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Preconception Protective Factors Associated with Preterm Birth in Black/African American and Non-Hispanic White Women in NYC

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Abstract

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MPH, University of Rochester, 1980

BA, Wesleyan University, 1978

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Racial disparities in preterm birth have persisted during the past two decades. Though studies have delineated the medical, behavioral, and social risk factors explaining racial disparities in preterm birth, less is known about protective factors. This quantitative, correlational study was conducted to examine the prevalence, association, and risk of preconception health protective factors and sociodemographic covariates between Black/African American and non-Hispanic White women with preterm birth in New York City (NYC). The maternal and child health (MCH) life course approach was the theoretical foundation. The NYC Pregnancy Risk Assessment Monitoring System 2016–2018 Phase 8 survey data, which included 2,161 women ages 15–44, were analyzed. Preterm birth was the dependent variable, and the independent variables were preconception health protective factors (pregnancy intention, prepregnancy health care visit, prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) and sociodemographic covariates (maternal age, maternal years of education, income level, marital status, and health insurance status). Bivariate crosstab, correlation, and logistic regression were used to analyze the variables' prevalence, association, and predictive values. Findings included significant associations between Black/African American and non-Hispanic White women with preterm birth and three preconception protective factors. Positive social change implications include changing preconception care, developing culturally responsive preconception interventions, and improving the education, training, and practice of MCH professionals.

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Dedication

This capstone dissertation is dedicated to Lillian Jeanette Hall, my mother, my inspiration, role model, and guiding force in my life. Even though she is no longer with us, she is my guardian angel. She encouraged me to pursue lifelong learning, supported my career in public health, and always modeled positive leadership as a strong Black woman. I also dedicate this dissertation to my brothers, Theodore Roger Hall, MD, and Bruce Dennis Hall (deceased), for your lifelong love and unquestioning support in all my endeavors and for being strong Black men. My sister-in-law, Dr. Phuong Quach, my nephew, Kaiden Grant Kenzo Hall, and niece, Teagan Reese Hall, who are the future. The Hall Family members, particularly Sylvia, Adelle, James, Kelli Hall, and Elise Buckles, have encouraged and supported me through this doctoral journey. I am eternally appreciative and grateful for your enduring love throughout the decades.

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Section 1: Foundation of the Study and Literature Review

In the United States and New York City (NYC), racial/ethnic disparities continue to increase in preterm birth (birth before 37 weeks of gestation) between Black/African American women and non-Hispanic White women. In 2018, the overall U.S. preterm birth rate was 10.2%, and the rate was 14.13% for Black/African Americans, which was 55% higher than the preterm birth rate (9.09%) for non-Hispanic White women (Martin et al., 2021). In response to an increased emphasis on preconception health to reduce preterm birth and resulting disparities, I examined racial/ethnic disparities between Black/African American women and non-Hispanic White women in NYC by exploring the relationship between preconception health protective factors or sociodemographic covariates and preterm birth using the maternal and child health (MCH) life course approach as the theoretical foundation. The preconception health protective factors included pregnancy intent, prepregnancy health care visits, prepregnancy improve health before pregnancy, prepregnancy use of birth control to prevent pregnancy, and prepregnancy control of medical conditions. Early programming/fetal development is the outcome—preterm birth. The sociodemographic covariates were maternal age, maternal years of education, marital status, income level, and health insurance, affecting life potential.

Section 1 explains the foundation of the study by delineating the problem statement, the purpose of the study, research questions and hypotheses, the theoretical foundation of the study, and the nature of the study. The literature search strategy provides information on how peer-reviewed articles and books were accessed and

selected through keywords and phrases. The literature review synthesizes research on preterm birth and racial/ethnic disparities, preconception health and health care, and preconception health and disparities. Then definitions of key terms, assumptions, scope and delineation of research, significance, conclusions, and summary of the research end in Section 1.

Problem Statement

Preconception care and inequities in birth outcomes, specifically preterm birth in African American women, are public health issues. The U.S. preterm birth rate for Black/African American women 18–45 is 13.4%, 48% higher than the preterm birth rate for non-Hispanic White women, which is 9.0% (Purisch & Gyamfi-Bannerman, 2017). In 2016 in NYC, the preterm birth rate was 8.9% of all live births and 12.2% for non-Hispanic Black/African American women, 67% higher than the preterm birth rate for non-Hispanic White women of 7.3 (Li et al., 2016). Though researchers have studied preconception and pregnancy-related health and behavioral risk factors such as prepregnancy weight/body mass index (BMI), smoking, alcohol and drug use, and stress and medical risk factors like multiple gestations and uterine anomalies (DeSisto et al., 2018; Dew et al., 2007; Matoba & Collins, 2017; Robbins, D'Angelo, et al., 2018; Robbins, Zapata, et al., 2014; Strutz et al., 2014), researchers have not fully explained the racial/ethnic disparities between Black/African American women and non-Hispanic White women. This study may guide the development of preconception interventions targeting Black/African American women's protective factors to reduce preterm birth inequities and inequalities.

Purpose of the Study

The purpose of the study was to determine the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy control medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) between Black/African American and non-Hispanic White women with a preterm birth in NYC. Additionally, the aim was to determine the strength of the association between preconception health protective factors including sociodemographic covariates in Black/African American and non-Hispanic White women with a preterm in NYC. Preterm birth is the dependent variable. The independent variables were preconception health protective factors that included pregnancy intention, prepregnancy health care visit, prepregnancy control medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy. Sociodemographic covariates included maternal age, maternal years of education, income level, marital status, and health insurance status.

Research Questions and Hypotheses

Research Question 1: What is the difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC in the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions)?

$H_0$1: There is no significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions).

H_a1: There is a significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy and prepregnancy control of medical conditions).

Research Question 2: What is the difference between Black/African American women and non-Hispanic White women in NYC in the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status)?

$H_0$2: There is no significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status).

H_a2: There is a significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status).

Research Question 3: What is the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions) and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm birth in NYC?

$H_0$3: There is no significant difference in the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions) and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm in NYC.

H_a3: There is a significant association between preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions) and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm birth in NYC.

Research Question 4: What is the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women with a preterm birth in NYC?

$H_0$4: There is no difference in the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women in NYC.

H_a4: There is a significant difference in the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women in NYC.

Theoretical Foundation

Lu and Halfon (2003) developed the MCH life course approach to address racial and ethnic disparities in birth outcomes, adapting the life course health development framework (Halfon & Hochstein, 2002). Lu and Halfon determined that the prenatal period is too late to impact adverse birth outcomes (i.e., infant mortality, preterm birth, and low birth weight infant) since women develop medical conditions such as hypertension, heart problems, and diabetes earlier in their lives. The MCH life course approach integrated two complementary mechanisms—the early programming and cumulative pathways models (Lu & Halfon, 2003). The early programming model emphasizes the importance of sensitive periods for development in utero or early life during which future reproductive potential becomes programmed. The cumulative pathways model conceptualizes a gradual decline in the reproductive potential resulting from the cumulative damage on the body's allostatic systems over a life course (Halfon &

Hochstein, 2002; Lu & Halfon, 2003). According to the MCH life course approach, there are sensitive periods (in utero, early childhood, puberty, pregnancy) during which a woman is vulnerable to risk factors and amenable to protective factors, which influence a woman's reproductive potential and outcomes (Lu & Halfon, 2003).

Based on the model, risk reduction and health promotion interventions can be applied to close the disparities gap between Black and White women. The action steps to operationalize the MCH life course approach include (a) mapping the landscape of what currently exists and sharing; (b) educating practitioners and policy makers about the life course perspective offering several points for intervention; (c) utilizing health equity as a guiding principle; (d) developing a set of life course-related materials for a toolbox; and (e) supporting priorities for changes in MCH policies with a life course, social determinants of health, and health equity focus (Pies & Kotelchuck, 2014). The study aligned with the MCH life course approach by examining a sensitive period—preconception (before pregnancy), the protective factors, risk factors (maternal race), and early programming—fetal development/preterm birth. To operationalize the MCH life course approach, the preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions), sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status), and the risk factor of race were selected to examine racial disparities between Black/African American and non-Hispanic White women with a preterm birth.

Nature of the Study

The study was quantitative and correlational to examine preconception health protective factors and preterm birth. I analyzed the NYC Pregnancy Risk Assessment and Monitoring System (PRAMS) Phase 8 2016–2018 data set, selecting preconception variables (NYC Department of Health and Mental Hygiene, 2021a). The prevalence of preterm birth, preconception health-protective, and sociodemographic factors were analyzed to determine their association between Black/African American and non-Hispanic White women with preterm birth. The independent variables were preconception health protective factors: pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions. The dependent variable was preterm birth, as measured by gestational age. The sociodemographic covariates included maternal age, maternal years of education, income level, marital status, and health insurance status.

Descriptive statistics—frequencies and percentages—were used to describe preterm birth, preconception health protective factors, and sociodemographic covariates in Black/African American and non-Hispanic White women. Bivariate crosstab analyses examined the prevalence of preconception health protective factors and sociodemographic covariates between Black/African American and non-Hispanic White women with preterm birth. Bivariate correlation analyzed the association of preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women. Chi-square,

Spearman's *Rho*, odds ratios, 95% confidence intervals (CIs), and a significance level of $p = .05$ provided evidence of a crude association between preconception health protective factors and preterm birth stratified by race (Research Questions 1, 2, 3). Logistic regression was used to evaluate how the predictor variables maternal race, preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions) or sociodemographic covariates predicted preterm birth and the risk (Research Question 4). All statistical analyses involved the IBM Statistical Package for the Social Sciences (SPSS) 27.0 statistical software. The results may guide the development of culturally sensitive and specific interventions to address the preconception health protective factors associated with preterm birth in Black/African American women.

Literature Search Strategy

Keywords and Databases

The following databases were accessed: CINAHL Plus with Full Text; ProQuest Health & Medical Collection. Medline with Full Text, PubMed, Cochrane Database of Systematic Reviews, Social Sciences Citation Index, Science Citation Index, APA PsychInfo, and Google Scholar. Historical and current peer-reviewed research articles were searched for 2010 to 2021, emphasizing the 2016–2021. Keywords used in combination to search databases for relevant articles were *preterm birth*, *premature birth*, *adverse birth outcomes*, *preconception*, *preconception care*, *preconception health*, *preconception health care*, *preconception health risks*, *life course*, *life course theory*, *life*

course health development; *racial and ethnic disparities or inequalities or inequities*, *minority*, and *Black/African American*.

Review of the Literature

Preterm Birth and Racial/Ethnic Disparities

Prevalence rates of preterm birth and disparities Despite improvements in prenatal and perinatal care in the United States, inequities persist in preterm birth (birth at less than 37 weeks of gestation) between Black/African American women and non-Hispanic White women. The preterm birth rate increased steadily in the late 20th century, from 9.5% in 1981 to a peak of 12.8% in 2006, and then the rate declined in 2015 to 9.62% (Martin & Osterman, 2018). Later, the overall U.S. preterm birth rate increased steadily between 2015 (9.62%) and 2019 (10.23%; Gupta & Froeb, 2020; Martin et al., 2021). Further, there was a 4.5% increase between 2016 and 2019 in the non-Hispanic Black preterm rate from 13.8% to 14.4%, whereas the non-Hispanic White preterm birth rate increased only 2.4% from 9.04% to 9.26% in this same period (Martin et al., 2021). In NYC, the preterm birth rate for non-Hispanic Black women was 12.2% of live births, 67% higher than the non-Hispanic White women's preterm birthrate of 7.3% (Li et al., 2016). Other research has indicated that the preterm birth rate is 48% higher for Black/African American women (13.4%) 18–45, compared with non-Hispanic White women (9.0%; Purisch & Gyamfi-Bannerman, 2017), meaning Black/African American infants born preterm were 2.2 times more likely to die than non-Hispanic White infants (Matoba & Collins, 2017).

Risk factors for preterm birth The neonatal complications and the medical and behavioral risk factors that contribute to preterm birth include preterm labor, prior spontaneous preterm birth, short cervix, short inter-pregnancy interval, multiple gestations, smoking, substance abuse, stress, prepregnancy weight, and uterine anomalies (Anderson et al., 2006; Cole-Lewis et al., 2014; DeSisto et al., 2018; Purisch & Gyamfi-Bannerman, 2017). Additionally, researchers have studied preterm risk factors related to the social determinants of health (i.e., socioeconomic status, education, income level, housing segregation, racism, and racial discrimination) with varied results (Alio et al., 2010; Bravemen et al., 2015, 2017; Dominguez, 2011; Manuck, 2017). For instance, Alio et al. (2010) and Dominguez (2011) concluded that chronic exposure to racism and social inequality through lower educational attainment, lower income or poverty, and segregated housing cause chronic stress, which adversely impacts preterm birth. Further, Bravemen et al. (2017) found that 26.9% of Black women and 5.5% of White women reported chronic worry, and Black women who were older, married, and had higher income or education levels were more likely to report chronic worry. However, the results in preterm birth were similar for both White and Black women who were a part of socioeconomically disadvantaged subgroups.

