakes and I'm going to be better.'" ***Active Coping:*** "I take a moment to breathe, relax...go do some activities that I like...just sit back and reflect and probably think of positive things to mask the stress, so, just, that's the stuff I do. So, like, breathing and, um,

				meditation helps out a lot. I like to do yoga so that helps out. I love watching true crime, so I watch true crime all the time, go for walks, taking a drive, go outside and you know kind of soothes the mind. That's what I tend to do, yeah, or I might watch my favorite movie or a movie I haven't seen in a while...that always makes me feel happy or makes me feel better."
Noelle	2	5	Spontaneous vaginal delivery, 39 weeks 2 days (275 days), male, Apgars 9 and 9, birth weight 3530 grams (about 7.78 lb.)	***Active Coping:*** "I sit and talk to Jesus and ask him what is it to make it better or I just get up and walk around or I just go to the moment of cooking food or anything to keep my mind off me being stressed then if I so stressed out I just try to lay and relax at the same time to keep me from just having me so broken down and having break throughs or stuff so I relieve my stress by just listening to my music like me and my kids sit around like we do fun activities and stuff like that and we bake cookies and just a lot of stuff to just keep stuff off of my mind." ***Social Support:*** "Me and my sister we hang together. My mom and dad. We just a 'family person' period, and the father of my child. I really have a lot of support." ***Nobody is 100% Mentally OK:*** "Well, it's better. It is way better than what it was. I am way better and I be thanking God for that every day that I don't have to take no medicine for being depressed, none of that stuff. Like, I been doing excellent! I feel like if I'm doing good right now I can continue doing good."

Jasmine	1	5	Cesarean section, 40 weeks 2 days (282 days), male, Apgars 9 and 9, birth weight 4000 grams (about 8.82 lb.)	***Active Coping:*** "Mostly it would be I like motorcycles most of it would be to ride take my mind off or, um, I dunno, uh, certain things. I like to draw. I like to paint. I love doing arts and crafts...these kind of things. Most of the stuff made in my house is kind of arts and crafts that I did versus me going to pay for something I made." ***Active Coping & Social Support:*** "I dunno, I have different ways...be out with my friends. I only have a couple and so when we do get together that is a stress reliever...or me and my brother we try to get together even if we have problems we get together and work em out together."
Renae	9	4	Spontaneous vaginal delivery, 37 weeks 2 days (261 days), female, Apgars 8 and 9, birth weight 2720 grams (about 6 lb.)	***Resilience:*** "[My first two kids] were born in the same year in 2010... one in February and one in December. It was a lot for me 'cause I was in high school and I tried my best not to be a stereotype because I was already becoming one by being a young mother. So, I just really didn't wanna, you know, go down the wrong path, so I just tried to make sure I finished and graduated high school 'cause it was very hard because for me. My mom was actually on drugs at that point. I pretty much had to grow up fast, which was not a problem. Actually, it was like a natural instinct. I don't know if it was because I was a mother, it was a natural instinct to do all those things, it wasn't really hindering me. It was motivating me to do better."
Shay	1	6	Cesarean section, 41 weeks (287 days), female,	***Resilience:*** "I'm more of the 'things are going to be ok regardless of the outcome' like, you are going to find a way to make it, keep pushing regardless, so I try to look at it as half-

			Apgars 8 and 9, birth weight 3510 grams (about 7.74 lb.)	full instead of half-empty. You might have lost your left arm, but you still have your right." ***Social Support:*** "Oh wow! You just made me realize just how much more blessed I am! Of course, my husband, my parents, my in-laws. I have two best friends who I don't see as best friends. I call them sisters, actually, I have a lot of support, you know you have it in different tiers, but as far as my parents, my in-laws, of course, my husband, and my sister best friends."
Audra	5	6	Spontaneous vaginal delivery, 39 weeks (273 days), female, Apgars 9 and 9, birth weight 3260 grams (about 7.19 lb.)	***Resilience:*** "It was definitely stressful. I had to grow up early." ***Active Coping:*** "I clean and then, having so many kids, it is kind of hard to dwell on anything too long before you have to do something with them. Since I been pregnant I definitely clean, but if I wasn't pregnant, I would definitely have myself a glass of pinot noir." ***Nobody is 100% Mentally OK:*** "I think I'm pretty solid with it besides I am an overthinker like, I stress myself, like I worry about some stuff that I should just be, I don't know, my brother told me that a few weeks ago that I should anticipate more positivity like he was telling me about starting a side hustle, like something that I like to do myself and he said the first thing that I went into was what could go wrong instead of thinking positive."
Celeste	0	4	Cesarean section, 39 weeks 2 days (275 days),	***Nobody is 100% Mentally OK:*** "Yeah, it's normal to worry, that's the thing. That's why I'm like hey, 'feel your feelings' but after a while if you just keep worrying, next thing you

