

Implicit Racial Bias in Prenatal Visit Patient-Clinician Communication, Prenatal Screening, and Interventions

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Submitted to the Graduate Faculty of the
Graduate School of Public Health
of the requirements for the degree of
Doctor of Philosophy

University of Pittsburgh

2021

UNIVERSITY OF PITTSBURGH

GRADUATE SCHOOL OF PUBLIC HEALTH

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Abstract

Racial/ethnic disparity in maternal health outcomes persists in the United States. The Institute of Medicine's report suggests that the racial and ethnic differences in the quality of care and existing healthcare disparities are likely related to healthcare clinicians' prejudices and biases, which could affect patient-clinician interactions, screening, diagnosis, and treatment. This unequal treatment may also play a role in the racial inequities in maternal healthcare quality and maternal morbidity and mortality rate.

This paper explores racial differences in patient-clinician communication and obstetrical care practices such as illicit drug testing and involvement of child protective services. We hypothesized that racial differences and biases exist in obstetric clinicians' care. Additionally, we explored study participants' perceptions of clinicians' communication behaviors during their initial prenatal visit and examined for racial differences in patients' reflections.

We utilized data from an NIH-funded study (Talking to Pregnant Patients), an observational study of patient-clinician communication regarding substance use in first prenatal visits. Some clinician participants consulted with more than one patient participant; therefore, we utilized generalized estimated equation for correlated data in all regression analyses to account for nonindependence across observations. Additionally, we performed a mixed-method analysis of the semi-structured patient interviews to elucidate patients' perceptions of clinicians' communication behaviors and explore racial differences in these reports.

Our study found significant racial differences in clinician communication patterns and illicit drug use testing for patients who disclosed illicit drug use to their clinician during the initial prenatal visit. Black

patients were more likely to receive stereotypical and inappropriate comments from their clinicians when compared to White patients. Additionally, Black patients who disclosed illicit drug use to their clinicians had higher odds of clinicians conducting urine toxicology testing than their White counterparts. Furthermore, during the semi-structured interviews, Black patients were more likely to discuss clinicians' negative communication behaviors than White patients.

Our study shows racial differences in the quality of prenatal care received by pregnant people, which could be due to clinicians' personally mediated racist practices. Addressing these contributing factors to racial inequities in maternal healthcare would be invaluable in reducing the racial gaps in maternal and child health outcomes.

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Preface

My experience in this graduate program has been beyond my expectation; I was supported in every aspect. It was an honor to be a part of the program. My sincere gratitude to my committee, Dr. Hawk, Dr. Chang, Dr. Mendez, and Dr. Albert, for your mentorship, support, and guidance. I will like to thank Dr. Hawk for her immense support and mentorship over the past four years; I wouldn't have achieved all I have accomplished during this period without it. I couldn't have asked for a better advisor and mentor. To Dr. Chang, you have made a tremendous impact on my experience, especially by supporting the use of your data for my dissertation, sharing your expertise, and providing resources to support this process; I am incredibly grateful. Dr. Mendez and the MCH Scholars group, thank you for sharing your wealth of knowledge around racial inequities in maternal and child health; I have learned a lot from you all. Thank you, Dr. Albert, for your vast contributions and support throughout these past four years.

I would also like to thank Dr. Trauth and Dr. Documet for their support and guidance throughout this period. My appreciation goes to the BCHS faculty, other GSPH faculty members, administration, and staff. Thank you also to Dr. Roberts for accepting me into the Health Systems Leadership and Management certificate and HPM faculty members for sharing your knowledge and expertise in healthcare policy and management.

To all the BCHS cohorts I met during my program, thank you for all your support and the opportunity to share experiences and knowledge. Many thanks to Stephanie Hartos, Anna Patterson, Natalie Stern, Sneha Patnaik, Sarah Leonard, Esther Kim, Robinson Taylor, Osirus Inngide, Dzigbordi Kamasas-Quashie, Monica Merante, and Ozge Burgut for their assistance with coding and data management. I would like to thank the Biostatistical Consulting Laboratory at the University of Pittsburgh Graduate School of Public Health for providing guidance on the statistical analysis.

Thank you to Jewish Healthcare Foundation, Pitt Public Health Bridging the Gaps Program, especially Dr. Elias, Gwen's Girls, and my fellow intern, Kiyomi Knox, for providing me with an opportunity to learn about maternal health programs and policies, and young girl's health in Pennsylvania. Thank you to Gwen's Girls 2019 summer campers for sharing your experiences with me and teaching me a lot during the brief period I shared with you all. These experiences broadened my knowledge about challenges faced by these groups, best practices, and the importance of public health and advocacy.

My immense gratitude goes to the Prokop family and Akinbola family for welcoming my family and I into their homes and providing us with the support needed to adjust to a new environment. My gratitude also goes to the Neumann family for their assistance throughout these past years. To my new family, the Isiguzo family, thank you for always being there to assist in every way possible. To my very supportive friends who have been there for me throughout this remarkable journey including my LASUCOM and CHAI family, and the Alenkhe family, thank you.

To my parents – Dr. and Mrs. Salako and Mr. and Mrs. Olaniyan, thank you for your support and teaching, and for showing me that gender isn't a barrier to pursuing my dreams. Thank you to my remarkable siblings – Tope and Abbey, for your continuous support and motivation on all my adventures. My eternal gratitude to my loving and ever-supportive husband and children; we did it. Thank you for your patience and care. You have all made so many sacrifices to assist me in achieving my dreams. I hope to pay it forward as I continue to make you proud.

1.0 Introduction

1.1 Definitions and Maternal Health Trends in the United States

Maternal health (maternal mortality rate) is a critical indicator of a nation's health and the status of its health care delivery system. Complications related to pregnancy is one of the ten leading causes of death for pregnant people aged 20 - 44 years in the US.¹ The United States spends the most on maternity care as compared to other countries in the world; despite this, the US has the highest maternal mortality and morbidity rate among all developed countries.^{2,3} (Note: In this paper, we utilize gender-neutral terms such as pregnant or birthing people as much as possible, as they incorporate all pregnant individuals including those who do not identify as women or females.) The World Health Organization defines maternal mortality as “the death of a woman (person) while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by pregnancy or its management but not incidental or accidental causes”.⁴ Maternal morbidity is “any physical or mental illness or disability directly related to pregnancy and/or childbirth”.⁵ Based on timing, complexity, and varying effect of pregnancy, the terms pregnancy-related mortality and severe maternal morbidity (SMM) are also utilized. Pregnancy-Related mortality is “the death of a woman (person) while pregnant or within one year of termination of pregnancy”.⁴ Severe maternal morbidity refers to “unexpected outcomes of labor and delivery that result in significant short- or long-term consequences to a woman's (person's) health” including eclampsia and acute myocardial infarction.⁶

In 2000, the United Nations Millennium Development Goal set a global target to achieve a 75% reduction in maternal mortality rate (MMR) by 2015. While this goal has been met globally, the estimated mortality rate in the US has increased during this period.⁷⁻¹¹ The increasing trend persists with the US at a maternal mortality rate of 17.4 deaths per 100,000 live births in 2018, while countries like Canada and Japan had MMR's of 10 deaths per 100,000 live births and 5 deaths per 100, 000 live births respectively in

2017.^{12,13} This rise is also the case for severe maternal morbidity, which rose by about 20% from 1993 to 2014.¹⁴ In 2014, more than 50,000 birthing people were affected by severe maternal morbidity in the United States.^{14,15} The increasing trend of maternal mortality and morbidity rates in the US is linked to the significant and persistent racial and ethnic disparities in these rates. The rising trend affects both Black and White pregnant people, but non-Hispanic Black (Black) pregnant people have had the most notable increases in maternal mortality and morbidity as compared to White pregnant people.^{11,16}

The increasing incidence of cardiovascular disease and obesity drives the rising rate of maternal deaths.^{8,9} Based on the report from 14 Maternal Mortality Review Committees, cardiovascular conditions including pulmonary hypertension, hypertensive cardiovascular disease, and coronary artery disease accounted for 13.8% of pregnancy-related deaths from 2008 to 2017; hemorrhage and infection accounted for 13.1 and 11.4% respectively.¹⁷ Also, factors such as intimate partner violence, severe mental illness, and substance use are significant predictors of high psychosocial stress during pregnancy¹⁸ and pregnancy-related deaths.¹⁹⁻²²

Substance use during pregnancy is a significant public health issue in the United States. The use of substances including alcohol, tobacco, illicit drugs and other psychoactive substances during pregnancy can result in harmful effects for both the mother and child including placental abruption, miscarriage, stillbirth, low birthweight, neonatal abstinence syndrome and neurodevelopmental and respiratory problems, fetal and neonatal deaths.²³⁻²⁶ National survey data from 2016 highlights, within that year, that 8% of pregnant people used illicit drugs and 13% smoked cigarettes within a given one-month recall period, possibly exposing as many as 320,000 and 500,000 fetuses to the adverse effects of illicit drugs and tobacco respectively.²⁵ In addition, there was a fivefold increase in the use of opioids during pregnancy between 2000 and 2009.²⁴ These data highlight the importance of clinicians conducting verbal screening of pregnant people for substance use and providing the necessary support to avoid the detrimental effects of substance use in pregnancy.

All of these risk factors of maternal morbidity and pregnancy-related deaths are inextricably linked to various social determinants experienced by birthing people.

1.2 Epidemiology of Racial Disparity in Maternal Health Outcomes

The CDC's Pregnancy Mortality Surveillance System (PRAMS) data from 2007 -2016 showed that Non-Hispanic Black (Black) birthing people experience pregnancy-related deaths three times more frequently than Non-Hispanic White (White) birthing people.²⁷ In 2018, the maternal mortality rate for Black birthing people was 37.1 deaths per 100,000 live births, which was 2.5 times the rate for their White counterparts (14.7 deaths per 100,000 live births).¹² This disparity persists across age groups and education levels. The Black-White disparity ratio in the pregnancy-related mortality rate (PRMR) was 1.5 times as high for ages less than 20 years, 1.2 for birthing people aged 20 to 24 years, and 4.3 among those aged 30 – 34 years. Among birthing people with a high school degree, some college education, and college graduate or higher, the Black-White disparity ratio in PRMR was 2.3, 3.5, and 5.2, respectively.²⁷ In general, there is evidence that a higher level of education and income acts as protective factors for other health issues.²⁸⁻
³¹ However, studies have found that education, economic stability, and comorbid illness do not eliminate racial and ethnic disparities in maternal outcomes.^{27,32-35} The CDC's Pregnancy Mortality Surveillance System (PRAMS) data also buttresses these findings, as it shows that Black birthing people with a college education or higher have a PRMR 1.6 times that of White birthing people with less than a high school diploma.²⁷ In addition, a study by Harper et al. found that after adjusting for maternal age, income, hypertension, gestational age at delivery and receipt of prenatal care, the odds of pregnancy-related mortality among Black as compared to White pregnant people reduced only minimally from 3.07 to 2.65.³³

Data also demonstrate racial differences in severe maternal morbidity, with Black pregnant people experiencing the highest rates for 22 of the 25 severe morbidity indicators used by the CDC.³⁶ Data from seven US states showed that Black pregnant people have 2.1 times higher severe maternal morbidity rates as compared with their White counterparts.³⁶ In Pennsylvania, the maternal mortality rate (MMR) has more than doubled over the past twenty years, and its impact also varies by race and ethnicity.³⁸ Black birthing people are almost three times more likely to die from pregnancy-related causes as compared to their White counterparts, with a maternal mortality rate of 33.9 deaths per 100,000 live births in Black birthing people and 13.1 deaths per 100,000 live births in White birthing people.^{37,38}

Black pregnant people also have a higher case fatality rate from various conditions despite Black and White pregnant people experiencing similar causes of maternal death.^{7,39} A national study showed that Black pregnant people had a case fatality rate of 2.4 to 3.3 times higher than that of White pregnant people from specific pregnancy complications including preeclampsia, eclampsia, abruptio placentae, placenta previa, and postpartum hemorrhage.⁴⁰ Also, a study showed that among birthing people diagnosed with pregnancy-induced hypertension, Black birthing people were 9.9 times more likely to die than White birthing people.⁴¹ This study, by Rosenberg, also showed that for a diagnosis of hemorrhage, Black pregnant people were 4.7 times more likely to die than White pregnant people.⁴¹

1.3 Access to Maternal Health Services, Prenatal Care Utilization, and Maternal Health Disparities

Racial disparities in health outcomes are not limited to maternal health; substantial research shows that these transcend a variety of health issues, including infant mortality, cardiovascular disease, asthma, and HIV/AIDS, with Black people experiencing worse outcomes.^{42,43} One of the identified etiologies of the disparity is unequal access to health care. Although the United States does not provide universal health

insurance coverage, it does provide coverage in the form of Medicaid to low-income pregnant people, which covers their care during pregnancy, delivery, and up to 60 days of postpartum care. Thus, with equal access to prenatal care irrespective of age, race, and socioeconomic status, one would expect equitable utilization of services and pregnancy outcomes. However, this is not the case. Black pregnant people are less likely than their White peers to initiate prenatal care early in their pregnancy and utilize adequate care before the end of the pregnancy.^{34,44-47} Studies have attributed this finding to various factors including homelessness, lack of transportation, distrust of the healthcare system rooted in generations of structural stigma, and perceived discrimination from healthcare clinicians and experiences of racism.^{44,48-50}

Early initiation and adequate utilization of prenatal care is an evidence-based mechanism to improve maternal health outcomes.^{51,52} Prenatal care is an avenue to engage patients early in pregnancy and provide risk assessment, medical treatment when indicated, and psychosocial, cultural, and educational support, to improve pregnancy outcomes. The American College of Obstetricians and Gynecologists recommends pregnant people begin prenatal care in the first trimester and have at least ten visits.⁵³ Four or fewer prenatal visits is associated with maternal death and severe maternal morbidity, and Black pregnant people are less likely to meet the recommended threshold of care.^{11,33,34,54} Pregnancy Mortality Surveillance System (PRAMS) data also shows that Black pregnant people who die of pregnancy-related causes are more likely to initiate prenatal care later than White pregnant people.³⁴ An observational study also found an association between the provision and adequate utilization of prenatal care and a decline in maternal mortality rates in Black pregnant people.⁵¹ Late initiation and inadequate prenatal care visits are associated with adverse maternal behaviors and risk factors, including smoking, alcohol consumption, insufficient weight gain, and precipitous labor.^{11,16,55,56}

Black, Hispanic, and Native American pregnant people are at a higher risk of commencing prenatal care late in pregnancy, but only Black pregnant people are at significantly higher risk for maternal death.⁵⁷ This finding indicates the need to explore the specific exposures of Black birthing people that place them at disproportionate maternal health risks compared to other racial/ethnic groups, such as historical

experiences of racism and discrimination. Black pregnant people have reported receiving prenatal care that does not consistently meet their needs.^{49,50,58} Also, their experiences of racial discriminations and interpersonal racism such as racial bias while seeking prenatal care results in unequal barriers to high quality, respectful, patient-centered care experiences which could underlie the racial disparities in maternal health outcomes.^{50,59-62}

1.4 Preconception Care and Maternal Health Disparities

A pregnant person takes all of the biopsychosocial experiences they have been exposed to and have been part of their lives into their pregnancy,⁶³ emphasizing the importance of preconception care. The provision of preconception care improves a woman's reproductive planning and her overall health, thereby potentially enhancing her pregnancy outcomes. Preconception counseling allows for identification of maternal risk factors such as smoking, alcohol consumption, hypertension, as well as a review of the management of these conditions leading to optimized clinical health.⁶⁴ Petersen et al. estimated that the provision of universal preconception care for all birthing people with pregestational diabetes in the US could prevent 1800 perinatal deaths, 8000 preterm deliveries, and 3000 congenital disabilities annually.⁶⁵ The prevention of these events would save the US more than \$900 million in direct costs and \$4.5 billion in lost productivity.⁶⁵

The lack of universal healthcare coverage in the US leads to unequal access to preconception care.⁶⁴ Critically, birthing people do not have equal access to preconception care. Since Black birthing people are more likely to be uninsured, they are least likely to have access to preconception care.^{66,67} This situation is made worse by the fact that Black birthing people are more likely to have preconception risk factors and comorbid illnesses such as obesity, hypertension, and diabetes before pregnancy, and these conditions are more likely to have been developed at an early age and inadequately managed.^{54,67,68} In addition, Black

pregnant people are also more likely to develop complications and die from these conditions,⁶⁸ due to lack of access to healthcare services, chronic stress, inadequate utilization of the healthcare system due to distrust, experiences of racism and discrimination.⁶⁹⁻⁷⁴ The failure to systematically provide Black birthing people with preconception care represents a significant missed opportunity to impact maternal health outcomes.

1.5 Healthy People 2020

These deep racial disparities and inequities run contrary to the portrayal of America as a country of opportunity and a land of equality and justice for all. Eliminating these inequities is an essential goal of the “Healthy People 2020”, which is the US national agenda put in place by Congress.⁷⁵ For maternal, infant and child health, Healthy People 2020 (HP 2020) aims to improve the health and well-being of birthing people, infants, children, and families.⁷⁶ Regarding maternal health, the objectives aim to improve pregnancy health and behaviors, including early prenatal care utilization, and abstinence from substance use during pregnancy, and reducing the rate of maternal morbidities and mortalities.⁷⁶ The US can only decrease these rates by reaching the HP 2020 goal of achieving health equity, eliminating disparities, and improving the health of all groups.⁷⁵ Maternal health equity and attaining the ultimate goal of HP 2020 requires the identification of all factors associated with the disparity without prejudice and resolving them.

1.6 Social Justice and Equity in Maternal Health Care and Outcomes

As said by Martin Luther King, Jr., “Of all forms of inequity, injustice in healthcare is the most shocking and inhumane.” The persistent racial disparity in maternal health despite the availability of services disputes the notion that access to healthcare alone determines an individual’s health; health is also

influenced by the social environment. The concept of race in the US drives inequities in health outcomes, and its relevance is indisputable. The US is the only major industrialized country that reports health status by race and uses race as a proxy for culture, socioeconomic status, and genes.^{77,78}

Some scientific literature has proposed a genetic explanation for the racial disparity in maternal health outcomes.^{79,80} The poorer maternal health outcomes for Black birthing people have been attributed to genetic factors.⁷⁹ This is disputed by the healthy immigrant paradox or effect, in which studies have shown that Black immigrant pregnant people have better pregnancy outcomes than US-born African American pregnant people, even when the immigrants are more socioeconomically disadvantaged.⁸¹⁻⁸⁷ Also, studies found that Black immigrant pregnant people have maternal health outcomes similar to that of their White counterparts.⁸⁶ These findings undermine a racial genetic basis for the persistent racial gap in maternal health outcomes since if genetics was the primary determinant Black race should confer the disadvantage on all birthing people of African descent. It is interesting to note that studies have shown that the healthy immigrant effect erodes with acculturation and increasing length of residency in the US.⁸¹ These findings indicate the need to explore the social definitions of race within the US and its effect on biological outcomes as opposed to treating race as a biological construct.

A substantial number of studies have attributed the racial gap in maternal health outcomes to social, environmental, behavioral and health care variables.^{34,88-90} Multiple determinants underlie the maternal health inequities across various levels including the individual (race, education, socioeconomic status), family and interpersonal (cultural distrust), organizational level (cultural competence), community and neighborhood (concentrated unemployment, poverty, and residential segregation) and at the level of the society (policies).^{34,36,74} These factors have been impacted by the multiple experiences of racism, including racially prejudiced healthcare practices from slavery through the post-Civil Rights era.

There is a long history of racism in the US, and it has had far-reaching effects on the lives of many Americans. Racism persists in institutions and attitudes that marginalize Black pregnant people.^{50,73,91} In addition, the legacy of medical experimentation on Black pregnant people and discriminatory healthcare

practices have bred distrust in the health care system among Black individuals.^{92,93} The social determinants of health associated with varying forms of racism (internalized, institutionalized, and interpersonal) including low educational level, poverty, unemployment, and residential segregation, may account for the disparate maternal health outcomes. Racism is an essential determinant of health status because it contributes to inequitable access to social resources resulting in poverty, lower level of education and employment opportunities,^{35,42} which persistently shapes health behaviors, emotional and mental wellbeing, access to healthcare, and interactions with health professionals.⁹⁴⁻⁹⁷

Many studies suggest that Black birthing people are more likely than White birthing people to experience discrimination in all aspects of their lives, including in the work setting and from healthcare clinicians,^{50,73,74,98-102} receive suboptimal medical care,^{50,66,101,102} and undergo unnecessary surgeries such as hysterectomies at far higher rates.¹⁰³ These inequities are independent of socioeconomic status³⁵ and access to quality medical care,⁶⁶ as research has highlighted that at similar levels of socioeconomic status, insurance coverage, and healthcare access, Black people receive lower quality medical care than White Americans.⁹¹ Further, persistent exposure to discrimination results in adverse physical and mental health outcomes including chronic stress and hypertension and is also an important contributor to health disparities.^{91,104-109} This discriminatory pattern is also seen in the context of substance use during pregnancy. Despite studies documenting similar rates of substance use in pregnancy for Black and White patients,¹¹⁰ literature has shown that Black pregnant people are more likely to be tested for illicit drugs than their White counterparts.^{111,112} Additionally, studies have also reported racial inequities in child protective services demonstrating that Black birthing people are more likely to be reported than their White counterparts even in the presence of similar substance use rates, prenatal substance use hospital protocols and mandatory reporting policies.^{110,113,114} These findings suggest that race-based mistreatment is a likely etiology of the racial inequities in maternal health outcomes as it could affect the patient's trust in the clinician, prenatal care utilization and patient's satisfaction with care.

One of the emerging issues in health disparities is the disparate treatment of patients by health care clinicians, which negatively impacts their utilization of the health care system and health outcomes.⁶⁶ In 2002, the Institute of Medicine (IOM) released a report that documented widespread racial disparities in healthcare.⁶⁶ The report concluded that after accounting for access-related differences, the outstanding disparities could be partially due to exposures of discrimination from healthcare workers prejudices, biases, or stereotyping of their minority patients.⁶⁶ There is currently a shortage of research that highlights the role of racism along with other social determinants of health on maternal health outcomes and explores the role of a modifiable factor within the healthcare system, clinician's bias, on patient-clinician interaction (communication and decision making) and maternal care.

1.7 Patient-Clinician interaction: Patient-Centered Care, Relationship-Centered care and its Relevance

Patient-clinician interaction (communication and decision-making) is a fundamental component of all healthcare as it influences a patient's health outcomes through its effect on patient's satisfaction with care, subsequent utilization of healthcare services, continuity of care, and patient's compliance with treatment and management.¹¹⁵⁻¹²³ Patient-clinician interaction is one of the most complex interactions between individuals due to the difference in positions and power of the participants, its importance, as well as the fact that it is sometimes non-voluntary and requires close cooperation between both parties.¹²⁴ Patient-clinician interaction is especially vital in maternal care as it affects the health of both the mother and the baby. A quantitative study by Nicoloro-SantaBarbara et al. found that pregnant people's perception of better communication with their midwives was associated with better health behavior practices.¹²⁵ In addition, Dahlem et al. reported that a higher rating of patient-clinician communication was associated with satisfaction in prenatal care experience and trust in clinicians.¹²⁶ A qualitative study of Black birthing people

exploring clinician characteristics they desired in prenatal care highlighted clinician characteristics that included the provision of respectful and compassionate care and quality patient-clinician communication.¹²⁷

A favorable patient-clinician interaction is crucial to developing a good interpersonal relationship, information exchange, and optimal medical decision making between the patient and healthcare clinician.^{116,128} Studies have identified the patient-centered model of patient-clinician interaction as being the most effective method of achieving positive health outcomes and acts as a central component of high-quality health care. Interpersonal communication is the primary tool utilized for information sharing and exchange during patient-clinician interaction, and specific aspects of this communication affect the patient's behavior, well-being, health status, and outcomes.¹²⁹ Patient-centered interactions and communication are those in which the healthcare clinician actively seeks the patient's perspective by behaving in a manner that facilitates the patient's comfort and trust in fully expressing themselves and also takes into consideration the patient's unique needs and life experiences. In patient-centered communication, patients are more verbally dominant, with high rates of patient question-asking and a higher ratio of sociomedical talk than task-focused exchange. Socioemotional talk includes emotional, positive, and negative social talk, which enhances relationship building, facilitation, and patient activation. In contrast, task-focused medical exchange focuses on biomedical and psychosocial data gathering, patient education, and counseling. Studies have demonstrated that patient-centered communication improves patients' satisfaction, physician satisfaction, patient's health, continuity of care, and does not increase the duration of the consultation.¹³⁰⁻
¹³⁹ Positive patient outcomes are associated with a facilitating physician behavior rather than a dominating one.¹⁴⁰

To complement the advantages of patient-centered care, the Pew-Fetzer Task Force developed another model for interpersonal processes in health care termed relationship-centered care.¹⁴¹ Relationship-centered care emphasizes the importance of meaningful patient-clinician relationships in health care and not just appropriate technical processes within patient-clinician interactions, as the foundation of any therapeutic activity.¹⁴¹ Relationship-centered care goes beyond patient-centered practices in patient-

clinician relationship and incorporates the importance of clinician-clinician, clinician-community and clinician-self (clinician self-awareness) as intrinsic components of health care. Relationship-centered care recognizes that the clinician's attitude is not only influenced by the patient but also by the culture of the healthcare institution they work in, their understanding of the dynamics of the local community and its impact on their patients, as well as clinicians' self-awareness, self-reflection and integrity.¹⁴¹⁻¹⁴³ In 2006, Beach and colleagues described four principles of relationship-centered care in health care including dimensions of personhood as well as roles in the clinical encounter, the central relevance of affect and emotions in developing and maintaining relationships, the reciprocal influence of healthcare relationships and moral foundation and value of the formation and maintenance of health care relationships.¹⁴² In a society riddled with racist practices which impact the quality of health care and health outcomes, there is a need to view these principles of relationship-centered care through a critical race lens to achieve racial equity in health care. Hardeman et. al. applied a critical race lens to these relationship-centered care principles in the pregnancy and childbirth care setting. From a critical race perspective, clinicians need critical consciousness in which they understand how the history of racism determines their patients experiences and available resources. In addition, clinicians need to be race conscious which would involve an awareness of their racial bias and how these biases may impact their communication and clinical decisions. From a critical race lens, relationship centered care also involves clinicians moving their perspective from that of the majority group to that of the marginalized group which is termed "centering in the margins" and taking in the patient's perspective.¹⁴⁴ Furthermore, relationship-centered care will require a racial diversification of the health workforce as personal relationships are easier to build and maintain when the patient and clinician have a share sense of identity and experiences.^{145,146} The training and implementation of relationship centered care with a critical race lens in medical education and healthcare institutions will assist with improving the quality of health care and health outcomes and reducing racial inequities in health care.

In addition to patient-centered communication and relationship-centered care, patients and physicians believe that medical visit duration is essential for quality of care.¹⁴⁷ Patients are more satisfied and report greater ease in discussing their complaints and making decisions during longer medical visits.^{148,149} An integrative review of birthing people's experience of prenatal care highlighted preferences for unhurried visits, active participation in their care, and the development of meaningful relationships with their healthcare clinicians. Healthcare clinicians can achieve people's preferences through a patient-centered and relationship-centered approach to patient-clinician interactions.