Gap in research Further research has not fully explained reasons for disparities (DeSisto et al., 2018; Thoma et al., 2019), though findings have indicated that sociodemographic, preconception, and prenatal health factors drive the known portion of racial disparity in preterm birth (Thoma et al., 2019). Thus, there are gaps in understanding why inequalities exist between Black/African American women and

women of other racial/ethnic groups regarding preterm birth (DeSisto et al., 2018; Purisch & Gyamfi-Bannerman, 2017; Thoma et al., 2019). Studies have described and analyzed the risk factors in pregnancy for preterm birth but did not focus on protective factors that affect preterm birth before pregnancy. Further research is needed to explain the social and health determinants, geographic, health and behavioral, and sociodemographic contributing factors to racial disparities in preterm birth between Black/African American and White women at state and city levels.

Preconception Health and Health Care

Even though there have been significant improvements in prenatal and maternity care and access to care, high preterm birth rates continued throughout the United States. Researchers concluded that prenatal care was too late to address preexisting medical conditions, i.e., hypertension, diabetes, heart disease, stress, and behavioral risks, i.e., alcohol and drug use, smoking, anxiety, depression, that impact pregnancy and birth outcomes. Lu and Halfon (2003) indicated that earlier interventions were needed before conception to impact maternal health development and future birth outcomes in their adapted MCH Life Course Approach.

The Centers for Disease Control and Prevention (CDC) convened the CDC/ATSDTR Preconception Work Group on Preconception and the Select Panel on Preconception Care to address the continued disparities in birth outcomes. The panel developed 10 recommendations to advance the field of preconception health and health care (CDC, 2006). The recommendations included (1) individual responsibility across the lifespan, (2) consumer awareness, (3) prevention visits, (4) interventions for identified

risks, (5) interconception care, (6) prepregnancy checkup, (7) health insurance coverage for women with low incomes, (8) public health programs and strategies, (9) research, and (10) monitoring improvements (CDC, 2006). Preconception care is defined as a set of interventions that aim to identify and modify biomedical, behavioral, environmental, and social risks to a woman's health or pregnancy outcome through ongoing prevention and management across the lifespan instead of during the prenatal or maternity periods (Verbeist et al., 2016). After CDC issued these recommendations, health care practitioners implemented preconception healthcare in health centers, hospitals, and community-based organizations with varying degrees of success. An Action Plan for the National Initiative on Preconception Health and Health Care was developed and implemented to delineate work in four areas to strengthen existing efforts; (1) action to shift to the social determinants of health; (2) engagement of and social marketing to consumers, (3) public health, and (4) community preventive services (Johnson et al., 2014).

Williams et al. (2012) assessed the association between receipt of preconception care and positive maternal behaviors before, during, and after pregnancy, analyzing the 2004-2008 PRAMS data from Maine, New Jersey, Utah, and Vermont. Williams et al. reported that 32% of women received preconception care associated with positive modifiable maternal behaviors (i.e., prepregnancy daily multivitamin consumption, early first-trimester prenatal care, and cessation of smoking drinking before pregnancy). Intended pregnancy was also associated with preconception care. Other research studies focused on preconception health and healthcare, including interventions involving sexual

and reproductive health counseling, health risk assessment, well-woman care, and medical care. Verbeist et al. (2016) reported integrating preconception health into clinic settings where women receive routine care. Several studies (Mead & Chapman, 2013; Mehta-Lee et al., 2017; Robbins, Gavin et al., 2017) reported implementing preconception care in various settings, i.e., colleges/universities, publicly funded health centers, and clinical settings, with women of different races and ethnicities. These studies reviewed preconception health and healthcare strategies regarding preconception peer education for college-age students to increase knowledge on preconception health and healthcare (Mead & Chapman, 2013), a preconception nomogram to predict preterm birth (Mehta-Lee et al., 2017), and reproductive life plan assessment and the link to preconception care in publicly funded health centers (Robbins, Gavin et al., 2017). Robbins, Gavin, et al. also indicated gaps in understanding preterm birth and preconception health and the need for more effective interventions to reduce the burden of disease and health inequalities.

Therefore challenges remained to the widespread implementation of preconception health and health care that included standardized preconception health indicators, addressing health equity and social determinants of health, consumer education to engage consumers on local, national, and regional levels, clinician engagement and buy-in of health system leaders, preconception health messages, and building engagement and investment from federal, state, local government, private foundations, and corporate sector funders.

Two of these challenges -- identifying preconception health indicators and health equity and addressing social determinants of health -- were integral to improving preconception health and operationalizing MCH life course theory into research and practice. Recent studies (Callahan et al., 2015; Frayne, 2017; Kroelinger et al., 2018; Mason et al., 2014) addressed these two challenges from an MCH life course perspective. Mason et al. (2014) reported on the increased evidence base for preconception care based on a life course theory framework, which included the potential benefits of preconception care, evidence-based interventions, potential risks, the challenges, and costs. Mason et al. concluded that specific actions -- i.e., developing informed national strategy and policies, are necessary on local, national, regional, and global levels to improve access to preconception interventions and implement sustainable preconception care programs. Frayne (2017) identified current strategies and opportunities for advancing preconception wellness to reduce modifiable maternal preconception health risks and concluded that a paradigm shift toward a life course approach is needed. Frayne also stated that preconception care should include behavioral and clinical areas and that venues needed to expand from clinical only to all places where women obtain care, including community and public health sites.

Callahan et al. (2015) delineated a multistate collaborative methodology to develop preconception health and healthcare indicators for use at the state and community level to assess, monitor, and evaluate MCH life course principles' translation for public health. Four hundred proposed preconception healthcare indicators were narrowed to 102 for full assessment and review, and 59 were selected for final

recommendations as MCH life course indicators from several CDC national surveys. Each indicator was assessed on five core features of the life course approach: equity, resource alignment, impact, intergenerational wellness, and life course evidence (Callahan et al., 2015). The indicators were evaluated on three criteria: quality, availability, and simplicity.

Robbins et al. (2014) reported on 39 core state preconception health indicators using the 2009 Behavioral Risk Factor Surveillance Survey (BRFSS) and 2009 PRAMS data. The preconception health indicators included 23 from PRAMS and 16 from the BRFSS to establish a comprehensive nationally recognized set of indicators in nine domains to monitor and evaluate preconception health. The surveillance summary reported frequencies and CIs of the 39 preconception health indicators for age or race for PRAMS and BRFSS for their respective reporting localities. Robbins et al. (2014) interpreted from the surveillance results opportunities to improve preconception health by reducing unintended pregnancies, reducing risky behaviors, ensuring chronic conditions are under control, and increasing access to healthcare for all nonpregnant women of reproductive age and encouraging the use of essential preventive services for women (Robbins et al., 2014). However, the surveillance report did not delineate associations between preconception health indicators with pregnancy outcomes, particularly preterm birth.

Subsequently, Kroelinger et al. (2018) and Robbins, D'Angelo et al. (2018) reported a systematic process to evaluate, prioritize, and reduce the original 50+ preconception health and preconception care indicators to a condensed set of 10

preconception health indicators for national and state reporting and monitoring. Kroelinger et al. reviewed research studies that used select preconception health indicators. There were no studies that used all existing 45 indicators, and there were no studies that examined the utility of the indicators for program or policy interventions. Kroelinger et al. and Robbins, D'Angelo et al. reported the workgroup focused on preconception modifiable health indicators rather than preconception care and selected a condensed set of ten preconception health indicators, six BRFSS indicators, and four PRAMS indicators.

Preconception Health and Disparities

Two research studies (Ayoola et al., 2016; Robbins, Boulet et al., 2018) focused on preconception health, modifiable risk factors and disparities by race/ethnicity, age group, and health insurance status. Robbins, Boulet et al. (2018) conducted a descriptive study on disparities in preconception health indicators analyzed from the BRFSS 2013-2015 and PRAMS 2013-2014 data. Nine of 10 prioritized preconception health indicators (i.e., depression, diabetes, hypertension, current cigarette smoking, normal weight, recommended physical activity, recent unwanted pregnancy, prepregnancy multivitamin use, and postpartum most or moderately effective contraceptive method) were analyzed. The results of Robbins, Boulet, et al. indicated disparities emerged by age group, race/ethnicity, insurance status, and reporting. Risk factors were more prevalent, and health-promoting indicators were less prevalent in non-Hispanic Black women and uninsured women. The southern states (Alabama, Arkansas, Georgia, Mississippi, and West Virginia) had the highest prevalence of risk factors and the lowest prevalence of

health-promoting behaviors (Robbins, Boulet et al., 2018). The study also reported health inequities with more diabetes and hypertension and the lowest normal weight in non-Hispanic Black women.

Ayoola et al. (2016) examined women's perceived health status and preconception modifiable health behaviors, i.e., drinking, smoking, exercise, taking multivitamins, and folic acid associated with pregnancy intention. The study described a convenience sample of 123 women ages 18-51 years who were 51.22% Hispanic, 36.59% African American, and 12.2% Caucasian with 70% having a household income of less than $20,000, 57.72% no health insurance, and 58.54% not married living in urban neighborhoods. Ayoola et al. reported a lack of difference between the women's health behaviors and pregnancy intention in the study. They concluded an opportunity for nurses to promote preconception education for all women, including those who intended and did not intend to become pregnant. The study did not analyze the data stratified by race/ethnicity or age. However, it provided relevant information on low-income ethnic minority women living in urban neighborhoods and the need to receive regular preconception education on health-promoting behaviors, which can be used as a basis for future studies.

Batra et al. (2016); Mehta-Lee et al. (2017); and Strutz et al. (2014) conducted studies on preconception health and adverse pregnancy outcomes (preterm birth, low birth weight infant, stillbirth, or major congenital disability) analyzing racial/ethnic differentials. Batra et al. (2016) analyzed data from the 2010 and 2012 Los Angeles Mommy and Baby surveys to identify significant associations between having a previous adverse infant outcome and receipt of preconception care prior to the most recent

pregnancy. There were 8327 Los Angeles Mommy and Baby respondents. The sample included 16.9% women with a previous adverse infant outcome, 48.8% foreign-born, and 82.8% non-White women. A woman reporting a previous adverse infant outcome and intended a subsequent pregnancy was 42.5% more likely to have used preconception care (Batra et al., 2016). Strong predictors of preconception care were a previous adverse infant outcome, pregnancy intention, more education, and known chronic conditions.

Strutz et al. (2014) analyzed data from the National Longitudinal Study of Adolescent Health, Wave I (1994-1995), Wave III (2001-2002), and Wave IV (2007-2008) using the life course development theory to analyze racial/ethnic differences in preconception health modifiable factors (smoking, overweight or obesity, inadequate physical activity, heavy alcohol consumption, and prenatal factors as potential confounders) and infant birth weight (outcome). Inclusion criteria were female respondents who completed survey interviews in Waves I, III, and IV and who had given birth. Strutz et al. evaluated preconception health risks at two-time points – adolescence and young adulthood – as potential critical or sensitive periods during which preconception exposures can affect infant health disparities. The researchers found that the selected modifiable preconception health indicators did not explain the Black-White disparity in low birth weight. However, the strength of the association for these variables increased after adjusting possible confounders and effect modifiers.

Mehta-Lee et al. (2017) created a preconception nomogram that identifies nonpregnant women at highest risk for preterm birth analyzing the CDC 2004-2009 PRAMS surveillance data. A nomogram is a graphical display of a prediction model that

uses numeric scales based on a validated multivariable logistic regression analysis as a tool for individual risk assessment or preconception risk for preterm birth (Mehta-Lee et al., 2017). Twenty-one variables, including sociodemographic, pregnancy history, prior live birth, spontaneous abortion or elective termination, pregnancy intention, diabetes, smoking, abuse, stressors, age, and prepregnancy BMI, were assessed to predict the risk of preterm birth. The results confirmed the well-known preterm birth risk factors and identified women at the lowest risk of preterm birth with negative predictive values of over 72% (Mehta-Lee et al., 2017). Black women had consistently higher odds of preterm birth than non-Hispanic White women. Mehta-Lee et al. developed the nomogram to help healthcare providers assess and predict women at the lowest risk for preterm birth in their populations.

The five studies delineated in this section indicated that preconception health modifiable and sociodemographic factors were critical to analyzing the strength of predicting preterm birth and the impact on racial/ethnic disparities. Except for Batra et al. (2016), the studies in this section were completed with national, regional, or state-level data. These studies indicated that more specific research is needed to determine which preconception health indicators impact preterm birth in Black/African American women. My study addressed this gap by examining the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions), and the sociodemographic covariates between Black/African American women and non-Hispanic White women with preterm birth. It also examined which preconception health

protective factors or sociodemographic covariates are associated with or predict preterm birth, increase or decrease protection for preterm birth, or affect racial/ethnic disparities using the MCH Life Course Approach between Black/African American and non-Hispanic White women in NYC.