			male, Apgars 8 and 9, birth weight 4080 grams (about 8.99 lb.)	know you're worrying about something else and the next thing and on top of that and on top of that and it just makes it worse and worse and worse, so I rather not do that for too long and then just let it work itself, you because, you know even though sometimes it might not be on your time." ***Resilience:*** **"**Eventually things work out, it might be a week, a month, sometimes a year, but things work out most of the time. I dunno, you just gotta think about it and let it be."
Cristin	2	7	Cesarean section, 39 weeks 5 days (278 days), male, Apgars 8 and 8, birth weight 3180 grams (about 7 lb.)	***Active Coping:*** "Normally my first thing is to maybe turn on some music and just clean up even if stuff is not like dirty or my house, you know, I just like organize clothes or I feel like that's not working I go over to my mom's house, I take a ride, like me and my son will go to the park...anything but just sitting in the house." ***Nobody is 100% Mentally OK & Social Support:*** "Sometimes I feel like I need a break and I get frustrated, but that is very rare 'cause I can just drop him off at my mom's house or his auntie or his dad side, so um, I just feel like I feel like it is pretty good right now. And dealing with postpartum depression, I didn't have postpartum depression after I had him."
Kyla	5	0	Cesarean section, 39 weeks 1 day (274 days), male, Apgars 5	***Resilience:*** "It was good I think. I learned a lot, experienced a lot, but it was overall good. I feel I learned a lot throughout my life. Good things, well, I do want to add something to that, my childhood at home was good but I met my biological dad around the age

			and 7, birth weight 2790 grams (about 6.15 lb.)	of 12 or 13 and he did sexually assault me." ***Active Coping:*** "Now, I actually like talking about things that bother me like the person I would most likely talk about things to would be my fiancé, a lot of things I just talk to him about and express to him how I feel and actually make me feel better and also have a little adult coloring book that I use sometimes that I color in."
Tara	10	0	Cesarean section, 37 weeks 2 days (261 days), male, Apgars 8, 4 and 9, birth weight 3660 grams (about 8.06 lb.)	***Active Coping:*** "I guess kind of come very in touch with my emotions and a lot of people will say they are sensitive. I am able to be very open with how I feel and not just lie about how I feel because I feel like that is one way to cope with emotions that are horrible which I used to do a lot, but I feel like I don't really have [one] main way of coping. I don't cause when I got pregnant, I had to figure it all out. I couldn't go outside and use drugs, or you know harm myself anymore, you know what I'm saying, so I guess a great way of coping for me is getting over it, working, go to the [inaudible], not being able to think about it."
Maggie	3	3	Spontaneous vaginal delivery, 40 weeks 2 days (282 days), female, Apgars 8 and 9, birth weight 3170 grams (about 7 lb.)	***Social Support:*** "[My fiancé] for sure. He has been great through all of this, but my mom has been a huge part of my support system and even though she isn't in town, I know that if I called her, she would be here like in no time." ***Nobody is 100% Mentally OK & Active Coping:*** "I struggle with anxiety for sure, yeah, I think I rely a lot on [my fiancé] not even necessarily my mom cause I don't like telling her that stuff 'cause it just

				worries her, but a lot of it with [my fiancé] cause he is the opposite of me, so where I stress about like every detail, he is like, go with the flow and like, at work, um, and I just try to take my mind off of it and take breaks. I like watching reality tv that doesn't make me have to think of anything. I just sit there and watch all of the drama unfold and it takes my mind off of it."

Integrated Findings

In a MMR study, it is crucial to have a clear mixing purpose to allow the PI to appropriately integrate the data from the qualitative and quantitative strands (Creswell & Plano Clark, 2018). The mixing purpose used in this study was complementarity. Complementarity uses one strand of the study to illustrate, elaborate, or clarify findings from another strand (McCrudden et al., 2021). For this study, the themes and corresponding subthemes that emerged from the qualitative strand served to clarify the findings from the quantitative strand. The advantage of integrating quantitative and qualitative data to examine various aspects of the phenomenon was that it provided more in-depth information on the participants' experiences and feelings in addition to the statistical findings (Ivankova, 2015). The integrated findings from this study illustrate that multiple psychosocial resources may have decreased the incidence of preterm birth risk for women with high rates of ACEs and/or experiences of discrimination.

The MMR notations for this study were purposefully selected to specify which strand of the overall MMR study was the priority. While the quantitative data did not

reveal statistically significant differences among the variables of interest, the interviews with the participants in the qualitative strand provided rich descriptions of specific psychosocial resources that the participants found meaningful in their lives. These findings illustrate the appropriateness of the chosen MMR design and integration strategies. Furthermore, the integrated findings also support the principles of the theory that guided this study: Life Course Health Development (LCHD) model. Discussion of the fit between the LCHD and the study design is presented in Chapter 5.