Patient-clinician interactions are an essential path towards birthing people feeling supported in their utilization of healthcare services and their experience of care. A positive patient-clinician interaction will make pregnant people feel comfortable to discuss sensitive topics with their clinicians including substance use in pregnancy. Various patient and physician variables influence the pattern of patient-clinician interactions. These include patient characteristics, such as sociodemographic characteristics and networks, and physician characteristics, including the healthcare system they operate in and their psychosocial beliefs. We will explore these factors by utilizing an encompassing theoretical framework taking into consideration the historically racist and patriarchal nature of the US system.¹⁵⁰

2.0 Theoretical Framework

2.1 Introduction

Patient-clinician interaction (communication and decision-making) is an important contributor to healthcare quality and disparities in health outcomes.^{97,99} In the presence of equal access to maternal health care services, it is crucial to explore the role of patient-clinician interaction on maternal health service utilization, the quality of maternal care, and racial disparity in maternal health indicators. Data and studies highlight that Black pregnant people are disproportionately affected by poor maternal health outcomes as compared with pregnant people of other races/ethnicities. Studies have suggested the role of social determinants of health, including poverty, unemployment, and limited education, on health disparities. However, with these unequal adverse experiences by the Black race, racism is a probable underlying determinant of the racial gap in maternal deaths and morbidities. This research, therefore, aims to use the socioecological model (SEM) and public health critical race praxis (an adaptation of the critical race theory) to allow for a race-conscious orientation and describe the influence of racism and factors associated with patient-clinician interaction at each level of the SEM. The study will further explore the influence of clinician's implicit racial bias on patient-clinician communication pattern and clinician decision-making and its effect on prenatal care utilization, which could contribute to the racial disparities in maternal morbidity and mortality.

2.2 Socioecological Model and Public Health Critical Race Praxis (an adaptation of the critical race theory)

Multilevel influences impact an individual's health decisions, attitudes, and patient-clinician interactions. The socioecological model describes how individual, interpersonal, organizational, community, and societal factors¹⁵¹ impact health outcomes and disparity, and how influential factors at each of these levels interact with each other. Multiple factors contribute to the disparity in maternal health outcomes at the various SEM levels. However, this paper will focus on the racial disparity in patient-clinician interaction, which contributes to differences in the quality of maternal healthcare. It is, therefore, crucial to understand the actors embedded in the levels of the socio-ecological milieu and racial concepts that shape patient-clinician communication and clinician decision-making.

Addressing the persistent racial inequities in maternal health discussed earlier requires an understanding of the context of racialized social structures that influence differential access to health risks, opportunities, and resources. Critical Race Theory (CRT) provides an avenue to investigate historical racial experiences and racialized risk factors and allows for an understanding of current racial phenomena and discussion about complex racial concepts, thereby enabling the application of race-conscious orientation to research.^{144,152} CRT recognizes the occurrence of racism and race-consciousness in the American society and identifies its impact on American institutions, power structures and individuals, and the resultant marginalization and oppression of people of color.^{144,153} Ford and Airhihenbuwa developed the Public Health Critical Race praxis (PHCR), an adaptation of CRT that facilitates its utilization in public health equity research.^{152,154} PHCR has four focus areas including contemporary racial relations, knowledge production, conceptualization and measurement, and action.^{152,154} The PHCR schematic provides a guide for conducting race-conscious research and does not indicate hypothesized causal relationships. The current study will explore and operationalize these focus areas.

The utilization of both SEM and PHCR is essential to develop a full understanding of the factors contributing to the racial gap in maternal health outcomes, particularly factors that affect patient-clinician interaction. The historical and current experiences of medical experimentation, suboptimal healthcare experiences, and quality of care coupled with social determinants of health have worsened the relationship Black people have with the healthcare system. These theories allow for the exploration of how these factors are related to the quality of maternal care and racial inequity in maternal health outcomes. They also permit the investigation of the role of racial bias at the healthcare clinician level on the racial gap in maternal health outcomes. PHCR driven research requires an exploration of the effect of historical and lived experiences of Black people and the impact of the varying forms of racism on study outcomes.

2.3 Historical Legacy, Contemporary Experiences, Coping Strategies and Effects on Maternal Health Inequities

Historical and contemporary factors have shaped various aspects of the lives of Black birthing people contributing to their personal experiences, utilization of the healthcare system, and healthcare experiences. The historical events that play a role in current maternal health outcomes span from the period of slavery in 1619, through the era of Jim Crow and Civil Rights, to the current Post-Civil Rights period. During these periods, healthcare professionals used Black women as the foundation of the American medical system through medical experimentations, particularly in sexual and reproductive health.¹⁵⁵

During the period of slavery, health professionals subjected enslaved women to non-consensual medical experiments, including gynecological and reproductive surgeries such as cesarean section and ovariectomy, ostensibly to improve the quality of these procedures.^{150,156} Through repeated experimentations, Francois Marie Prevost established cesarean section surgeries on American enslaved women.⁹² The “Father of Modern Gynecology”, James Marion Sims, achieved his status by performing

many reproductive experimental surgeries without anesthesia to treat various illnesses during childbirth among a group of Alabama enslaved Black women.^{92,156}

Even after the discontinuation of legalized slavery, non-consensual medical experiments continued on Black women.¹⁵⁰ Impoverished Black women lacked or had inadequate health care services, and they were exposed to compulsory sterilization.¹⁵⁷ During the Jim Crow era, eugenic programs commenced with Black women coerced to undergo sterilizations without the women's knowledge that these procedures were not reversible. From the early 1900s to the 1970s, thirty US states supported formal eugenics programs that imposed compulsory sterilization. Another medical experiment in the US, the "Tuskegee Syphilis Study of Untreated Syphilis in Black Men" not only affected the men but also led to their wives acquiring syphilis and some of their children suffering complications from congenital syphilis.^{158,159}

The Civil Rights and post-civil rights eras have had more subtle yet still destructive forms of racism, including legal segregation in healthcare.¹⁶⁰ During this period, federal funding supported enforced sterilization, with Black birthing people being threatened with denial of medical care or discontinuations of their medical benefits if they refused sterilization.¹⁶¹ Also, many Black birthing people had unnecessary hysterectomies as practice for medical students at some teaching hospitals.¹⁶² The legacy of these practices continues as studies have shown that Black birthing people experience racial discrimination when seeking family planning services.^{61,163} Black birthing people are more likely to be advised to reduce childbearing,^{61,163} and Black birthing people of low socioeconomic status are more likely to be recommended intrauterine contraception (a long-acting contraceptive) as compared to their White peers.¹⁶⁴

The American healthcare system has a long history of enacted racism, which impacts the health of Black people. Benkert et al.'s study highlights the strategies Black birthing people have developed to cope with perceived healthcare discrimination, including anger, being assertive, and walking away, which has led to the stereotype of the "angry Black woman".¹⁰⁷ Studies have shown that the employment of these active coping strategies results in fewer health risks than passive coping.^{165,166} Passive coping with discriminatory experiences leads to increased heart rate variability and blood pressure in Black people.^{165,166}

The field of obstetrics and gynecology advanced from American slavery and the bodies of Black birthing people without their consent, resulting in the precarious relationship Black birthing people have with this field and its practitioners.⁹³ The racism rooted in the American medical system and the continuous mistreatment of Black birthing people underlies the health risks experienced by these people. These events have engendered Black birthing people's suspicion of the healthcare system and distrust of healthcare clinicians that have historically victimized their ancestors for centuries,^{66,167} could have contributed to their late initiation and inadequate use of prenatal care.

Therefore, an essential strategy for reducing health disparities is for healthcare clinicians to be more sensitive to the personal and cultural concerns of Black birthing people. This includes providing medical care in a manner that does not perpetuate these historical experiences and discrimination. It is critical that the healthcare system and healthcare clinicians decolonize their medical care, including obstetric and gynecological care, and employ comprehensive antiracist policies to prevent maternal morbidities and mortalities and reduce racial disparities in these maternal outcomes.

One of the health care level factors which could contribute to persistent disparities is the systemic differences in the quality of health care received by pregnant people due to race. Reports have attributed the gap to possible implicit bias of healthcare.⁶⁶ There is a dearth of research exploring real-life scenarios of clinicians' implicit bias on patient-clinician interaction during the perinatal period and its impact on prenatal care utilization. To explore healthcare clinician's implicit bias, we have to understand the different forms of racism a woman could encounter and their effects. The different levels of racism could also have a role to play in the interaction between the woman and her healthcare clinician.

2.4 Definition and Levels of Racism

Williams defines racism as an “organized social system in which the dominant racial group, based on an ideology of inferiority, categorizes and ranks people into social groups called “races,” and uses its power to devalue, disempower, and differentially allocate valued societal resources and opportunities to groups defined as inferior”.¹⁶⁸ Racism operates in different forms and on multiple levels. Jones outlines three levels of racism that contribute to racial disparities in health.¹⁶⁹ Institutional or structural racism is racial differences in access to goods, services, and opportunities in the society due to societal laws, policies, and practices that create and sustain racial inequities.¹⁶⁹ It is characterized by institutional laws and practices which result in effects such as social segregation and unequal access to health services, which contribute to the disparity in healthcare quality for racial/ethnic minority groups. Personally mediated racism includes prejudice and discrimination and can be intentional or unintentional.¹⁶⁹ An example is preconceived ideologies of healthcare clinicians associated with minority racial groups, resulting in the provision of lower healthcare quality to these groups. The third level, internalized racism, is the acceptance and embodiment of stigma and negative messages about intrinsic worth by the racially oppressed groups.¹⁶⁹ Internalized racism manifests in various ways, including engaging in risky health behaviors.¹⁶⁹ Literature demonstrates that internalized and interpersonal racism contributes to the higher prevalence of risky health behaviors including smoking and alcohol consumption seen in Black people as it acts as a coping mechanism for the lower levels of happiness and satisfaction, lower self-esteem and experiences of higher levels of chronic health conditions and psychological distress.¹⁷⁰⁻¹⁷⁵ The persistence of institutional and interpersonal discrimination in the United States is due to deeply ingrained racism in American culture, which is referred to by Williams as cultural racism.¹⁶⁷

All of these forms of racism can produce effects at the individual and population levels. The three levels of racism, internalized, interpersonal, and institutional racism, harm health through various pathways,^{95,96,167,176} and play a critical role in maternal health outcomes. At the level of the healthcare

system, studies have shown that interpersonal racism in the form of implicit bias on the part of healthcare clinicians has contributed to the racial disparities in healthcare through disparities in quality of care, patient-clinician communication pattern, clinician's decision making and management.^{164,177-184} The investigation of the effect of clinician's racial bias on pregnant people during the perinatal period and maternal health outcomes in non-hypothetical situations is required to determine if it also contributes to the racial disparity seen in maternal health outcomes.

Theoretical framework/ Conceptual model^{34,74,99,126}

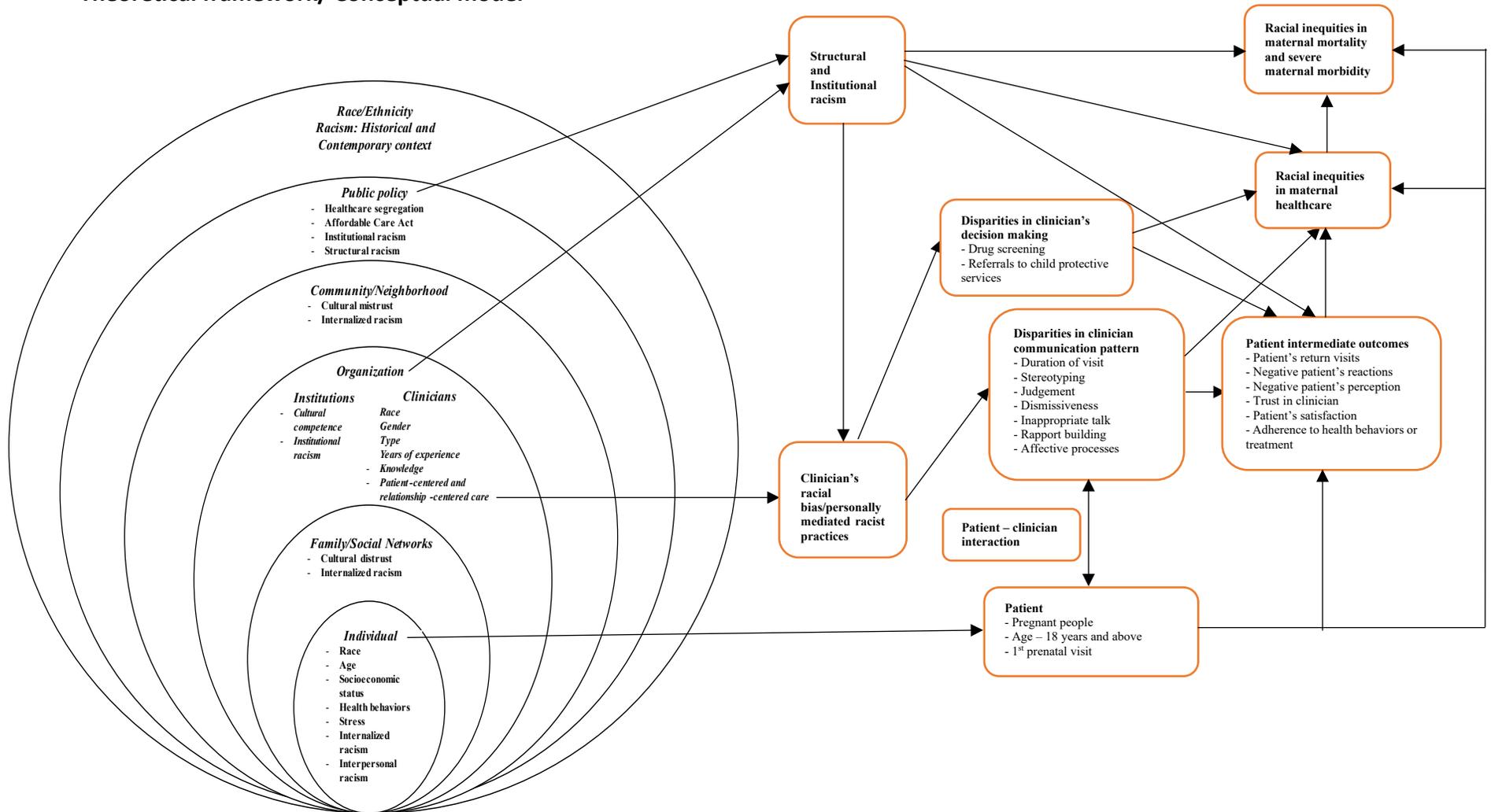


Figure 1: Theoretical Framework/ Conceptual Model^{34,74,99,126}

2.5 Application of the Socioecological Model and Public Health Critical Race Praxis to Understand Racial Inequities in Maternal Health Outcomes

2.5.1 Individual level

A woman's intrinsic characteristics contribute to her health status. Some of these are non-modifiable such as race and age, while others are modifiable, such as level of education, socioeconomic status, and health behaviors. These factors including internalized and interpersonal racism, also influence a woman's interaction with her healthcare clinician.^{185,186}

A substantial number of studies have highlighted racial disparities in quality of healthcare even with equal healthcare access due to differences in patient-clinician communication, cognition, decision making, and management based on the patient's race. Black birthing people have reported their perceptions of receiving substandard care from their healthcare clinician during maternal care as a result of the color of their skin.^{50,101,187} This is due to the clinicians' assumption that Black people are of low socioeconomic status, have low levels of education, are more likely to engage in adverse health behaviors and are less likely to adhere to healthcare management.^{115,188} This evidence is reinforced by studies that have demonstrated that healthcare clinicians often provide substandard care to low SES patients as compared to high SES patients due to stereotyping of low SES patients as being less adherent to recommended management and having poorer self-control.¹¹⁵ Studies have also reported suboptimal patient-clinician interaction among patients with lower educational levels, lower levels of literacy, low levels of knowledge about health issues, and inadequate linguistic and informational resources to communicate effectively with their clinicians.^{97,189-192} Low SES also predisposes patients to inadequate access to healthcare services. Low-income pregnant people might not have access to healthcare services before being pregnant, and this could also affect their ability to navigate the healthcare setting and communicate effectively with their healthcare

clinicians. In addition, studies have found that young patients usually have less participatory medical consultations and experience more barriers to medical discussion as compared to older patients.^{69,189}

Unfortunately, Black birthing people are more predisposed to these contributing factors of poor patient-clinician interaction as compared to their White counterparts. This higher predisposition to risk factors is because, on average, Black birthing people have a higher likelihood of having lower education levels, lower socioeconomic status, and younger maternal age^{34,193} due to various reasons. These include the social context of race in the US, which acts as a determinant of access to social resources such as education, jobs, healthcare, and economic opportunity,^{35,95,167,194} resulting in lower access to these resources for Black people. Economic factors and historical events have marginalized Black birthing people and entrenched them in continuous and intergenerational cycles of inequity.

In addition to and because of these predisposing factors, Black birthing people are also more likely to engage in risky health behaviors, have comorbid illnesses such as hypertension and diabetes,^{34,195,196} and experience racism⁹⁸, which also contribute to patient-clinician interaction.^{69,97} Research has found that birthing people with hypertension and diabetes have a greater reluctance to ask questions from their healthcare clinician, which affects communication patterns. In addition, internalized and interpersonal racism affects patient-clinician interaction^{50,97,197} through the race-related feelings and thoughts of Black people, their distrust of the healthcare system due to historical events, and a Black individual's expectation or past experiences of healthcare clinician discrimination.^{74,97,108,198,199} Internalized racism in the form of low self-worth and low self-confidence may influence what the patient says or does during the consultation. Also, a Black patient's heightened sensitivity to discrimination and bias due to past experiences or expectations of prejudice results in stereotype threat in medical encounters, which makes them reluctant to ask questions or provide relevant medical information, thereby negatively affecting their interaction with the healthcare clinician.²⁰⁰ This lifetime and constant exposure to racism, traumatic life events, poverty, and abuse on Black birthing people results in increased maternal stress.^{201,202} These chronic stressors also

negatively affect social relationships, including patient-clinician relationships, and communication behavior, which could be health-protective.²⁰³

2.5.2 Family and Interpersonal level

A woman's social network also plays a role in her medical interaction. According to the social identity theory, when an individual's group membership is essential, their feelings of esteem are closely tied to the status of the group they belong to, and they display their perception and behavior in a manner that promotes their group's distinctiveness and enhances the group's status.²⁰⁴ Therefore, a Black woman's interaction with her healthcare clinician is influenced by the cultural distrust and internalized racism of the Black minority group.

Cultural distrust is the tendency for Black people to distrust White individuals due to the history of medical experimentation and the legacy of medical mistreatment.^{205,206} Black people are also of the belief that they will be the target of prejudice and discrimination when they interact with White people.²⁰⁷ This results in interactions between Black and White people within a unique historical and sociopolitical context that influences each party's comfort, sense of balance, power, trust, and perception of the interaction. Black patients have reported more negative perceptions of their communication with healthcare clinicians when consulting with White physicians than with Black physicians, which could be a result of the cultural distrust.^{208,209} This patient-clinician race discordant interaction is inevitable when seeking medical care, as statistics show that approximately 75% of Black patients see non-Black physicians for medical care.²¹⁰ This race discordant patient-clinician pairing is not entirely by the patient's choice as there is underrepresentation of racial minority groups in medical schools and practice.²¹¹ Also, data show that while 12% of the US population is Black, only about 4% of all physicians self-identify as Black.²¹² Studies have associated cultural distrust and internalized racism of the racial minority groups with low self-esteem and healthcare dissatisfaction, both of which influence medical interactions.^{209,213,214} These are worsened by

study findings that doctors provide more patient-centered care to patients they perceive as being good communicators, more involved in medical interaction, and less contentious.²¹⁵

2.5.3 Neighborhood and community level

Neighborhood and community characteristics play a role in a patient's interactions with their healthcare clinician. Studies have associated neighborhood characteristics, including residential segregation, concentrated poverty, unemployment, built environment, and lower educational level with lack of or inadequate access to healthcare. These challenging characteristics of a patient's social environment could also directly and indirectly influence patient-clinician interaction in various ways.

The resultant lack or inadequate access to healthcare services as a result of the problematic social environment could influence a patient's ability to seek the care they require and to communicate effectively with their healthcare clinician due to a lack of past experiences dealing with such situations. In addition, the low SES and low literacy level of the community may result in community-level stigma, which also impacts a patient's comfort and trust in their healthcare clinician, thereby influencing the medical interaction. A meta-analysis study by Reid et al. postulated that Black people living in residentially segregated communities with widespread negative attitudes towards Black people might feel they are targets of discrimination and prejudice, and thereby trust White people less.²¹⁶ This may also influence their medical interaction with White healthcare clinicians.

These challenging neighborhood and community settings are more frequently associated with Black segregated areas, and literature has historically related these as institutional racism.^{217,218} The knowledge by Black people that these poor environmental conditions are as a result of racism may further enhance their feelings of being the target of discrimination and their distrust of the healthcare system, which could influence their interaction with healthcare clinicians, particularly White clinicians.

Also, studies have associated the built environment within Black segregated areas and neighborhood poverty with a higher prevalence of comorbidities, including hypertension, diabetes, and obesity.²¹⁹ LaVeist et al. found that when Black and White individuals lived in an integrated setting, there was a substantial narrowing of the racial gaps in hypertension, diabetes, obesity among birthing people, and health services utilization.²²⁰ Having these comorbid illnesses also affects patient-clinician interaction, as demonstrated by Attanasio et al., who found that Black birthing people with these diseases were more reluctant to ask questions during medical consultations and had higher odds of perceived discrimination.⁶⁹

2.5.4 Public Policy level

At the public policy level, institutional racism facilitates interpersonal and internalized racism by enhancing attitudes, practices, beliefs, and policies that are favorable to White people facilitating White supremacy while disadvantaging other racial groups.²²¹ Racially discriminatory policies affect housing, employment, and educational opportunities, as well as access to healthcare and healthcare quality, which directly and indirectly influence medical interactions.¹⁶⁷ Before the passage of the Civil Rights Act of 1964, healthcare segregation existed as a matter of policy, resulting in unequal access to and quality of healthcare services for Black people.^{222,223} The enactment of the Civil Rights Act and the expansion of the Affordable Care Act has improved healthcare access for low-income Black people and birthing people; however, it has not sufficiently improved the quality of care available to Black people.^{66,223-226} This could be due to their previous lack of access to healthcare that might make it difficult to navigate the healthcare system and communicate effectively with their healthcare clinicians, and clinicians and the healthcare system have also not supported Black people in this process. Also, low-income birthing people have also reported perceived discrimination from healthcare clinicians due to their insurance type including Medicaid, which also impacts their perception, trust, and interaction with clinicians.^{48,50,101,227}

Implementation of certain policies could be instrumental in addressing factors adversely affecting patient-clinician interactions. An example of this would be policies that facilitate enrollment of racial minority groups in medical schools to increase the number of minority health professionals, thereby increasing racially concordant patient-clinician partnerships, which studies have found to improve access to care, patient-clinician interaction, and satisfaction with healthcare among Black patients.²²⁸

2.5.5 Organizational level

Patient-clinician communication and clinician decision-making are influenced at the organizational level by factors within healthcare institutions and healthcare clinician variables.

2.5.5.1 Healthcare institutions

Institutional racism is exhibited in health-related institutions by the lack of racial diversity in the healthcare workforce. According to the 2019 Association of American Medical Colleges report, 56.2% of active physicians are White.²²⁹ White people are also more dominant in prestigious specialties and leading major medical practices, hospital systems, and public health institutions.²²⁹ This lack of diversity impacts the healthcare system's level of knowledge and understanding of the cultural needs of the racial minority group, including during medical interactions. Cultural competency includes cultural awareness, behaviors, knowledge, attitudes, and policies that allow healthcare institutions and their clinicians to effectively serve and respond to health care encounters with diverse racial/ethnic patients.^{230,231} Over the years, cultural competence has evolved. Previously, healthcare professionals learned information and made assumptions about patients based on their race, ethnicity, or cultural background, but now they are trained to develop and utilize skills that align with the principles of patient-centered care.²³² A healthcare professional can only become culturally competent with the support of the health system they operate. A healthcare institution can, therefore, improve patient-clinician interaction by implementing cultural competence

interventions. These interventions include implementing a structural process of care that guarantees full access to quality care for all its patients and by ensuring that the workforce and leadership are diverse and representative of its patient population. The incorporation of cultural competence in health care is a crucial step towards achieving the overarching goals of Healthy People 2020 of attaining health equity and eliminating health disparities.

2.5.5.2 Healthcare clinician

Literature has emphasized the crucial role the physician's behavior plays in the patient-clinician interaction.¹⁴⁰ A healthcare clinician's interpersonal behavior has an effect on patient behaviors including communication, health-seeking behavior, healthcare utilization, and adherence to treatment and recommendations.^{130,140,215,233} Healthcare professional characteristics that influence patient-clinician interaction include designation, gender, race, and years of experience. In addition to these, studies have also demonstrated the role of physicians' interpersonal racism in patient-clinician interactions. Most healthcare clinicians are consciously dedicated to providing equal treatment for all patients and eliminating racial disparities in health care, but they are also not immune to the cultural and social forces and the racial frame they are exposed to within the American society, which results in racial bias. Despite the best intentions of physicians for healthcare equity, racial disparities in patient-clinician interaction and decision-making, leading to racial disparities in health care, occur, which may result in racial disparities in morbidities and mortalities. One of the main contributors to these disparities is racial bias, specifically clinician's implicit racism.^{66,234}

Racial bias involves negative feelings, perceptions, and evaluations of individuals because of their racial group membership, overgeneralized beliefs about the characteristics of the racial group members, and inequitable treatment. Racial bias may be explicit, which is conscious or intentional and usually self-reported, while implicit bias is activated automatically and occurs unconsciously. As indicated in the Hippocratic Oath, the medical profession disavows any form of explicit racial bias. Explicit expressions of

interpersonal racism are rare, and acts that could exemplify explicit bias in medical care are generally and strongly condemned.¹⁷⁸ Despite this, there is substantial evidence of the more subtle, unintentional implicit racism in healthcare clinicians.^{235,236}

Implicit bias develops early in life as a result of intermittent reinforcement of social stereotypes. Studies have shown that implicit pro-White bias occurs among children as young as three years old throughout the world and usually remained unchanged.²³⁷⁻²⁴⁰ Greenwald et al. also highlighted that the majority of non-Black individuals in the US exhibit biases against Black people.¹⁸⁴ Studies have also found that the majority of physicians show a moderate to strong implicit preference for White people as compared to Black people.^{235,236} Physicians also demonstrate implicit bias in other areas, including gender, age, and obesity,²⁴¹⁻²⁴⁶ but this study will focus on implicit racial bias.