Definitions

Black /African American: A person having origins in any of the Black racial groups of Africa. It also includes a person who reports African American, Sub-Saharan Africans such as Kenyan, Nigerian, and Afro-Caribbean, such as Haitian and Jamaican (Rastogi et al., 2011). Wherever Black is used, it is synonymous with Black/African American.

Birth control: Contraceptive methods, i.e., hormonal "the pill," diaphragm, IUD, condom, used to avoid pregnancy and sexually transmitted infections (Office of Women's Health, 2015).

Cumulative pathways model: Suggests that chronic stress (both biological and psychological) can cause wear and tear on the body's regulatory system, which over time can lead to a decline in health and function (Lu et al., 2018).

Disparities: Racial or ethnic differences in healthcare quality that are not due to the access-related factors or clinical needs, preferences, and appropriateness of intervention (Smedley et al., pg. 21, 2003).

Early programming: Refers to the importance of sensitive developmental periods i*n utero* or early life during which future health and function become programmed. (Lu et al., 2018).

Hispanic: Persons who identify as Latina, Mexican, Puerto Rican, Salvadoran, or of other national origin or ethnicity who speak the Spanish language (Rastogi et al., 2011).

Life course health development framework: Explains how different environmental, physiological, behavioral, and psychological contexts influences risk profiles and long-term health development trajectories over an individual's lifetime (Halfon & Hochstein, 2002).

Maternal and child health (MCH): Is "the professional and academic field that focuses on the determinants, mechanisms and systems that promote and maintain the health, safety, well-being and appropriate development of children and their families in communities and societies." (Kotch, 2012, pg. ix)

Maternal and child health (MCH) life course health development model: Integrates two complementary programming mechanisms of early life events and the cumulative pathway mechanisms of the allostatic load over the life course into a longitudinal model of health development, which includes sensitive periods, risk factors, and protective factors that impacts on a woman's reproductive potential (Lu & Halfon, 2003).

Maternal age: The chronological age as reported on the infant birth certificate (NYC Department of Health and Mental Hygiene, 2016).

Maternal years of education: The number of years of completed education; study variable in NYC PRAMS survey and codebook (NYC Department of Health and Mental Hygiene, 2021a, 2016).

Preterm birth: The birth of an infant at less than 37 weeks of gestation (Institute of Medicine, 2007).

Preconception health: The overall health of nonpregnant women during their reproductive years (defined as 18-44 years of age), which, when optimized, improves both birth outcomes should pregnancy occur and the woman's health regardless of whether she has children. (Robbins, D'Angelo, et al., 2018).

Preconception care: A set of interventions that aim to identify and modify the biomedical, behavioral, and social risks to a woman's health or pregnancy outcome through prevention and management (CDC, 2006).

Pregnancy intention: The decision of whether or not to get pregnant (NYC Department of Health and Mental Hygiene, 2021a).

Prepregnancy birth control use to prevent pregnancy: Use of a contraceptive method to prevent conception and study variable in NYC PRAMS survey and codebook (NYC Department of Health and Mental Hygiene, 2016, 2021a).

Prepregnancy control medical conditions: Take appropriate medications under health providers' care to control medical conditions such as hypertension and diabetes type 2 before pregnancy (NYC Department of Health and Mental Hygiene, 2016, 2021a).

Prepregnancy healthcare visit: A healthcare visit to health care provider 6-12 months before conception and study variable in NYC PRAMS survey and codebook (NYC Department of Health and Mental Hygiene, 2016, 2021a).

Prepregnancy improve health before pregnancy: A decision to take care of physical and mental health issues before conception (NYC Department of Health and Mental Hygiene, 2016, 2021a).

White: A person having origins in any of the original peoples of Europe, the Middle East, or North Africa. It includes people who indicate their race as "White" or report it, such as Irish, German, Italian, Lebanese, Arab, Moroccan, or Caucasian (Rastogi et al., 2011).

Assumptions

It is assumed that the NYC Department of Health and Mental Hygiene PRAMS data collection methods used the standard quality assurance practices as specified by the CDC. It is assumed that the responses based on maternal self-reports reflected the women who responded to the survey. It is assumed that the incentive provided to survey participants was not coercive and did not bias the results. It is also assumed that the general population is not aware of (1) the magnitude of the racial disparities in preterm birth and adverse birth outcomes between Black/African American and non-Hispanic White women, (2) the importance of preconception health and healthcare, and (c) the concept of life course health development.

Scope and Delimitations

Purisch and Gyamfi-Bannerman (2017) delineated the preterm birth rate (13.4%) in the United States for Black women as 48% higher than the preterm birth rate (9.0%) for non-Hispanic White women. In NYC, the disparity is 67% higher for Black women (12.2%) than for non-Hispanic White women (7.3%) (Li et al., 2016). Researchers (; Dew

et al., 2007; DeSisto et al., 2018; Matoba & Collins, 2017; Robbins et al., 2014; Robbins, D'Angelo et al., 2018; Strutz et al., 2014;) have studied preconception health indicators and pregnancy behavioral risk factors that include prepregnancy weight/BMI, smoking, alcohol and drug use, medical conditions, stress, hypertension, diabetes, and prior preterm births, concluding their impact on adverse birth outcomes. However, most preconception health and preterm birth studies (Batra et al., 2016; Kroelinger et al., 2018; Mehta-Lee et al., 2017; Robbins, D'Angelo, 2018; Robbins, et al., 2014) have not used a theoretical framework or constructs to guide the research. This study explored racial disparities in preterm birth by examining the preconception health-protective and sociodemographic factors that affect Black/African American women compared to non-Hispanic White women in NYC using the MCH Life Course Approach. The study population was Black/African American and non-Hispanic White women, ages 15-44 years, with singleton births, in NYC, who responded to the NYC PRAMS Phase 8 surveys in 2016, 2017, and 2018. Exclusion criteria included Black/African American and non-Hispanic White women with a prior preterm birth, plural birth, ages less than 15 years old or older than 45 years old.

The weathering hypothesis and allostatic load theory were investigated but not included since the MCH Life Course Approach incorporates aspects of the weathering hypothesis and the allostatic load theory. The weathering hypothesis theorized worsening birth outcomes with increasing maternal age, resulting from the cumulative impact of socioeconomic disadvantages on Black/African American women (Geronimus, 1996). The allostatic load theory postulated that chronic or cumulative stress is a maladaptive

process that increases the inflammatory and nervous systems' adverse response, leading to negative health outcomes (Giurgescu et al., 2013).

This study is generalizable to a population with similar demographic characteristics as the NYC PRAMS survey respondents. The results will guide the development of culturally sensitive and specific interventions targeting Black/African American women to address the preconception health protective factors associated with preterm birth.

Summary, Significance, and Conclusion

Preterm birth is a significant public health concern that disproportionately affects Black/African American women more than non-Hispanic White women in the United States. Research (Anderson et al., 2006; DeSisto et al., 2018; Purisch & Gyamfi-Bannerman, 2017) delineated the risk factors for preterm birth and racial disparities during the past two decades. The risks included preexisting medical conditions, medical conditions in pregnancy, prior preterm birth, Black race, stress, the social determinants of health. However, the racial disparities were not fully explained. DeSisto et al. (2018) and Thoma et al. (2019) conducted studies to determine the relative contributions of risk factors and sociodemographic covariates to excess preterm birth in Black/African American women and non-Hispanic White women. The results concluded that these factors explained only 18-27 percent (DeSisto et al., 2018) and 38 percent (Thoma et al., 2019) of the racial disparity. Researchers (Mead & Chapman, 2013; Mehta-Lee et al., 2017; Robbins et al., 2017; Verbeist et al., 2016; Williams et al., 2012) reported

incorporating preconception health in healthcare settings, i.e., colleges-universities, publicly funded health centers, and clinical settings with varied success.

Other researchers (Callahan et al., 2015; Frayne, 2017; Kroelinger et al., 2018; Mason et al., 2014) operationalized the MCH Life Course Approach using preconception health indicators, health equity, and the social determinants of health to understand the risk and protective factors to improve preterm birth outcomes. Kroelinger et al. (2018) and Robbins, D'Angelo et al. (2018) reported the systematic process to condense 45 preconception health indicators into ten modifiable preconception health indicators to be used for research and preconception health tracking. Preconception and racial disparities research indicated varied results. Robbins, Boulet, et al. (2018) used the ten modifiable preconception health indicators and reported more prevalent health risk factors and less prevalent health-promoting indicators in Black and uninsured women than non-Hispanic White women. More hypertension and diabetes were reported in Black women. Many research studies delineated the preconception risk and sociodemographic factors in preterm birth, and some studies incorporated the life course development framework. However, a gap remained regarding preconception health research to determine the protective factors that can contribute to reducing racial disparities in preterm birth and systematically using the MCH Life Course Approach to guide racial disparities research studies. The research was also missing regarding developing culturally sensitive interventions that target preconception health protective factors in Black/African American women.

This study addressed a gap in research by examining racial disparities in the prevalence and association of preconception health protective factors and sociodemographic factors between Black/African American and non-Hispanic White women with a preterm birth in NYC using the MCH Life Course Approach (Lu & Halfon, 2003). The preconception health protective factors included pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions. The sociodemographic factors were maternal age, maternal years of education, income level, marital status, and health insurance. The MCH Life Course Approach (Lu & Halfon, 2003) theoretical framework anchored the research. Findings from this research study may guide the development of preconception interventions that explicitly target preconception protective factors to reduce preterm birth inequities and inequalities in Black/African American women and communities.

There were several social change implications delineated which included (1) improving the reproductive health and birth outcomes for Black/African American women and infants through systematic preconception healthcare and health education; (2) contributing to reducing gaps in the literature by delineating how preconception health protective factors, and sociodemographic factors contribute to racial disparities in preterm birth using the MCH Life Course Approach, (3) using the results of this study to guide the development of preconception health interventions which target the preconception protective factors for Black/African American women to be implemented in healthcare and community-based organizations, (4) developing collaborative,

comprehensive programs to deliver preconception care for Black/African American women in equitable, supportive environments across the life span, and (5) developing upstream public health advocacy and policy responses to address preconception health protective factors and social determinants to improve adverse birth outcomes. The social change implications will be discussed more fully in Section 4.

Section 2: Research Design and Data Collection

Racial disparities in preterm birth have persisted despite improvements with women obtaining prenatal care in the first trimester and increased emphasis on preconception health and health care (Johnson et al., 2014). Studies have noted racial disparities in preterm birth and the contributing risk factors such as preconception health indicators to explain the gap (Batra et al., 2016; DeSisto et al., 2018; Kroelinger et al., 2018; Manuck, 2017; Matoba & Collins, 2017; Mehta-Lee et al., 2017; Purisch & Gyamfi-Bannerman, 2017; Robbins, Boulet, et al., 2018; Robbins, D'Angelo, et al., 2018; Thoma et al., 2019). However, the prior research focused on preterm birth risk factors rather than preconception health protective factors. This study addressed racial disparities between Black/African American and non-Hispanic White women experiencing preterm birth by analyzing preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improving health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions) as well as sociodemographic factors (i.e., maternal years of education, maternal age, income level, marital status, and health insurance). The results may guide the development of culturally sensitive interventions that target preconception health protective factors in Black/African American women.

This section describes the research design and rationale. The research methodology includes a description of the study population, secondary data types and sources of information, sampling and sampling procedures, and instrumentalization and operationalization of constructs. The data analysis plan includes the statistical methods

used to answer the research questions. The section also states the threats to validity and ethical procedures.

Research Design and Rationale

This study was a quantitative, correlational secondary data analysis conducted to examine racial disparities between Black/African American and non-Hispanic White women with preterm birth. I analyzed preconception health protective factors and sociodemographic covariates using the NYC PRAMS Phase 8 2016–2018 data set (NYC Department of Health and Mental Hygiene, 2021a). I investigated the association of preconception health protective factors and sociodemographic covariate in Black/African American women compared to non-Hispanic white women with a preterm birth. The dependent variable was preterm birth, as measured by gestational age. The independent variables were maternal race, preconception health protective factors of pregnancy intention, prepregnancy health care visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions. The sociodemographic covariates included maternal age, maternal years of education, income level, marital status, and health insurance status.

The PRAMS survey collected self-reported data on women's health and behavior in the preconception, pregnancy, and postpartum periods. The NYC PRAMS data included the variables of interest for preconception health (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), the sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health

insurance), and preterm birth (dependent variable) as well as race and ethnicity to answer the study's research questions (NYC Department of Health and Mental Hygiene, 2021a). Because the study was a correlational research design, I used correlational statistics to investigate the relationship among selected variables in a sample (see Bloomfield & Fisher, 2019; Rumrill, 2004). The statistics also describe the nature, magnitude, and strength of association and type of relationship between quantitatively coded variables.