The quantitative findings for this study reject the hypothesis that pregnant AA women with higher rates of ACEs and/or experiences of perceived racial discrimination over the life course would have shorter lengths of gestation than AA women with low-range rates of exposure to the stressors. Four themes and eight subthemes emerged from the qualitative data. The major themes of "childhood" and "new baby" included descriptions of experiences that overlapped with the major theme "psychosocial resources." This could likely be explained by the evidence of resilience in the study sample. Most of the participants described "stress" as an overwhelming feeling of worry and/or loss of control. They explained that to them stress is an emotional drain that preoccupies their every thought, often disrupting their mental health. They also expressed that stress sometimes causes them physical, emotional, and mental distress. When asked questions related to stress management, participants described positive, active coping strategies such as spending time with their children, prayer/meditation, talking about it with someone they trust, breathing techniques, going for a drive or a walk, cooking, cleaning, listening to music, or watching a television program that they enjoy, just to name a few. When asked about their social support networks, all but one of the

participants cited multiple trusted support persons in their life, including mothers, sisters, partners, friends, and in-laws, among others. The participant who only named one support person (her fiancé) followed up by saying that she did not feel that she needed anyone else and that she felt "very supported by him."

The psychosocial resources of the participants emerged from multiple-question topics. When speaking about their impression of their childhood, most of the participants recalled "good" times, but even the ones who described difficult or traumatic situations expressed that they had grown or learned something because of those experiences. They explained that it drove them to do better with their own children. This led to the emergence of the subtheme "resilience." Psychological research demonstrates that the resources and skills associated with more positive adaptation (i.e., greater resilience) can be cultivated and practiced. The themes and subthemes that emerged during qualitative data analysis overwhelmingly illustrated resiliency in adaptation skills. The MMR question was, "What psychosocial resources provide a protective effect against PTB and/or shortened length of gestation among "high-scoring" pregnant AA women living in Jefferson County, Alabama?" For this study sample, specific active coping strategies, social support, and resilience appear to have provided a protective effect against PTB among high-scoring participants.

Conclusion

As reported previously in this chapter, there was no statistically significant relationship between ACE and EOD scores and length of gestation at birth, either individually or collectively. Participants who were eligible for the qualitative strand of

the study (ACE score ≥ 2 and/or EOD score ≥ 3) had birth outcomes that were like those of participants who were not eligible for the qualitative strand. The qualitative findings included themes and subthemes that revealed active coping skills, strong social support, and resilience, which may have provided a protective effect against PTB and/or shortened length of gestation among the sample of high-scoring participants. Chapter 5 discusses the findings relative to the existing literature as well as implications, strengths, limitations, and a conclusion.

CHAPTER 5

DISCUSSION

An explanatory sequential quan → QUAL MMR study was conducted to explore the relationships among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women living in Jefferson County, Alabama. The goal of the quantitative strand of the study was to survey participants (n = 98) prior to delivery. The goal of the qualitative strand of the study was to utilize in-depth, semi-structured interviews to explore psychosocial resources and coping strategies of participants (n = 12) scoring ≥ 2 on the ACE (range 0–10) and/or ≥ 3 on the EOD (range 0–9). This chapter will begin with a discussion of the major findings relative to existing literature followed by a discussion of the fit between the Life Course Health Development (LCHD) model and the integrated findings. In addition, this chapter will present implications, limitations, strengths, and a conclusion.

Findings Relative to Existing Literature

Adverse Childhood Experiences

Little is known about the relationship between maternal exposure to many of the ACEs risk categories and the incidence of PTB. Several studies relating single categories of maternal risk (i.e., child abuse, child sexual abuse) with adverse birth outcomes have

been conducted, but only two studies were found that investigated multiple categories of maternal risk in a single study (Cammack et al., 2019; Christiaens et al., 2015). An integrated review of the literature did not uncover a single study that measured both ACEs and psychosocial resources. This is the first study to present MMR results related to ACEs and PTB risk in a pregnant AA population. Like this study, findings from the literature investigating the relationship between maternal exposure to ACEs and adverse birth outcomes have had mixed results; however, the additional exploration of psychosocial resources may help to explain why previous studies have had mixed findings. This study found that psychosocial resources may provide a protective effect against PTB risk for individuals exposed to multiple categories of ACEs.

Perceived Racial Discrimination

Racial discrimination affects minority groups all around the world and has been found to have a negative impact on both mental and physical health (Krieger, 1999). Over the past two decades, several studies have found that the negative consequences of racial discrimination are associated with adverse birth outcomes such as PTB and low birth weight or very low birth weight, which may help to explain the racial disparities in infant mortality rates in the United States (Bower et al., 2018; Braveman et al., 2017; Collins et al., 2000; Dole et al., 2004; Dominguez et al., 2008; Mustillo et al., 2004; Rankin et al., 2011). Other studies have had mixed results, and their limitations warranted further investigation (Misra et al., 2010; Rosenberg et al., 2002; Slaughter-Acey et al., 2016). While this study did not find that AA pregnant women with high levels of exposure to perceived racial discrimination had shortened length of gestation, qualitative findings do

suggest that psychosocial resources for this sample may have modified the negative impact of those experiences. This is the first study to explore experiences of racial discrimination and psychosocial resources using an MMR design.

Dole et al. (2004) performed one of the first studies to examine the association between several psychosocial stressors (including perceived racial discrimination) and PTB in a sample of pregnant women. A strength of this study was that a measure of coping was included as a variable. African American participants were at higher risk for PTB if they reported "distancing from the problem" as a coping mechanism (Dole et al., 2004). This finding supports the theory that negative coping skills in women with exposure to life-course stressors may be at higher risk for PTB. The participants in this dissertation study did not report "distancing from the problem" as a coping mechanism, which may help to explain the quantitative findings relative to the qualitative findings.