Physicians are prone to relying on stereotypes and racial bias due to varying factors including the presence of uncertainty and time sensitivity surrounding diagnosing patients.²⁴⁷⁻²⁵¹ In addition, healthcare professionals' training facilitates group level information and may expose medical students or trainees to minorities in unfavorable circumstances such as substance use disorders, thereby reinforcing stereotypes.²⁵² Also, their vast knowledge of scientific information may result in a strong belief in their objectivity, thus promoting bias in decision-making.²⁵³ Healthcare clinicians are also more likely to rely on stereotypes for outgroup members, who are people they see as not like them, including those that belong to a different racial or ethnic group.²⁴⁷ People are prone to viewing outgroup members as homogenous thereby making fewer distinctions between them, while ingroup members (members of similar race or ethnicity) are more likely to be considered to be heterogenous.²⁵⁴⁻²⁵⁷

Judd et al. have suggested that utilization of stereotypes backed by statistical evidence might be acceptable,²⁵⁸ but even evidence-based stereotypes may result in disparities in care when clinicians fail to consider individual data in their diagnoses and decision-making processes. The creation of racial disparity in care does not require a White clinician to treat a Black patient poorly; merely providing more favorable

treatment to a White patient will lead to the disparity. Therefore, it is crucial to identify the presence of implicit racial bias in healthcare clinicians and address them.

Implicit racial bias can be measured directly by utilizing the Implicit Association Test (IAT), and can also be suggested by analyzing data to identify the presence of implicit bias.^{259,260} Studies have shown that healthcare professionals could have low explicit and implicit racial bias, especially female clinicians, and some could have low explicit but high implicit racial bias. Dovidio et al. used the term “aversive racist” for people with low level of explicit racial bias but high levels of implicit racial bias because they view racial bias as being aversive but are unconsciously biased, especially in the absence of set guidelines for decision-making or management.²⁶¹

Social psychology research has demonstrated that implicit racial bias influences an individual’s nonverbal behaviors, including eye contact and body posture, and paraverbal behaviors, including the amount of speech and speech speed.²⁶² Also, racial bias has been related to social dominance, with the minority group being the target, therefore affecting patient-clinician communication patterns.²⁶³ Healthcare clinicians' implicit racial biases result in racial disparities in healthcare and health outcomes through two pathways, including racial disparities in patient-clinician communication and clinician’s decision making.⁹⁹ Studies have found that healthcare clinicians with implicit pro-White bias on the IAT correlated with Black patients reporting poorer communication, lower quality of care, less patient-centered care, lower levels of trust and satisfaction in care.²⁶⁴⁻²⁶⁶ This finding was consistent even though the researchers conducted the studies in different US regions, with healthcare clinicians of different race/ethnicities and varying experiences, and with new and long-term patients. Also, studies found that physicians with higher implicit bias tend to speak faster, speak more, manifest anxiety, and use more anxiety-related words and have shorter visits with Black than with White patients during interactions.^{182,264,267} A study also showed that clinicians with higher implicit racial bias tend to use more first-person plural pronouns such as we, us, and our, which reflect social dominance.²⁶⁸ Mustillo et al. also found that Black pregnant people were less likely to receive medical advice, information about health risks, and complications during interactions with their healthcare

clinicians than their White counterparts.²⁶⁹ Therefore, healthcare clinicians' implicit racial bias is generally linked with a lack of patient-centered communication.

Studies have also highlighted the effect of implicit racial bias on the clinician's decision-making, including interventions and management of children and adults. Black patients seen in emergency departments were likely to receive less analgesia than White patients.^{270,271} Another study showed that physicians with higher implicit bias were less willing to prescribe narcotics for the management of pain for Black as compared to White pediatric patients.²⁷² In acute coronary syndrome, Black patients were less likely to receive appropriate therapies as compared to their White counterparts.¹⁷⁸ This implicit racial bias also influences decision making in medical students. Calabrese et al. found that after medical students read a case of a Black versus a White patient at risk of HIV, the medical students indicated that the Black patient was more likely to engage in risky sexual behaviors if given prophylactic antiretroviral drugs and this led to a reduction in their willingness to provide the drugs.²⁷³ In the perinatal period, implicit racial bias in decision making resulted in lower prenatal treatments with tocolytics and antenatal steroids in Black birthing people as compared to White birthing people with similar clinical features.²⁷⁴ These disparities in the treatment of Black patients as compared to White patients with Black patients receiving suboptimal care has also been reported in renal and liver transplantation, orthopedic surgical procedures, cancer treatment, and rehabilitative and neurologic services.²⁷⁵⁻²⁸⁰ Most of these studies utilized theoretical patients to measure implicit bias in treatment decisions.

A healthcare professional's behavior influenced by implicit racial bias may induce stereotype threat among patients, which may negatively impact the patient's communication, healthcare utilization, and treatment adherence. Studies that have utilized the IAT have found that implicit racial bias varies by the race and gender of the physician, with women showing less implicit race bias than men and Black people being neutral. These findings validate study findings of better patient satisfaction with care, treatment adherence, and health outcomes with race concordant patient-clinician relationships, especially for Black

patients. This further emphasizes the importance of policies and practices which ensure more diversity in the healthcare workforce.

2.6 Conclusion

The introduction provides overwhelming evidence of the presence and effect of implicit interpersonal racism of clinicians on their and the patients' behaviors, disparities in care, and health outcomes, emphasizing the importance of exploring the presence and effect of racial bias in maternal health and its contribution to the racial disparities in maternal morbidity and mortality.

Section 4.1 presents a quantitative analysis of racial disparity in clinician communication pattern during the patient's initial prenatal visit. Section 4.2 discusses another quantitative analysis of racial disparity in illicit drug use toxicology testing based on patient's disclosure pattern. This section also presents a quantitative analysis of racial disparity in involvement of child protective services in birthing people who test positive for substance use during labor/delivery. Section 4.3 presents a mixed-method analysis (qualitative dominant) of patient's perception of clinicians' communication behavior and racial trends in these reports.

The dissertation concludes by summarizing the racial inequities in clinician communication pattern and diagnostic testing and recommendations.

3.0 Methods

This dissertation includes 3 distinct manuscripts. We present the three papers within the results section. The first paper measures racial disparity in patient-clinician communication during the initial prenatal visit. The second paper measures racial differences in illicit drug use testing during the initial obstetric visit based on patients' current illicit drug use disclosure pattern and racial disparities in referral to Children, Youth, and Families office. The third paper explores patients' perception of clinicians' communication behaviors. The current methods section represents a summary of the three papers with more details of the data analysis for each paper included in the results section.

3.1 Design

The current study utilized data from an NIH-funded parent study (Talking to Pregnant Patients – T2P2), an observational study of patient-clinician communication regarding substance use in first prenatal visits. The goal of T2P2 was to identify communication styles and processes that encourage pregnant, substance-using people to disclose alcohol or illicit drug use and subsequently inform patient-clinician conversations that promote the adoption of positive behaviors.²⁸¹ T2P2 enrolled 479 pregnant patients during their first obstetric visit (average gestational age (GA) of patients at the first obstetric visit – 12.1weeks, minimum GA – 2.4weeks, and maximum GA – 39.3weeks). The study team collected audio recordings of pregnant people's initial obstetric visits, administered post-visit questionnaires including a detailed alcohol use assessment, collected urine samples for toxicology and cotinine testing, abstracted medical records data from participants and their infants, and conducted semi-structured interviews with some patient participants.^{281,282}

3.2 Research Aims

The research aims for the first paper were to: 1) quantitatively measure racial disparity in clinician communication pattern during the patient's initial prenatal visit, 2) quantitatively measure if elements of the clinicians' communication behavior moderate the relationship between a patient's race and prenatal care utilization.

The research aims for the second paper were to: 1) quantitatively measure racial disparity in illicit drug use testing for patients who disclose illicit drug use at the initial prenatal visit, 2) quantitatively measure racial disparity in illicit drug use testing for patients who do not disclose illicit drug use at the initial prenatal visit, 3) quantitatively measure racial disparity in referral to children, youth and families (CYF) office for patients who test positive for substance use during labor/delivery.

The research aims for the third were to: 1) qualitatively explore patients' perceptions of clinicians communication behavior during their prenatal visit, 2) quantitatively measure racial trends in patients' reports of clinicians' communication behavior.

3.3 Description of the parent study

The parent study enrolled 479 pregnant patients collecting data from audio-recorded initial obstetric visits, administered questionnaires including a detailed alcohol use assessment, urine samples for toxicology and cotinine testing, medical record abstraction, and semi-structured qualitative interviews.²⁸¹ The active study period (participant recruitment to semi-structured interviews) took place from February 2011 through August 2014 while patient medical record abstraction continued till 2018. Patient and clinician participants were provided with incentives for each stage of the study.

3.3.1 Setting

The audio-recorded first obstetric visits between patients and obstetric care clinicians were from five outpatient obstetrics and gynecology clinics located in Pittsburgh, Pennsylvania. These clinical sites serve racially diverse birthing people, of whom about 50% or more utilize Medical Assistance (Medicaid) as their health insurance.

3.3.2 Participants

The study team recruited patient and clinician participants. Patients were eligible if they were pregnant, 18 years of age or older, English speaking and attending their first obstetric visit. Clinicians, including nurse midwives, nurse practitioners, physician assistants, obstetrics and gynecology faculty physicians, and obstetrics and gynecology resident physicians, were eligible if they saw patients for first obstetric visits at the participating study sites.

The study coordinators recruited clinicians from the five outpatient clinics, and the clinicians signed written consent before participating in the study. Patients were recruited for the study using recruitment flyers and by medical assistants and/or clinic nurses asking patients if they were interested in hearing about the study. Study staff then described the study to those patients who were interested. At the time of consent, patients were told that the study was about patient-clinician communication and that the study team was interested in how clinicians talked to patients during their first obstetric visits. Patients understood that the clinicians were the study focus and that the research team was looking for ways to improve clinician communication. Patients were not specifically told that the study was focusing on substance use discussions or communication before the prenatal consultation. Patients who agreed to participate in the study signed an informed consent form that included digital audio-recording of the first obstetric visit, post-visits administered questionnaires, and permission for data abstraction from the prenatal, labor and delivery,

postpartum, and newborn records (Pt Consent 1). After the audio recorded first obstetric visit, the study team informed patient participants of the study's substance use focus and no patient voluntarily left the study following this information.

The study team told clinicians that the study was about patient-clinician communication; clinician participants were blinded to the actual study topic or knowing that the study team was explicitly looking about substance use communication or discussions. At the end of clinicians' study participation (which occurred after participating in recorded visits with ten patient participants or if they were planning to leave their position at the study sites) the research team informed the clinicians about the study's substance use focus.

The research team asked any third parties (e.g., partner, husband, sibling, mother, and friend) with patients enrolled in the study to sign a consent form giving the research team permission to be audio recorded. They could identify if they did not want their conversation included or transcribed (two separate lines provided for signature on consent). For those third parties who did not want to be included, their communication was removed from all transcripts. Third-party communication that was also not consented was removed from all transcripts.

3.3.3 Data Collection Methods

3.3.3.1 Audio recording of first obstetric visit

The research personnel placed a digital voice recorder in the exam room with the patient prior to the obstetric care clinician entering the room. They began recordings when the patient entered the examination room and before seeing the clinician. The team stopped the audiotape when the patient exited the room to be discharged from the clinic. The entirety of visits, including health history and physical exams, were audio recorded. After the audio-recorded obstetric visit, a research team member debriefed patient participant about the focus on substance use, allowing participants to voice any questions or

concerns or consider withdrawal of participation. All patient participants decided to remain in the study. Out of the 479 enrolled participants, there were no audio recordings for 11 participants due to recorder malfunction. The study team provided patient participants with a \$20 gift card following the completion of the audio-recording of their initial obstetric visit. Clinician participants were given \$10 gift cards for each audio-recorded visit.

3.3.3.2 Post-visit questionnaire

The study team also administered written post-visit questionnaires, including sociodemographic characteristics, patients' obstetric histories, alcohol-use assessment using a validated instrument, questions about the consultation, and if the recording affected their behavior.

3.3.3.3 Post-visit urine toxicology and cotinine testing

At this time, study team members disclosed a study focus on substance use communication and invited participation in additional phases of the study, including the provision of urine for toxicology and cotinine testing in the research laboratory. Willing participants signed an additional consent form (Pt Consent 2); test results were not connected to the medical records or shared in any way with the obstetrical team. The study team gave patient participants \$10 gift cards if they provided urine to the study team for urine testing following their initial visit.

3.3.3.4 Semi-structured interviews

Additionally, from the larger set of study patient participants, the study team invited a subset of patient participants to participate in semi-structured interviews within four weeks of their recorded obstetric visit to discuss perspectives on prenatal substance use and listen to portions of the recorded visit and share their thoughts and reactions regarding the substance use communication. Patients were eligible for the semi-structured interviews based on meeting one or more of the following criteria:

- Disclosed substance use to their obstetric care clinician during their first audio recorded obstetric visit.
- Had a positive urine drug screen from the test conducted by the study team
- Disclosed current alcohol use to study staff during the post questionnaire

All interviews were conducted in person. Eligible and interested participants signed a separated consent form (Pt. Consent 3). The interviews focused on the patients' expectations of the visit, their perception of the general patient-clinician communication, and substance use communication during obstetric encounters. Participants were also asked if they had concerns about disclosing their substance use habits to their clinicians and were asked to provide suggestions for obstetric clinicians to improve or change their approach/screening or discussions about substance use, as well as recommendations on ways to improve prenatal care and patient-clinician communication in general. During the interview, interviewers played back portions of the first obstetric visit, specifically addressing patient participants' substance use. Participants were asked to react to the discussions regarding substance use and provide suggestions on what changes the clinician could make, what the patient did or didn't like, and their overall impressions of the interaction. Each interview was audio-recorded, and the interview duration ranged from 18 to 43 minutes, with a mean interview duration of 29 minutes. Interviews were transcribed verbatim and reviewed by interviewers for accuracy. Patient participants who took part in semi-structured interviews following their first obstetric visits were given a \$30 gift card.

3.3.3.5 Patient participants medical record abstraction

The study team also abstracted the electronic medical records of patients, including number of prenatal visits attended by the patient, clinically requested urine drug testing at the initial obstetric visit and delivery and the results, and notes indicating if healthcare clinicians contacted CYF.

The University of Pittsburgh Institutional Review Board approved the study through a full board review. All study participants signed written informed consent before any study procedures.

3.4 Analysis

3.4.1 Paper 1 Analysis

We utilized observer's rating and Linguistic Inquiry Word Count (LIWC) to conduct a quantitative analysis of the audio recordings. Following this, we conducted a descriptive analysis of the demographic characteristics of participants and clinicians. Independent t-test was used to test for differences across the patient groups (Black/African Americans and White/Caucasians) for the continuous variables and Chi-squared test for categorical variables. To identify potential confounders, we performed chi-square tests for categorical variables and analyses of variance for continuous variables to test the association of all patient and clinician characteristics with patient race/ethnicity. Logistic and Linear regression were used to assess the univariate association of each independent variable with the categorical and continuous outcome measures. We utilized negative binomial regression for the analysis of the number of prenatal visits attended due to overdispersion of the data. The significance level was set at α of 0.05. Little's test of missing completely at random (MCAR) showed that missing data was MCAR.

To test for the moderating effect of elements of clinician communication patterns on the relationship between patient's race and prenatal care utilization, we generated interaction models of patient's race and patient-clinician communication measures - stereotyping and judgment, and another interaction model of patient's race and rapport building and included them in different models as dummy variables. We used the Likelihood Ratio Test (LRT) to test the models with the interaction term against a model without the interaction term.

We used the generalized estimating equation method in all regression analyses to account for the clustering effects of any within-clinician correlations and the different number of patients per clinician because the same clinician was involved in several patients' obstetric consultations and most likely at patient

deliveries. An in-depth description of the variables and data analysis is provided in Sections 4.1.2.3. and 4.1.3.

3.4.2 Paper 2 Analysis

We conducted a descriptive analysis of the demographic characteristics of participants and clinicians. Independent t-test was used to test for differences across the patient groups (Black/African Americans and White/Caucasians) for the continuous variables and Chi-squared test for categorical variables. To identify potential confounders, we performed chi-square tests for categorical variables and analyses of variance for continuous variables to test the association of all patient and clinician characteristics with patient race/ethnicity. Logistic regression was used to assess the univariate association of each independent variable with the outcome measure. The significance level was set at α of 0.05. Little's test of missing completely at random (MCAR) showed that missing data was MCAR. We generated interaction terms and tested for significance.

We used the generalized estimating equation method in all regression analyses to account for the clustering effects of any within-clinician correlations and the different number of patients per clinician because the same clinician was involved in several patients' obstetric consultations and most likely at patient deliveries. A detailed description of the variables and data analysis is provided in Sections 4.2.2.2 and 4.2.3.

3.4.3 Paper 3 Analysis

This study used a mixed-method approach to analyze the data in which we combined quantitative and qualitative analysis and concepts into a single study. We utilized an integrative strategy and used data transformation²⁸³ to convert qualitative data from a single study into quantitative data for statistical analysis, to further explain the racial trends of behaviors discussed by participants. A qualitative dominant

approach and sequential dependent design²⁸⁴ was employed by relying on the qualitative research findings and utilizing the outcomes to guide the quantitative analysis.

For the qualitative analysis, we utilized an iterative process of thematic analysis employing an inductive coding approach to analyze the patient interviews.²⁸⁵ Following this, our quantitative analysis concentrated on positive and negative clinician communication behaviors around substance use and general discussions described by participants based on their experiences with clinicians and discussed hypothetical situations from the qualitative results. We used data transformation to quantify the presence of identified themes in our sample. Specifically, we assigned dichotomous values to indicate the presence (yes) or absence (no) of each identified theme and related concepts in the interview transcript for each participant. We assigned a yes only if negative behavior themes were mentioned as a negative by participants and used the same approach for the positive behavior themes. Following this, we analyzed the proportion of participants who discussed these themes by race to enable us explore for clustering of these themes by patient's race.

4.0 Results

4.1 Racial Disparity in Patient-Clinician Communication during Prenatal Visit and its Effect on Prenatal Care Utilization

4.1.1 Background

The existence of racial/ethnic disparities in maternal health care and outcomes in the United States (US) is mostly undisputed as various studies, reports, and literature have documented compelling evidence.^{12,27,33,36,41} In 2018, the US maternal mortality rate for Black birthing people was 37.1 deaths per 100,000 live births, which was 2.5 times the rate for their White counterparts (14.7 deaths per 100,000 live births).¹² In addition, studies have shown racial differences in severe maternal morbidity with Black birthing people experiencing the highest rates for 22 of the 25 severe morbidity indicators used by the CDC.³⁶ Literature has also documented that Black birthing people have 2.1 times higher severe maternal morbidity rates as compared with their White counterparts.³⁶ Attanasio et. al also reported higher odds of perceived racial discrimination in Black birthing people versus White birthing people during prenatal care.⁶⁹

The mechanism through which race/ethnicity, a social construct, results in these disparities are complex, intertwined, and sometimes unclear. It is crucial to identify and address these mechanisms as achieving racial equity in maternal health outcomes is critical to a nation's health and wellbeing. Studies have reported various etiologies of these racial/ethnic disparities in maternal health care, including differences in access to preconception care, site of care, appropriateness of clinical care, and patient's underlying comorbidities.^{34,54,67,88,286} However, the Institute of Medicine report, *Unequal Treatment*, confirmed that health care disparities cannot be entirely attributed to these factors and indicated the significance and effect of health care quality on health disparities, including various aspects of the patient-

clinician relationship that contribute to racial differences in health outcomes.⁶⁶ A prominent determinant of patient-clinician relationship is patient-clinician communication, which could foster or inhibit this relationship.⁶⁶

Substantial literature has provided evidence of the critical role of patient-clinician communication on patients care.^{115,116,122,132,133,287,288} High-quality patient-clinician communication is associated with better patient-clinician relationships, patient satisfaction with care, improved health care utilization, positive behavior change, adherence to treatment and lifestyle modification recommendations, and ultimately better health outcomes.¹³⁰⁻¹³⁸ Unfortunately, several studies have documented racial disparities in patient-clinician communication with racial minority patients receiving poorer communication practices with study findings linking this outcome to clinicians' personally mediated racist practices evidenced by discriminatory behaviors and biases.^{180,264,268,289} The IOM report indicates that clinicians' racial prejudices and biases contribute to healthcare disparities these shape interpersonal interactions.⁶⁶

Although providers may not blatantly express negative feelings toward racial/ethnic minorities (explicit racial bias), they may still harbor racial bias at the automatic and unconscious level (implicit racial bias), which could also be exhibited while communicating. Clinicians racial bias could be attributed to structural racism which produces inequitable outcomes and then reinforces harmful racial stereotypes creating an insidious cycle.²⁹⁰ Studies have shown that clinicians' racial bias and discriminatory behavior manifests in patient-clinician communication resulting in poorer communication and quality of care for minority groups.^{66,97,264,266,291,292} It is likely that these patterns are present in prenatal care where clinician's racial bias could affect their communication with pregnant people who are racial minorities.

Prenatal care is an important determinant of maternal, neonatal, and infant outcomes. Prenatal care may also be an adult female's first encounter with the health care system. Therefore, in addition to its impact on perinatal outcomes, it provides an avenue for pregnant people to develop a trusting relationship with a healthcare clinician, promote healthy lifestyle choices, and adopt healthy behaviors. Achieving high-quality prenatal care requires positive patient-clinician interaction and relationship. In previous

studies, pregnant people have indicated relationship-centered care, trust, respect, lack of discrimination, and provision of compassionate care as the characteristics required in prenatal care clinicians.^{58,127,293-296} Additionally, an integrative review of birthing people's prenatal care experience highlighted their preferences for unhurried visits, active participation in their care, and the development of meaningful relationships with their clinicians through rapport building.²⁹³ However, this isn't the experience for all pregnant people, as Black birthing people have reported experiencing racial discrimination and interpersonal racism such as racial bias and microaggressions during maternal care.^{102,187,297} These experiences could result in unequal barriers to high-quality, respectful, relationship-centered care and account for the racial inequities in maternal health outcomes.^{50,59-62}

Social psychology research on implicit bias reports that an individual's implicit racial bias influences their paraverbal behaviors, including word use and other linguistic patterns such as frequency of use of emotion-related words in interactions.²⁹⁸ Research has shown that individuals with greater implicit bias tend to have less positive affective tone during interactions.^{299,300} Additionally, studies have shown that clinicians' racial bias could also result in stereotypical assumptions and discriminatory communication patterns.^{235,266,301} In addition to race, clinician's bias during consultations has also been reported for other patient's characteristics including weight, gender, socioeconomic status and patient's health status including mental health and disability.³⁰² Clinician's discriminatory behaviors and poorer quality of communication has most especially been reported in patients with a history of substance use including pregnant people.^{62,303,304}

Despite emerging evidence linking interpersonal processes of health care, including patient-clinician communication and manifestations of bias to satisfaction with care, continuity of care, and health outcomes, most studies exploring causes of racial/ethnic disparity in care have focused on the technical aspects such as the provision of certain diagnostic tests, procedures, and medications. Additionally, to our knowledge no other studies have empirically examined patient-clinician conversations during prenatal care. Our study, therefore, fills this gap by exploring racial disparity in patient-clinician communication during

prenatal care and its effect on the continuity of prenatal care. We used audio-recorded and transcribed patient-provider communication during the first obstetric visits to examine the conversation patterns, content, semantics, and styles for any differences in provider communication with patients self-identified as Black versus those self-identified as White or Other Race. Patient-clinician communication patterns were analyzed using an integration of previously described communication and racial discrimination frameworks and findings from social psychology research. We hypothesized that Black/African American patients would experience poorer-quality prenatal visit communication, including higher number of biased and stereotyped comments or questions than White patients. Furthermore, we hypothesized that elements of the patient-clinician communication would moderate the relationship between a patient's race and prenatal care utilization.

Our study findings will highlight potential factors that could be contributory to the racial inequities in maternal healthcare and outcomes. Our findings could also guide the design and development of programs and policies to address racial inequities in the obstetric setting and ensure receipt of equitable, respectful, culturally sensitive and high-quality maternal healthcare services by all birthing people, especially marginalized and vulnerable groups.

4.1.2 Methods

4.1.2.1 Sample used for this analysis

In response to limitations related to time, personnel, and funding, we considered the most efficient method of choosing a subset of the data for this analysis. We determined that the subset of patients who either reported or tested positive for substance use would be one in which more of the concerning communication patterns we wished to explore would occur. Focusing on this population also allowed us to pursue other related and overlapping analyses (described in other papers). We began by including all patient participants who had participated in the semi-structured interviews and then chose a sampling of the

remaining participants who had reported or tested positive for substances to ensure a balance between White and Black participants and included all participants who self-described their race as Other Race. Due to the small sample of patients who identified as other races apart from Black and White, we excluded these patient participants (12). Our final analytic sample was 100 participants who self-identified as Black or White. There were no statistically significant differences in patient and clinician characteristics between these 100 participants and the excluded patient sample.

4.1.2.2 Procedures

Observer rating

A group of racially diverse researchers (6) developed the codebook and Excel template used for data analysis to ensure a diverse race-conscious orientation to patient-clinician communication pattern review and analysis. We employed an iterative process of descriptive analysis with an inductive coding approach. We commenced by listening to the audio-recordings of six participants' first prenatal visits to discover patterns, themes, and categories in the data. We identified concepts eliciting the presence or lack of respectful and non-discriminatory maternal care based on practice expected in the prenatal care setting, researchers' experiences, and newly created concepts based on recurring themes in the data. We documented these concepts in memos and held weekly group meetings for in-depth discussions of identified concepts. Following these meetings, we developed an Excel template to analyze the audio-recordings of patient visits, which was used to note data or information such as a change in clinician tone that the coders could not capture in NVivo. Responses to some questions in the Excel template, such as "Did the clinician ask if your other children were from the same father?" were yes, no, or not applicable. For other questions such as "Did the clinician interrupt the patient?" responses were yes/often, sometimes, or no. We also developed a document with interactions or statements and recordings (included time certain observations occurred) that provided examples for each concept to ensure all coders had an understanding of how and when each code should be applied. This document was shared with all coders prior to the commencement of coding with

the excel template and NVivo. We used the Excel template questions to develop the codes in the NVivo codebook and used the NVivo codebook to analyze the transcripts of the patient visits to provide contexts and quotes for the analysis. For example, the Excel template had a question asking if the clinician sounded judgmental and, if yes, the subject and evidence of the clinician's judgment. The NVivo codebook also had a code to capture if the clinician was judgmental, providing context to the yes or no response in the Excel template. Therefore, we expected to have alignment between Excel and NVivo data output. The Excel template (Appendix A) provided an additional avenue to capture more nuanced data from listening to the audio-recordings of patient visits, such as patient wait time or negative change in clinicians' tone, which couldn't have been captured by just analyzing the transcripts in NVivo. Following the development of the excel template and NVivo codebook, we compared our codes to various communication frameworks, racial discriminatory surveys, and an obstetric racism framework to ensure all relevant concepts were captured.

Three team members conducted the data analysis. To begin, each researcher reviewed four audio-recordings and transcripts of the patient visits. All the researchers then analyzed all the four audio-recordings and transcripts by completing the Excel template and coding in NVivo. We then met to compare the data entered in the Excel analysis template and NVivo coding for each of the four audio-recordings and transcripts to ensure consistency in data analysis on both platforms. Based on our discussions, we refined the Excel template, codes, and code application until there was full agreement. Then, we analyzed the rest of the audio-recordings and transcripts of patient visits, double-coding 30% of the 112 audio-recordings and transcripts to ensure consistent application of codes and to identify new themes. Intercoder reliability was 0.75. The team held regular meetings to compare similarities and differences among the observers-report in the Excel template analysis and NVivo coding. During these meetings, if there was a discrepancy in how a code was applied by two coders, the three coders listening to the audio recording again and the third coder who did not initially analyze the recording made the final decision on if the code was valid. Also, we revisited the audio-recordings and transcripts several times to ensure we captured the essence of their meaning, especially cultural nuances, and to define features of complex entities. The study team

members compiled and reviewed excerpts from the coded transcripts and Excel template, then discussed and analyzed emerging and prominent themes from the observer-reports of the data.