Methodology

Population

The primary research populations were Black/African American women and non-Hispanic White women, ages 15–44, who gave birth to singleton infants. These women responded to the NYC PRAMS surveys in 2016, 2017, and 2018. There were 6,047 women who received the NYC PRAMS surveys during this period, with 4,272 women responding (NYC Department of Health and Mental Hygiene, 2021a).

Secondary Data Types and Sources of Information

The CDC's PRAMS Phase 8 survey for NYC was the survey instrument and data set used. The CDC PRAMS survey was developed in 1987 by the CDC (2015; Shulman et al., 2018). It systematically collects information from a sample of women who have given birth in 47 states, NYC, Washington, DC, Puerto Rico, and the Great Plains Tribal Chairman's Health Board annually (Shulman et al., 2018). The PRAMS is a state-based surveillance system developed to monitor maternal behaviors, attitudes, and experiences before, during, and shortly after pregnancy (Shulman et al., 2018). Data collection used a specific protocol to identify and contact women from infant birth certificates to respond

to the PRAMS questionnaire. The questionnaire consisted of three types of questions: core questions common to all PRAMS states, standard questions developed by the CDC, and state-specific questions. Each jurisdiction developed its survey, including the core questions, some CDC standard questions, and state-specific questions approved by the CDC (Shulman et al., 2018).

Sampling and Sampling Procedures

The study sample included 2,161 women ages 15–33 who were non-Hispanic, Black or White, with singleton birth cases. The PRAMS data were collected separately for NYC and New York State. This study explicitly used the NYC PRAMS 2016–2018 data set, including preconception health variables and mother demographic characteristics linked to the infant's birth certificate (NYC Department of Health and Mental Hygiene, 2021a).

The NYC PRAMS survey protocol used a mixed-mode data collection method with mail surveys as the primary method and a telephone survey to follow-up with non-responders for all survey types (NYC Department of Health and Mental Hygiene, 2018). All selected participants received a $20 cash incentive in the survey's first mailing. The NYC Department of Health and Mental Hygiene used this procedure for all NYC PRAMS surveys, including the Phase 8 survey for 2016–2018. For NYC, the annual sample size was 1,838 women with a 72.3% weighted response rate (NYC Department of Health and Mental Hygiene, 2018). In NYC, women were sent three copies of the survey by mail in either English, Spanish, or Chinese. Women who did not respond by mail were contacted by telephone (in English, Spanish or Chinese; NYC Department of Health and

Mental Hygiene, 2018). The data collection cycle lasted for 95 days for each monthly sample cycle. The CDC response rate threshold has been 55% nationally since 2015 (Shulman et al., 2018).

PRAMS data were weighted to represent NYC resident women who gave birth during a given year. The analysis weights included the sampling weight, a nonresponse adjustment, and a noncoverage adjustment (NYC Department of Health and Mental Hygiene, 2018). Since birth certificate data were available for both responders and non-responders, the information on non-responders was used to adjust for nonresponse to understand the factors associated with survey nonresponse. The final analytic data set included questionnaire responses, correlates from birth certificates, participants' comments, and operations data rate (NYC Department of Health and Mental Hygiene, 2018).

To gain access to the NYC PRAMS data set, a brief proposal application and request for an analytic dataset was submitted specifying the following (a) research questions, (b) methods and software, (c) discussion of the intended outcome of the analysis, (d) rationale for using PRAMS as the data source, (e) justification for additional questionnaire indicators not part of the PRAMS analytic research file, (f) type of publication, and (g) years of PRAMS data requested. An application to the Walden University Institutional Review Board (IRB) was submitted for approval of the study in addition to the Walden IRB approval letter submitted to the NYC DOHMH to obtain and negotiate the data use and non-disclosure agreement for access to the PRAMS data set. A

secure account in BISCOM was set up with the NYC Department of Health and Mental Hygiene to transfer the PRAMS 2016–2018 data.

Instrumentation and Operationalization of Constructs

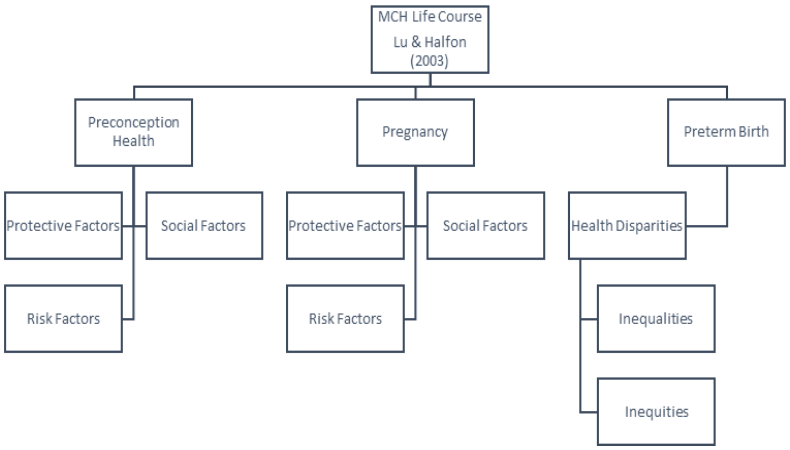
The CDC PRAMS Phase 8 survey consisted of three types of questions: core questions, common to all states, including NYC; standard questions developed and made available for selection to all jurisdictions by CDC; and state-developed questions (CDC, 2015). Core questions generally accounted for 55% to 60% of the questionnaire (Shulman et al., 2018). States selected from the library of standard questions or developed their questions to address state priority topics. The mail questionnaire was limited to 14 pages and required approximately 20 minutes to complete. The phone interview needed about 25–30 minutes. Two separate surveys were available, a self-administered survey for the mail component and an interview administered survey for the telephone component (CDC, 2015). The NYC PRAMS Phase 8 survey included 90 questions for participants to answer, with some questions including skip to a later question depending on the respondent's answer (NYC Department of Health and Mental Hygiene, 2016). The NYC PRAMS Phase 8 survey questions remained the same for the CDC grant period 2016–2021 to allow for comparisons between data sets for multiple years.

The preconception health protective data points analyzed from the PRAMS survey were pregnancy intent (decision whether to get pregnant), prepregnancy health care visit (preconception visit to health care provider 6–12 months before conception), prepregnancy improve health before pregnancy (decision to take care of physical and

mental health issues before conception), prepregnancy birth control use to prevent pregnancy (use of reliable birth control method, i.e., hormonal “the pill,” diaphragm, IUD, condom regularly), and prepregnancy control of medical conditions (take appropriate medications under health provider’s care to prepregnancy control medical conditions such as hypertension, diabetes; NYC Department of Health and Mental Hygiene, 2021a). The PRAMS data set linked birth certificate sociodemographic covariates were maternal race, maternal age, maternal years of education, marital status, income level, and health insurance status (NYC Department of Health and Mental Hygiene, 2021a). The dependent variable was preterm birth (gestational age of the infant). Figure 1 shows the MCH life course approach constructs using the sensitive periods of preconception (6–12 months before pregnancy) and birth (preterm birth), preconception health protective factors, the sociodemographic covariates), and the risk factor of race (Black).

Figure 1

MCH Life Course Approach



Operationalization for Each Variable

The PRAMS codebook delineated linked birth certificates, survey, and analytic variables available for analysis (NYC Department of Health and Mental Hygiene, 2021a). Preterm birth, preconception health-protective variables, risk factors, and sociodemographic covariates are recoded. Table 1 delineates the PRAMS coding and study recoding of the variables.

Table 1

Operationalization of Study Variables: PRAMS Coding and Recoding

Variable	PRAMS Coding	Recode
Dependent variable: Preterm birth	U = Unknown	Preterm birth
Clinical estimate of gestational ages grouped (weeks)	1 = <-27	U = Unknown
	2 = 28-33	0 = No (4,5)
	3 = 34-36	1 = Yes (1, 2, 3)
	4 = 37 -42	
	5 – 43+	
Independent variables		
Preconception Protective factors		
Pre-pregnancy health care visit	A = Not applicable	0 = No (A, B, N, U, 1)
	B = DK/Blank	1 = Yes
	N = Not recorded	
	U = Unknown	
	1 = No	
	2 = Yes	
Pregnancy Intention	B = Blank	0 = No (B, 4, 5)
	1 = Later	1 = Yes (1, 2, 3)
	2 = Sooner	
	3 = Then	
	4 = Did not want then or any time	
	5 = Was not sure	
Prepregnancy improve health before pregnancy	B=DK/Blank	0 = No
	N = Not recorded	1 = Yes
	S=Skip	
	T=Teen Mom – Not asked	
	1 = No	
	2 = Yes	
Prepregnancy birth control use to prevent pregnancy	B=DK/Blank	0 = No
	N = Not recorded	1 = Yes
	S=Skip	
	T=Teen Mom – Not asked	
	1 = No	
	2 = Yes	
Prepregnancy control of medical conditions	B=DK/Blank	0 = No
	N = Not recorded	1 = Yes
	S=Skip	
	T=Teen Mom – Not asked	
	1 = No	
	2 = Yes	
Risk factor		
Maternal race (Black)	N = Not recorded	0 = (N. U. 2)
	U = Unknown	1 = Yes
	1 = Yes	White
	2 = No	0 = (N. U. 2)
	White	1 = Yes
	N = Not recorded	
	U = Unknown	
	1 = Yes	
	2 = No	

(table continues)

Variable	PRAMS Coding	Recode
Maternal race (non-Hispanic)	N = Not recorded U – Unknown 1 = Yes 2 = No	0 = No (U, 2) 1 = Yes
Sociodemographic Covariates		
Maternal age grouped	U = Unknown 1 = <= 17 2 = 18-19 3 = 20-24 4 = 25-29 5 = 30-34 6 = 35-39 7 = 40+	U = Unknown 0 = Under 17 years – 29 years 1 = 30 years to 40+ years
Marital status	U= Unknown 1 = Married 2 = Other	U = Unknown 0 = Other 1 = Married
Maternal years of education	U = Unknown 1 = 0-8 years 2 = 9-11 years 3 = 12 years 4 = 13-15 year 5 = >=16 years	0 = Less than 12 years (1,2) 1 = 12 years or more (3, 4, & 5)
Income level 12 months before	B = Blank 101 = $ 0 to $16,000 102 = $16,001 to $20,000 103 = $20,001 to $24,000 104 = $24,001 to $28,000 105 = $28,001 to $32,000 106 = $32,001 to $40,000 107 = $40,001 to $48,000 108 = $48,001 to $57,000 109 = $57,001 to $60,000 110 = $60,001 to $73,000 111 = $73,001 to $85,000 112 = $85,001 to More	0 = Low income (101, 102, 103, 104) 1 = Middle income (105, 106, 107, 108) 2 = High income (109, 110, 111, 112)
Health insurance before pregnancy	U = Unknown 1 = Medicaid 2 = Private insurance 3 = Self-pay 4 = Indian Health Service 5 = CHAMPUS/TRICARE 6 = Other GOV 8 = Other	0 = No (U, 3, 8) 1 = Yes (1, 2, 4, 5, 6)

Data Analysis Plan

The NYC PRAMS 2016-2018 data set was screened to check for errors and then, finding errors corrected the error in the data file using the codebook. A two-step procedure was followed for categorical variables. Step 1, each study variable was checked to determine if the variable scores were out of range (i.e., not within the range of possible scores). The statistics run for study variables requested the minimum and maximum and then checked the number of valid and missing cases using SPSS Version 27. Step 2, after determining where an error occurred in the data file, either corrected or deleted the value (Pallant, 2016).

The research questions and hypotheses were:

- Research Question 1: What is the difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC in the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions)?
  - $H_0$1: There is no significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health

before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions).

- H_a1: There is a significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy and prepregnancy control of medical conditions).

- Research Question 2: What is the difference between Black/African American women and non-Hispanic White women in NYC in the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status)?
  - $H_0 2$: There is no significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status).
  - $H_a 2$: There is a significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status).

- Research Question 3: What is the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm birth in NYC?
  - $H_0$3: There is no significant difference in the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm in NYC.
  - H_a3: There is a significant association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in

Black/African American women and non-Hispanic White women with a preterm birth in NYC.

- Research Question 4: What is the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women with a preterm birth in NYC?
  - $H_0$4: There is no difference in the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women in NYC.
  - H_a4: There is a significant difference in the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women in NYC.