The findings from this study are consistent with a hybrid retrospective and prospective study that examined how social and psychosocial factors may influence the risk of PTB (Misra et al., 2010). The researchers found a three-way interaction between racial discrimination (experienced over the life course), depressive symptoms during pregnancy, and stress during pregnancy. Higher racism scores were associated with an increased risk of PTB, but rates were moderated by both depressive symptoms and stress (Misra et al., 2010). It was the first study to consider that a woman's response to experiences of perceived racial discrimination could have a modifying effect on birth outcomes; however, the findings did not suggest a strong relationship. The authors' findings may have been limited by the exclusively quantitative measurement of psychosocial factors and therefore supported the need for qualitative data that were

collected for this study. The participants in this dissertation study provided rich details regarding psychosocial resources that appear to have mediated a risk for PTB associated with perceived racial discrimination over the life course.

Another study found that participants with passive coping behaviors in the absence of any active coping strategies had seven-fold increased odds of PTB when exposed to high levels of perceived racial discrimination (Rankin et al., 2011). This may explain the findings from this dissertation study since our qualitative findings revealed predominantly active coping strategies. Extending the research to include participants with negative/passive coping skills may better explain the relationships among psychosocial resources, life-course stress, and birth outcomes.

Protective Factors

The findings from this study provide insight into the role of risk and protective factors in adverse birth outcomes such as PTB. A strong support system has been shown to help improve overall health, reduce stress, and relieve anxiety (Latendresse, 2009). Having a strong support system means that individuals have trusted people to rely on when they need them the most. Resilience is the ability to successfully adapt to challenging or difficult life experiences through mental, emotional, and behavioral flexibility and adjustment to internal and external challenges (VandenBos, 2007). Individuals with significant exposures to life-course stressors who have passive and/or negative coping strategies, weak social support, and low levels of resiliency may be at higher risk for PTB or other adverse birth outcomes (Latendresse, 2009). However, an individual's ability to adapt to stressful situations utilizing a combination of active coping

skills, social support, and resiliency in an essential element in a comprehensive picture of psychosocial stress (Hobel, 2004; Latendresse, 2009). More comprehensive education and health screenings for high-risk individuals should be considered, particularly for AA women. There is growing support in the literature for the idea that these actions have the potential to mitigate the negative effects of ACEs and experiences of perceived racial discrimination (Goyal et al., 2013; Tanner-Smith et al., 2014).

Life Course Health Development Model and the Integrated Findings

Lu and Halfon (2003) synthesized two theoretical approaches to offer a comprehensive model to help explain how risk and protective factors impact women's reproductive health potential. The LCHD model was created to explain how health trajectories develop over an individual's life course (Halfon & Hochstein, 2002). LCHD helps to explain the cumulative effect of everyday experiences and how an individual adapts to those experiences. The underpinnings of the LCHD model have been applied in several disciplines to better explain how optimal health and development can evolve over a lifetime and across generations (Fine & Kotelchuck, 2010; Lu & Halfon, 2003). The model theorizes that women who experience more risk factors and fewer protective factors over their life course may be at greater risk for adverse birth outcomes such as PTB. It also theorizes that racial disparities may be explained because of differential developmental trajectories over the life course during sensitive periods (i.e., childhood, puberty, pregnancy) as well as cumulative exposures to risk and protective factors over the life course. The researchers posit that risk factors "push down" on the health trajectory while protective factors "push up" to overcome the "push down" effects of the

risk factors. The idea is that a woman's reproductive potential is a result of her trajectory of risk and protective factors, particularly during periods of vulnerability, over the life course.

In 2010, the United States Department of Health Resources and Services Administration Maternal and Child Health (MCH) Bureau published a concept paper entitled "Rethinking MCH: The Life Course Model as an Organizing Framework" in hopes that LCHD might be the guiding framework for future studies aimed at explaining health and disease patterns, especially racial disparities, across populations and over time in the maternal-child population. In an effort to address these broad questions, the LCHD proposes five concepts: (a) pathways or trajectories, (b) early programming, (c) critical or sensitive periods (i.e., childhood, adolescence, pregnancy), (d) cumulative impact, and (e) risk and protective factors (Fine & Kotelchuck, 2010). This MMR study addressed each of these five concepts in an effort to better explain the relationships among two specific life-course stressors, psychosocial resources, and PTB in an AA population.

Over half (n = 57) of the overall sample (n = 98) reported exposures to at least one of the two selected life-course stressors (ACEs and/or experiences of discrimination), which are categorized as "push down" effects, according to the theory. The qualitative data revealed a variety of protective factors that may have provided the "push up" effect described in the theory. Active coping skills, positive life outlook, strong social support, and characteristics of resiliency are just a few examples of the protective factors that may have served as effect modifiers for the study sample. The principles of the LCHD model helped to answer the research questions for each strand of the study. The "push down" effect of the life-course stressors appears to have been overcome by the "push up" effect

of the psychosocial resources described by the participants in the qualitative sample. The model provided a multidimensional theory that integrated the quantitative and qualitative findings, making it an ideal fit for this explanatory sequential quan → QUAL MMR study.