Linguistic Inquiry Word Count (LIWC)

The audio-recordings of the first obstetric visit were also analyzed using the Linguistic Inquiry Word Count. Linguistic Inquiry and Word Count software identifies and counts words from a given transcript in more than 70 categories, including emotion-related words and affect. The program then computes the percentage of use of the words in the categories (the number of times words in a particular category was used divided by the number of words in the entire transcript). This approach has been used extensively in social psychology research.³⁰⁵⁻³⁰⁷ This program was used to assess the clinician's affective processes including the use of positive and negative emotion-related words during the consultation.

In order to ensure proper word categorization, all transcripts for this study were adapted to follow the transcription instructions for LIWC analysis specified how to deal with things like filler words (e.g., "you know"), nonfluencies (e.g., "hm"), and stuttering. Additionally, we retained only the physicians' language spoken to a patient in a given consultation in the final transcripts uploaded in the LIWC program.

4.1.2.3 Study Variables

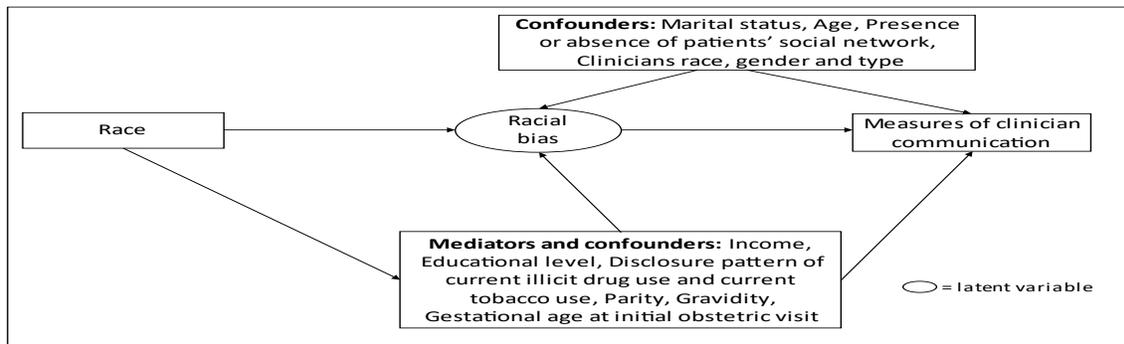


Figure 3: Variables for Research Question 1

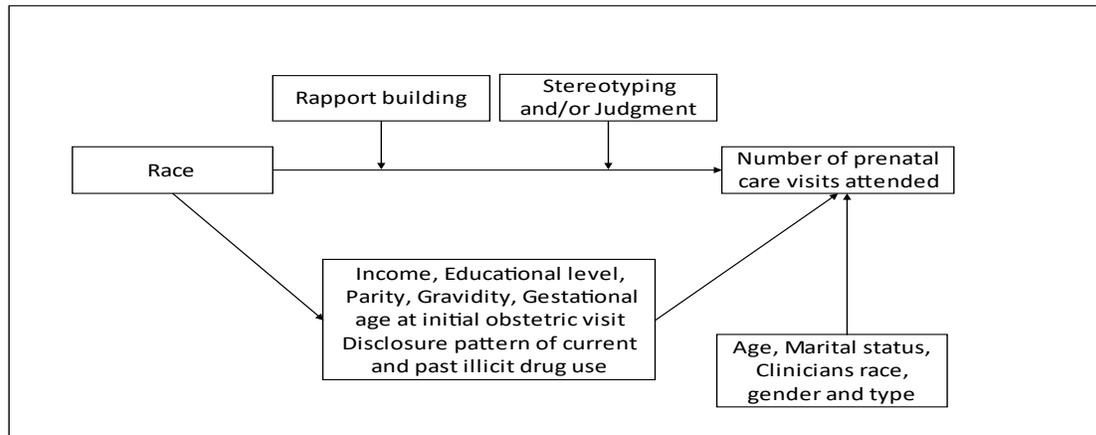


Figure 4: Variables for Research Question 2

Outcome variables: Measures of clinician communication

Observer's rating (sample quotes are provided in Table 3)

- Stereotyping – statements made by the clinician that could be due to widely held perception of the patient's characteristics such as race. These included stereotypes around sexual activities, family structure and substance use. They were rated as "yes" if present and "no" if absent.
- Judgment – as evidenced by a negative change in tone, negative assumptions and repetition of enquiries around the subject of judgment. Judgment could be due to substance use in pregnancy, sexual habits, late commencement of prenatal care and patient's health conditions. Rated as "yes" if present and "no" if absent.
- Dismissiveness of patient's concern/s or complaint/s – counted when the clinician ignores or minimizes patient's complaints or concerns. Rated as "yes" if present and "no" if absent.

- Inappropriate statement/s – statements made by the clinician which could be misconstrued and could be offensive to the patient. These include use of words such as "abuse" when discussing substance use, use of endearments such as "hon", and referring to patients as being skinny.
- Rapport building – was rated as "Really well", "Yes", "Somewhat", and "No" depending on how well the clinician incorporated social talk and informal conversations into the consultation. For data analysis, "No" and "Somewhat" were collapsed into "No" and "Yes" and "Really well" collapsed to "Yes".
- Visit duration – was the amount of time in minutes from the start of the prenatal visit to its conclusion. This excludes patient's wait time and time spent by the clinician out of the consultation room during the visit. Longer visit duration is preferred.

Linguistic Inquiry Word Count

- Affective processes: based on the LIWC dictionary
 - Use of positive-emotion related words – Examples of positive-emotion related words include "nice" and "sweet."
 - Use of negative-emotion related words – including "ugly" and "nasty".

Number of prenatal care visit attended

This outcome measure was obtained by reviewing patients' medical records to determine the number of prenatal care visits attended by the patient.

Independent variables

The independent variable related to measures of clinician communication was patients' race. We used patients' race as a variable to measure racial differences in the pattern of the outcome measure. Patients' race was obtained from patients' reports of race/ethnicity identified in the post-visit questionnaire. Patients identified as White/Caucasian, Black/African American, Hispanic/Latina, Asian and Other.

The independent variable related to number of prenatal care visits attended was, again, patients' race which acted as a measure of racial differences.

Potential confounders and covariates

Several demographic characteristics of both patients and clinicians were considered for inclusion as potential confounders and covariates. Possible characteristics of patients that might be confounders include age, marital status, educational attainment, annual income, gravidity, and parity, which were retrieved from post-visit questionnaires and medical records. In addition, we treated disclosure of current and past substance use at the initial obstetric visit as a potential confounder; these data were collected by listening to the audio recording of the initial obstetric visit. Another potential confounder considered was the presence of the patient's social network, including partner, mother, sibling, friend, and child in the consultation room, which was also collected from listening to the audio recording. Physician characteristics considered as confounders were gender, race/ethnicity, and type, including nurse midwives, nurse practitioners, residents, physician assistants, and faculty physicians.

For the outcome measure of number of prenatal care visits attended we included patients' gestational age at first prenatal visits.

Interaction terms

Interaction terms were included in the final model and tested for significance. Interaction terms generated include race and income, marital status and income, race and disclosure pattern, race and educational attainment, age and marital status, and age and educational attainment.

To test for the moderating effect of measures of clinician communication (stereotyping and judgment, rapport building) on the relationship between patient's race and number of prenatal care visits attended, we included interaction terms of patient's race and stereotyping and judgement in a model and also included an interaction term of race and rapport building in another model.

4.1.3 Analysis

Our analysis was limited to patients with a history of illicit drug use in current pregnancy; this represents a subset of the larger database (100 out of 468 enrolled patients with audio-recordings). We conducted a descriptive analysis of the demographic characteristics of participants and clinicians. Independent t-test was used to test for differences across the two patient groups (Black/African American and White/Caucasians) for the continuous variables and Chi-squared test for categorical variables.

To identify potential confounders, we performed chi-square tests for categorical variables and t-test for continuous variables to test the association of all patient and clinician characteristics with patient race/ethnicity. Logistic and linear regression were used to assess the univariate association of each independent variable with the categorical and continuous outcome measures. We utilized negative binomial regression for the analysis of the count outcome, number of prenatal visits attended, due to overdispersion of the data. The significance level was at α of 0.05. Little's test of missing completely at random (MCAR) showed that missing data was MCAR.

We generated interaction terms between race and disclosure of substance use and other patient demographic characteristics, including age, marital status, income, and educational attainment, and tested for significance. All interaction terms such as race and income, marital status and income, age and educational attainment, age and income, race and disclosure pattern, educational attainment and income were tested for significance.

To test for the moderating effect of elements of clinician communication patterns on the relationship between patient's race and prenatal care utilization, we generated interaction models of patient's race and patient-clinician communication measures - stereotyping and judgment, and another interaction model of patient's race and rapport building and included them in different models as dummy variables. We used the Likelihood Ratio Test (LRT) to test the models with the interaction term against a model without the interaction term.

Confounders were included in the multivariable models if there was substantial evidence from existing literature as potential confounders of the relationship under investigation or if they were statistically significantly associated with the independent variables and the outcome measure. The most parsimonious model and best correlation structure was selected based on the quasi-likelihood under the independence model criterion (QIC).³⁰⁸ Horton et al.'s extension of Hosmer-Lemeshow test statistics was used to test the goodness of fit of the final model.³⁰⁹ Primary independent variable of interest for the outcome measures (race) was included in the final parsimonious models, as well as statistically significant independent variables and covariates with substantial evidence from existing literature as potential confounders of the relationship under investigation.

We used the generalized estimating equation method in all regression analyses to account for the clustering effects of any within-clinician correlations and the different number of patients per clinician because the same clinician was involved in several patients' obstetric consultations and most likely at patient deliveries. We assumed an exchangeable correlation structure with strongly consistent estimation because it yields more valid and robust coefficient estimates even with misspecification of the correlation structure. The study team recruited more than 90% of clinicians and patients from one of the five study sites; therefore, we ignored correlation within sites and accounted for only intraclass correlation within clinicians.

We present findings from one final multivariable model for the different outcome measures that included both patient and clinician characteristics as covariates because models in which these characteristics were inputted in separate blocks yielded similar outputs. The final multivariable model for the different measures of clinician communication adjusted for patient characteristics including educational status, age group, parity, disclosure of current tobacco and/or illicit drug use, and presence of patient's social network, and clinician characteristics including race and type. The final analytic sample was 100 participants. The mathematical model to explain this analysis is:

Measures of clinician communication = $\beta_0 + \beta_1$ (Patients' Race) + β_2 (Patients' age group) + β_3 (Patients' educational level) + β_4 (Patients' parity) + β_5 (Current tobacco and/or illicit drug use disclosure pattern) + β_6 (Presence/absence of patients' social network) + β_7 (Clinicians' race) + β_8 (Clinician type)

The final multivariable model for the outcome measure of number of prenatal visits attended adjusted for patient characteristics (educational status, income, parity, gravidity and gestational age at the initial obstetric visit) and clinician characteristics (race and type). We then included the interaction terms of rapport building and patients race in one model and the interaction term of stereotyping, judgment and patients race in another model to test for moderating effect. Due to missing data for one participant, the final analytic sample was 99 of the same 100 participants. The mathematical models to explain these analyses are:

Without the moderator:

Number of prenatal care visits attended = $\beta_0 + \beta_1$ (Patients' Race) + β_2 (Patients' income) + β_3 (Patients' educational level) + β_4 (Patients' parity) + β_5 (Patients' gravidity) + β_6 (Patients' gestational age at initial obstetric visit) + β_7 (Clinician race) + β_8 (Clinician type)

With moderator (rapport building patient's race):*

Number of prenatal care visits attended = $\beta_0 + \beta_1$ (Patients' Race) + β_2 (Rapport building) + β_3 (Patients' race * Rapport building) + β_4 (Patients' income) + β_5 (Patients' educational level) + β_6 (Patients' parity) + β_7 (Patients' gravidity) + β_8 (Patients' gestational age at initial obstetric visit) + β_9 (Clinician race) + β_{10} (Clinician type)

*With moderator (stereotyping*judgment* patient's race):*

Number of prenatal care visits attended = $\beta_0 + \beta_1$ (Patients' Race) + β_2 (Stereotyping and/or Judgment) + β_3 (Patients' race * Stereotyping and/or Judgment) + β_4 (Patients' income) + β_5 (Patients' educational level) + β_6 (Patients' parity) + β_7 (Patients' gravidity) + β_8 (Patients' gestational age at initial obstetric visit) + β_9 (Clinician race) + β_{10} (Clinician type)

STATA statistical software, version 16.0 was used to perform all analyses.³¹⁰

4.1.4 Results

Recruitment and Study Sample Characteristics

From February 2011 to August 2014, the study team enrolled 479 eligible participants. Of the 479 enrolled participants, there were no audio-recordings for 11 participants due to recorder malfunction. Of the remaining 468, we excluded patients with no history of illicit drug use from disclosure and/or positive urine toxicology testing. In total, 164 patients from the overall sample had a history of illicit drug use in pregnancy. Our study analyzed data from 112 patients of the 164 participants; in this sample we included all 62 patients with illicit drug use who participated in the semi-structured interview. Of these 62 patients, 40 self-reported as Black, 16 as White and 6 as Other race. To achieve a balanced sample, we randomly selected 34 White patients, all patients who self-reported as Other race (6) and 10 Black patients (to assist with blinding observers to patient's race), therefore adding data from 50 more patients from the participants with histories of illicit substance use in pregnancy. This enabled us to achieve an equal sample of Black/African American (50) and White study participants (50), as well as to increase the sample size for Other race patients (12) to improve their representation in this analysis. Due to the small sample size of patients who identified as other races apart from Black/African American or White/Caucasian (12), they were excluded from the analytic sample. Our final analytic sample was 100 patient participants who identified as Black (50) or White (50).

The characteristics of patient and clinician participants are shown in Table 1. Fifty percent (50%) of participants identified as Black/African American and 50% as White/Caucasian. Most participants were less than 30 years of age (79%) and had an income less than \$20,000 annually (85%). Thirty-nine percent (39%) of our sample were single, 45% were living with their partner and 11% were married. The mean parity for our sample was one and mean gravidity was three. The mean gestational age for our participants

at the time of their first obstetric visit was 13.4 weeks. There were 46 clinicians in our sample. The majority of clinicians were female (93%) and identified as White (80%) and obstetrics and gynecology residents (77%). The mean number of patients seen by each clinician was two with a minimum of one and maximum of six.

For significant testing, some categories were combined due to small cell sizes (less than five observations). For example, we included patients who self-reported as separated and divorced to the single category; created two categories for age groups (less than 30 and 30 years and above); combined provider type into nurses (nurse midwives and nurse practitioners) and physicians (residents and faculty physicians); and clinicians race into non-White (Black, Asian and Other) and White. Additionally, we created a binary measure for educational attainment: high school and less (grade school and high school/GED) and more than high school (associate's degree, some college, finished college, and graduate school).

Table 2 shows that Black patients were more likely to commence prenatal care at an earlier gestational age and attend more prenatal care visits than White patients. There were no other statistically significant differences in other patient and clinician characteristics by patients' race.

Table 1: Patient and Clinician Characteristics

Variables	Category	No. (%)
Patients (n = 100)		
Race/Ethnicity	Black	50 (50%)
	White	50 (50%)
Age, years (mean = 25, SD = 4.7, min/max = 18/36)	<20	9 (9%)
	20 - 29	70 (70%)
	30 +	21 (21%)
Marital status	Single	39 (39%)
	Living with partner	45 (45%)
	Married	11 (11%)

	Separated	3 (3%)
	Divorced	2 (2%)
	Widowed	0 (0%)
Highest level of education completed	Grade school	21 (21%)
	High school/GED	49 (49%)
	Associates degree	7 (7%)
	Some college	23 (23%)
	Finished college	0 (0%)
	Graduate school	0 (0%)
Annual income, \$	0 – 4,999	49 (49%)
	5,000 – 9,999	18 (18%)
	10,000 – 14,999	13 (13%)
	15,000 – 19,999	5 (5%)
	20,000 and higher	14 (14%)
	Refused	1 (1%)
Gravidity - mean = 3, SD = 2, min = 1, max = 9		
Parity – mean = 1, SD = 1, min = 0, max = 5		
Gestational age at new obstetric appointment, week/s – mean = 13.4, SD = 7.9, min = 5, max = 38.3		
Number of prenatal care visits attended – mean = 8, SD = 4, min = 1, max = 14		
Clinicians (n = 46)		
Gender	Female	43 (93%)
	Male	3 (7%)
Race/Ethnicity	Black	3 (7%)
	White	37 (80%)
	Asian	2 (4%)
	Other	4 (9%)
Type	Nurse practitioner	5 (11%)

	Nurse midwife	4 (9%)
	First-year resident	9 (20%)
	Second-year resident	12 (26%)
	Third-year resident	11 (24%)
	Fourth-year resident	3 (7%)
	Faculty physician	2 (4%)
No. of patients' provider saw in the study - mean = 2, min = 1, max = 6		

*min/max = minimum/maximum, GED = general equivalency diploma

*Some numbers may not add to the total number of patients due to missing data for certain variables (marital status, highest level of education completed and annual income)

*Some percentages add up to less than or greater than 100% due to rounding

Table 2: Patient and Clinician Characteristics by Patient Race/Ethnicity

Variables	Patients (N = 100)		
	Black Patients (n = 50)	White Patients (n = 50)	P value
Age			
<30	41 (82%)	38 (76%)	P = 0.46
30+	9 (18%)	12 (24%)	
Marital status			
Single	24 (48%)	20 (40%)	P = 0.55
Living with partner	22 (44%)	23 (46%)	
Married	4 (8%)	7 (14%)	
Educational level, n (%)			
High school/GED and less	36 (72%)	34 (68%)	P = 0.66
More than high school	14 (28%)	16 (32%)	
Annual income, n (%)			
\$0 – 4,999	24 (48%)	25 (51%)	
\$5,000 – 14,999	19 (38%)	12 (24%)	

\$15,000 and higher	7 (14%)	12 (24%)	
Mean gravidity	3	3	P = 0.95
Mean parity	1	1	P = 1.0
Mean gestational age at new obstetric appointment, week/s	11.4	15.4	P = 0.01**
Mean number of prenatal care visits attended	10	7	P < 0.00001**
Clinicians			
Gender, n (%)			
Female	47 (94%)	48 (96%)	P = 0.65
Male	3 (6%)	2 (4%)	
Race/Ethnicity			
White	42 (84%)	43 (86%)	P = 0.78
Non-White	8 (16%)	7 (14%)	
Type			
Nurses	15 (30%)	10 (20%)	P = 0.25
Physicians	35 (70%)	40 (80%)	

* Some percentages add up to less than or greater than 100% due to rounding

^aDifferences across patient groups were analyzed with Chi square statistics for categorical variables and with analysis of variance for continuous variables

**Statistically significant values

Relation of Patient's Race/Ethnicity with Clinician Communication Measures

Table 4 shows the associations of patient race/ethnicity with several measures of clinical communication including stereotyping, judgment, dismissiveness, making inappropriate statement/s, rapport building, visit duration and affective processes (use of positive and negative-emotion related words). There were no statistically significant differences in the occurrence of clinicians' judgment, dismissiveness of patient's concerns/complaints, visit duration, and use of negative motion-related words when prenatal visits of Black, White, and Other patients were compared.

Clinicians were more likely to make stereotypical assumptions for Black (OR = 2.5, p = 0.03) when compared to White patients, in the unadjusted model. After controlling for patient and clinician characteristics, racial/ethnic differences in clinician's stereotyping remained statistically significant as Black patients (p = 0.04) were 2.9 times more likely to be receive stereotypical questions/statements as compared to White patients. Additionally, in both the adjusted and unadjusted analyses, clinicians were more likely to make inappropriate statements with Black patients (unadj: OR = 2.3, p = 0.05; adj: OR = 2.6, p = 0.05) than with White patients.

Table 3: Measures of Clinician Communication – Sample Quotes

Theme	Brief explanation of quote	Sample quote (C: Clinician, PT: Patient)
Stereotyping	Clinician doubts that this is the patient's first pregnancy.	C: ... Is this the first time you have ever been pregnant? PT: Yes C: Ever ever? PT: Ever ever C: No miscarriages or abortions? PT: No miscarriages, abortion.
	Clinician is surprised that the patient's relationship has lasted this long.	C: Are you still with the father of your son? PT: Yes. ... 8 years. C: Oh wow. That is rare. Good for you! I'm glad you made that. That is really good. ...That is rare. You are an exception to the rule.
	Clinician starts family history taking with the assumption of patient's sibling might not be from the same parents.	C: Do you have any brothers or sisters with the same mom and dad? PT: Yes, one sister
	Clinician assumes patient also drinks alcohol because patient uses other substances.	C: And how much alcohol do you drink a week? PT: None.
	Clinician provided these examples as possible meals the patient might be eating when discussing diet in pregnancy.	C: Just, so your hot sauce, ketchup, um (.) Oodles of noodles, potato chips.
	Clinician's first questions about the baby's father.	C: ...Ok, and the father of the baby, is he steady, a steady guy? Have you been together for some time?

	Clinician stating the patient's youngest child has an easier name (a "more traditional" name) to spell than the older child with a distinctively Black/African American" name.	<p>C: Ok, and then your youngest child... ...And is that a boy or a girl? PT: Boy. C: And his name? PT: X. C: And that is a little easier.</p>
Judgment	Clinician sounded harsh and accusatory about the gestational age at which the patient is starting prenatal care without probing for possible reasons.	<p>C: =Ok, alright. Um, so let's see, this would put you at (says patient's gestational age); what took you so long? To come in? (asked in a harsh and accusatory tone)</p>
	Clinician sounded judgmental about patient's age and repeatedly made references to the patient's age during the consultation.	<p>C: Alright, you are 19 years young. Correct? PT: Yes. C: ...And potentially you may feel like, you may be someone who feels like I'm 19 and to have a baby that I know has Down Syndrome is too much. You know what I mean?</p>
	Clinician sounded judgmental about patient's blood transfusion decision.	<p>C: ...If you needed a blood transfusion to save your life would you accept it? P: ...probably not, really. C: ...You feel you would rather die than have a blood transfusion? PT: Yeah, probably, yeah.</p>
	Clinician sounded judgmental about patient's substance use history.	<p>C: So, no theft nothing like that? PT: No. ...I have a very very supportive family so I really never had to steal. I just had money. There was always money. ...Available to myself. C: So, no exchanging like your body or anything like that? PT: No. No. C: Ok. You never been in jail because of?</p>
	Clinician sounded judgmental about patient's substance use history and late commencement of prenatal care.	<p>C: And also just since you have the history of Suboxone use and you are kind of coming into care a little bit late. ...We will go ahead and send your urine off to test for drugs.</p>
Dismissiveness	Clinician ignored patient's concern about the cord being wrapped around the fetus and didn't not address patient's concern before leaving the consulting room.	<p>PT: The cord isn't wrapped around or anything is it? I get nervous about that too. The cord [laugh] C: Yeah, why don't you hang out here for one second.</p>
	Clinician did not probe to understand why patient had this concern. Clinician also	<p>PT: Yeah, because I think I got breast cancer. C: Oh, I doubt it.</p>

minimized and failed to address the patient’s concern.

Clinician did not attempt to allay the patient’s fears.

PT: You are good. I just don’t like the swab. That part kind of hurts.
C: Oh, well, here it comes.

Clinician ignored patient’s expression of pain during the pelvic examination with no form expression of empathy.

PT: [Feeling pain during the pelvic examination]
C: This is that pap smear we talked about.
PT: Ouch, ouch.
C: You can have a little bit of bleeding or spotting after this.

Inappropriate statement

Clinician used the word “abusing” instead of “using” to ask what substance the patient was using before commencing methadone.

C: Okay, what were you abusing?

Clinician described the patient as skinny which could have a negative connotation for the patient.

C: ...Usually we start trying at about 15 weeks but you are so skinny we might be able to find it now.
 ... You are a skinny thing.

Clinicians use of an endearment, hon, has been described by some people as paternalistic, condescending, trite and disrespectful.

C: Alright hon, let’s do a breast exam.

C: Obstetric clinician
 PT: Patient

Table 4: Association between Patient Race/Ethnicity and Measures of Clinician Communication

Measures of clinician communication	White patients (n = 50)	Black patients (n = 50)
	OR (p value, confidence interval)*	
Stereotyping		
Univariate model	Reference	2.5 (0.03, 1.09 – 5.65)**
Multivariable model^a	Reference	2.9 (0.04, 1.03 – 7.97)**
Judgment		

Univariate model	Reference	1.3 (0.53, 0.58 – 2.87)
Multivariable model^a	Reference	1.3 (0.59, 0.50 – 3.45)
Dismissiveness		
Univariate model	Reference	1.4 (0.41, 0.63 – 3.09)
Multivariable model^a	Reference	1.8 (0.22, 0.69 – 4.83)
Inappropriate statement/s		
Univariate model	Reference	2.3 (0.05, 1.00 – 5.20)**
Multivariable model^a	Reference	2.6 (0.05, 1.02 – 6.45)**
Rapport building		
Univariate model	Reference	1.9 (0.15, 0.79 – 4.57)
Multivariable model^a	Reference	1.5 (0.41, 0.55 – 4.18)
	β Coefficients (p value, confidence interval)*	
Visit duration		
Univariate model	Reference	-2.1 (0.32, -6.09 – 1.99)
Multivariable model^a	Reference	-1.8 (0.36, -5.66 – 2.07)
Use of positive-emotion related words		
Univariate model	Reference	0.2 (0.44, -0.24 – 0.56)
Multivariable model^a	Reference	0.04 (0.86, -0.34 – 0.43)
Use of negative-emotion related words		
Univariate model	Reference	0.02 (0.65, -0.08 – 0.12)
Multivariable model^a	Reference	0.03 (0.59, -0.07 – 0.12)

*From generalized estimating equations

**p value ≤ 0.05 – Statistically significant

^a The multivariate model included patient characteristics (educational level, age group, parity, disclosure of current tobacco and/or illicit drug use, and presence of patient's social network) and clinician demographics (race and type)

Moderating Effect of Clinician Communication Measures on Relation of Patient's Race and Prenatal Care utilization

In the unadjusted model, Black patients had a slightly higher incidence of prenatal care visits attended as compared to White patients (IRR = 1.04, p = 0.03). After adjusting for patient and clinician characteristics, there was no statistically significant difference in the incidence of prenatal care visits attended by Black and White patients. The relationship of patient's race and prenatal care visits attended did not change when we tested the moderating effect of rapport building. Incorporation of stereotyping and judgment in the multivariable model to test for its moderating effect led to a slight decrease in the incidence of prenatal care visits attended by Black patients; however, this was not statistically significant.