Descriptive statistics included frequencies and percentages for preterm birth (dependent), preconception health-protective variables (independent), risk factors (independent-race), and sociodemographic covariates to describe the characteristics of the study population. Bivariate crosstab analysis examined the prevalence of preterm birth, preconception health protective factors, and sociodemographic covariates by maternal race. The Chi-square, contingency coefficient, Phi and Cramer's V, and Lambda tests were run. A significance level of $p = .05$ was used. The bivariate correlation analyzed preterm birth by race and preconception health-protective variables and

sociodemographic covariates to determine the associations. Since all variables were categorical, Spearman's rho statistic was run. A significance level of p =.05 was used. These analyses determined the extent of the difference in the prevalence of preconception health protective factors and sociodemographic factors associated with preterm birth in Black/African American women and non-Hispanic White women for Research Questions 1, 2, and 3 and Null Hypotheses 1, 2, and 3.

The logistic regression analyzed how well the predictor variables--preconception health-protective variables or the sociodemographic covariates predicted or explained preterm birth (dependent variable) controlling for maternal race. Binary logistic recoded categorical variables were used in the forced entry method for logistic regression. All predictor variables were added as one block in the regression models to assess their predictive ability while controlling for the effects of other predictors in the model. The statistical tests to answer Research Question 4 were classification plots, Hosmer-Lemeshow goodness of fit, Casewise listing of residuals, and CI for Exp(B) options. A significance level of p = .05 was used. For Block 1, the Omnibus Tests of Model Coefficients provided the overall indication of how well the model performed over and above the results delineated in Block 0 with none of the predictors in the model. The model summary provided the usefulness of the model when reviewing Cox & Snell R Square and the Nagelkerke R Square tests. The Classification Table indicated how well the model could predict the correct category for each case. The variables in the Equation Table provided information about the contribution or importance of each of the predictor variables with the Wald Test. The Casewise List provided information on cases in the

sample when the model did not fit well (Pallant, 2016). The Statistical Program for the Social Sciences (SPSS) version 27 was used for all statistical analyses.

Threats to Validity

Babbie (2017) defined "validity as the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration." Creswell & Creswell (2018) and Babbie (2017) delineated three forms of validity in survey research: content validity, predictive or concurrent validity, and construct validity. Content validity is related to whether items measure what they were intended to measure. Concurrent or predictive validity refers to whether the scores predict a criterion measure. Construct validity refers to whether the items measure hypothetical constructs or concepts. The main threat to validity with conducting secondary data analysis was that the data was collected for a purpose different from the current study. There was no assurance that the data measured the concepts under investigation. The NYC PRAMS survey collected data from women who had given birth three months before survey administration to delineate their experiences before, during, and after pregnancy. Therefore, the research questions may not adequately measure the concepts outlined for this study. The results of this secondary analysis may be generalizable to only women of similar characteristics who gave birth in the United States since the sample of selected participants reflected the composition of women who gave birth in NYC in the specified period.

Ethical Procedures

The PRAMS methodology and protocol were reviewed and approved by the CDC and NYC Department of Health and Mental Hygiene IRBs. An informed consent

document was sent with each survey packet explaining the participant's rights. No written consent was required; consent was implied if the survey was completed. The informed consent was read verbally on phone interviews for the telephone survey, and the participant agreed verbally to proceed with the survey (Shulman et al., 2018). Minors younger than 18 who gave birth are considered emancipated and did not require parental or guardian consent to participate. Deviations from the PRAMS protocol were approved by both the NYC Department of Health and Mental Hygiene and the CDC institutional review boards before implementation.

The study proposal was submitted to the Walden University IRB for review and approval. Preliminary approval was received on April 26, 2021, Walden IRB Approval #4-27-2021-0971528, with final approval on September 17, 2021. A proposal application and request was submitted for the NYC PRAMS analytic data with the IRB approval letter to the NYC Department of Health and Mental Hygiene to obtain data access. The data use agreement delineated specific terms for access and use and described what use the data recipient may make of the data. The agreement specified the security requirements for which data access and use were conditioned, including the data recipient responsibilities, agreed to assume in connection with access and use of the data, and the procedures for security, transfer, use, retention, ownership, and confidentiality of the data. The PRAMS data was transmitted via a secure data transfer system (BISCOM) by the NYC Department of Health and Mental Hygiene. The data were deidentified and included no personally identifying information on survey respondents. There were no ethical concerns regarding the recruitment materials or process described in the

secondary data set materials. Women could refuse to participate by not returning the survey or verbally refusing during a follow-up telephone call. Respondents could decide not to answer questions that they did not want to answer.

Summary

The current study was a quantitative, correlational research study that analyzed preconception health protective factors, sociodemographic covariates, and preterm birth in Black/African American and non-Hispanic White women using the NYC PRAMS 2016-2018 Phase 8 data set (NYC Department of Health and Mental Hygiene, 2021a). The gap addressed in research was racial disparities between Black/African American and non-Hispanic White women with preterm birth focused on analyzing preconception protective factors and sociodemographic factors that may contribute to reducing disparities. Also, another gap addressed was explicitly using the MCH Life Course Approach constructs of a sensitive period, risk factors, and protective factors in racial disparities and preconception health research. The prevalence and strength of the association of preconception health protective factors and sociodemographic covariates in Black/African American and non-Hispanic White women with a preterm birth was investigated. Also, the risk and predictive value the variables for preterm birth were examined. The independent variables were maternal race, preconception health-protective variables of pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions. The dependent variable was preterm birth, which was measured by gestational age. The sociodemographic covariates included

maternal age, maternal years of education, income level, marital status, and health insurance status.

Descriptive statistics delineated study population characteristics for all variables – preterm birth, preconception health-protective variables, risk factor, and sociodemographic covariates. The bivariate crosstabs analyses examined the prevalence of preterm birth, preconception health protective factors, and sociodemographic factors between Black/African American and non-Hispanic White women. The bivariate correlation analysis examined an association between preconception health protective factors and sociodemographic covariates. Logistic regression analyzed how well the predictor variables predicted or explained preterm birth and the risk of preterm birth in Black/African American women compared to non-Hispanic White women. A significance level of p=.05 was used in all analyses. SPSS was used to conduct all analyses.

Section 3: Presentation of the Results and Findings

In this quantitative, correlational study I examined racial disparities between Black/African American and non-Hispanic White women experiencing preterm birth in NYC and the prevalence and association of preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visit, prepregnancy improving health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions) and sociodemographic factors (i.e., maternal years of education, maternal age, income level, marital status, and health insurance). I analyzed whether there was a significant difference in the prevalence of preconception health protective factors and sociodemographic covariates between Black/African American and non-Hispanic White women with a preterm birth in NYC (Research Question 1 & 2). I also investigated the association and predictive value of preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women with a preterm in NYC (Research Question 3 & 4).

Research Question (RQ) 1. What is the difference between Black/African American women and non-Hispanic White women with a preterm birth in New York City in the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions)?

- Null $H_0$1: There is no significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control of medical conditions),.
- Alternate H_A1: There is a significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy and prepregnancy control of medical conditions).

Research Question (RQ) 2. What is the difference between Black/African American women and non-Hispanic White women in New York City in the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status)?

- Null $H_0$2: There is no significant difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC with the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status).
- Alternate H_A2: There is a significant difference between Black/African American Women and non-Hispanic White women with a preterm birth in NYC with the

prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status).

Research Question (RQ) 3. What is the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm birth in New York City?

- Null $H_0$3: There is no significant difference in the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm in NYC.
- Alternate H_A3: There is a significant association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital

status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm birth in NYC.

Research Question (RQ) 4. What is the risk associated with preconception health protective factors and sociodemographic covariates in Black women compared to non-Hispanic White women with a preterm birth in New York City?

- Null $H_0$4: There is no difference in the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women in New York City.
- Alternate H_A4: There is a significant difference in the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women in New York City.

Section 3 describes data collection of the secondary data set, presents the data analyzed results, and summarizes the study findings. The description of data collection for the NYC PRAMS Phase 8 survey includes recruitment and response rates. It also presents any discrepancies in using the PRAMS data set from the original plan in Section 2. A baseline description of the data and demographic characteristics of the sample is also presented. Results include descriptive analysis and justification of the covariates included any statistical assumptions, statistical analysis, bivariate crosstabs, and logistic regression, of the study sample by research question and hypotheses, any statistical tests that emerged from the analyses of the null hypotheses, and a summary of the results.

Data Collection of Secondary Data Set

The data use agreement between the NYC Department of Health and Mental Hygiene and Walden University permitted access to the NYC PRAMS Phase 8 survey 2016–2018 data set as of September 17, 2021. The study sample was collected from January 2016 through December 2018 from randomly selected birth certificates of infants for women who had given birth in NYC. Birth certificate data were linked to PRAMS survey responses (NYC Department of Health and Mental Hygiene, 2021a). Table 2 shows the number of participants selected, the respondents, and response rates. The total number of cases for the three cohorts was 4,272, with an overall response rate of 70.6% (CDC, 2021). There were no discrepancies in the use of the NYC PRAMS data set as presented in the data analysis plan in Section 2.

Table 2

PRAMS Cases Selected, Respondents, and Response Rates for 2016, 2017, and 2018

Year	Cases Selected	Respondents	Unweighted Response Rate %	Weighted Response Rate %
2016	2,532	1,543	60.9%	64.7%
2017	1,983	1,293	65.2%	67.2%
2018	2,033	1,436	70.6%	72.5%
Total	6,047	4,272	70.6%	

Source: CDC, 2021.

Results

The results presented are for the total cases in the PRAMS data set and the study population subset with the criteria of non-Hispanic, Black and White women with a singleton birth.

Sociodemographic Characteristics

Table 3 shows the descriptive and sociodemographic characteristics of survey respondents for total cases (N = 4,272) and the study sample with criteria non-Hispanic, Black and White, singleton cases (n = 2,161). The sociodemographic characteristics for total cases showed that most (45.9%) were White and 25.6% were Black/African American. The majority of women (53.3%) were between 30 and 39 years old, and most (44.9%) were high school graduates. Family income in the previous 12 months was mostly in the $60,001–$85,000 range (31.2%). For health insurance, 57.6% of respondents had Medicaid, and 40.4% private insurance.

For the non-Hispanic cases, maternal race was 56.1% White and 43.9% Black/African American. Most (66.5%) were married, were between 30–39 years old (55.8%), and were college graduates (46.8%). There was almost an even split between those who had Medicaid (49.7%) and those who had private insurance (48.6%). Family income in the previous 12 months was mostly in between $60,001–$85,000 (38.8%).

Table 3

Sociodemographic Characteristics for All Cases and Non-Hispanic Sample

	All Cases		Non-Hispanic Cases	
	N = 4,272	%	*n*= 2,161	%
Maternal Race	4,272		2,161	
White	1,961	45.9	1,213	56.1
Black/African American	1,093	25.6	948	43.9
Other	1,204	28.2		
Missing	14	0.3		
Mother Hispanic				
Yes	1,186	27.8		
No	2,997	70.2	2,161	100.0
Missing	89	2.1		
Marital Status				
Married	2,677	62.7	1,436	66.5
Other	1,595	37.3	725	33.5
Maternal Age				
Less than 17 years	35	0.8	14	0.6
18-19 years	70	1.6	25	1.2
20-24 years	575	13.5	273	12.6
25-29 years	1,033	24.2	472	21.8
30-34 years	1,294	30.3	689	31.6
35-39 years	982	23.0	524	24.2
40 + years	283	6.6	164	7.6
Maternal Years of Education				
0-8 years	230	5.4	44	2.0
9-11 years	459	10.7	157	7.3
12 years	929	21.7	468	21.7
13-15 years	985	23.1	480	22.2
16 years & more	1,660	38.9	1011	46.8
Missing	9	0.2	1	0.0
Income 12 Months Before				
$0-$20,000	1,083	25.3	420	19.4
$20,001-$40,000	752	17.6	341	15.8
$40,001-$60,000	354	8.4	187	8.6
$60,001-$85,000+	1,333	31.2	838	38.8
Missing	750	17.6	375	17.4
Health Insurance				
Medicaid	2,466	57.6	1,073	49.7
Private Insurance	1,734	40.6	1,050	48.6
Self-Pay	18	0.4	8	0.4
Other Insurance	31	0.8	22	1.0
Missing	23	0.5	8	0.4

Preterm Birth and Preconception Health Protective Factors

Table 4 shows the results for preterm birth and preconception health protective factors (i.e., pregnancy intention, prepregnancy health care visits, prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) for all cases and the study sample. Preterm birth was defined as the birth of an infant at 37 weeks or less gestation. For total and non-Hispanic singleton cases, the preterm birth rates were 17.7% and 15.1%, respectively. For total cases, most respondents indicated pregnancy intent 18.3% later, 17.3% sooner, or 44.6% then, and 63.6% had a prepregnancy health care visit. Results for non-Hispanic, singleton cases indicated pregnancy intent of 45.4% then, and 70.5% responded having a prepregnancy health care visit. For total and non-Hispanic singleton cases, the results for prepregnancy control of medical conditions, prepregnancy use birth control to prevent pregnancy, and prepregnancy improve health before pregnancy indicated that most respondents answered no to these PRAMS survey questions. The nonresponse/missing rate for these variables was higher for the total cases than for the non-Hispanic, singleton cases.