Implications

Findings from this study suggest that further investigation of PTB and effect modifiers such as active coping, social support, and resilience should be conducted. Future studies may inform interventions and policy to mitigate the effects of adverse birth outcomes such as PTB. This section explains how this study could inform clinical practice, future research, and policy.

Clinical Practice

Understanding what psychosocial resources may provide a protective effect against the chronic stressors may better inform interventions and lead to fewer racial disparities in birth outcomes. It is important that providers consider reproductive health from the life-course perspective because a pregnancy may be compromised before it even begins. However, the findings from this study suggest that screening for experiences of life-course stressors such as ACEs and perceived racial discrimination should be accompanied by screening for psychosocial resources such as active coping, social support, and resiliency. As mentioned in Chapter 2, insights into the processes through which chronic stress over the life course leads to adverse birth outcomes may help to inform interventions such as home visiting programs, more comprehensive preconception

screening, and support for the group prenatal care model (Ickovics, 2007; Tanner-Smith et al., 2014).

The physical and mental consequences of ACEs and experiences of perceived racial discrimination should be carefully considered by health care providers when developing individualized care plans; however, patients with a lack of social support, passive or negative coping strategies, and/or low levels of resiliency may be at greater risk for adverse birth outcomes. Identifying at-risk pregnant women based on these characteristics is the first step. Once at-risk individuals are identified, there are evidence-based interventions that can be implemented to reduce the risks. Group prenatal care is a novel concept that has been found to be beneficial to women in need of more social, psychological, and medical support/supervision for certain chronic or pregnancy-related conditions, particularly AA women (CenteringPregnancy, 2019).

Policy

Understanding AA women's interpersonal interactions and social and structural contexts is a crucial step towards the development of policies and programs designed to reduce infant mortality and morbidity and the disproportionate racial gap in PTB that exists and persists in the United States (Wallace et al., 2017). One model of care that has been found to reduce both PTB rates and IMR, particularly for AA women, is group prenatal care.

Group Prenatal Care

While research comparing group care to the traditional model of prenatal care delivery is limited, there is promising evidence that group prenatal care, as an alternative to the traditional prenatal care model, is associated with significant reduction in preterm birth (Ickovics et al., 2007; Klima et al., 2009; Picklesimer et al, 2012; Tanner-Smith et al., 2014). One randomized control trial sought to determine whether group prenatal care improves pregnancy outcomes, psychosocial function, and patient satisfaction and to examine potential cost differences (Ickovics et al., 2007). Researchers found that women assigned to group care were significantly less likely to have preterm births compared with those in standard care: 9.8% compared with 13.8%. This is equivalent to a risk reduction of 33%, or 40 per 1,000 births. Effects were strengthened for AA women: 10.0% compared with 15.8%. Additionally, women in group sessions were less likely to have suboptimal prenatal care, had significantly better prenatal knowledge, felt more ready for labor and delivery, and had greater satisfaction with care. Breastfeeding initiation was higher in group care: 66.5% compared with 54.6%. There were no differences in birth weight nor in costs associated with prenatal care or delivery (Ickovics et al., 2007). Women with a history of life-course stressors such as ACEs and experiences of discrimination may benefit from the resources, education, and social support provided by this model of care. To the PI's knowledge, group prenatal care is currently only being offered by a few providers in the state of Alabama. Funding for group prenatal care should be a priority for programs aiming to reduce state and national infant mortality rates.

Future Research

Adverse childhood experiences and perceived racial discrimination as chronic, life-course stressors may increase odds of PTB in AA women, and meaningful psychosocial resources (i.e., coping strategies, optimism, self-esteem, self-worth, and social support) may modify that risk. For this study, psychosocial resources were measured qualitatively; however, future research should include survey tools to quantitatively measure psychosocial resources for at-risk individuals. Measuring exposure to ACEs and experiences of discrimination as well as resiliency, coping strategies, self-esteem, optimism, and social support (among other psychosocial resources) may help to identify individuals lacking adequate psychosocial resources that may have modified the risk of PTB in this study sample. Comparing birth outcomes between women with "negative" versus "positive" psychosocial resources may better explain the relationships among life-course stress, psychosocial resources, and PTB risk in AA pregnant women. In addition, study samples should include participants of a variety of ethnic backgrounds so that better comparisons can be made to help to explain the racial disparities in birth outcomes in the United States, particularly in the south.

Many studies have examined whether factors such as maternal age, lifestyle, socioeconomic status, or education can explain the racial gap in the IMR in the United States. Even when accounting for all those factors, there is not a significant link. In fact, college-educated AA women are more likely to have a preterm or low birth weight baby than their White counterparts. This evidence demands exploration of other causative factors for the racial gap in IMR. Based on the findings from this study, extending that evidence to further investigate the role that life-course stressors and psychosocial

resources play in improving birth outcomes for AA women may help to solve the puzzle that is the racial gap in the IMR in the United States.