Table 5: Association between Patient Race/Ethnicity and Measures of Clinician Communication (Rapport Building, Stereotyping, and Judgment) and Prenatal Visits

Number of prenatal visits attended	Incidence Rate Ratio (p value, confidence interval)	
	White patients	Black patients
Unadjusted model	Reference	1.04 (0.03, 1.00 – 1.08)**
Model 1**	Reference	1.04 (0.11, 0.99 – 1.08)
Model 2^a	Reference	1.04 (0.22, 0.98 – 1.10)
Model 3^b	Reference	1.01 (0.72, 0.93 – 1.11)

*From generalized estimating equations

**Adjusted for patient's characteristics (educational level, income, parity, gravidity, gestational age at initial obstetric visit) and clinician's characteristics (clinician's race and type)

^aAdjusted for patient and clinician's characteristics and a measure of clinician communication - rapport building

^bAdjusted for patient and clinician's demographic characteristics and measures of clinician communication - stereotyping and judgment

4.1.5 Discussion and conclusion

Our study showed racial differences in clinician communication patterns during prenatal consultation. This finding complements previously reported disparities in communication patterns of clinicians due to race and other patient characteristics and also mirrors documented differences in patients' perceptions of their quality of health care, especially relating to interpersonal processes.^{69,299,311-313}

Clinicians were more likely to make stereotypical assumptions and inappropriate comments to Black patients as compared with their White counterparts. This disparity in clinician communication patterns by patients' race may be the result of clinicians' racial prejudices and biases.

At the outset of this study, following the review of some of the audio recordings of the initial obstetric visit, the study team realized the presence of some stereotypical comments and assumptions from the clinicians. Examples include assuming that a patient with a past history of substance use is currently using (the “once a user, always a user” assumption); asking if the baby’s father (especially for Black/African American fathers) was “steady and involved” in the pregnancy based on the stereotypical assumption that Black/African American men are lazy and irresponsible; and asking if the patient had one or more partners, or a new partner or for the patient’s total number of lifetime partners, all of which could be due to the hypersexual stereotype of Black birthing people.

In addition to stereotypical statements, the study team also noticed that clinicians used words that could have negative connotations for some patients. Studies have shown that words do matter especially in the healthcare setting and certain words could be stigmatizing, sound condescending and disrespectful.³¹⁴
³¹⁷ We therefore classified these words as negative, including “abuse” when discussing substance use, “skinny or fat” when discussing patient’s weight, and the use of endearments such as honey as inappropriate statements. Categorizing words and phrase in this way is in concert with documented reports from the National Institute on Drug Abuse, the extant literature, and the Nursing and Midwifery Council guidance.³¹⁴
³¹⁷ Our finding of racial inequities in use of inappropriate words and stereotyping by clinicians buttresses the importance of examining these clinician communication practices.

Stereotyping is seen across many settings and encounters but ideally should be absent from healthcare settings, especially during prenatal consultation, given expectations relating to the Hippocratic Oath and medical training. However, observers' report from the analysis of audio files indicated otherwise, with higher odds of clinicians' stereotyping in obstetric consultations with Black patients. Multiple examples of race-based stereotyping in the healthcare environment and maternal setting have been

documented.^{50,62,69,102,187,318,319} In our study, observers noted that most of the stereotypical assumptions made by the clinicians were associated with sexual activity and risk-oriented questions including questions on the total number of lifetime partners, if all of the patient's children were from the same father and if patient's siblings are from the same parents. These stereotypes of Black patients related to sexuality corroborates the long-standing history of the sexual objectification of Black women and girls,³²⁰⁻³²³ and results of studies highlighting Black females being viewed through a hypersexual lens.^{324,325}

A review of the historical underpinnings of sexual stereotyping of Black women provides a better understanding of present-day clinicians' discriminatory behaviors and negative stereotypes, and highlights the fact that slavery plays a harmful role in the quality of healthcare received by Black patients and, ultimately, in ongoing inequities in maternal health outcomes. During the 246-year period of enslavement of the Black population, Black women often experienced legalized sexual assaults by slave owners and other white men.^{155,326-329} This was a result of laws defining these enslaved women as property, thereby depriving them of legal protection from acts of sexual violence.³²⁶ Despite these exposures to nonconsensual sexual acts, enslaved women's objective realities, and subjective interpretations of slavery resulting in voluntary sexual relations, Black women were labelled as being hypersexual resulting in the Jezebel stereotype.³³⁰ These negative sexual stereotypes were profitable to the white men as a means to justify continued enslavement and acts of sexual violence.³³¹ Negative sexual images of Black women have continued after slavery and persist to date.³³⁰ The negative representation of Black birthing people could contribute to our finding of clinicians being more likely to make sexually related stereotypical assumptions of Black patients through questions asked and comments made. This highlights the persistence of obstetric racism in current clinical settings. Other studies have also shown that racial minority patients are more likely to experience discriminatory behaviors from their clinicians.^{269,301,332,333} These behaviors have been documented as barriers to prenatal care utilization and positive patient-clinician communication,²⁹³ which ultimately affect maternal and child health outcomes and contribute to the broad health inequities.

Stereotypical assumptions and inappropriate comments were also made by the clinicians about patients' characteristics such as weight, while others tended to use terms such as "honey/hon" or "sweetie". While these terms could be due to clinicians' cultural tendencies and said with no intention of harm, they can be experienced by some patients as being condescending or white supremacist. Some clinicians were also found to use inappropriate words when discussing patient's substance use. These words could be interpreted by patients as stigmatizing and reflections of negative biases. These inappropriate statements emphasize the importance of words use and appropriate language in healthcare settings as well as the relevance of continuous training to improve clinician competency on appropriate language for various clinical presentations. Training clinicians to address their biases and to use appropriate language could ultimately improve patients' perceptions of the quality of care received and increase healthcare follow-up and adherence to prenatal management.

Our study highlights the anti-Black racism and misogyny Black birthing people experience (misogynoir) in the obstetric setting. However, our study's findings should be interpreted in light of its limitations. First, the parent study selected clinical populations known from prior studies and review of medical documentation to have high rates of substance use, given the study's focus on capturing substance use communication. This, then, could result in selection bias of both patient and clinician participants. Second, the study team recruited all pregnant participants and clinicians from prenatal clinics in urban neighborhoods in Pittsburgh, Pennsylvania. Thus, we cannot generalize our findings to other patient and clinician populations, and health care systems serving rural or suburban populations. However, this study provides awareness of discriminatory practices in the obstetric care setting and acts as a call for social justice by addressing these racial inequities to improve maternal health outcomes. Third, patients' and clinicians' awareness that the initial obstetric visit was being recorded might have altered patients' disclosure patterns of substance use in pregnancy. However, none of the patient or clinician participants were aware of the study's focus on substance use conversations until debriefing discussions after the recorded visit (for patient participants) or at the end of their study participation (for clinician patients). Additionally,

participants were aware that the study data's confidentiality was protected by a National Institutes of Health Certificate of Confidentiality, which would protect all study information from being used in any court of law against any of the participants. Also, when patient participants were asked immediately after the visit whether the audio recording affected their behavior, 98% reported that it did not. Regardless, if any change in behavior occurred due to the fact that participants were aware that they were being recorded, this likely would have reduced the occurrence of stereotyping behaviors and inappropriate language, suggesting that our results are conservative and that even greater rates of provider bias might occur in applied settings. Lastly, we did not collect information about how well the clinician knew the patient as data were collected via the patients' initial obstetric visits. However, some patients had met their clinicians during prior pregnancies or at emergency clinics.

Despite these limitations, our study is among the few that have assessed associations of patient race/ethnicity with measures of clinician communication during prenatal care using observer's rating and a text analysis software application guided by psychological processes of word use. Our study highlights the presence of racial disparities in the interpersonal processes during prenatal care, which likely exacerbate factors contributing to racial inequities in maternal health outcomes. Clinicians, institutions, and other stakeholders who seek to improve birthing people's prenatal care experience and address the racial inequities in maternal health outcomes need to advocate in their settings for the reduction of external and internal barriers to prenatal care, especially those related to systemic racism. There is a critical need to educate all healthcare providers and related stakeholders that race matters as it affects various aspects of health outcomes.^{34,90} Creating awareness of the existence of clinicians' interpersonal racism whether it is manifested consciously or unconsciously, as well as systemic racism and its contribution to the racial inequities in health outcomes is also pertinent.^{34,90,145,334} Advocacy for institutionalizing culturally competency, cultural humility and anti-racism training in the healthcare institutions is required to support the reduction of interpersonal and institutional racism.^{34,90,335-337} Additionally, training medical students and clinicians on relationship centered care with a critical race lens will also assist with reducing racist practices

within the healthcare setting.¹⁴⁶ Relationship centered care promotes clinician's self-awareness of their personal prejudices and biases, monitoring and positively adjusting their behaviors based on this awareness.^{142,146} It also encourages incorporation of emotion and positive affect in patient-clinician interactions and facilitates clinicians understanding of patients experiences and how this affects their perspective and preferences. Patient-clinician relationships can also be fostered when patients have a shared identity and lived experiences with their clinicians emphasizing the importance of racial concordance between patients and clinicians.

Clinicians racial bias is facilitated and enabled by structural and institutionalized racism which reinforce stereotyping and prejudices.²⁹⁰ This buttresses the need to expand our focus beyond individual level interventions and develop strategies that address institutional and structural racism. Healthcare institutions need to adopt and implement evidence-based processes that embed diversity, equity and inclusion principles in practice. One of these strategies is to enhance patient-clinician racial concordance. Studies have demonstrated better quality of care with race-concordant visits: Black patients report better quality of care when they consult with Black clinicians.^{179,209,214,311} Race-concordant medical visits have also been associated with improved healthcare utilization.³³⁸ Greenwood et. al also found a significant improvement in Black infant mortality with newborn-physician racial concordance.³³⁹ Current racial distribution of the medical workforce does not facilitate race concordance for minority population as studies have also shown that White patients were more likely to be race-concordant with their clinician.²¹⁴ This can also be evidenced in our study with 80% of recruited clinicians self-reporting as White. Racial concordance of patient and their clinician for minority populations can be achieved through the implementation of policies and programs nationally and institutionally that enhance diversification of the medical workforce. In addition, healthcare institutions need to review and eliminate practices or images within their institutions which foster stereotyping or discriminatory patterns and adopt standardized protocols for care.

At the public policy level, policymakers need to develop collaboratives at the federal, state and local level to design and develop policies to address to structural racism. In addition, policy makers need

to invest in research that identify the root causes of structural racism, its effects and potential interventions to address it. Furthermore, policymakers need to fund evidence-based programs and policies that would eliminate structural racism.

Many healthcare institutions and policymakers have declared their dedication to attaining racial equity in health outcomes, however some are yet to design and implement processes to achieve these goals. The above strategies outlined are initial steps healthcare systems and policymakers can employ to demonstrate their commitment to achieving racial equity in healthcare. Addressing the etiologies of the racial inequities in maternal healthcare will go a long way in improving maternal and child health indices and the health of the nation.

4.2 Racial Inequities in Clinicians' Illicit Drug Test Ordering Proclivities and Interventions for Pregnant People

4.2.1 Background

The use of alcohol, tobacco, illicit drugs and other psychoactive substances during pregnancy is an important public health issue as it can result in significant and persistent adverse effects on pregnant people and their babies, including preeclampsia, gestational hypertension, miscarriage, preterm birth, low birth weight, small for gestational age infants, neonatal abstinence syndrome, respiratory disorders, and neurological damage.²⁵ Additionally, the Maternal Mortality Review Committee and Perinatal Mortality Review Committee of some states in the United States, including California, Utah, Washington, and Massachusetts, have reported drug use and accidental substance overdose as significant contributors to pregnancy-related maternal deaths in these states.³⁴⁰⁻³⁴² National survey data from 2018 shows that about 5.4% of pregnant people self-reported using illicit drugs in the past month including cannabis.³⁴³ The Centers for Disease Control and Prevention (CDC) defines illicit drug use as the nonmedical use of drugs prohibited by law; these drugs are usually highly addictive and include marijuana, amphetamine-type stimulants, cocaine, heroin, and other opioids.³⁴⁴

The American College of Obstetricians and Gynecologists (ACOG) recommends universal verbal screening of pregnant people for substance use during pregnancy to ensure the provision of appropriate and adequate care to birthing people and newborns.³⁴⁵ Under-reporting of substance use in pregnancy is common;^{281,346-352} consequently urine toxicology testing of pregnant and delivering people may be utilized to measure the use of illicit drugs in these people. However, ACOG does not endorse routine urine toxicology testing in pregnancy, and ³⁵³ states in the US have varying policies around illicit drug use screening and toxicological testing. Additionally, states have also adopted varying legal mandates for reports of births of mothers who used illegal substances to child protective services.³⁵⁴ The state of

Pennsylvania, for example, has mandated reporting for children born affected by substance use by the mother.³⁵⁵

National survey data showed that current illicit drug use rates do not meaningfully differ between race/ethnic groups.³⁵⁶ Additionally, several studies have revealed no association between substance use and race, with some reporting a similar prevalence of substance use in Black and White people in pregnancy.^{110,357-359} Despite this, literature has shown racial differences in clinicians' testing for illicit drug use during the prenatal and peripartum period^{111,112} and reporting to child protective services even in states with universal screening, testing, and mandatory reporting policies.^{110,113} The Institute of Medicine's report suggests that institutional racism and the discriminatory behavior of healthcare workers due to their prejudices and/or implicit or explicit stereotyping may contribute to the racial/ethnic disparities in the type and quality of care and existing healthcare disparities.⁶⁶ Camara Jones describes these prejudices and discrimination as personally mediated racism.¹⁶⁹

Personally mediated racism involves negative feelings, perceptions, and evaluations of individuals because of their racial group membership, overgeneralized beliefs about the characteristics of the racial group members, and inequitable treatment.¹⁶⁹ As indicated in the Hippocratic Oath, the medical profession disavows any form of racism or discriminatory racial behavior. Despite this, there is substantial evidence of racial discriminatory behaviors and patterns portrayed by healthcare workers. There is ample evidence of clinicians' unequal treatment of their patients due to their race and ethnicity during patient-clinician interactions, screening, diagnosis, and treatment due to clinicians' racial discrimination.^{66,97,99,102,164,177-180,183,187,264,272,279,280,289,299,360} This unequal treatment is critical in the racial inequity in the quality of maternal health care and maternal morbidity and mortality, and the distrust of the healthcare system by the Black population.

Studies have shown evidence of racial disparities in clinicians' decision-making and treatment options due to clinicians' engrained notions of the Black populace, resulting in suboptimal care for minority patients.^{99,177,279,280,361} This racial discriminatory pattern and stereotyping has also been reported with clinicians' decisions to test pregnant people for illicit drug use in pregnancy, with studies showing that Black birthing people were more likely to be tested for illicit drug use than White birthing people.^{111,112} The consequences of clinicians' decisions to test for illicit drug use may extend beyond the medical effects and outcomes of illicit drug use in pregnancy; it may also include the involvement of child protective services in the lives of birthing people and children. Therefore, racial inequities in obstetric care workers' decision to test for illicit drug use in pregnant people may also be associated with the racial differences observed in clinicians reporting of pregnant people who used illicit drugs during pregnancy to health authorities.

Researchers have highlighted racial differences in the provision of prenatal care and reported experiences of assumptions of substance use by clinicians due to the patient's race.⁵⁰ A study by Kunins et al. provided empirical evidence of racial differences in testing rates for illicit drug use between Black and Non-Black patients in the peripartum setting.¹¹² Literature has also highlighted the racial disparity in referral to child protective services due to various factors.^{113,362} Chasnoff et al.'s study highlighted that despite similar rates of substance use during pregnancy in White and Black patients, Black patients were ten times more likely to be reported to health authorities for substance use during pregnancy than White patients.¹¹⁰ In addition, a study by Holland et al. from the analysis of Talking to Pregnant Patients (T2P2) data found that Black/African-American pregnant patients who disclosed marijuana use were almost ten times as likely as their White counterparts to have punitive counseling, which involved discussion on legal ramifications of patient's substance use and contacting child protective services.³⁶³ All of these disparate treatments and forms of racial discrimination may enhance Black birthing people's mistrust of the healthcare system and reduce healthcare utilization, in turn leading to poorer health outcomes.

In New York City, there have been recent investigations of three hospitals by the New York City's Commission on Human Rights exploring racism and classism as the potential cause for the higher occurrence of drug testing of Black and Latino pregnant mothers and newborns.³⁶⁴ These investigations commenced due to reports from advocates of new and expecting mothers, low-income communities, and child welfare-involved families of concerns that hospitals report parents with positive drug use tests to the child maltreatment online platform.³⁶⁴ There is also a current litigation case in Allegheny County, Pennsylvania, in which a Black mother is suing a hospital for conducting a drug test without her consent and providing the results to Allegheny County Children, Youth, and Families, resulting in child abuse allegations.³⁶⁵ With these investigations and litigations around prenatal and perinatal illicit drug testing and reporting to Children Youth and Families office (CYF) and associated racial connections, it is pertinent to study clinicians' decisions to test for illicit drug use during prenatal care and at delivery, how this differs by race/ethnicity, as well as on their referrals to CYF involvement within Allegheny County.

Although studies have explored racial disparities in clinicians' testing for illicit drug use during the prenatal and perinatal period, these studies did not consider the variations in patients' disclosure of illicit drug use during these periods. Patient disclosure could impact the clinicians' decisions to request illicit drug use testing. Additionally, studies have explored racial disparities in child protective services reporting, but these studies did not examine this outcome accounting for the urine drug test result of the birthing people at delivery. The mother's urine drug test result at delivery may affect the clinicians' decision to refer the neonate to the Children, Youth, and Families offices.

The present research study aims to fill important gaps in the literature. The study aims to measure racial differences in clinicians' decisions regarding substance use testing for patients and subsequent referral to CYF when patients test positive for substances during labor/delivery. This study will use data collected within Allegheny County, PA, including data from directly observed obstetric visits and abstracted data from pregnant patients' medical records. We hypothesized that i) Clinicians are more likely to conduct urine drug testing for Black pregnant people who report illicit drug use in pregnancy during the first obstetric

visit compared to White pregnant people; ii) Clinicians are more likely to conduct urine drug testing for Black pregnant people who did not report illicit drug use during the first prenatal visit as compared to their White counterparts; iii) Clinicians are more likely to contact Children, Youth, and Families office for infants of Black birthing people who test positive for substance use during labor/delivery as compared to their White counterparts.

4.2.2 Methods

4.2.2.1 Focus for this analysis

For this paper, we focused on a quantitative analysis of racial differences in urine drug testing at the initial obstetric visit based on patients' illicit drug use disclosure pattern during this visit. Additionally, we measured racial differences in clinicians' referral to the Children, Youth, and Families office for birthing people with positive urine toxicology tests at delivery. We collected information on patient's illicit drug use disclosure pattern from the audio-recordings. Also, we retrieved data on the conduct of urine drug testing at the initial obstetric visit, referral to the Children, Youth and Families office, and urine drug testing at delivery for patients whose clinician screened for illicit drug use at the initial obstetric visit from the patient participants abstracted medical records.

For the outcome measure, conducting urine drug testing at the initial obstetric visit, we limited the observations for our data analysis to prenatal visits in which the clinician asked about illicit drug use. The study team enrolled 479 eligible participants. Of the 479 enrolled participants, there were no audio-recordings for 11 participants due to recorder malfunction. Of the remaining 468, we excluded patients recruited from Wilkinsburg clinic (21) because universal urine drug testing occurs at the initial obstetric visit at this clinic. Of the remaining 447 visits, obstetric care clinicians screened for illicit drug use in only 366 of the recorded visits. Of these 366 observations, we dropped 25 participants who identified as other races apart from Black and White from the analytic sample. The sample of 341 participants was further

divided based on patients' current illicit drug use disclosure pattern at the initial obstetric visit (70 disclosed and 271 did not), as shown in Figure 1. Due to missing data, the final analytic sample for patients who revealed current illicit use was 66, while for those who did not was 264.

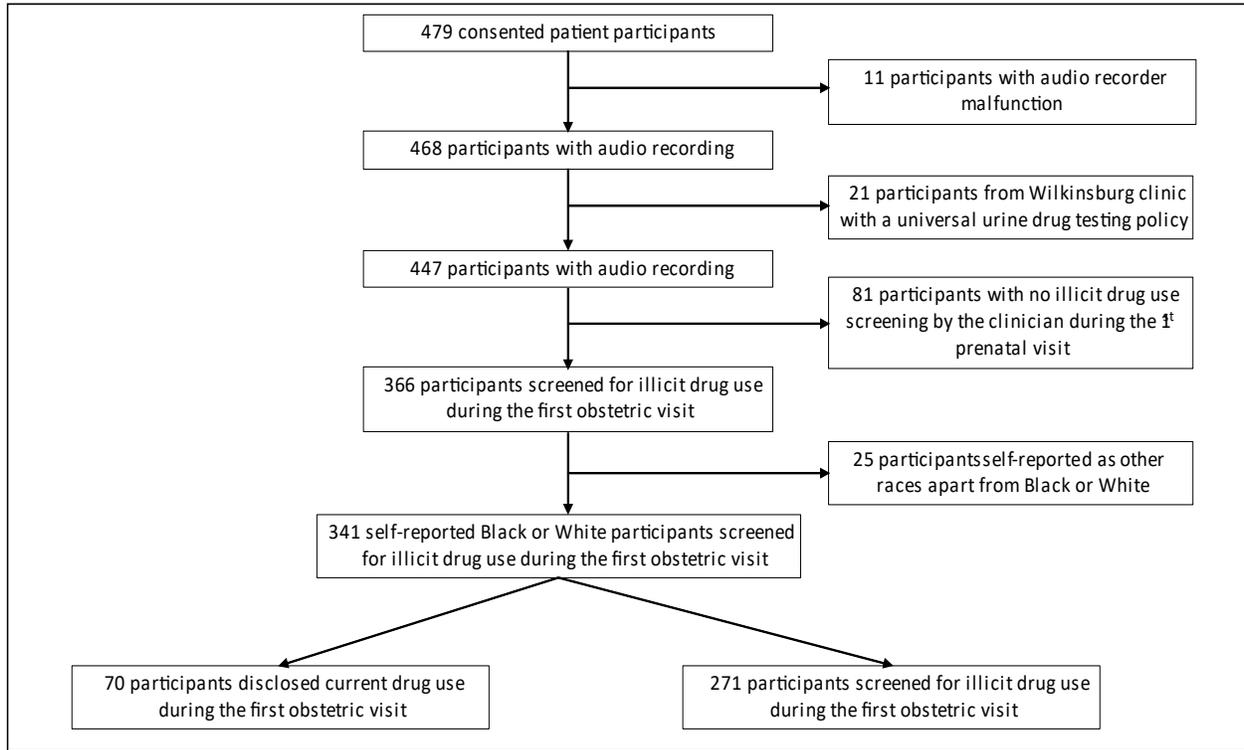


Figure 5: Patient Participant Sample for Illicit Drug Use Testing Analysis

For the outcome measure of referral to CYF, our data analysis was limited to observations with data on CYF reporting status. This sample represents a subset of the larger database (157 (33%) of the 479) as it was limited to participants who consented to the inclusion of the infant medical records and who delivered at our study hospital. Of these 157 patients, we dropped six patients that identified as races other than Black or White. 27 of the 151 patients had positive urine drug test result at delivery, as shown in Figure 2. Due to missing data for one participant, the final analytic sample was 26.

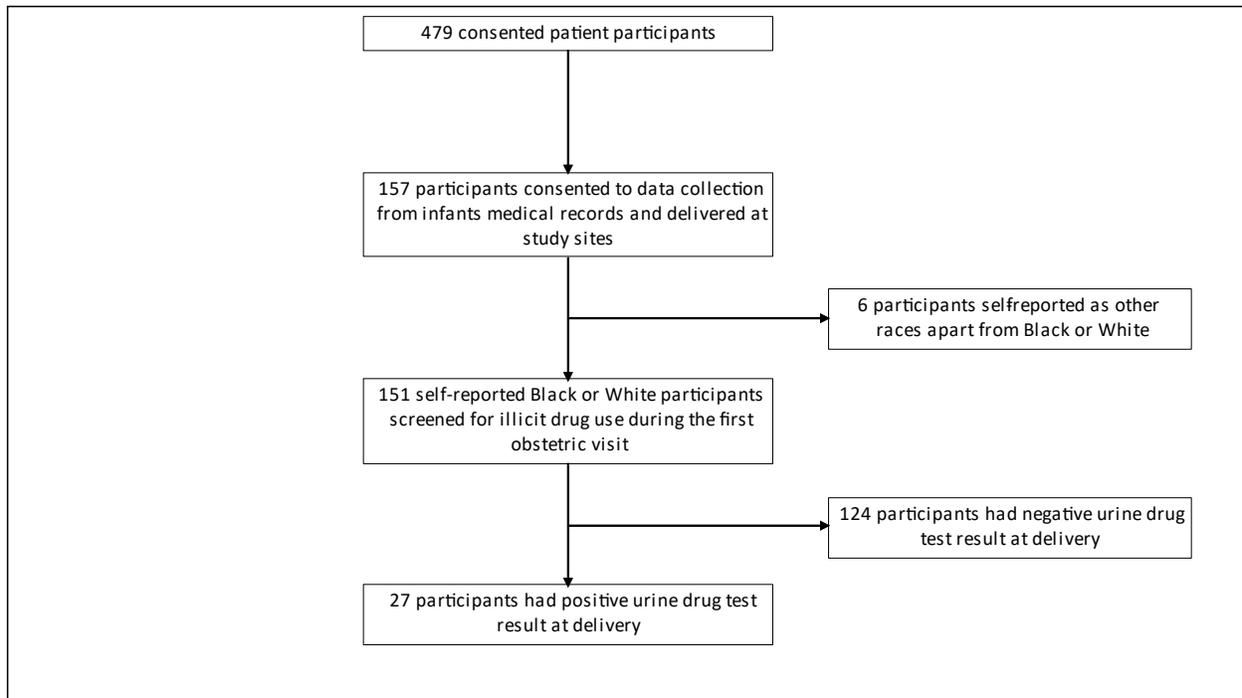


Figure 6: Patient Participant Sample for CYF Referral Analysis

4.2.2.2 Study Variables

Outcome variables

The main study outcomes were: 1) the conduct of urine drug testing (binary measure) ordered by the obstetrics clinician at the initial obstetric visit for patients who disclosed current illicit drug use; 2) the conduct of urine drug testing ordered by the obstetrics clinician at the initial obstetric visit for patients who did not disclose current illicit drug use; 3) and referral to CYF following delivery (binary measure). The first outcome measure was obtained by reviewing patients' medical records to determine if urine drug testing was ordered and conducted at the initial obstetric visit. *Urine drug testing* was recorded as "yes" if urine drug testing was conducted and "no" if it wasn't. Data for the outcome measure of *referrals to CYF* was also obtained from the patients' or infants' medical records including progress notes, disposition notes or notes from the social worker. It was reported as "yes" if CYF was contacted and "no" if there was no report to CYF.