Table 4

Preterm Birth and Preconception Health Protective Factors

	All Cases		Non-Hispanic, Singleton	
	N = 4,272	%	*n* = 2,161	%
Preterm Birth				
Less than 27 weeks	77	1.8	44	2.0
28-33 weeks	224	5.2	90	4.2
34-36 weeks	457	10.7	192	8.9
37-42 weeks	3,512	82.2	1,834	84.9
43+ weeks	1	0.0	1	0.0
Pregnancy intention				
Later	782	18.3	346	26.3
Sooner	739	17.3	414	19.2
Then	1,906	44.6	932	45.4
Did not want then or anytime	166	3.9	77	3.6
Was not sure	346	12.8	281	13.0
Missing	133	3.1	61	2.8
Prepregnancy healthcare visit				
No	1,417	33.2	578	26.7
Yes	2,716	63.6	1,523	70.5
Missing	139	3.3	60	2.8
Prepregnancy control medical conditions				
No	2,184	51.1	1,263	58.4
Yes	495	11.6	238	11.0
Missing	1,593	37.3	660	30.6
Prepregnancy birth control to prevent pregnancy				
No	1,685	39.4	966	44.7
Yes	1,014	23.7	548	25.4
Missing	1,573	36.8	647	29.9
Prepregnancy improve health before pregnancy				
No	1,811	42.4	1,008	46.6
Yes	866	20.3	496	23.0
Missing	1,595	37.3	657	30.4

Prevalence of Maternal Race with Preterm Birth, Preconception Health Protective Factors, and Sociodemographic Covariates

Nonparametric Tests

Since all study variables were categorical, bivariate crosstabs and correlation analyses were conducted to determine the prevalence and association between variables. The nonparametric tests for bivariate crosstab analysis were applied since all assumptions were met. These assumptions included (1) random samples and (2) independent observations – each person or case can be counted only once, they cannot appear in more than one category or group, and the data from one subject cannot influence the data from another (Pallant, 2016). Preconception health protective factors and sociodemographic covariates were recoded as specified in the Methods section. Preterm birth was recoded as 0 = No (>37 weeks gestation) and 1 = Yes (<= 37 weeks gestation).

Bivariate crosstab analyses were conducted using the NYC PRAMS 2016-2018 data set with the following selection criteria: ethnicity - non-Hispanic, maternal race – Black/African American and White, plurality – singleton, and preterm birth – yes; 326 cases were eligible from 2,161 study population cases. Recoded sociodemographic covariates included two categories for maternal years of education (non-High school graduate and High school graduate), maternal age (<17 years-29 years and 30 year-40+years), and health insurance (Medicaid and private insurance), and three categories for family income (low, middle, and high income). I conducted bivariate crosstab analyses with maternal race as the dependent variable and the preconception health protective factors and sociodemographic covariates as independent variables controlling

to determine their prevalence and association to answer Research Question 1 and Research Question 2.

Research Question 1. What is the difference between Black/African American women and non-Hispanic White women with a preterm birth in NYC in the prevalence of preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, prepregnancy improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions)?

Table 5 shows the results of the bivariate crosstab analysis for the prevalence of preterm birth by maternal race and the preconception health protective factors. Preterm birth was more prevalent in Black/African American women (54.6%) than non-Hispanic White women (45.4%). Prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy were more prevalent in Black/African American women than non-Hispanic White women with preterm birth. Pregnancy intent and prepregnancy healthcare visits were more prevalent in non-Hispanic White women than in Black/African American women with preterm birth. Significant differences were found between Black/African American women and non-Hispanic White women with a preterm birth in the prevalence of three preconception health protective factors (pregnancy intent, prepregnancy healthcare visit, and prepregnancy control of medical conditions). There were no significant differences between Black/African American women and non-Hispanic White women with a preterm birth in the prevalence of two preconception health protective factors (prepregnancy birth control use to prevent pregnancy and prepregnancy improve health before pregnancy).

Table 5

Bivariate Crosstabs for Prevalence of Preterm Birth by Maternal Race and Preconception Health Protective Factors

	Preterm birth							
	Black	%	White	%	X^2	df	*p*	*Phi*
Maternal Race	178	54.6	148	45.4				
Pregnancy intent	*n* = 315							
No	34	19.8	13	9.1	6.1965	1	.013*	-.149
Yes	138	80.2	130	90.9				
Prepregnancy healthcare visit	*n* = 316							
No	58	34.5	22	14.9	15.060	1	.001*	.226
Yes	110	65.5	126	85.1				
Prepregnancy control medical conditions	*n* = 232							
No	75	68.2	109	89.3	14.524	1	.001*	-.261
Yes	35	31.8	13	10.7				
Prepregnancy birth control use to prevent pregnancy	*n* = 234							
No	65	58.0	85	69.7	2.949	1	.086	-.121
Yes	47	42.0	37	30.3				
Prepregnancy improve health before pregnancy	*n* = 236							
No	63	55.8	76	61.8	.655	1	.418	-.061
Yes	50	44.2	47	38.2				

Note. *Significance indicated at the *p* = .05 level

Research Question 2. What is the difference between Black/African American women and non-Hispanic White women in NYC in the prevalence of sociodemographic covariates (i.e., maternal age, maternal years of education, income level, marital status, and health insurance status)?

The results of the bivariate crosstabs analysis for preterm birth, maternal race, and the sociodemographic covariates follow in Table 6. Four sociodemographic covariates (maternal education-high school graduate, marital status-married, family income-high, and health insurance- private) considered protective factors were more prevalent in non-Hispanic White women. Maternal age-younger was more prevalent in Black/African

American than non-Hispanic White women with preterm birth. Black/African American women with preterm birth were more likely to have Medicaid for insurance than non-Hispanic White women. Black/African American women with a preterm birth experienced only one sociodemographic covariate compared to non-Hispanic White women.

Table 6

Bivariate Crosstabs for Prevalence of Preterm Birth by Maternal Race and Sociodemographic Covariates

	Preterm birth							
	Black	%	White	%	X^2	df	*p*	*Phi*
Maternal Race	178	54.6	148	45.4				
Maternal years of education	*n* = 326							
Non-High school graduate	27	15.2	7	4.7	9.426	1	.002*	.170
High school graduate	151	84.8	141	95.3				
Maternal age	*n* = 326							
<17 years – 29 years	64	36.0	37	25.0	4.038	1	.044*	.118
30 years – 40+ years	114	64.0	111	75.0				
Marital Status	*n* = 326							
Married	70	39.3	131	88.5	80.633	1	.001*	-.504
Other	108	60.7	17	11.5				
Family Income prior 12 months	*n* = 280							
Low income	68	45.9	22	16.7	74.560	2	.001*	.505
Middle income	49	33.1	16	12.1				
High income	31	20.9	94	71.2				
Health Insurance	*n* = 324							
Medicaid	121	68.8	46	31.1	44.178	1	.001*	.375
Private Insurance/Other	55	31.2	102	68.9				

Note. *Significance indicated at the $p = .05$ level

Bivariate Correlations

Research Question 3. What is the association between preconception health protective factors (i.e., pregnancy intention, prepregnancy healthcare visit, improve health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions), and sociodemographic covariates (i.e.,

maternal age, maternal years of education, income level, marital status, and health insurance status) in Black/African American women and non-Hispanic White women with a preterm birth in NYC?

Table 7 shows the results for the bivariate correlation analysis for the maternal race by preterm birth and the preconception health protective factors and sociodemographic covariates. The bivariate correlation analysis showed a small effect between preconception health protective factors and the sociodemographic covariates in Black/African American women and non-Hispanic White women with a preterm birth (Cohen, 1988, pp. 79–81). The amount of shared variance was also small. There were significant associations at the p=.05 level for Black/African American women with preterm birth with pregnancy intent and maternal age. Two preconception health protective factors (pregnancy intent and prepregnancy birth control use to prevent pregnancy had weak negative associations, meaning Black/African American women with preterm birth planned their pregnancies and did not use birth control to prevent pregnancy. There were also weak associations for Black/African American women with three preconception health protective factors (prepregnancy control of medical conditions, and prepregnancy improve health before pregnancy. For the sociodemographic covariates, marital status and maternal education had weak, negative associations with preterm birth in Black/African American women, indicating younger age and less than high school graduation. There was a also weak association between Black/African American women with preterm birth and health insurance and family income.

For non-Hispanic White women with preterm birth, one preconception health protective factor had a significant weak association for prepregnancy health care visit. There were weak negative associations for non-Hispanic white women with preterm birth and three preconception health protective factors (pregnancy intent (r=-.015, *p*=.595), prepregnancy control of medical conditions (r=-.004, *p*=.910), and prepregnancy birth control use (r=.006, *p*=.846). Prepregnancy improves health before pregnancy (r=.057, *p*=.084) indicated a weak association with preterm birth for non-Hispanic White women. All the sociodemographic covariates, marital status (r=-.007, *p*=.802), maternal education (r=.022, *p*=.434), health insurance (r=.030, *p*=.298), family income (r=.018, *p*=.574), and maternal age (r=.052, *p*=.073) had weak associations with preterm birth in non-Hispanic White women. For Black/African American women with preterm birth, there were two significant associations for pregnancy intent and maternal age compared to non-Hispanic White women with preterm birth with one significant association, prepregnancy health care visit.

Table 7

Bivariate Correlation for Preterm Birth by Maternal Race and Preconception Health Protective Factors and Sociodemographic Covariates

	Black			White		
Preterm Birth	r	*p*	95% CI	r	*p*	95% CI
Pregnancy Intent	-.066	.047*	[-.132, .001]	-.015	.595	[-.074, .043]
Prepregnancy healthcare visit	.015	.654	[-.052, .081]	.056	.053*	[-.002, .115]
Prepregnancy control medical conditions	.071	.070	[-.008, .149]	-.004	.910	[-.071, .063]
Prepregnancy birth control use	-.030	.443	[-.108, .049]	-.006	.846	[-.073, .060]
Prepregnancy improve health	.055	.160	[-.024, .134]	.057	.084	[-.008, .121]
Maternal years of education	-.026	.417	[-.092, .039]	.022	.434	[-.035, .080]
Maternal age	.064	.050*	[-.002, .129]	.051	.073	[-.006, .109]
Marital status	-.003	.928	[-.068, .063]	-.007	.802	[-.065, .051]
Family income	.025	.486	[-.048, .098]	.018	.574	[-.046, .081]
Health insurance	.003	.918	[-.062, .069]	.030	.298	[-.028, .088]

Note. *Significance indicated at the $p = .05$ level

Binomial Logistic Regression: Predictive Value of Preterm Birth Models

Binomial logistic regression analysis was performed to determine the predictive ability of maternal race, preconception health protective factors (pregnancy intent, prepregnancy healthcare visit, prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy), or sociodemographic covariates (maternal education of years, maternal age, marital status, income level 12 months before pregnancy, and health insurance status) for preterm birth. Two logistic regressions were conducted for preconception health protective factors (Model 1) and the sociodemographic covariates (Model 2) with maternal race to determine their predictive value for preterm birth. Model 1 tested the predictive ability of preconception health protective factors and maternal race for preterm

birth. Model 2 tested the predictive ability of sociodemographic covariates and maternal race for preterm birth. The sample included the 2,161 cases who met the criteria.

Research Question 4. What is the risk associated with preconception health protective factors and sociodemographic covariates in Black/African American women compared to non-Hispanic White women with a preterm birth in NYC?

Table 8 shows the logistic regression analysis for Model 1, which assessed the predictive ability of maternal race and preconception health protective factors for the likelihood that women would have a preterm birth. Model 1 included six independent variables (maternal race, pregnancy intent, prepregnancy healthcare visit, prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) and preterm birth (dependent variable). Model 1 with all predictors was statistically significant at the p=.05 level, [X^2 (5, N=1,435) =17.647, p=.003, indicating that the model could predict which women had and did not have a preterm birth. The model explained 1.2% (Cox & Snell R square) and 2.1% (Nagelkerke R square) of the variance in preterm birth, and correctly classified 84.6% of cases, The Hosmer and Lemeshow Goodness of Fit Test, X^2(7, N=1,435) =2.556, p=.923 is larger than p=.05 which indicated strong support for the model. As shown in Table 8, only two independent variables made statistically significant contributions to the model, maternal race Black (p = .004) and prepregnancy improve health before pregnancy (p=.019). The strongest predictor of preterm birth was Black, with an odds ratio of 1.548. Black/African American women were 1.548 times more at

risk of a preterm birth than non-Hispanic White women. Also, women who improved their health before pregnancy were 1.46 times more likely not to have a preterm birth.