Limitations

1. Convenience sampling was used for the quantitative phase, which limits representation and has a risk for sampling bias.
2. The qualitative sample included participants with high scores on one or both survey tools. Limiting eligibility to individuals with high scores on both survey tools may have provided a more representative sample of "high" versus "low" risk individuals.
3. Not all eligible participants were included in the qualitative strand of the study as the sample would have been too large and not feasible for a dissertation project.
4. Participants eligible for the qualitative strand who were not included or declined inclusion may not have provided the same examples of active coping strategies, social support, and resiliency characteristics.
5. Interviews were not able to be conducted in person due to COVID-19 restrictions and participant burden factors such as travel, time spent in the clinic, and childcare issues.

Strengths

1. The PI has over 20 years of experience working with this patient population, clinic personnel, and obstetric care providers both in clinical practice and in research immersions.

2. The PI took coursework dedicated to MMR, earning a Certificate in Applications of Mixed Methods Research.
3. This is the first MMR study to explore the relationships among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women.
4. The chosen MMR design strategy was the ideal approach to address all specific aims and research questions.
5. The survey tools used in the quantitative strand have been previously found to be valid and reliable for use with the population of interest. In addition, the ACE tool is the "gold standard" for measuring levels of adverse childhood experiences.
6. The PI was solely responsible for eligibility screening, recruitment, and enrollment of all study participants. Surveys were scored by the PI, and eligibility for the qualitative strand was also determined by the PI. In addition, all interviews were conducted by the PI as well as transcription and coding of the data.
7. Rich, thick descriptions of psychosocial resources were collected from willing, eligible participants in a private and secure setting.
8. Peer review was conducted by the dissertation committee to ensure that the study was rigorous.

Conclusion

This is the first MMR study to explore the relationship among adverse childhood experiences, perceived racial discrimination over the life course, psychosocial resources, and length of gestation in a population of AA pregnant women. Using an explanatory

sequential quan → QUAL MMR design, this study found that an individual's ability to cope with stressful life experiences may modify the effect of experiences of racism and/or ACEs on adverse birth outcomes such as PTB. Findings from the study can be used to inform clinical practice, future research, and policy.

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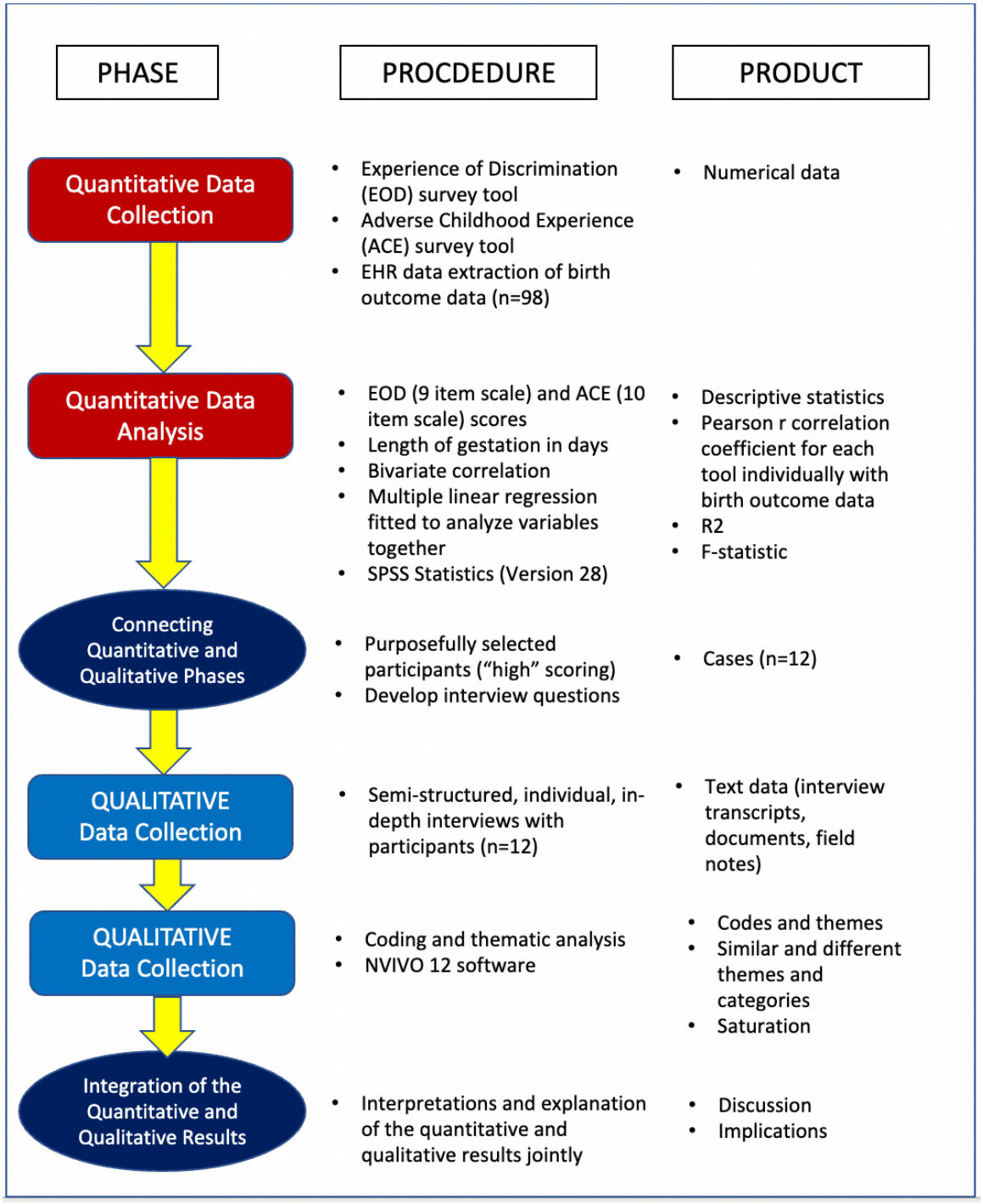
APPENDIX A