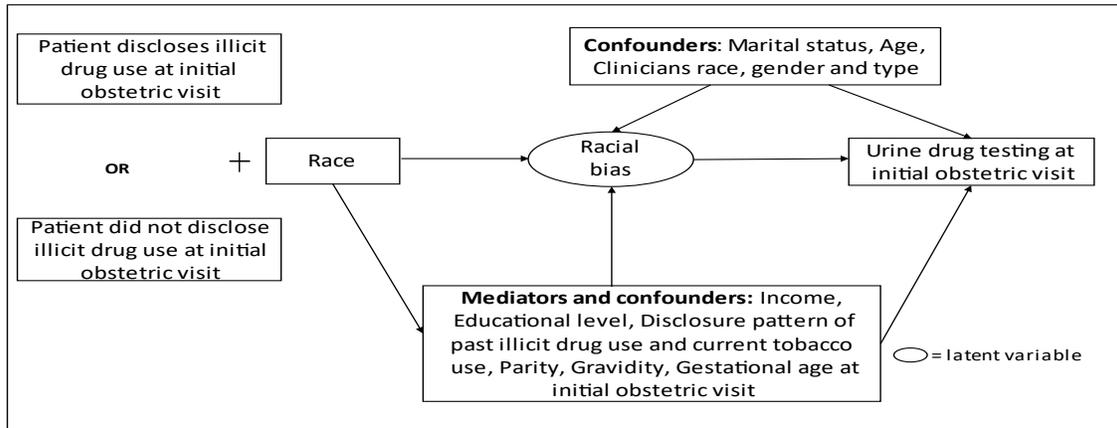


Figure 7: Variables for Research Question 1 and 2

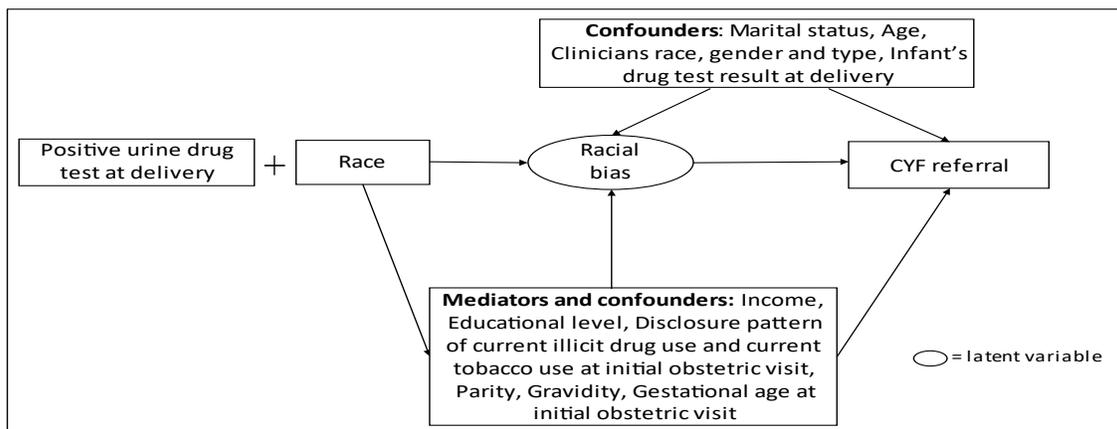


Figure 8: Variables for Research Question 3

Independent variables

The independent variables for the outcome measure of conducting urine drug testing at the initial obstetric visit were patients' race and disclosure of current illicit drug use. Patients' race is used as a variable to measure racial differences in the pattern of the outcome measures. Patients' race was obtained from

patients' reports of race/ethnicity identified in the post-visit questionnaire. Patients identified as White/Caucasian, Black/African American, Hispanic/Latina, Asian and Other. For this analysis, due to the insufficient numbers of patients who self-reported as anything other than White or Black, we excluded other racial categories (n = 25). We retrieved data indicating if patients disclosed current illicit drug use during the initial obstetric visit from listening to the audio-recordings of the visits. The study coordinators defined current illicit drug use as use within the last 30 days of the patient participant's audio-recorded visit, which was self-reported to the clinician during the obstetric visit.

The independent variables for the outcome measure, CYF referral, were patients' race and positive urine drug test result at delivery. We retrieved the result of the urine drug test at delivery from patients' medical records.

Potential confounders

We considered several demographic characteristics of both patients and clinicians for inclusion as potential confounders. Patient characteristics include age, marital status, educational attainment, annual income, gravidity, and parity, retrieved from their post-visit questionnaires and medical records.

Additional potential confounders for the outcome measure – conducting urine drug testing at initial obstetric visit

In addition, we treated disclosure of past illicit drug use (defined as use greater than 30 days before the obstetric visit), disclosure of current tobacco and alcohol use at the initial obstetric visit as potential confounders for the outcome measure, and conducting urine drug testing at the initial obstetric visit; these data were collected by listening to the audio-recording of the initial obstetric visit. Physician characteristics considered were gender, race/ethnicity, and type, including nurse midwives, nurse practitioners, residents, physician assistants, and faculty physicians.

Additional potential confounders for the outcome measure – CYF referral

For this outcome measure, disclosure of past and current illicit drug use collected by listening to the audio-recording of the visits were considered as potential confounders. The variables of urine drug test result at initial obstetric visit and infant's urine drug test results were retrieved from patients and infants' medical records and included.

Interaction terms

Several interaction terms were included in the final model and tested for significance. Interaction terms generated include race and income, marital status and income, race and disclosure pattern, race and educational attainment, age and marital status, and age and educational attainment.

4.2.3 Analysis

For the outcome measure, conducting urine drug testing at the initial obstetric visit, we limited the observations for our data analysis to prenatal visits in which the clinician asked about illicit drug use. Because we wished to assess the impact of patients' disclosure pattern on clinicians' ordering of urine drug testing, we removed visits during which patients had not been asked and thus were not prompted to disclose. There were no statistically significant differences in patient and clinician characteristics between those who remained in the final analytic sample and the dropped observations. There were insufficient numbers of patients who identified themselves as any race other than White or Black/African American for meaningful statistical analysis, especially after categorization based on current disclosure pattern; therefore, we excluded those patients from the final sample (n = 25). Due to missing data, the final analytic sample for patients who revealed current illicit use was 66, while for those who did not was 264.

For the outcome measure of referral to CYF, we limited our data analysis to observations with data on CYF reporting status (157 (33%) of the 479 enrolled patient participants); this represents a subset of the larger database as it was limited to participants who consented to the inclusion of the infant medical records and who delivered at our study hospital. There were no statistically significant differences in patient characteristics between the 157 participants and the 322 dropped observations. We excluded six patients who identified themselves as other races other than White or Black/African American from the 157 observations. 27 of the 151 patients had positive urine drug test result at delivery, and were included in the analytic sample. Due to missing data, the final analytic sample was 26.

We conducted a descriptive analysis of the demographic characteristics of participants and clinicians. We used independent t-test to test for differences across the two patient groups (Blacks and Whites) for the continuous variables and Chi-squared test for categorical variables. To identify potential confounders, we performed chi-square tests for categorical variables and analyses of variance for continuous variables to associate all patient and clinician characteristics with patient race/ethnicity. We used logistic regression to assess bivariate association of each independent variable with the outcome measures. The significance level was at α of 0.05. Little's test of missing completely at random (MCAR) showed that missing data was MCAR.

We generated interaction terms between race and disclosure of substance use and other patient demographic characteristics, including age, marital status, income, and educational attainment. All interaction terms such as race and income, marital status and income, age and educational attainment, age and income race and disclosure pattern, educational attainment and income were tested for significance. Confounders were included in the multivariable models if there was substantial evidence from existing literature as potential confounders of the relationship under investigation or if they were statistically significantly associated with the independent variables and the outcome measure. We selected the most parsimonious model and best correlation structure based on the quasi-likelihood under the independence model criterion (QIC).³⁰⁸ Horton et al.'s extension of Hosmer-Lemeshow test statistics was used to test the

goodness of fit of the final model.³⁰⁹ Primary independent variables of interest for the different outcome measures such as race (Blacks and Whites), substance use disclosure (for urine drug testing at initial obstetric visit) and positive urine drug testing result at delivery (for CYF contacted) were included in the final parsimonious models, as well as patient and clinician characteristics with substantial evidence from existing literature as potential confounders of the relationship under investigation or characteristics found to be statistically significant after analyses.

We used the generalized estimating equation method in all regression analyses to account for the clustering effects of any within-clinician correlations and the different number of patients per clinician because the same clinician was involved in several patients' obstetric consultations and most likely at patient deliveries. We assumed an exchangeable correlation structure with strongly consistent estimation because it yields more valid and robust coefficient estimates even with misspecification of the correlation structure.³⁶⁶ The study team recruited more than 90% of clinicians and patients from one of the five study sites; therefore, we ignored correlation within sites and accounted for only intraclass correlation within clinicians. Generalized estimating equation were also used for the regression analyses for the outcome measure, CYF contacted, based on the assumption that a clinician might be involved in the peripartum care (including delivery) of more than one of the patient-participants.

We present findings from the final multivariable model for the different outcome measures: 1) urine drug testing at initial obstetric visit for pregnant people who disclose current illicit drug use; 2) urine drug testing at initial obstetric visit for pregnant people who did not disclose current illicit drug use; and 3) referral to CYF. The final multivariable model for the outcome measure - urine drug testing at initial obstetric visit for patients who disclosed illicit drug use at this visit included race and other patient characteristics including age group, educational level, annual income, and marital status and disclosure of past illicit drug use. The mathematical model to explain this analysis is:

Urine drug testing at initial obstetric visit = $\beta_0 + \beta_1$ (Patients' race) + β_2 (Patients' age group) + β_3 (Patients' marital status) + β_4 (Patients' educational level) + β_5 (Patients' annual income) + β_6 (Past illicit

drug use at initial obstetric visit disclosure pattern) + if patient discloses illicit drug use at initial obstetric visit

For patients who did not disclose illicit drug use at their prenatal visit, variables included in the final multivariable model were patients' race, marital status, age group, annual income, educational attainment, gestational age at initial obstetric visit, disclosure of current tobacco use, and disclosure of past illicit drug use. The mathematical model to explain this analysis is:

Urine drug testing at initial obstetric visit = $\beta_0 + \beta_1$ (Patients' Race) + β_2 (Patients' age group) + β_3 (Patients' marital status) + β_4 (Patients' educational level) + β_5 (Patients' annual income) + β_6 (Patients' gestational age at initial obstetric visit) + β_7 (Past illicit drug use at initial obstetric visit disclosure pattern) + β_8 (Current tobacco use at initial obstetric visit disclosure pattern) + if patient did NOT disclose illicit drug use at initial obstetric visit

The final multivariable model for the outcome measure, referral to CYF, included patients' race, patients' educational level and infant's result from urine drug testing. The mathematical model to explain this analysis is:

Referral to CYF = $\beta_0 + \beta_1$ (Patients' race) + β_2 (Patients' educational level) + β_3 (Infant's urine drug test result) + if patient had positive urine drug test result at delivery

STATA statistical software, version 16.0 was used to perform all analyses.³¹⁰

4.2.4 Results

Urine drug testing at initial obstetric visit

Of the 341 participants included in this analysis, three participants were missing data on income, marital status, and educational attainment. The characteristics of patient and clinician participants are shown in Table 6. Sixty percent (60%) of participants identified as Black/African American and 40% as

White/Caucasian. The majority of participants were less than 30 years of age (79%) and had an individual income less than \$20,000 annually (77%). Thirteen percent (13%) of our sample were married, and 41% were living with a partner. The mean parity for our sample was 1, and the mean gravidity was 3. The mean gestational age for our participants at the time of their first obstetric visit was 12 weeks. There were 61 clinicians in our sample. The majority of clinicians were female (93%) and identified as White (82%) and obstetrics and gynecology residents (76%). The mean number of patients in this sample seen by each clinician was 6 with a minimum of one and a maximum of 10.

For significance testing, we combined some categories due to the small cell sizes (less than five observations). For example, we included patients who self-reported as separated and divorced to the single category, combined provider type into nurses (nurse midwives, nurse practitioners and physician assistants) and physicians (residents and faculty physicians), and clinicians race into non-White (Black, Asian and Other) and White. Additionally, we created a binary measure for educational attainment: high school and less (grade school and high school/GED) and more than high school (associate's degree, some college, finished college, and graduate school).

There were statistically significant demographic differences between the Black and White, as shown in Table 7. Compared with White patients, Black patients were younger and more likely to earn an annual income of less than \$15,000. There were no statistically significant differences in the race, gender, or type of clinician seen by Black and White patients.

Table 6: Patient and Clinician Characteristics for Visits with Clinician Illicit Drug use Screening

Variables	Category	No. (%)
Patients (n = 341)		
Race/Ethnicity	Black	205 (60%)
	White	136 (40%)
Age, years (mean= 25.2, SD= 5, min/max= 18/45)	<20	34 (10%)
	20 - 29	235 (69%)

	30+	72 (21%)
Marital status	Single	145 (43%)
	Living with partner	139 (41%)
	Married	43 (13%)
	Separated	6 (2%)
	Divorced	5 (1%)
	Widowed	0 (0%)
Highest level of education completed	Grade school	40 (12%)
	High school/GED	133 (39%)
	Associates degree	35 (10%)
	Some college	101 (30%)
	Finished college	23 (7%)
	Graduate school	6 (2%)
Annual income, \$	0 – 4,999	129 (38%)
	5,000 – 9,999	50 (15%)
	10,000 – 14,999	43 (13%)
	15,000 – 19,999	38 (11%)
	20,000 and higher	70 (21%)
	Refused	8 (2%)
Gravidity - mean = 3, SD =2, min = 1, max = 14		
Parity – mean = 1, SD = 1, min = 0, max = 8		
Gestational age at new obstetric appointment, week/s – mean = 12, SD = 7, min = 4, max = 39		
Clinicians (n = 61)		
Gender	Female	57 (93%)
	Male	4 (7%)
Race/Ethnicity	Black	4 (7%)
	White	50 (82%)

	Asian	3 (5%)
	Other	4 (7%)
Type	First-year resident	26 (43%)
	Second-year resident	9 (15%)
	Third-year resident	10 (16%)
	Fourth-year resident	1 (2%)
	Nurse midwife	6 (10%)
	Nurse practitioner	7 (11%)
	Physician assistant	1 (2%)
	Faculty physician	1 (2%)
No. of patients' provider saw in the study - mean = 6, min = 1, max = 10		

*min/max = minimum/maximum, GED = general equivalency diploma

*Some numbers may not add to the total number of patients due to missing data for certain variables (marital status, highest level of education completed and annual income)

*Some percentages add up to less than or greater than 100% due to rounding

Table 7: Patient and Clinician Characteristics by Patient Race/Ethnicity

Variables	Patients (N = 341)		
	Black Patients (n = 205)	White Patients (n = 136)	P value ^a
Age			
<20	24 (11%)	10 (7%)	P = 0.09
20 - 29	145 (71%)	90 (66%)	
30+	36 (18%)	36 (26%)	
Marital status			
Single	104 (51%)	52 (39%)	P = 0.001**
Living with partner	85 (42%)	54 (40%)	
Married	15 (7%)	28 (21%)	
Educational level, n (%)			
High school/GED and less	109 (53%)	64 (48%)	P = 0.3

More than high school	95 (47%)	70 (52%)	
Annual income, n (%)			
\$0 – 4,999	84 (42%)	45 (34%)	P = 0.02**
\$5,000 – 14,999	61 (31%)	32 (24%)	
\$15,000 and higher	53 (27%)	55 (42%)	
Mean gravidity	3	3	P = 0.07
Mean parity	1	1	P = 0.07
Mean gestational age at new obstetric appointment, week/s	11.4	13.7	P = 0.003**
Clinicians			
Gender, n (%)			
Female	194 (95%)	128 (94%)	P = 0.8
Male	11 (5%)	8 (6%)	
Race/Ethnicity			
White	173 (84%)	114 (84%)	P = 0.9
Non-White	32 (16%)	22 (16%)	
Type			
Nurses	58 (28%)	36 (26%)	P = 0.7
Physicians	147 (72%)	100 (74%)	

* Some percentages add up to less than or greater than 100% due to rounding

^a Differences across patient groups were analyzed with Chi square statistics for categorical variables and with analysis of variance for continuous variables

**Statistically significant values

Pregnant people who disclosed current illicit drug use at initial obstetric visit

Of the 341 Black and White patients screened for illicit substance use, 70 (21%) disclosed current illicit drug use at the initial obstetric visit. Of the 70 patient participants who disclosed current illicit drug use, 33 (47%) were Black, 37 (53%) were White, as shown in Table 3. Urine drug testing was conducted in 50 (71%) of these 70 patients; 56% of these 50 patients were Black while 44% were White (Table 8).

To test for statistical significance, we combined age groups into two groups: less than 30 years and 30 years and above due to the small cell size for those less than 20 years of age (3 observations). There were statistically significant differences in patient characteristics by race/ethnicity, as shown in Table 9. Patients who identified as White were more likely to disclose past illicit drug use and current tobacco use than Black patients. Additionally, White patients were more likely to present for their initial obstetric visit at a later gestational age than Black patients. There were no statistically significant differences in clinician characteristics, including race, gender, and type by patients' race. Table 10 shows that 85% of Black patients and 59% of White patients who disclosed current illicit drug use had urine testing conducted at the initial obstetric visit; these percentages indicate that clinicians were more likely to request urine drug testing for Black pregnant patients.

Table 8: Patient Characteristics – Disclosed Current Illicit Drug Use at Initial Obstetric Visit and Urine Drug Testing at Initial Obstetric Visit

Variables	Patient disclosed current illicit drug use at initial obstetric visit (n= 70)	Urine drug testing conducted at initial obstetric visit	
		Yes (50)	No (20)
Race/ethnicity, n (%)			
Black	33 (47%)	28 (56%)	5 (25%)
White	37 (53%)	22 (44%)	15 (75%)
Age, n (%)			
<20	3 (4%)	2 (4%)	1 (5%)
20 - 29	54 (77%)	37 (74%)	17 (85%)
30+	13 (19%)	11 (22%)	2 (10%)
Marital status			
Single	26 (38%)	20 (42%)	6 (30%)
Living with partner	34 (50%)	22 (46%)	12 (60%)
Married	8 (12%)	6 (13%)	2 (10%)

Educational level, n (%)			
High school/GED and less	48 (71%)	36 (75%)	12 (60%)
More than high school	20 (29%)	12 (25%)	8 (40%)
Annual income, n (%)			
\$0 – 4,999	32 (48%)	20 (43%)	12 (60%)
\$5,000 – 14,999	20 (30%)	17 (37%)	3 (15%)
\$15,000 and higher	14 (21%)	9 (20%)	5 (20%)
Clinicians			
Gender, n (%)			
Female	68 (97%)	49 (98%)	19 (95%)
Male	2 (3%)	1 (2%)	1 (5%)
Race/Ethnicity			
White	58 (83%)	41 (82%)	17 (85%)
Non-White	12 (17%)	9 (18%)	3 (15%)
Type			
Nurses	18 (26%)	12 (24%)	6 (30%)
Physicians	52 (74%)	38 (76%)	14 (70%)

*Some numbers may not add to the total number of patients due to missing data for certain variables

*Some percentages add up to less than or greater than 100% due to rounding

Table 9: For Patients who Disclosed Current Illicit Drug Use - Patient and Clinician Characteristics by Patient Race/Ethnicity

Variables	Patients who disclosed current illicit drug use (N = 70)		
	Black Patients	White Patients	P value^a
Patients	(n = 33)	(n = 37)	
Age, n (%)			
<30	28 (85%)	29 (78%)	P = 0.5

30+	5 (15%)	8 (22%)	
Marital status			
Single	12 (38%)	14 (39%)	P = 0.8
Living with partner	17 (53%)	17 (47%)	
Married	3 (9%)	5 (14%)	
Educational level, n (%)			
High school/GED and less	25 (78%)	23 (64%)	P = 0.2
More than high school	7 (22%)	13 (36%)	
Annual income, n (%)			
\$0 – 4,999	12 (39%)	20 (57%)	P = 0.1
\$5,000 – 14,999	13 (42%)	7 (20%)	
\$15,000 and higher	6 (19%)	8 (23%)	
Mean gravidity	3	3	P = 0.2
Mean parity	1	1	P = 0.9
Mean gestational age at new obstetric appointment, week/s	11	16.7	P = 0.003**
Disclosure of past illicit drug use			
Yes	1 (3%)	26 (70%)	P < 0.00001**
No	32 (97%)	11 (30%)	
Disclosure of current tobacco use			
Yes	18 (55%)	33 (89%)	P = 0.001**
No	15 (45%)	4 (11%)	
Clinicians			
Gender, n (%)			
Female	31 (94%)	37 (100%)	P = 0.1
Male	2 (6%)	0 (0%)	
Race/Ethnicity, n (%)			

White	29 (88%)	29 (78%)	P = 0.3
Non-White	4 (12%)	8 (22%)	
Type, n (%)			P = 0.2
Nurses	22 (67%)	30 (81%)	
Physicians	11 (33%)	7 (19%)	

* Some percentages add up to less than or greater than 100% due to rounding

° Differences across patient groups were analyzed with Chi square statistics for categorical variables and with analysis of variance for continuous variables

**Statistically significant values

Table 10: Disclosure of Current Illicit Drug Use and Status of Urine Testing at Initial Obstetric Visit by Race

Urine drug testing status	Patients disclosed current illicit drug use at initial obstetric visit (N= 70)	
	Black patients (n = 33)	White patients (n=37)
Urine drug testing conducted at initial obstetric visit (n = 50)	28 (85%)	22 (59%)
Urine drug testing not conducted at initial obstetric visit (n = 20)	5 (15%)	15 (41%)

Table 11 shows the results associating patients' characteristics that disclosed current illicit drug use at the initial obstetric visit with the conduct of urine drug testing at this visit. In the bivariate analyses, Black pregnant people who disclose current illicit drug use at the initial obstetric visit were 3.1 times ($p = 0.04$) more likely to have urine drug testing conducted at this visit compared to their White counterparts. After controlling for other patient demographics and if the patient disclosed past illicit drug use, Black patients who disclosed illicit drug use at the initial obstetric visit were still more likely to have urine drug testing conducted when compared to their White counterparts ($p = 0.01$). Also, from the multivariable analyses, patients that disclosed past drug use were more likely to have urine drug testing conducted as compared to those who don't ($p = 0.05$). Table 12 shows that irrespective of the combination of independent variables included in the final multivariable model, there was still a statistically significant difference in urine drug

testing at the initial obstetric visit by patient's race, with Black patients who disclosed illicit drug use at the initial obstetric visit more likely to have urine drug testing conducted when compared to their White counterparts.

Table 11: Associations between Characteristics of Pregnant People who Disclosed Current Illicit Drug Use at Initial Obstetric Visit and Urine Testing for Illicit Drug use at Initial Obstetric Visit

Characteristics: For patients who disclosed current illicit drug use at initial obstetric visit	Unadjusted odds ratio* (p value)	Adjusted odds ratio* (p value)
Race/Ethnicity		
White	Reference	Reference
Black	3.1 (p = 0.04)**	11.8 (p = 0.01)**
Age, n (%)		
<30	Reference	Reference
30+	3.5 (p = 0.2)	2.9 (p = 0.2)
Marital status		
Married	Reference	Reference
Single	1.2 (p = 0.8)	1.1 (p = 0.9)
Living with partner	0.7 (p = 0.7)	0.7 (p = 0.7)
Educational level, n (%)		
More than high school	Reference	Reference
High school/GED and less	2.2 (p = 0.1)	2.0 (p = 0.3)
Annual income, n (%)		
\$0 – 4,999	Reference	Reference
\$5,000 – 14,999	2.4 (p = 0.2)	2.1 (p = 0.4)
\$15,000 and higher	1.0 (p = 0.9)	1.2 (p = 0.8)
Gravidity	1.0 (p = 0.7)	—

Parity	1.0 (p = 0.7)	—
Gestational age at initial obstetric visit	1.0 (p = 0.4)	—
Disclosure of past illicit drug use		
No	Reference	Reference
Yes	1.2 (p = 0.7)	6.7 (p = 0.05)**
Disclosure of current tobacco use		
No	Reference	—
Yes	0.5 (p = 0.2)	
Gender, n (%)		
Male	Reference	—
Female	2.7 (p = 0.5)	
Race/Ethnicity, n (%)		
White	Reference	—
Non-White	1.1 (p = 0.9)	
Type, n (%)		
Physicians	Reference	—
Nurses	0.9 (p = 0.9)	

*From generalized estimating equations

**p value < 0.05

***Omitted by GEE due to lack or very few observations

† Categories collapsed due to minimal or no values in some levels

Table 12: Sensitivity Analysis using Different Combinations of the Covariates

Models	Odds ratio	P value	95% C.I.
Race	3.1	0.04	1.0 – 9.1
+ Age (age)	3.6	0.03	1.1 – 11.1
+ Marital status (mar)	3.4	0.03	1.2 – 10.0
+ Educational level (edu)	3.1	0.04	1.0 – 9.3
+ Annual Income (inc)	3.1	0.05	1.0 – 9.6
+ Past illicit drug use (pid)	11	0.002	2.4 – 51.1
Combined variables:			
+ age, mar, edu, inc, pid*	11.8	0.01	1.8 – 76.2
+ age, mar, inc, pid	12.6	0.006	2.0 – 77.9
+ age, edu, inc, pid	12.6	0.007	2.0 – 80.3
+ age, mar, edu, pid	14.7	0.003	2.5 – 87.3
+ mar, edu, inc, pid	14.7	0.004	2.4 – 90.4
+ age, edu, pid	15.5	0.003	2.6 – 91.8

+ mar, inc, pid	15.3	0.003	2.6 – 90.0
+ mar, edu, pid	17.5	0.001	3.1 – 99.6
+ age, pid	10.3	0.003	2.2 – 49.0
+ inc, pid	16	0.002	2.7 – 95.1
+ mar, pid	17.5	0.001	3.2 – 95.5
+ edu, pid	17.7	0.001	3.1 – 101.4

* Final multivariable model

Pregnant people who did not disclose current illicit drug use at initial obstetric visit

Two hundred and seventy-one (79%) of the 341 participants did not disclose current illicit drug use; 172 (63%) identified as Black and 99 (37%) as White (Table 13). Table 14 shows that among patients who did not disclose current illicit drug use during the obstetric visit, there were statistically significant differences in some patient characteristics between Black and White patients. Black patients were younger, more likely to be single, earn lower annual income, and have higher parity than White patients. Compared with Black patients, White patients were more likely to disclose past illicit drug use and current tobacco use to their clinician during the initial obstetric visit. Thirty-eight (14%) of the 271 patients who did not disclose current illicit drug use had urine drug testing conducted at the initial obstetric visit. Of these 38 patients, 18 (47%) were Black and 20 (53%) White (Table 15).