Table 8

Binomial Logistic Regression for Model 1: Preterm Birth, Maternal Race, and Preconception Health Protective Factors

						95% CI for Exp(B)	
	B	SE	Wald	Sig.	Exp(B)	Lower	Upper
Step 1							
Black	.437	.153	8.194	.004*	1.548	1.148	2.087
PregIntent	-.219	.214	1.047	.306	.803	.528	1.222
PrepregControl	.156	.201	.603	.437	1.169	.788	1.735
Med. Condtns							
PrepregBC	.170	.161	1.104	.293	.844	.615	1.158
PrepregImpHlth	.380	.162	5.486	.019*	1.463	1.064	2.011
Constant	-1.954	.120	266.01	.000*	.143		

Note. *Significance indicated at the p = .05 level

Table 9 shows the binomial regression analysis for Model 2, which assessed the predictive ability of maternal race and sociodemographic covariates for the likelihood that women would have a preterm birth. Model 2 includes six independent variables (maternal race, maternal years of education, maternal age, marital status, income 12 months before pregnancy, and health insurance status) and preterm birth (dependent variable). Model 2 with all predictors was statistically significant, X^2 (7, N=1,779) =5.539, p=.005, indicating that the model could distinguish between women who had and did not have a preterm birth. The model explained only 1.1% (Cox & Snell R square) and 2.0% (Nagelkerke R square) of variability in the model and correctly classified 84.4% of cases. The Hosmer and Lemeshow Goodness of Fit Test, [X^2 (7, n=1,779) =5.539, p=.594, indicated support for the model since the p-value is more than .05. Table 9 shows that only two independent variables (maternal age older, p=.023 and Black/African American (maternal race), p-.008) made a statistically significant contribution to the

model. The strongest predictor was maternal race, Black/African American, with an odds ratio of 1.551. Black/African American women were 1.551 times more at risk of preterm birth than non-Hispanic White women with these predictor variables. Women with maternal age older (30 years-40+years) were 1.433 times more at risk of having a preterm birth than younger women (<17 years to 29 years).

Table 9

Binomial Logistic Regression for Model 2: Preterm Birth, Maternal Race, and Sociodemographic Covariates

						95% CI for Exp(B)	
	B	S.E.	Wald	Sig.	Exp(B)	Lower	Upper
Step 1							
MaternalAgeOlder	.360	.158	5.194	.023*	1.433	1.052	1.952
Marital Other	.142	.168	.760	.383	1.152	.838	1.585
Maternal Educ	.102	.263	.149	.699	1.107	.661	1.852
Health Insurance	.013	.203	.004	.949	1.013	.681	1.508
IncomeMiddle	.151	.197	.593	.441	1.163	.791	1.710
IncomeHigh	.045	.251	.032	.858	1.046	.640	1.709
Black	.439	.165	7.070	.008*	1.551	1.122	2.143
Constant	-2.252	.262	73.639	.000*	.105		

Note. *Significance indicated at the $p = .05$ level

Overall, the logistic regression analysis results indicated the strongest predictors of preterm birth are Black/African American, prepregnancy improve health before pregnancy-no, and older maternal age.

Research Questions and Hypotheses

For Research Question 1, there was a significant difference between Black/African American women and non-Hispanic White women with preterm birth in the prevalence of three preconception health protective factors, pregnancy intent, prepregnancy healthcare visit, and prepregnancy control of medical conditions. There were no significant differences between Black/African American women and non-

Hispanic White women with preterm birth in the prevalence of prepregnancy birth control use to prevent pregnancy and prepregnancy improve health before pregnancy. Therefore, the null hypothesis was partially supported. There was a significant difference in the prevalence of three preconception protective factors between Black/African American and non-Hispanic White women with a preterm birth. The alternative hypothesis partially supported the preconception health protective factors. However, Black/African American women with preterm birth reported more prevalent preconception health protective factors (i.e., prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) than non-Hispanic White women with preterm birth.

For Research Question 2, there were significant differences between Black/African American women and non-Hispanic White women with preterm birth in the prevalence of the five sociodemographic covariates (maternal years of education, maternal age, marital status, income level 12 months before pregnancy, and health insurance status). Therefore, the alternative hypothesis was supported, and the null hypothesis was not supported. Black/African American women with preterm birth were more likely to have less sociodemographic protective factors—less education, younger, unmarried, low to middle income, and to have Medicaid than non-Hispanic White women experiencing preterm birth.

For Research Question 3, there were significant associations with pregnancy intent and maternal age in Black/African American women experiencing preterm birth. For non-Hispanic White women with preterm birth, there was a significant association

with prepregnancy healthcare visits. Therefore, the null hypothesis was partially supported. Developing program interventions to address preterm birth, pregnancy intent, prepregnancy health care visit, and maternal age should be emphasized in curricula, social media, and educational materials.

For Research Question 4, Model 1, preconception protective factors, and Model 2, sociodemographic covariates were significant predictors for preterm birth. There was statistical significance in the odds ratio associated with three variables – Black, prepregnancy improve health before pregnancy, and maternal age older in Black/African American women compared to non-Hispanic White women with a preterm birth. The odds ratio of preterm birth in Black/African American women was 1.548-1.551 times more than non-Hispanic White women. The odds ratio associated with prepregnancy improve health before pregnancy (1.463) and maternal age (1.433) was significantly higher in Black/African American women compared to non-Hispanic White women with preterm birth. However, the risk associated with the other preconception health protective factors and sociodemographic covariates was not significantly associated in Black/African American women compared to non-Hispanic White women with preterm birth. The alternative hypothesis is partially supported for Black/African American, prepregnancy improve health before pregnancy, and maternal age older.

Summary

This study analyzed the NYC PRAMS Phase 8, 2016-2018 data to examine preconception health protective factors and sociodemographic covariates to determine their prevalence and association in Black/African American women compared to non-

Hispanic White women with preterm birth in NYC. There were 2161 cases selected from the total cases that met the criteria of non-Hispanic, singleton birth, and maternal race (Black and White). The statistical analyses included descriptive statistics, bivariate crosstabs, bivariate correlation, and logistic regression to answer the research questions.

The study included 58.1% non-Hispanic White women and 43.9% Black/African American women. The prevalence of preterm birth was statistically significant in Black/African American women (18.8%) who were 1.548 times more at risk to experience preterm birth than in non-Hispanic White women (12.2%). There was a statistically significant difference between Black/African American women and non-Hispanic White women in the prevalence of three preconception health protective factors (pregnancy intent, prepregnancy control of medical conditions, and prepregnancy healthcare visit) and the five sociodemographic covariates (maternal age, maternal years of education, income level, marital status, and health insurance status). The null hypothesis was partially supported for the preconception health protective factors (Research Question 1. The alternative hypothesis was supported for the sociodemographic covariates to answer Research Question 2. Black/African American women experienced more preconception health-protective behaviors than non-Hispanic White women. For Research Question 3, Black/African American women compared to non-Hispanic White women with a preterm birth, there were significant associations with pregnancy intent and maternal age. There was a significant association between non-Hispanic White women and prepregnancy healthcare visit. The null hypothesis was partially supported. For Research Question 4, the logistic regression analysis results

indicated a significant difference in the odds ratio associated in Model 1, preconception health protective factors and Model 2, sociodemographic covariates for Black/African American (race), pregnancy improve health before pregnancy, and maternal age older. These variables were the strongest predictors of preterm birth in Black/African American women compared to non-Hispanic White women.

These results indicated significant racial disparities in prevalence and association of preconception protective factors and sociodemographic covariates between Black/African American women and non-Hispanic White women with a preterm birth in NYC. Black/African American women were 1.548 times more likely to have a preterm birth than non-Hispanic White women. However, Black/African American experienced more preconception health protective factors and fewer protective sociodemographic covariates than non-Hispanic White women in this study. These results will be discussed and interpreted concerning previous research findings and the MCH Life Course theoretical framework, and recommend actions for future research, applications to professional practice, and implications for social change in Section 4.

Section 4: Application to Professional Practice and Implications for Social Change

I examined racial disparities between Black/African American and non-Hispanic White women with a preterm birth in NYC and the prevalence and association of preconception health protective factors (pregnancy intention, prepregnancy health care visit, prepregnancy improving health before pregnancy, prepregnancy birth control use to prevent pregnancy, and prepregnancy control medical conditions) and sociodemographic covariates (maternal years of education, maternal age, income level, marital status, and health insurance). I also investigated the predictive value of the variables for preterm birth in Black/African American compared to non-Hispanic White women. The MCH life course approach was the theoretical foundation (Lu & Halfon, 2003).

The prevalence of preterm birth was statistically significant in Black/African American women (18.8%), who were 1.548 times more likely than non-Hispanic White women (12.2%) with a preterm birth. There was also a statistically significant difference between Black/African American women and non-Hispanic White women with a preterm birth in the prevalence of three preconception health protective factors (pregnancy intent, prepregnancy health care visit, and prepregnancy control of medical conditions) and the five sociodemographic covariates (maternal age, maternal years of education, income level, marital status, and health insurance status). The null hypothesis was partially supported for the preconception health protective factors (Research Question 1) and not supported for the sociodemographic covariates (Research Question 2). The bivariate correlation analysis also showed a significant association between pregnancy intent and maternal age in Black/African American women with a preterm birth. There was also a

significant association between non-Hispanic White women with a preterm birth with prepregnancy health care visit, meaning the null hypothesis for Research Question 3 was partially supported. Black/African American women with preterm birth had more associations with preconception health-protective behaviors than non-Hispanic White women. The logistic regression analysis for Model 1 and Model 2 indicated statistically significant differences in the odds ratio of preterm birth associated with Black/African American, prepregnancy improve health before pregnancy, and maternal age older. These variables were the strongest predictors of preterm birth.

Section 4 will include an interpretation of the study's findings related to the literature. I will also interpret the results related to the MCH life course approach. This section further includes the limitations of the study, recommendations, implications to professional practice and social change, and conclusions.

Interpretation of Findings

Findings Related to Literature

This current study starts to fill a research gap in racial disparities, preterm birth, and preconception health protective factors by focusing specifically on preconception health protective factors rather than risk factors, and identifying three preconception protective behaviors (i.e., prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) that were significantly more prevalent in Black/African American women with preterm birth. These findings indicate that increasing preconception health protective behaviors in Black/African American women can contribute to improving health and reducing racial

disparities in preterm birth. Another research gap filled was the explicit use of the MCH life course approach, which specifically addresses racial disparities over the life course to guide the selection of protective factors in the preconception period and to focus the data analysis on preconception health protective factors, Black/African American race, and sociodemographic covariates rather than focusing on risk factors. Prior research studies have not explicitly focused on using the MCH life course approach constructs (Lu & Halfon, 2003).

Preterm Birth and Racial Disparities

This study's findings align with previous studies on the prevalence of preterm birth in Black/African American women compared to non-Hispanic White women with Black/African American women being 1.548 times more likely to have a preterm birth than non-Hispanic White women in NYC. Previous studies reported that Black/African American women were 1.48 times more likely to have a preterm birth than non-Hispanic White women nationally (Matoba & Collins, 2017; Purisch & Gyamfi-Bannerman, 2017). Recent U.S. trends have also reported an increase in preterm birth rates between 2015 (9.63%) to 2019 (10.23%), with Black/African American women 1.52-1.55 times more likely to have a preterm birth than non-Hispanic White women, indicating an increase in racial disparities (Gupta & Froeb, 2020; Martin et al., 2021). The overall increase coincides with an increase in severe maternal morbidity and mortality (Gupta & Froeb, 2020).

In NYC, research has reported the 2016 preterm birth rate was 12.2% for non-Hispanic Black and 7.3% for non-Hispanic White women, 1.67 times more (Li et al.,

2016). In 2019, the NYC preterm birth rate for non-Hispanic Black women (13.1%) was 1.926 times more than non-Hispanic White women (6.8%; Li et al., 2019). Though the risk of preterm birth was less in this study, the prevalence of preterm birth (18.8%) was higher in Black/African American women than non-Hispanic White women (12.2%). This widening of racial disparities in preterm birth between Black/African American and non-Hispanic White women coincides with the increase in maternal mortality and severe maternal morbidity in Black/African American women in NYC (NYC Department of Health and Mental Hygiene, 2021b, 2020). Most pregnancy-related deaths were associated with cardiovascular conditions, embolism, and hemorrhage. Severe maternal morbidity was associated with prepregnancy diabetes and hypertension, indicating the importance of preconception health and care.

Preconception Health and Preterm Birth

This study found that three preconception health protective factors (i.e., prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) were more prevalent in Black/African American women than non-Hispanic White women with a preterm birth. These results differed from previous studies in that Black/African American women reported more preconception health protective factors. For example, Robbins, Boulet, et al. (2018) reported that non-Hispanic Black women were less likely to engage in health-promoting behaviors than non-Hispanic White women. These results indicate the importance of incorporating preconception health protective information in all venues (i.e., reproductive hospital clinics, obstetrics/gynecology practices, primary health clinics,

school-based health centers, federally qualified health centers, health center, and community-based MCH organizations) that women receive health care to improve birth outcomes.