PROCEDURAL DIAGRAM


PHASE
PROCDEDURE
PRODUCT
Quantitative Data Collection
Experience of Discrimination (EOD) survey tool
Adverse Childhood Experience (ACE) survey tool
EHR data extraction of birth outcome data (n=98)
Numerical data
Quantitative Data Analysis
EOD (9 item scale) and ACE (10 item scale) scores
Length of gestation in days
Bivariate correlation
Multiple linear regression fitted to analyze variables together
SPSS Statistics (Version 28)
Descriptive statistics
Pearson r correlation coefficient for each tool individually with birth outcome data
R2
F-statistic
Connecting Quantitative and Qualitative Phases
Purposefully selected participants ("high" scoring)
Develop interview questions
Cases (n=12)
QUALITATIVE Data Collection
Semi-structured, individual, in-depth interviews with participants (n=12)
Text data (interview transcripts, documents, field notes)
QUALITATIVE Data Collection
Coding and thematic analysis
NVIVO 12 software
Codes and themes
Similar and different themes and categories
Saturation
Integration of the Quantitative and Qualitative Results
Interpretations and explanation of the quantitative and qualitative results jointly
Discussion
Implications

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470 Administration Building
701 20th Street South
Birmingham, AL 35294-0104
205.934.3789 | Fax 205.934.1301 |
irb@uab.edu

APPROVAL LETTER

TO: Mileski, Megan Rutland

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)
IORG Registration # IRB00012550 (IRB 03)

DATE: 06-Jan-2021

RE: IRB-300005843
IRB-300005843-005
Exploring the Relationship Between Chronic Stressors and Protective Factors and Preterm Birth Risk in an African American Pregnant Population

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The IRB reviewed and approved the Initial Application submitted on 17-Dec-2020 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Type of Review: Expedited
Expedited Categories: 7
Determination: Approved
Approval Date: 06-Jan-2021
Approval Period: Expedited Status Update (ESU)
Expiration Date: 05-Jan-2024

Although annual continuing review is not required for this project, the principal investigator is still responsible for (1) obtaining IRB approval for any modifications before implementing those changes except when necessary to eliminate apparent immediate hazards to the subject, and (2) submitting reportable problems to the IRB. Please see the IRB Guidebook for more information on these topics.

The following populations are approved for inclusion in this project:

- Pregnant Women

The following apply to this project related to informed consent and/or assent:

- Waiver of 24 Hour Waiting Period
- Waiver (Partial) of HIPAA

Documents Included in Review:

- waiverpartial.201020
- interview.201020
- hsp.clean.201208
- surveyquest.EOD.201020
- pregnant.201020
- ppletter.201020
- consent.clean.201217
- surveyquest.ACE.201020

To access stamped consent/assent forms (full and expedited protocols only) and/or other approved documents:
1. Open your protocol in IRAP.
2. On the Submissions page, open the submission corresponding to this approval letter. NOTE: The Determination for the submission will be "Approved."
3. In the list of documents, select and download the desired approved documents. The stamped consent/assent form(s) will be listed with a category of Consent/Assent Document (CF, AF, Info Sheet, Phone Script, etc.)