Table 13: Patient Characteristics – For Patients who Did Not Disclose Current Illicit Drug Use at Initial Obstetric Visit

Variables	Patient who did not disclose current illicit drug use at initial obstetric visit (n = 271)	Urine drug testing conducted at initial obstetric visit	
		Yes (38)	No (233)
Race/ethnicity, n (%)			
Black	172 (63%)	18 (47%)	154 (66%)
White	99 (37%)	20 (53%)	79 (34%)
Age, n (%)			
<20	31 (11%)	6 (16%)	25 (11%)
20 - 29	181 (67%)	23 (61%)	158 (68%)

30+	59 (22%)	9 (24%)	50 (21%)
Marital status			
Single	130 (48%)	23 (62%)	107 (46%)
Living with partner	105 (39%)	14 (38%)	91 (39%)
Married	35 (13%)	0 (0%)	35 (15%)
Educational level, n (%)			
High school/GED and less	125 (46%)	20 (54%)	105 (45%)
More than high school	145 (54%)	17 (46%)	128 (55%)
Annual income, n (%)			
\$0 – 4,999	97 (37%)	15 (41%)	82 (36%)
\$5,000 – 14,999	73 (28%)	15 (41%)	58 (26%)
\$15,000 and higher	94 (36%)	7 (19%)	87 (38%)
Clinicians			
Gender, n (%)			
Female	254 (94%)	37 (97%)	217 (93%)
Male	17 (6%)	1 (3%)	16 (7%)
Race/Ethnicity			
White	229 (85%)	34 (89%)	195 (84%)
Non-White	42 (16%)	4 (11%)	38 (61%)
Type			
Nurses	76 (28%)	12 (32%)	64 (27%)
Physicians	195 (72%)	26 (68%)	169 (73%)

*Some numbers may not add to the total number of patients due to missing data for certain variables

*Some percentages add up to less than or greater than 100% due to rounding

**Table 14: For Patients who Did Not Disclose Current Illicit Drug Use: Patient and Clinician Characteristics
by Patient Race/Ethnicity**

Variables	Patients who did not disclose current illicit drug use (N = 271)		
	Black Patients (n = 172)	White Patients (n = 99)	P value ^a
Age, n (%)			
<30	141 (82%)	71 (71%)	P = 0.05**
30+	31 (18%)	28 (28%)	
Marital status			
Single	92 (53%)	38 (39%)	P < 0.00001**
Living with partner	68 (40%)	37 (38%)	
Married	12 (7%)	23 (23%)	
Educational level, n (%)			
High school/GED and less	84 (49%)	41 (42%)	P = 0.3
More than high school	88 (51%)	57 (58%)	
Annual income, n (%)			
\$0 – 4,999	72 (43%)	25 (26%)	P = 0.002**
\$5,000 – 14,999	48 (29%)	25 (26%)	
\$15,000 and higher	47 (28%)	47 (48%)	
Mean gravidity	3	3	P = 0.1
Mean parity	1.2	0.9	P = 0.04**
Mean gestational age at new obstetric appointment, week/s	11.5	12.6	P = 0.2
Disclosure of past illicit drug use			
Yes	16 (9%)	20 (20%)	P = 0.01**
No	156 (91%)	79 (80%)	
Disclosure of current tobacco use			

Yes	47 (27%)	38 (38%)	P = 0.05**
No	125 (73%)	61 (62%)	
Clinicians			
Gender, n (%)			
Female	163 (95%)	91 (92%)	P = 0.4
Male	9 (5%)	8 (8%)	
Race/Ethnicity, n (%)			
White	144 (84%)	85 (86%)	P = 0.6
Non-White	28 (16%)	14 (14%)	
Type, n (%)			
Nurses	47 (27%)	29 (29%)	P = 0.7
Physicians	125 (73%)	70 (71%)	

* Some percentages add up to less than or greater than 100% due to rounding

^a Differences across patient groups were analyzed with Chi square statistics for categorical variables and with analysis of variance for continuous variables

**Statistically significant values

Table 15: Patient Characteristics – Patients who Did Not Disclose Current Illicit Drug Use and Status of Urine Testing at Initial Obstetric Visit

Urine drug testing status	Patients did not disclose current illicit drug use at initial obstetric visit (N= 271)	
	Black patients (n = 172)	White patients (n = 99)
	Urine drug testing conducted at initial obstetric visit (n = 38)	18 (10%)
Urine drug testing not conducted at initial obstetric visit (n = 233)	154 (90%)	79 (80%)

Table 16 shows associations of patient race/ethnicity among patients that did not disclose current illicit drug use at the initial obstetric visit with providers conducting urine drug testing at this visit. We combined the living with partner and married categories of the marital status categories to ensure adequate cell sizes.

In the unadjusted analyses, we found that White patients who did not disclose illicit drug use have a higher likelihood of urine drug testing ($p=0.03$, $OR=2$) than their Black and other racial counterparts. After adjusting for other potential confounders, there was no statistically significant difference ($p = 0.4$) in urine drug testing at the initial obstetric visit by race for patients who did not disclose illicit drug use at the first obstetric visit.

In this sample of patients who did not disclose illicit drug use, we also found an association between disclosing current tobacco use and having received urine drug testing at the first obstetric visit from the bivariate analysis ($p = 0.009$). Further analysis showed that a higher percentage of White patients (68%) who did not disclose illicit drug use and had urine drug testing conducted, revealed current tobacco use compared to patients who identified as Black (32%). In addition, there was a statistically significant difference in the odds of conducting urine drug testing with patients who disclosed past illicit drug use during the initial obstetric visit, with those who disclosed past use being more likely to get tested than those who did not ($p<0.0001$). For patients who did not disclose illicit drug use and had urine drug testing conducted, a higher percentage of White patients (71%) revealed past illicit drug use during the consultation than Black patients (28%).

Additionally, the odds of urine drug testing occurring at the initial obstetric visit increased with higher gestational age ($p < 0.00001$).

Table 16: Associations between Characteristics of Pregnant People who Did Not Disclose Current Illicit Drug Use at Initial Obstetric Visit and Urine Testing for Illicit Drug use at Initial Obstetric Visit

Characteristics: For patients who did not disclose current illicit drug use at initial obstetric visit	Unadjusted odds ratio* (p value)	Adjusted odds ratio* (p value)
Race/Ethnicity		
White	Reference	Reference
Black	0.5 (p = 0.03)**	0.7 (p = 0.4)
Age, n (%)		
<30	Reference	Reference
30+	1.1 (p = 0.7)	1.0 (p = 0.9)
Marital status		
Married/Living with partner	Reference	Reference
Single	1.9 (p = 0.07)	1.6 (p = 0.3)
Educational level, n (%)		
More than high school	Reference	Reference
High school/GED and less	1.4 (p = 0.3)	1.2 (p = 0.6)
Annual income, n (%)		
\$0 – 4,999	Reference	Reference
\$5,000 – 14,999	1.4 (p = 0.4)	1.5 (p = 0.4)
\$15,000 and higher	0.4 (p = 0.09)	0.5 (p = 0.2)
Gravidity	1.1 (p = 0.4)	—
Parity	1.2 (p = 0.1)	—
Gestational age at initial obstetric visit	1.1 (p < 0.00001)**	1.2 (p < 0.00001)**
Disclosure of past illicit drug use		
No	Reference	Reference
Yes	9.7 (p < 0.00001)**	12.6 (p < 0.00001)**

Disclosure of current tobacco use		
No	Reference	Reference
Yes	2.7 (p = 0.009)**	1.6 (p = 0.3)
Clinicians		
Gender, n (%)		
Male	Reference	—
Female	2.7 (p = 0.3)	
Race/Ethnicity, n (%)		
White	Reference	—
Non-White	0.6 (p = 0.4)	
Type, n (%)		
Physicians	Reference	—
Nurses	1.2 (p = 0.6)	

*From generalized estimating equations

**p value < 0.05

***Omitted by GEE due to lack or very few observations

° Categories collapsed due to minimal or no values in some levels

Reporting to Children, Youth and Families office (CYF)

Table 17 shows the descriptive demographic characteristics of our sample (151 observations). One participant had missing data on annual income, marital status, and educational attainment. Most of the sample was young with 77% less than 30 years of age. 63% of these participants identified as Black/African-American and 37% as White. Almost half of the sample were single (44%), and 39% were living with a partner. 54% of the participants had grade school and high school/GED level of education, while 56% earned an annual income of less than \$10,000.

For significant testing, we combined some categories due to small cell sizes (less than 5). There were statistically significant differences in patients' age, marital status by race/ethnicity, and annual income, with a higher percentage of Black patients being less than 30 years of age, single or living with a partner, and earning less than \$5,000 annually as compared to White patients (Table 18).

Table 17: Patient Characteristics for CYF observations

Variables	Category	No. (%)
Patients (n = 151)		
Race/Ethnicity	Black	95 (63%)
	White	56 (37%)
Age, years (mean = , SD = , min/max=)	<20	10 (7%)
	20-29	106 (70%)
	30+	35 (23%)
Marital status	Single	66 (44%)
	Living with partner	58 (39%)
	Married	20 (13%)
	Separated	3 (2%)
	Divorced	3 (2%)
	Widowed	0 (0%)
Highest level of education completed	Grade school	16 (11%)
	High school/GED	65 (43%)
	Associates degree	16 (11%)
	Some college	38 (25%)
	Finished college	12 (8%)
	Graduate school	3 (2%)
Annual income, \$	0 – 4,999	58 (39%)
	5,000 – 9,999	25 (17%)
	10,000 – 14,999	18 (12%)
	15,000 – 19,999	11 (7%)
	20,000 and higher	37 (25%)
	Refused	1 (1%)
Gravidity - mean = 3, SD = 2, min = 1, max = 10		

Parity – mean = 1, SD = 1, min = 0, max = 5

*min/max = minimum/maximum, GED = general equivalency diploma

*Some numbers may not add to the total number of patients due to missing data for certain variables (marital status, highest level of education completed and annual income)

*Some percentages add up to less than or greater than 100% due to rounding

Table 18: Patient Characteristics by Patient Race/Ethnicity for CYF observations

Variables	Patients (N = 151)		
	Black Patients (n = 95)	White Patients (n = 56)	P value
Age			
<30	80 (84%)	36 (64%)	P = 0.005**
30+	15 (16%)	20 (36%)	
Marital status			
Single	52 (54%)	20 (36%)	P = 0.009**
Living with partner	36 (38%)	22 (40%)	
Married	7 (7%)	13 (24%)	
Educational level, n (%)			
High school/GED and less	52 (55%)	29 (53%)	P = 0.8
More than high school	43 (45%)	26 (47%)	
Annual income, n (%)			
\$0 – 4,999	44 (47%)	14 (25%)	P = 0.01**
\$5,000 – 9,999	17 (18%)	8 (15%)	
\$10,000 and higher	33 (35%)	33 (60%)	
Mean gravidity	3	3	P = 0.8
Mean parity	1	1	P = 0.9

*Some percentages add up to less than or greater than 100% due to rounding

*Some numbers may not add to the total number of patients due to missing data for certain variables (marital status, highest level of education completed and annual income)

*Differences across patient groups were analyzed with Fisher's exact statistics for categorical variables and with analysis of variance for continuous variables

**Statistically significant values

Of the 151 patient participants, 27 (18%) had positive urine drug test result at delivery, with 11 (41%) Black patients and 16 (59%) White patients (Table 20 and 21). For significant testing, we combined

some categories to ensure adequate cell sizes. Among patients who had positive urine drug tests at delivery, Black patients were more likely to be younger than White patients, as shown in Table 20. Obstetric clinicians referred seventeen (11%) of the 151 participants to CYF (Table 19). Fourteen (52%) of the 27 participants with positive urine drug test result had CYF contacted, which included 7 (64%) of the 11 Black patients who had positive urine drug test at delivery, 7 (44%) of the 16 White patients, as shown in Table 21. Three patients had CYF referrals despite two having negative urine drug testing at delivery, one did not have urine drug testing conducted at delivery, and no indication of positive tests in the infant; all three patients identified as Black/African American. Of the 14 patients with positive urine drug test and referral to CYF, 9 (64%) of them had infants with positive urine toxicology testing; 4 (44%) of the nine infants were born to Black patients and 5 (56%) to White patients.

Table 19: CYF Observations by Patient Characteristics

Variables	CYF contacted (N = 151)	
	Yes (n = 17)	No (n = 134)
Race/ethnicity, n (%)		
Black	10 (59%)	85 (63%)
White	7 (41%)	49 (37%)
Age, n (%)		
<20	0 (0%)	10 (7%)
20-29	14 (82%)	92 (69%)
30-39	3 (18%)	31 (23%)
40+	0 (0%)	1 (1%)
Marital status		
Single	7 (44%)	59 (44%)
Living with partner	8 (50%)	50 (37%)
Married	1 (6%)	19 (14%)
Separated	0 (0%)	3 (2%)

Divorced	0 (0%)	3 (2%)
Widowed	0 (0%)	0 (0%)
Educational level, n (%)		
Grade school	5 (31%)	11 (8%)
High school/GED	6 (38%)	59 (44%)
Associates degree	1 (6%)	15 (11%)
Some college	4 (25%)	34 (25%)
Finished college	0 (0%)	12 (9%)
Graduate school	0 (0%)	3 (2%)
Annual income, n (%)		
\$0 – 4,999	8 (50%)	50 (37%)
\$5,000 – 9,999	3 (19%)	22 (16%)
\$10,000 – 14,999	2 (13%)	16 (12%)
\$15,000 – 19,999	0 (0%)	11 (8%)
\$20,000 and higher	3 (19%)	34 (25%)
Refused	0 (0%)	1 (1%)

*Some numbers may not add to the total number of patients due to missing data for certain variables (marital status, highest level of education completed and annual income)
 *Some percentages add up to less than or greater than 100% due to rounding

Table 20: Patient and Clinician Characteristics by Patient Race/Ethnicity for Patient with Positive Urine Drug Test at Delivery

Variables	Patients (N = 27)		
	Black Patients (n = 11)	White Patients (n = 16)	P value ^a
Age			
<30	11 (100%)	9 (56%)	P = 0.01**
30+	0 (0%)	7 (44%)	
Marital status			
Single	4 (36%)	7 (47%)	P = 0.6

Living with partner/ Married	7 (64%)	8 (53%)	
Educational level, n (%)			
High school/GED and less	7 (64%)	7 (47%)	P = 0.4
More than high school	4 (36%)	8 (53%)	
Annual income, n (%)			
\$0 – 4,999	7 (64%)	7 (47%)	P = 0.6
\$5,000 and higher	4 (36%)	8 (53%)	
Mean gravidity	3	4	P = 0.2
Mean parity	1	2	P = 0.1

* Some percentages add up to less than or greater than 100% due to rounding

^a Differences across patient groups were analyzed with Chi square statistics for categorical variables and with analysis of variance for continuous variables

**Statistically significant value

Table 21: Percentage of Positive urine Drug Result at Delivery with CYF Contacted by Race

CYF referral status	Patients with positive urine drug result at delivery by race (n=27)	
	Black patients (n = 11)	White patients (n = 16)
CYF contacted, n (%)	7 (64%)	7 (44%)
CYF not contacted, n (%)	4 (36%)	9 (56%)

Table 22 shows the association between characteristics of pregnant people who had positive urine drug testing at delivery and if clinicians contacted (CYF). In both the adjusted and unadjusted analyses, Black patients with positive urine drug test results at delivery were more likely to have CYF contacted than their White counterparts, although these results were not statistically significant, again likely due to small sample sizes.

Table 22: Associations between Maternal Race/Ethnicity for Pregnant People who had Positive Urine Drug Testing at Delivery and Referral to Children, Youth and Families Office

Characteristic	Unadjusted odds ratio* (p value)	Adjusted odds ratio* (p value)
Race/Ethnicity		
White	Reference	Reference
Black	2.5 (p = 0.3)	4.2 (p = 0.1)
Age, years		
<30	Reference	—
30+	0.6 (p = 0.5)	
Marital status		
Married/Living with partner	Reference	—
Single	0.7 (p = 0.6)	
Educational level		
More than high school	Reference	Reference
High school/GED and less	1.7 (p = 0.5)	1.4 (p = 0.7)
Annual income		
\$0 – 4,999	Reference	—
\$5,000 and higher	3.0 (p = 0.2)	
Disclosure of current illicit drug use at initial obstetric visit		
No	Reference	—
Yes	0.4 (p = 0.3)	
Disclosure of past illicit drug use at initial obstetric visit		
No	Reference	—
Yes	0.9 (p = 0.9)	

Positive Urine Drug Test for baby		
No	Reference	Reference
Yes	2.9 (p = 0.2)	3.8 (p = 0.2)

*From generalized estimating equations (GEE)

***Omitted by GEE due to lack or very few observations

Table 23: Associations between Maternal Race/Ethnicity for Pregnant People who had Positive Urine Drug Testing at Delivery and Referral to Children, Youth and Families Office

Outcome measures	White patients	Black patients
	OR (p value)*	
Illicit drug use testing for patients who disclosed current illicit drug use at first obstetric visit		
Univariate model	Reference	3.1 (0.04)**
Multivariable model	Reference	11.8 (0.01)**
Illicit drug use testing for patients who did not disclose current illicit drug use		
Univariate model	Reference	0.5 (0.03)**
Multivariable model	Reference	0.7 (0.4)
CYF referral		
Univariate model	Reference	2.5 (0.3)
Multivariable model	Reference	4.5 (0.1)

*From generalized estimating equations

**p value ≤ 0.05 – Statistically significant

4.2.5 Discussion and conclusion

We found evidence of racial differences in urine drug testing at the initial obstetric visit for pregnant patients who disclosed and those who did not disclose current illicit use at this visit when comparing Black versus White patients. For patients who did not disclose current illicit drug use, White pregnant people were

found to have a higher likelihood for urine testing than their Black counterparts before controlling for potential confounders. For the sample of patients who did not reveal illicit drug use during the obstetric consultation, there was also an association found between disclosure of current tobacco use and the conduct of urine drug testing. Thus, the increased likelihood of urine drug testing at the initial obstetric visit could be explained by the higher percentage of White patients in this sample who revealed current tobacco use since tobacco use has been associated with potential illegal drug use.^{367,368} Therefore, clinicians' decisions to conduct urine toxicology testing despite non-disclosure of current illicit drug use could have been driven by patients' self-report of tobacco use.

For patients who revealed current illicit drug use, those who identified as Black/African American had an increased likelihood of clinicians ordering urine toxicology screening at the initial obstetric visit. Although some researchers have previously found significant associations between substance use in pregnancy and Black race, several studies have reported no difference in the prevalence of substance use in pregnancy in both Black and White patients, eliminating the stereotypical assumption that Black people have a higher prevalence of substance use in pregnancy than their White counterparts.^{110,357-359} Our finding of racial disparity in urine toxicology testing for patients who disclosed illicit drug use might be due to clinicians' inaccurate and stereotypical perceptions of the Black population, suggesting that racial bias influenced clinicians' decisions to conduct urine testing for these birthing people. Our finding is another example of the occurrence of medical racism in the obstetric setting in the US¹⁸⁷ in which the race of these pregnant people influenced the clinician's diagnostic decision.

Racialized urine toxicology testing in the obstetric setting has various implications; it could contribute to the racial disparities in reporting to child protective services reported by other studies. Also, it could produce a bias in programs implemented by states which utilize this data. For example, the Hello Baby program established by the Allegheny County Department of Human Services uses an algorithm that collects data from birth records and child protective services data to identify families most at risk for

problems such as potential child abuse or neglect and intervene;³⁶⁹ in the presence of racialized testing for illicit drugs, this could further perpetuate racial bias in the families reached through this program.

Disclosure of past illicit drug use was also found to be associated with a higher likelihood of urine toxicology tests being conducted at the initial obstetric visit irrespective of patients' current illicit drug use disclosure pattern. For patients who disclosed current illicit drug use, disclosure of past drug use could establish a pattern of substance use in pregnancy, resulting in a higher likelihood of clinicians requesting urine toxicology testing. For patients who did not disclose current illicit drug use but disclosed past illicit drug use, an increased likelihood of conducting urine drug testing could be due to clinicians taking into consideration a history of substance use in their decision as studies have shown that disclosure of past illicit drug use is predictive of current prenatal illicit drug use.^{370,371} However, it could also indicate clinicians' tendencies to doubt patients' responses to inquiries about current illicit drug use or bias about patients who have had a history of illicit drug use.

Previous literature has found race and past illicit drug use to influence clinicians' screening decisions.^{111,112} Studies have also found other factors as predictors of urine drug testing such as patients' marital status, age, and educational status.^{111,112} This discordance could be due to our small sample size of those who disclosed and those who didn't disclose current illicit drug use, differences in the population studied, or the timing of data collection (initial obstetric visit). While most other studies have relied on patient or provider recall, this study's strength was its use of researcher-observed data (audio-recordings of prenatal visits) and patients' medical records.

In our sample, we did not detect any association between clinicians' referrals to child protective services and patients' race for patients who had positive illicit drug tests at delivery. However, this finding should be interpreted in light of the small sample size available. More research in a larger sample is warranted. Our result differs from other studies showing associations between patients' race and reports to children protective services.^{110,113} This difference could be due to the limited sample size of those who had positive urine drug tests at delivery in our study. Researchers have shown racial disparities in the actions

taken by clinicians and other health workers when birthing people tested positive for illicit drugs. Drug testing in the prenatal period and peripartum period increases the risk of interventions from legal and social service agencies in birthing people and their newborn, especially for Black birthing people.^{162,372,373} Chasnoff et al. reported that in Florida, Black birthing people who tested positive for illicit drugs were ten times more likely than their white counterparts to be reported child protective services than their White and Hispanic counterparts, despite a state regulation that all babies with positive toxicology results should be reported.¹¹⁰ Another study found that Black children with urine tests positive for cocaine were less likely to be discharged to their mother's care than non-Black children after adjusting for various factors.³⁷⁴

The federal Child Abuse Prevention and Treatment Act (CAPTA) requires that state governments have policies and procedures in place mandating clinicians to report "infants born with and identifies as being affected by substance use or withdrawal symptoms resulting from prenatal drug exposure or a Fetal Alcohol Spectrum Disorder." States have adopted varying approaches to execute these federal requirements. Unfortunately, these mandatory reporting policies could worsen maternal health indices as studies have shown that birthing people who use substances in pregnancy perceive these policies as being punitive and this could result in delayed prenatal care initiation, under-reporting of substance in pregnancy and also act as a barrier to seeking assistance for substance use.³⁷⁵⁻³⁷⁷ Also, a study by Angelotta et al. found that states with punitive legal measures for pregnant people with substance use in pregnancy had a lower percentage (54% lower) of pregnant people with opioid use in pregnancy on medication treatment.³⁷⁸ Furthermore, these mandatory policies could increase the racial inequities in maternal health outcomes due to the racial differences in drug screening, urine testing, and implementation of these policies, which could affect patient and clinicians' behavior.^{110,114,379} Black birthing people's awareness of these discriminatory patterns and the fear of CYF involvement could act as another barrier to seeking and accessing prenatal care, thereby worsening their health outcomes. Additionally, a qualitative study with obstetricians and pediatricians has also documented their perception that these mandatory policies should be reviewed and improved to provide health and social services resources and support for pregnant people with substance

use in pregnancy and not act as a punitive measure.³⁸⁰ Therefore, there is a need to review and optimize these mandatory reporting policies to ensure they provide the necessary support required by birthing people with substance use in pregnancy and not criminalize these individuals.

Several studies have reported racial inequities in health care and health outcomes in various health areas, including birth outcomes, treatment of infants in neonatal intensive care units, the recommendation of intrauterine contraceptives, cancer treatment, prescription of analgesics, orthopedic surgeries, and management and control of diabetes.^{66,164,277,278,381-386} This literature has highlighted the racial inequities in health services, health-related tests, and interventions.^{177,188,387} However, none of these studies have explored racial or ethnic disparities in illicit drug use testing patterns based on patient's disclosure and reports to CYF in a sub-sample of the same population.

Although our study has highlighted some critical factors influencing toxicology screening decisions among clinicians depending on patients' disclosure patterns and CYF involvement following delivery, it had certain limitations. First, the parent study selected clinical populations known from prior research and review of medical documentation to have high substance use rates, given its focus on capturing substance use communication. This, then, could result in selection bias of both patient and clinician participants. Additionally, the study sample's racial distribution is not a true reflection of the racial distribution of birthing people in Pittsburgh, Pennsylvania/Allegheny County, where 20% of birthing people identify as Black/African American.³⁸⁸ However, the study sample's racial distribution reflects the racial presentation of the study's clinical sites. The study coordinators selected prenatal clinics which serve 50% or more pregnant people who rely on medical assistance. Second, the study team recruited all pregnant participants and clinicians from prenatal clinics in urban neighborhoods in Pittsburgh, Pennsylvania (Allegheny County). Thus, we cannot generalize our findings to other patient and clinician populations, health care systems serving rural or suburban populations, and other institutions with different substance use policies, including universal drug screening during pregnancy, legalization of marijuana, and policies surrounding the involvement of child protective services. Third, patients' and clinicians' awareness that the study team

was recording the initial obstetric visit might have altered patients' disclosure patterns of substance use in pregnancy. However, none of the patient or clinician participants were aware of the study's focus on substance use conversations until debriefing discussions after the recorded visit (for patient participants) or at the end of their study participation (for clinician patients). Additionally, participants were aware that the study data's confidentiality was protected by a National Institutes of Health Certificate of Confidentiality, which would protect all study information from being used in any court of law against any of the participants. Also, when patient participants were asked immediately after the visit whether the audio recording affected their behavior, 98% reported that it did not. Patients and clinician participants were blinded to the study's substance use focus to minimize bias and maximize the validity of the study results. A bioethicist and the University of Pittsburgh Institutional Review Board reviewed and approved the study's plan to blind study participants. Additionally, after the study team informed participants of the study's substance use focus, none of the study participants requested to withdraw voluntarily from the research, and they continued with other study phases.

Another limitation of the study is the late realization during the study period that child protective services referral data can only be retrieved from the infant's medical records, resulting in missing referral data for some participants as they had completed the study and it was difficult to reach them to sign mailed consent forms. We had a limited sample size, especially for those who identified as other race/ethnicity. Finally, while our findings are significant, we do note that our confidence interval was wide, especially in the adjusted model for the conduct of urine drug testing at initial obstetric visit for participants who disclosed illicit drug use; this might be due to our small sample size. However, regardless of the variables included in the adjusted model, our result remained statistically significant.

Despite these limitations, we conclude that clinicians' decisions to test pregnant people for illicit substance use are influenced by the clinicians' attitudes regarding their patients' characteristics. From a critical race perspective, this finding highlights the importance of clinicians being race-conscious. In this setting, clinician's race consciousness would involve reflecting within themselves and with colleagues, the

institutions where they work, and societal factors to examine if and how their unconscious bias influences how they classify the potential behaviors of their patients and how this influences their verbal and nonverbal cues and behaviors including illicit drug testing decision which could emphasize their racial bias.

Investigators have suggested institutionalizing universal screening and testing policies to avoid decisions based on clinicians' personal attitudes and bias. However, there have been controversies on whether such policies should be implemented,³⁸⁹ as studies have shown that the presence of universal screening doesn't eliminate racial disparities in reporting to child protective services.¹¹³ Also, it has been queried if the high cost of implementing universal testing is ethical and cost-effective in the midst of limited resources.³⁹⁰ Additionally, the clinical utility of urine drug testing in certain situations can be questioned, and we suggest the need for other approaches that focus on building a trusting and therapeutic partnership with birthing people who use substances as the central approach to addressing substance use rather than urine drug testing. Furthermore, inequities in substance use screening and testing decisions can be addressed by implementing hospital policies around substance use screening and testing with clear guidelines to avoid biases and personal feelings guiding clinicians' decisions to conduct toxicology screenings and reports to child protective services. However, studies have also shown that clear prenatal substance use protocols in hospitals do not eliminate racial disparities in reporting to child protective services.¹¹⁴

Our results highlight the importance of interventions to address institutional and personally mediated racism in healthcare. Health professionals need to explore and identify their prejudices and biases and implement effective strategies to mitigate them. Potential strategies include anti-racism training in healthcare institutions, promotion of diversity, equity, and inclusion within healthcare institutions, including diversification of health workforce.