Despite the differing results on health protective factors, the sociodemographic covariates (i.e., less likely to have graduated from high school, more likely to be younger and not married, to have a lower income level, and to have Medicaid) of Black/African American women with preterm birth aligned with past research (Ayoola et al., 2016; Robbins, Boulet et al., 2018). Older maternal age was a significant risk factor for Black/African American women and non-Hispanic White women with a preterm birth. Black/African American women with preterm birth had fewer protective social determinants. These results show how racial disparities in the social determinants can contribute to preterm birth outcomes, and their consistency across research studies. The preconception health protective factors (behaviors) in this study relate to both individual-level and systems-level (health care provider) issues that were broader than other studies (Ayoola et al., 2016; Robbins Boulet et al., 2018) that identified select risk factors and individual preconception modifiable health behaviors, such as normal weight, physical activity, prepregnancy multivitamin use, and postpartum effective contraceptive method but did not specifically research racial disparities in preterm birth.

Additionally, in this current study, Black/African American women were more likely to plan pregnancy (pregnancy intent), prepregnancy control of medical conditions, prepregnancy use birth control, and prepregnancy improve health before pregnancy. The results indicated that racial disparities in preterm birth could be reduced if more

Black/African American women would increase these preconception health protective behaviors and decrease medical, social, and behavioral risk factors. There should be particular attention to educating women in their 30s regarding the risk of preterm birth and preconception protective behaviors.

This current study found the preconception health protective factors and sociodemographic covariates selected for predictor models were statistically significant predictors of preterm birth. Black/African American, prepregnancy improve health before pregnancy, and older maternal age were the strongest predictors for preterm birth. Prior studies' results varied regarding preconception modifiable risk factors, preterm birth or adverse infant outcomes to predict preterm birth, preconception care use, and explain racial/ethnic since different data sources, study populations, variables and measures were used (Batra et al., 2016; Mehta-Lee et al., 2017; Strutz et al., 2014).

This study can shift the racial disparities birth outcome research paradigm to focus on preconception health protective factors rather than preconception health risk factors in Black/African American women. It delineated which preconception health protective factors (behaviors) should be emphasized in preconception care and reproductive care programs for women, ages 15-45 years. Public health practitioners, preconception care/reproductive health care providers, and community-based providers should incorporate this information in counseling sessions, training, educational programs, and research to reduce racial disparities in preterm birth.

Findings Related to Theoretical Foundation

The current study used the MCH Life Course Approach as the theoretical framework to guide the selection of the critical developmental periods (preconception and *in utero)*, risk factor (Black race), and preconception health protective factors to investigate racial disparities between Black/African American and non-Hispanic White women with preterm birth. Focusing on protective factors rather than risk factors was a departure from prior research studies (Batra et al., 2016; Mehta-Lee et al., 2017; Strutz et al., 2014). Lu and Halfon (2003) stated that reducing risk factors and increasing protective factors in Black women over the life course by using health promotion/intervention strategies should close the disparities gap between Black and White women. The current study results indicated maternal race (Black/African American) was significantly associated with and a significant predictor of preterm birth as a risk factor. However, there were four preconception health protective factors (i.e., pregnancy intent, prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy) associated more with Black/African American women with preterm births as protective factors. The sociodemographic covariates considered protective were less prevalent and associated with Black/African American women with a preterm birth. These results can be used to improve Black/African American women's health not only in the preconception period but also throughout the Black/African American woman's reproductive life course. Prior research that applied the life course framework with varied results indicated the full realization of benefits in terms of health outcomes and cost savings depended on the

contributions of many individuals, groups, and institutions, and systems-level changes (Frayne, 2017; Mason et al., 2014).

The MCH Life Course Approach can guide MCH research in selecting sensitive/vulnerable periods, risk factors, and protective factors associated that reduce racial disparities in preterm birth and other adverse birth outcomes over a Black/African American woman's life course (Lu & Halfon, 2003). It can identify which preconception health protective factors (behaviors) to increase and risk factors to decrease to reduce racial disparities in birth outcomes. This current study's findings that preconception health protective factors are associated more in Black/African American than non-Hispanic White women with a preterm birth is one step towards improving racial disparities in preterm birth.

Limitations of the Study

There are several limitations to this study. The NYC PRAMS study population was selected from the infant birth certificates of women who had given birth to a live infant in NYC between 2016 and 2018 were sent the PRAMS Phase 8 survey. The findings are limited to Black/African American and non-Hispanic White women with similar sociodemographic characteristics and geographic locations (urban/large city) as the study population. Results are also limited if women who participated in the PRAMS survey are different from all women who gave birth in NYC during this period, and the weighting process does not correct for these differences. The study findings are limited to similar preconception health protective factors such as pregnancy intent, prepregnancy

healthcare visit, prepregnancy control of medical conditions, prepregnancy birth control use to prevent pregnancy, and prepregnancy improve health before pregnancy.

Since the PRAMS survey was sent to potential respondents 2 to 4 months post-birth of a live infant, a respondent might have had recall bias because the 90 questions included three-time periods -- preconception (6-12 months before pregnancy), pregnancy, and post-partum (6-12 weeks after birth) (CDC, 2015). Survey respondents answered questions regarding events/experiences that happened 18-24 months before. There might also have been nonresponse bias which occurs when some sample subgroups do not respond to the survey or are less likely to respond than other groups.

Since PRAMS data was collected for a different purpose than the current study, there is no assurance that the data measured the same concepts under investigation. Another limitation might be reporting bias whereby women might be unwilling to report some behaviors or events, leading to an underestimate of the prevalence of these events, or they may over-report socially desirable behaviors (CDC, 2015).

Recommendations

There are five recommendations based on the study's findings on racial disparities between Black/African American and non-Hispanic White women with a preterm birth and the prevalence and association of preconception health protective factors and sociodemographic covariates. First, the results from this study can guide future research on preconception health-protective, risk factors, preterm birth, and other adverse birth outcomes by including Black/African American women as integral team members involved with framing the research questions, identifying protective and risk factors, and

assisting in the research as advisors, consultants, or research team members. Franck et al. (2020) conducted focus groups with women of color at risk for preterm birth to help develop research priorities in three California communities using a Research Justice framework. This framework recognizes and values the lived experiences and expertise of the women of color and their communities in identifying and setting a research agenda as critical partners.

Second, future qualitative and quantitative research should explore racial disparities in preterm birth by examining the same preconception health protective variables/measures and other preconception health protective factors to determine their associations and which ones are more prevalent and associated with Black/African American women. Secondary data analysis can provide this information using the CDC PRAMS national database of 47 states and Washington D.C., or another database with similar preconception health data points.

Third, prospective research studies, quantitative and qualitative, should developed to collect primary data from cohorts of women across the reproductive life span, from adolescence into adulthood, to assess preconception health protective factors and racial disparities in birth outcomes. A prospective research study could collect primary data from women on reproductive health, preconception health, and pregnancy during sensitive periods, i.e., adolescence, young adulthood, and mid-adulthood, using the MCH Life Course Approach as the theoretical framework (Lu & Halfon, 2003).

Fourth, the results can be used to develop interventions and programs that translate preconception health protective factors, (i.e., pregnancy intent, prepregnancy

healthcare visit, prepregnancy control of medical conditions, and prepregnancy improve health before pregnancy) into preconception/reproductive care programs, and social marketing/social media messages that will help reduce racial disparities in preterm birth.

Fifth, the results indicate that reducing racial disparities in preterm birth and preconception health must be addressed on multiple levels, i.e., the individual, community, institutional, and policy, and intersectoral (i.e., health, education, finance, legislative). Preconception health care and the social determinants require not only individual behavior change but also upstream investments for systems level change.

Implications for Professional Practice and Social Change

Professional Practice

The results of this study can be translated to improve and change professional practice by explicitly incorporating preconception health protective factors and sociodemographic covariates associated with preterm birth in the education and training of MCH professionals, i.e., health care, program managers and administrators, health educators, and community health workers. MCH professionals can use these results to develop culturally responsive preconception programs, services, and interventions for Black/African American women and all women by incorporating specific health-protective information that contributes to improving preterm birth outcomes into counseling/educational sessions and preconception healthcare visits for Black/African American women. The MCH programs and services should be updated using the MCH Life Course Approach (Lu & Halfon, 2003) in health care and community-based settings that focus on providing preconception health information from adolescence through

adulthood. These results can also be used to revise or develop culturally appropriate educational materials on preconception health protective factors, i.e., curricula, education and training modules, pamphlets/brochures, and social media postings, for MCH educational or counseling sessions.

These results are a preliminary step towards improving and changing MCH professional practice in preconception health care, not only for Black/African American women but for all women. Researchers should work with MCH professionals, patients/clients, and communities to translate these findings into culturally responsive professional practice.

Positive Social Change

Five social change implications were delineated before the study started which included (1) improving the reproductive health and birth outcomes for Black/African American women and infants through systematic preconception healthcare and health education; (2) contributing to reducing gaps in the literature by delineating how preconception health protective factors, and sociodemographic factors contribute to racial disparities in preterm birth using the MCH Life Course Approach, (3) using the results of this study to guide the development of preconception health interventions which target the preconception protective factors for Black/African American women to be implemented in healthcare and community-based organizations, (4) developing collaborative, comprehensive programs to deliver preconception care for Black/African American women in equitable, supportive environments across the life span, and (5) developing upstream public health advocacy and policy responses to address

preconception health protective factors and social determinants to improve adverse birth outcomes. These positive social change implications align with the individual, family, organizational, and societal/policy levels.

Individual and Family Levels

This study's results can improve reproductive health and birth outcomes for Black/African American women and infants by guiding the development and implementation of systematic preconception health care programs and services. Public health practitioners would incorporate the four preconception health protective factors (i.e., pregnancy intent, pregnancy healthcare visit, prepregnancy control of medical conditions, and pregnancy improve health before pregnancy) into program interventions. Women and families should receive positive information to encourage preconception behavior change. By standardizing preconception health protective factors in counseling and education sessions, and healthcare encounters, positive social change can positively impact birth outcomes, particularly preterm birth, in Black/African American women.

Organizational Level

The results of this study can start a paradigm shift in healthcare institutions, community-based organizations, and healthcare professional training programs by sharing responsibility for improving patient/client reproductive health and birth outcomes. The MCH healthcare and community-based organizations can use the study results to guide their development of preconception health interventions, and training staff to initiate counseling on preconception health protective behaviors. Public health practitioners would incorporate pregnancy intent, prepregnancy healthcare visit,

prepregnancy control of medical conditions, and prepregnancy improve health into social marketing materials and preconception/reproductive health care programs and services that target Black/African American women to improve preterm birth outcomes. The interventions should include information on how the social determinants of health, particularly maternal age, can impact preterm in Black/African American women in NYC and suggestions for addressing them.

Societal/Policy Level

The last two positive social change implications will entail work with legislators, MCH advocates, and women/families. The results can be translated into increased funding for preconception and reproductive health care priorities to develop collaborative, comprehensive programs to deliver preconception care for Black/African American women equitable, supportive environments across the life span. Legislators and social policy advocates can be educated on how specific preconception health protective factors and the social determinants (sociodemographic covariates) can positively impact racial disparities and adverse birth outcomes. Upstream public health advocacy should occur to formulate strategies to address racial disparities in birth outcomes, preconception health protective factors, and the social determinants of health on the city, state, and federal levels. The social determinants need special attention since three factors are associated with access to education, income, and health insurance/health care which should be addressed on an intersectoral systems level.

To summarize, the results of this study will be used to improve and change MCH professional practice and influence positive social change for women and their families,

community institutions -- healthcare and community-based organizations, and society to implement collaborative, comprehensive programs and services, and to develop preconception health-protective legislative policies.

Conclusion

This study on racial disparities between Black/African American and non-Hispanic White women with a preterm birth determined the prevalence and the association of preconception health protective factors and sociodemographic. Black/African American women (18.8%) were 1.548 times more at risk for preterm birth than non-Hispanic White women (12.2%). The findings indicated significant associations in Black/African American and non-Hispanic White women with preterm birth and four preconception health protective factors (pregnancy intent, prepregnancy healthcare visit, prepregnancy control of medical conditions, and prepregnancy improve health before pregnancy). The strongest predictors of preterm birth were Black/African American, prepregnancy improve health before pregnancy, and maternal age older. However, the social determinants for Black/African American women with a preterm birth were less protective than non-Hispanic White women. Preconception health protective factors are essential in future research on racial disparities between Black/African American and non-Hispanic White women to determine the optimal configuration of protective factors to risk factors to reduce preterm birth disparities using the MCH Life Course Approach as the theoretical framework. Positive social change in professional practice will result regarding preconception/reproductive health care by incorporating the study findings on the individual, community, and societal/political levels.

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