APPENDIX C

EXPERIENCES OF DISCRIMINATION (EOD) TOOL

1) EOD INSTRUMENT

Measure	Question (English version)	Stem
Experience of Discrimination (EOD)	Introduction: "This next section is going to ask about how you and others like you are treated, and how you typically respond"	
Response to unfair treatment	If you feel you have been treated unfairly, do you usually: (please select the best response)	1. accept it as a fact of life 2. try to do something about it
	If you have been treated unfairly, do you usually: (please select the best response)	1. talk to other people about it 2. keep it to yourself
Discrimination	Have you ever experienced discrimination, been prevented from doing something, or been hassled or made to feel inferior in any of the following situations because of your race, ethnicity, or color? 1) At school? 2) Getting hired or getting a job? 3) At work? 4) Getting housing? 5) Getting medical care? 6) Getting service in a store or restaurant? 7) Getting credit, bank loans, or a mortgage? 8) On the street or in a public setting? 9) From the police or in the courts?	For each situation to which the participant replied "yes" (versus "no"), the follow-up question was: How many times did this happen? 1. once 2. two or three times 3. four or more times
	Question (Spanish version)	**Stem**
Experience of Discrimination (EOD)	Introduction: "En esta sección se le preguntará acerca de cómo usted, y otros como usted, son tratados, y cómo usted responde típicamente"	
Response to unfair treatment	En caso de sentir que ha sido tratado de manera injusta, usted normalmente: (por favor elija la mejor respuesta)	1. lo toma como un hecho de su vida 2. trata de hacer algo al respecto
	Si usted ha sido tratado injustamente, usted normalmente: (por favor elija la mejor respuesta)	1. habla acerca de esto con otras personas 2. se lo guarda para sí mismo
Discrimination	¿Alguna vez ha experimentado discriminación, no se le ha permitido hacer algo, se le ha molestado o hecho sentir inferior en alguna de las siguientes situaciones debido a su raza, etnia o color? 1) ¿En la escuela? 2) ¿Al ser contratado u obtener un empleo? 3) ¿En el trabajo? 4) ¿Al obtener una casa? 5) ¿Al obtener asistencia médica? 6) ¿El requerir servicio en una tienda o restaurante? 7) ¿Al obtener crédito, préstamos bancarios o hipotecarios? 8) ¿En la calle, en un lugar público? 9) ¿De la policía o en las cortes?	For each situation to which the participant replied "Sí" (versus "No"), the follow-up question was: ¿Cuántas veces ocurrió esto? 1. una vez 2. dos o tres veces 3. cuatro o más veces

APPENDIX D

ADVERSE CHILDHOOD EXPERIENCES (ACE) TOOL

Adverse Childhood Experience (ACE) Questionnaire

Finding your ACE Score rahbr 10 24 06

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often** …
   Swear at you, insult you, put you down, or humiliate you?
   or
   Act in a way that made you afraid that you might be physically hurt?
   Yes No If yes enter 1 _____

2. Did a parent or other adult in the household **often** …
   Push, grab, slap, or throw something at you?
   or
   Ever hit you so hard that you had marks or were injured?
   Yes No If yes enter 1 _____

3. Did an adult or person at least 5 years older than you **ever**…
   Touch or fondle you or have you touch their body in a sexual way?
   or
   Try to or actually have oral, anal, or vaginal sex with you?
   Yes No If yes enter 1 _____

4. Did you **often** feel that …
   No one in your family loved you or thought you were important or special?
   or
   Your family didn't look out for each other, feel close to each other, or support each other?
   Yes No If yes enter 1 _____

5. Did you **often** feel that …
   You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?
   or
   Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
   Yes No If yes enter 1 _____

6. Were your parents **ever** separated or divorced?
   Yes No If yes enter 1 _____

7. Was your mother or stepmother:
   Often pushed, grabbed, slapped, or had something thrown at her?
   or
   Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?
   or
   Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
   Yes No If yes enter 1 _____

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
   Yes No If yes enter 1 _____

9. Was a household member depressed or mentally ill or did a household member attempt suicide?
   Yes No If yes enter 1 _____

10. Did a household member go to prison?
    Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score

APPENDIX E

INTERVIEW GUIDE

Opening Dialogue: “Thank you so much for taking the time to allow me to talk with you today. My name is Megan Mileski, and I am a PhD student in the UAB School of Nursing. I appreciate you taking the time to complete the survey tools at an earlier prenatal visit. The purpose of this interview is to understand what resources you find meaningful in dealing with stress on a day-to-day basis, both now and since childhood. I will ask some questions to guide our time together, but feel free to share anything that you feel comfortable sharing. I expect the interview to last between 45-60 minutes. If at any point you would like to stop the interview, please let me know. That is completely acceptable. Thank you and let’s get started.”

1. Tell me a little about yourself
    a. Where did you grow up?
    b. How would you describe your childhood, early adulthood?
    c. Who did you live with growing up?
    d. Where do you live now and with whom?
    e. Who do you consider to be your “support system”?
2. When I say the word stress, what does that mean to you?

3. What do you do to manage stress? *Can you give me specific examples?*

4. How do you feel like you handle stress on a daily basis? *Please describe who or what you rely on to deal with stress. Are there specific people that you go to?*

5. So based on those examples, what would you say your top three coping

mechanisms are?

6. What are the most effective strategies you use to deal with a stressful situation? *Why do these strategies work so well for you?*

7. Think about something that has stressed you out in recent days. *Can you describe the experience? What did you do to deal with the stress of that situation?*

8. Think about a stressful time in your life, as far back as childhood. Do you remember how you coped with that experience? *If you could go back, would you handle anything differently?*

9. In light of recent events related to the Covid-19 pandemic, how have you managed this stressor? *What have you found the most stressful during this time? How have you coped with the stress?*

10. How do you feel about bringing a new baby into your life right now? *What challenges do you anticipate? Do you have specific plans about how you will manage the adjustment?*

11. How would you describe your mental health? *Do you have worries about any mental health challenges after your new baby is born? Can you explain?*