4.3 Perception of First Obstetric Visit and Patient-Clinician Communication in Pregnant People with a History of Substance Use in Pregnancy

4.3.1 Background

Among all developed countries, the United States (US) has the highest maternal morbidity and mortality rate despite spending the highest percentage of its Gross Domestic Product (GDP) on health, including maternal health.^{2,3,391} In 2018, the US maternal mortality rate was 17.4 maternal deaths per 100,000 live births, with 658 people dying of maternal causes.¹² Wide racial and ethnic disparities exist in maternal mortality and morbidity rates in the US. Non-Hispanic Black (Black) birthing people have a death rate of 37.1 per 100,000 live births; non-Hispanic White (White) birthing people, 14.7 per 100,000 live births; and Hispanic birthing people, 11.8 per 100,000 live births.¹² Black birthing people experience the highest rates for 22 of the CDC's 25 severe morbidity indicators including hysterectomy, blood transfusion, acute renal failure and disseminated intravascular coagulation.³⁶ Also, data from seven US states show that Black birthing people have 2.1 times higher severe maternal morbidity rates than their White counterparts.³⁶

The racial disparities in maternal morbidity and mortality rates are due to medical and non-medical factors, some of which could also result in maternal morbidity and deaths for all pregnant people irrespective race. However, minority populations are at a greater risk for these medical and non-medical factors associated with maternal morbidity and mortality due to their exposure to racism and racial discrimination, which contributes to the racial disparities in adverse health outcomes, including maternal health outcomes.^{34,35,73,74,91,95,167,168,176,332} Literature has shown that for pregnant people, institutionalized racism has led to increased stress in minority populations and unequal access to resources and opportunities, including healthy food and access to healthcare,^{167,169} which increases the incidence of comorbid illnesses in this population and contributes to inequity in maternal health outcomes. Internalized racism accounts for a higher uptake of unhealthy behaviors, including substance use.¹⁶⁹⁻¹⁷¹ Minority populations' experiences of

interpersonal racism, such as implicit racial bias and microaggressions from healthcare workers, have led to mistrust of their clinicians,¹⁰⁸ affects their communication and interactions with clinicians,^{69,392} and creates disproportionate barriers to high-quality, respectful, patient-centered care.^{50,59-62,72,101,297,333} In these ways, exposure to racism contributes to the racial inequity in the prevalence of medical comorbidities in pregnant people, resulting in racial inequity in maternal health outcomes.

Medical factors associated with the rise in maternal morbidity and mortality include increasing cardiovascular disease and obesity incidence.^{8,9} The main medical causes of maternal deaths include hemorrhage, infection, and cardiovascular conditions such as pulmonary hypertension, hypertensive cardiovascular disease, and coronary artery disease.¹⁷ However, other factors play significant roles, including intimate partner violence, severe mental illness, and substance use, all of which are significant predictors of high psychosocial stress during pregnancy,¹⁸ and pregnancy-related deaths.¹⁹⁻²²

Substance use during pregnancy is a critically important consideration, especially given there is evidence of increases in certain prenatal substance use such as opioids in the past decade.^{24,393,394} Prenatal substance pregnancy can result in significant and persistent adverse effects for the woman and the baby, and thus has important implications for consideration by healthcare workers and policymakers. Prenatal substance use has been associated with a number of adverse pregnancy outcomes, including prematurity, low birth weight, congenital anomalies, fetal and neonatal deaths.^{23,25,26} National survey data from 2016 highlights that in a one-month period, 8% of pregnant people used illicit drugs and 13% smoked cigarettes, possibly exposing 320,000 and up to 500,000 fetuses to the adverse effects of illicit drugs and tobacco respectively within that year.²⁵ Many pregnant people do not disclose substance use to their health care clinicians,^{349-351,395} eliminating the opportunity to assist them by providing information about the adverse effects of substance use during pregnancy and available helpful resources. Studies have shown that these substance use-related outcomes could be addressed and resolved with high-quality prenatal care and good patient-clinician relationship/interaction,^{62,396} which foster patient communication about sensitive topics

and other health issues with the healthcare worker. The disclosure of substance use to healthcare workers provides an avenue for counseling and uptake of healthy behaviors among pregnant people.

Prenatal care plays a significant role in ensuring positive pregnancy outcomes. It provides an avenue to engage patients early in pregnancy to provide risk assessments, promote healthy behaviors, provide medical treatment when indicated, and offer psychosocial, cultural, and educational support to improve pregnancy outcomes. Early initiation and adequate utilization of prenatal care is an important determinant of perinatal and infant outcomes.^{51,52} Various studies have demonstrated that nearly half of severe maternal morbidity events and maternal deaths are preventable,^{397,398} making the quality of prenatal care a critical factor in addressing the increase and racial and ethnic disparities in adverse maternal health outcomes.

A key to successful health care encounters is the quality of the patient-clinician relationship,^{116,128} this relationship is critical to achieving high-quality prenatal care.^{125,126} Positive patient-clinician relationships are associated with patient satisfaction, patient adherence to medical advice and management, and better health outcomes.^{115-119,121-123,140} For all birthing people, especially those at higher risk of maternal morbidity and deaths including Black birthing people and pregnant people with a history of substance use during pregnancy, it is pertinent to understand factors that facilitate and inhibit positive patient-clinician interaction/relationship. One way clinicians can achieve positive patient-clinician relationships is through the provision of relationship-centered care which acknowledges that both the patient and clinician are unique individuals with their own sets of experiences, values, and perspectives.¹⁴² Understanding and applying relationship-centered care principles for pregnant people, especially Black pregnant people and people who use substances during pregnancy, can facilitate disclosure of substance use by patients. Additionally, it can encourage adherence to medical advice and treatment, improve health care utilization, and satisfaction with care, thereby contributing to reductions in the rates and racial inequities in maternal morbidity and mortality.

Epstein et al. highlighted the importance of knowing what patients notice, want, and need when communicating with their clinicians, as these may differ from clinicians' and researchers' perspectives.³⁹⁹ Researchers have explored pregnant people's views of their prenatal care experiences and characteristics desired in their clinicians, with some of these studies focusing on Black birthing people specifically.^{49,50,58,126,400-402} However, these studies have included racially homogenous participants, which limits the ability to explore for differences in patient preferences by race. Further, to our knowledge no study to date has specifically explored the perspectives of pregnant people who used substances. The current study addresses the gap in knowledge of favorable patient-clinician communication from a patient's perspective for pregnant people who use illicit drugs during pregnancy from participants who identified as various races and not a racially homogenous group. We aim to add to the existing literature by providing information on negative and positive clinician communication patterns with all patients irrespective of race and barriers and facilitators of patient-clinician relationship building. We explore their views on barriers and facilitators of disclosing substance use to clinicians, views on clinician communication and relationship-building during prenatal care.

Our study findings are of great importance as they will guide the development of interventions to improve patient-clinician communication during medical consultations especially prenatal care, thereby facilitating relationship-centered care which could improve patients healthcare utilization, satisfaction with care, adherence to therapeutic management and overall health outcomes.

4.3.2 Methods

4.3.2.1 Focus for this analysis

For this paper, we focused on the semi-structured interviews. A total of 479 patients participated in the larger parent study; 170 met eligibility criteria for follow up interviews based on current drug use disclosure or positive study testing for urine toxicology. Among them, 88 agreed to participate in the semi-

structured interviews within 4 weeks of the recorded visit. We analyzed data from 85 participants as there was no data for three participants due to malfunction of the audio recorder. The interview guide (Appendix B) explored topics such as the patient's expectation of the prenatal visit, perception of the visit, patient-clinician communication in general, and specifically about substance use screening communication and recommendations for positive patient-clinician communication.

For this paper, we focused on themes which patient participants perceived as positive or good and negative or bad clinician communication behaviors related to fostering patient-clinician relationships. Positive clinician communication behaviors were described by participants as what they liked about their clinician, behaviors that facilitated substance use disclosure, fostered communication, made them feel comfortable with their clinician and as reasons why they would want to continue prenatal care with the clinician. Negative clinician communication behaviors were behaviors described by participant as something they didn't like about their clinician, behaviors that acted as a barrier to substance use disclosure, hindered communication with the clinician, made them uncomfortable with the clinician or acted as reasons why they didn't want to continue care with the clinician.

4.3.3 Analysis

The study team used a mixed-method approach to analyze the data in which we combined quantitative and qualitative analysis and concepts into a single study. We utilized an integrative strategy and used data transformation ²⁸³ to convert qualitative data from a single study into quantitative data for statistical analysis, to further explain the racial trends of behaviors discussed by participants. A qualitative dominant approach and sequential dependent design ²⁸⁴ was employed by relying on the qualitative research findings and utilizing the outcomes to guide the quantitative analysis.

4.3.3.1 Qualitative analysis

We began with a qualitative approach with coding performed in an iterative, constant-comparison manner.⁴⁰³ Coders were blinded to the patient's race to avoid observer bias. All transcripts were imported into NVivo 12 for storage and organization of our coding and analysis. We utilized an iterative process of thematic analysis employing an inductive coding approach to analyze the patient interviews.²⁸⁵ To develop our initial codebook, three members of the study team independently read the first two transcripts and organized the data into initial categories and concepts regarding patient impressions of obstetric clinicians' communication. We met to compare the categories, topics, and observations noted and then developed codes to represent them. We then repeated this process, independently reading another two transcripts and then adding to or adapting the initial codebook. Using this codebook, the three members then independently coded four interviews and met to compare codes, discussing any inconsistencies in coding approaches and altering or adding new codes as needed. This iterative process was repeated, with coders meeting periodically to discuss any differences in coding and to refine and expand codes in response to new themes that emerged. After regular meetings, we updated the coding scheme as required, resulting in a final codebook with definitions of codes, rules for code application, and examples of the use of each code. The final codebook was re-applied to all already coded transcripts and used to complete coding on all remaining transcripts.

The team members double-coded 30% of the 85 transcripts of patient interviews to ensure we applied codes consistently. After coding all the patients' interview transcripts, we compiled and reviewed the coding, then discussed and analyzed emerging and prominent themes. We identified recurring codes, identifying relationships between codes and checking for patterns. Following this, we clustered codes and concepts with similar patterns into mutually exclusive categories and checked for categories which were frequently mentioned. Then we utilized these categories to generate overarching themes.

For this paper, we focused on themes related to patients' perceptions of the clinician's communication including general communication behaviors and communication around substance use.

We highlight clinician communication behaviors mentioned by participants during the interviews including both those experienced during their visit and in general such as previous experiences and hypothetical situations, as it was challenging to differentiate these scenarios.

4.3.3.2 Quantitative analysis

Our quantitative analysis concentrated on the positive and negative clinician communication themes around substance use and general discussions identified in the qualitative analysis. While still blinded to patient's identified race, we used data transformation to quantify the presence of identified themes in our sample. Specifically, we assigned dichotomous values to indicate the presence (yes) or absence (no) of each identified theme and related concepts in the interview transcript for each participant. We assigned a yes only if negative behavior themes were mentioned as a negative by participants and used the same approach for the positive behavior themes. We also categorized behaviors described in interviews into those patients described having experienced with their obstetric clinician and those anticipated or expected but not necessarily experienced. Following this, we analyzed the proportion of participants who discussed these themes by race to enable us explore for clustering of these themes by patient's race.

4.3.4 Results

Of the 85 patient-participants who participated in semi-structure interviews, 62% identified as Black or African American, 28% as White, and 9% as Other Race. Participants' age ranged from 19 – 39 years, with an average age of 25.1 years. The participants were seen by nurse midwives, nurse practitioners, 1st - 4th-year residents, and attending physicians. Table 24 provides more information about the sociodemographic and clinical characteristics of these participants.

Table 24: Participants Sociodemographic and Clinical Characteristics

Variables	Category	No. (%)
Patients (n = 85)		
Race/Ethnicity	Black	53 (62%)
	White	24 (28%)
	Other	8 (9%)
Age, years (mean = 25.1, SD = 4.9, min/max = 19/39)	<20	8 (9%)
	20 - 29	58 (68%)
	30 - 39	19 (22%)
	40+	0 (0%)
Marital status	Single	35 (41%)
	Living with partner	40 (47%)
	Married	7 (8%)
	Separated	2 (2%)
	Divorced	1 (1%)
	Widowed	0 (0%)
Highest level of education completed	Grade school	18 (21%)
	High school/GED	33 (39%)
	Associates degree	7 (8%)
	Some college	25 (29%)
	Finished college	2 (2%)
	Graduate school	0 (0%)
Annual income, \$	0 – 4,999	37 (44%)
	5,000 – 9,999	17 (20%)
	10,000 – 14,999	15 (18%)
	15,000 – 19,999	6 (7%)
	20,000 and higher	10 (12%)
	Refused	0 (0%)
Gravidity - mean = 3, SD = 1.7, min = 1, max = 9		
Parity – mean = 1, SD = 1.1, min = 0, max = 5		
Gestational age at new obstetric appointment, week – mean = 13.4, SD = 8.0, min = 5, max = 39.3		

* Some percentages add up to less than or greater than 100% due to rounding

4.3.4.1 Qualitative results

We identified four major themes each for patient-reported negative clinician communication behaviors and positive clinician communication behaviors, which included both experienced and hypothetical discussions. Negative communication behaviors highlighted by the participants included:

A1: clinicians expressing judgement about some aspect of the patient or patient's behavior;

A2: limited information provided by clinicians;

A3: rushing through the visit and communication;

A4: making statements that dehumanize the patient.

Positive communication behaviors discussed by the participants included:

B1: expressing care or concern about the patient's wellbeing and health of their pregnancy;

B2: demonstrations of attentive listening;

B3: eye contact

B4: rapport building through social talk and informal questions.

Table 25 shows the proportion of participant's responses to the identified communication behavior themes by patient's race. Table 26 shows the proportion of participant's reports of any negative or positive communication behavior by patient's race. The following sections provide additional detail and illustrative quotations regarding each of the communication behavior themes.

A - NEGATIVE CLINICIAN COMMUNICATION BEHAVIOR

Racial differences in negative clinician communication patterns were noted in patients' feedback during the interviews. Black patients and patients who identified race as "Other" were more likely to report negative communication behaviors from current or past experiences with their clinicians and when

discussing hypothetical situations. The following themes were described by some participants as negative patient-clinician communication patterns or interactions.

A1 – Clinicians expressing judgement about some aspect of the patient or patient’s behavior

Concern about clinician judgment was a prominent theme discussed by participants especially in relation to their substance use habits. White pregnant people were more likely to report past and current experiences of judgmental communication or interactions with their clinicians. Black patients and patients who indicated their race as “Other” were more likely to describe anticipating or expecting clinicians’ judgment due to their substance use behavior and the mother-blame. Overall, when participants described what constituted judgmental communication and why they categorized this as negative, they described associated negative effects clinician’s judgement had on their relationship and interaction as these experiences made them feel uncomfortable. For some patients, these experiences served as barriers to disclosing their substance use to other clinicians as discussed by this patient: “... *I always denied it about being an addict and all that because I didn’t want people to put me down for anything ...*” In the following quotation, this participant describes how she felt her disclosure of her methadone use influenced her clinician’s communication and treatment: “*I can’t go to that one [doctor] because I missed one appointment, and he says he has no tolerance for women on methadone. I missed one appointment, but it was after I had my baby.*”

Another participant described how her interaction made her feel:

I: How did you feel about that?

PT: Oh, I mean, they made me feel shitty, you know, because it was like, everything, you know. My counselor was talking, she said yeah, your pregnancy is not going to be that different [from other women]. You know, so that was the attitude I had. Okay, it is not going to be that different. There are plenty of other women on medication that have to have a pregnancy and to hear the doctor tell me that, it just kind of hurt because that is not the first time. You know, I felt like I have gotten less qual....., or you know worse quality care because somebody finds out that I’ve used drugs or because I’m in drug treatment or something like that. And even when I had to come, the day I missed dosing, you know, as soon as the doctor, you know, saw me, she just, the whole attitude flipped on me. You know and it is not uncommon to encounter that, which is why I think a lot of

people do lie about their use and they don't want to talk about it. Because they know as soon as they admit it, you know, doctors are supposed to remain objective, they are not supposed to let personal prejudices get in the way, but they do, you know. And I feel like a lot of times addicts in particular receive sub-par care because of it. It is like doctors and nurses figure ok, well, if they are not going to take care of themselves, then why the hell should we. And that seems to be the general consensus, so.

Other patients described how clinician judgment made them feel like bad mothers. More participants who were Black described in their interviews compared to participants who were White or Other Race. The following example describes this experience:

I want to tell them that I'm been two weeks clean. And I am trying. But nobody's bringing it up and I'm nervous to bring it up. So, it's like I don't want to be treated like I'm a bad mom. You know what I mean? And picking up drugs is bad. You know, it is. I don't have a really good support system. I'm 24 years old, I live by myself. I've been living by myself since I was 18. So, a lot of it, I never really grew up with a mom and a dad, somebody to show me the ways. So, when somebody comes at you, like you don't, you know what I mean. Like I'm trying to be all of those things.

Experiences with clinician judgement were not limited to substance use. In the following example, this participant shared how she felt with her clinician's approach to talking about condom use and safe sex practices:

*I went to clinic one time and it just seemed like she was just pissed off the whole day. Like she just did not make your day any better. Like she just well said, "Honey you know you're having sex so you should use this." Well, honey I didn't. So, help me and let me know everything. Don't just give it to me like that. That's not the way you receive, or show somebody information. Like you shouldn't just judge me because you don't know me....
So, you shouldn't have given it to me like that and you need to fix your face because it was totally unprofessional.*

While not all participants described experiencing judgment with their obstetric clinician, most reported an expectation of negative or harsh judgment. They indicated this expectation was due to previous negative experiences with other clinicians, warnings from their friends or family members, or general societal messages they perceived. For some participants the anticipated judgment acted as a barrier to disclosing their substance use or addressing any other sensitive topics. One woman described how this anticipation of judgment influenced her willingness to disclose: "...Society says that I'm a bad mom because of that [using marijuana during pregnancy] ... So, um, I will probably always tell the doctors

.....*that I do not do anything.*” Black patients and those who identified as Other Race were more likely than participants who described their race as White to discuss anticipating clinicians’ negative judgements due to their substance use. The following excerpt from one of the pregnant people captures the expectation of clinicians' judgments and its impact:

I: Okay, and what might be some fear or concerns, you know other fears and concerns that women would have about this, you know?

PT: Judgment

I: Judgment?

PT: People not understanding why they do what they do.

In addition to anticipating clinicians’ negative judgements, Black pregnant people and those who identified as Other Race were also more likely to discuss expecting Children, Youth and Families (child protective services) involvement due to their substance use disclosure to their clinicians. They attributed this expectation to previous experiences with other clinicians and from discussions within their communities and social networks as described by this participant: “...*But I quit because um I was told like um..... they take blood towards the end of your pregnancy or three months prior or something if you are positive; CYF gets involved so that scared me, so...*”

In the following quotation, this participant reflected on her decision not to disclose her substance use to her obstetric clinician when asked: “*She just asked a question straight out and I thought I needed to give her a straight answer. But it was just, it sucked because I wasn’t honest about the weed. But I was afraid it would go from here to like CYF or something, I was like, Oh my God.*”

The patient participants also described various verbal and nonverbal ways clinicians expressed negative judgment, which could be through a change in the clinicians' tones, rolling of the eyes, or changes in clinicians' attitudes.

PT: I mean, if the doctor like say the first time I went there and I was telling her something like if I could see she was judging me, I would probably feel uncomfortable telling her something.

I: Tell me, what tips you off that you feel that you are being judged by the doctor?

PT: I mean their attitude, their body language, like if they roll their eyes...

Or they look like they just keep their head down they don't want to look at you eye to eye, like different things like that. Or like you tell them something (takes a deep breath and sighs) and the

different things they do with their body - shrug their shoulders, roll their eyes, put their head down different things like that.

Or the way they talk at you, like their tone of voice, like you know what I mean you can tell. Like they're looking at you, like you're a piece of shit like, sorry...

They're going to be like all giddy with you at first, then you like start telling them something and it's like oh well. you know you can just tell by their actions...

...like, they get all monotone. Like hmmm, they are looking at you like, wow, you're worthless. You know what I mean, that's how I feel if like they were judging me, that's how I would feel.

A2 – Limited information provided by clinicians

Another aspect of their prenatal conversations the participants described as negative was not receiving adequate information from their clinicians about pregnancy in general and specifically about substance use during their obstetric visit. Black patients and those who identified as Other Race were more likely than White participants to report not receiving adequate education from their clinicians. Some pregnant people indicated that they wanted their clinicians to ask them more questions as a way of creating more opportunities for discussion and provide them information. The following excerpt describes a participant's experience:

...Well, she asked me about, did I smoke anything?...

I told her cigarettes, but she never got into it about marijuana or anything else. And I was going to tell her, but she just was focused on the cigarettes...

So, I didn't get a chance to tell her about the marijuana. So, um, that could be an option [of a question to ask] because I am trying to stop....

... Just ask me more questions about stuff....

Everything.

Like... what my body is going to go through....

While I'm pregnant. What can I take for morning sicknesses or do for morning sicknesses?...

Um, my iron because I'm always freezing. So, just stuff like that.

A3 – Rushing through the visit and communication

Another communication style described as negative was when the patients felt that the conversations were rushed and quick. They attributed this to their feelings of dissatisfaction with the care and perceptions that they did not receive an adequate amount of information. They emphasized the need for clinicians to spend adequate time with them and to use the interaction not just to collect information

needed from patient's history and physical examination but to also solicit their questions, concerns, and opinions. The patients wanted unhurried visits and some described feeling disheartened by the short time spent with the clinician when compared to the long wait-time they had experienced for the consultation.

I: Ok, so after listening to that again, what do you think about how your clinician asked you about smoking and drugs?

PT: That's all she asked me. She didn't explain nothing else. That's all she said; she asked a question, "Do people around you?" I mean no, but I could've been more you know, gotten more into it.

I: Why didn't you?

PT: Because that, that was, it was just going quick. It's just like the answers from her were just quick, and being that this was my first I didn't know really, understand or nothing. But then talking to you it's like, it's better to open your mouth then, you know, than not, let it just go back. But I'm going to go back today because I'm having problems, I need help. I don't want no, I can't do marijuana or cigarettes anymore like it's starting to just drive me crazy, I don't want it around me.

Participants described that communication that was quick, brief, and rushed created the impression that the clinician was not interested in getting to know them as individuals and did not want to hear their views. The following quotation describes a participant's experiences and her views of this experience:

...I just felt like she was ready to be done [with the visit] and she was just, oh well, I'm going to just sit here and type. This is what she said if you listen to the recorder she said, "I'm going to sit here at the computer and I'm basically going to type everything that you are saying." And she literally typed everything I was saying. And it's just like no, no, no. So, do you have this? Ok, um do you do this? Like and then she was like put your legs up we're going to why are you, you're fast. You're moving fast. I'm not saying move slow, but you know just take it, take it easy. Let's talk, because I like to get to know people. Like I'm a people person I like to sit there and chat with you and talk...

Like I don't care if it's hours. Like we could just sit there and talk or whatever. And I just really felt like she didn't want to be there, like she was tired and wanted to go home or something. That's what I got off of her. Like I really, so, that's just that.

Participants self-described as Black or Other Race were more likely than those self-described as White to mention the rushed communication in their interviews.

A4 – Making statements that dehumanize the patient

Another concern regarding their obstetric care communication raised by our participants was when they perceived that they were not regarded as people. Some of the pregnant people in our study described that their clinicians made them feel like they were “just a number.” This was more likely to be mentioned by pregnant people in our study who identified as Black and Other Race. The excerpts below describe two of the participants’ views of this theme:

I: What could've, what could this clinician, what could've X done differently, that would've been helpful for you personally?

PT: Like, sometimes the way she was talking, like I said, it just felt like so unpersonable. Like you were trying to distance yourself from, finding out who I, who this pregnant person is...

To you, I'm age 27, height 5'4" and weight 220 pounds...

...Like I'm not XX, that's who I am. That's the person I am. I'm a mother of one, soon to be two. Like, it's like, trying to give a little bonding. Like, I mean when you walk through the door, you're used to the person shaking your hand; hi, I'm doctor so and so. She came in, went to the desk, Hi, I'm doctor X, and sat down. I mean, shake a hand or something, a friendly smile, a glance, or anything. Like you're so quick into wanting to get into the appointment that you didn't personalize yourself with the person you are having the appointment with. If I was a different person, I could've just shut down and didn't want to say, didn't want to talk to you.

Another participant described how she felt depersonalized and anonymous when her clinician did not speak to her during the physical exam portion of the visit:

He didn't explain like anything...

...it makes it kind of awkward because he doesn't really say anything. Like his tests and stuff, like when he measures my belly, he doesn't tell me the measurements. Like he doesn't tell me anything...

...and it is just like alright, next appointment.

Participants also discussed how clinicians seemed to be more concerned about their baby and pregnancy and less concerned about them as people with their own health concerns and needs. They also highlighted how the dehumanization of pregnant people overall might make a patient feel less likely to discuss concerns freely with her healthcare worker. A participant describes her experience, in the following quotation:

...I think it might just by being pregnant in general but you don't always get talked to. You're almost talked as if you are a baby maker, like baby machine (laughs, interviewers laughs). It's like, they almost like talk and look at your stomach, like when they are talking to you. It's just like, you lose that sort of normal talking thing.

B - POSITIVE CLINICIAN COMMUNICATION BEHAVIOR

During the semi-structured interviews, some participants discussed verbal and non-verbal features of their consultations that they thought were positive and facilitated discussions with their clinicians. We note that White patients were more likely to report experiences of these positive communication behavior themes or discuss them in hypothetical scenarios.

B1 – Expressing care or concern about the patient’s wellbeing and health of their pregnancy

Many of the participants discussed the importance of their clinicians demonstrating care and concern for their own and the baby's wellbeing, which helped them to feel as if they were valued as human beings. In addition to helping patients feel comfortable, when clinicians showed care and concern it helped to build rapport. Participants indicated that when clinicians seemed genuinely concerned about their physical, social, and mental health they were more likely to adhere to their medical advice. A participant described her experience of her clinician’s expression of care about her wellbeing and its effect, as follows:

...Smoking isn't difficult to stop, so being that she asked and it gives you more input and time to think about it. Most people don't really think about it when nobody cares. When you find out somebody cares and they are telling you in such a way that you know they care, it makes you think twice about even thinking about even doing it again or even stopping, you know, depending on the situation.

B2 – Demonstrations of attentive listening

Our participants also described that when clinicians demonstrated they were listening to them they felt respected and this helped ensure accurate history-sharing. They also described that indications of attentive listening made them feel the clinician cared about the patient and what they had to say. Some described this attentive listening as an attribute they liked about their clinician and said it made them feel like the clinician was present. They also described that careful listening was seen as a sign of clinicians'

respect for their patients. In this excerpt, the participant described this theme as what she liked about her clinician: “...*She was friendly, she, she seems like she listens. You know, whatever I did say that I had a concern about anything.*”

Patients said they could tell clinicians were listening attentively to them when they were not just looking at the computer or typing on it throughout the consultation. Some participants noted that their clinicians paused between filling the electronic medical records (EMR) on the computer to look at them. A participant had the following to say about her clinician listening to her during the prenatal visit:

She wasn't just looking at the computer when I spoke. Or when she was writing down answers or asking questions. She wasn't just focused on the papers; she was attentive to me and was listening to what I had to say, and you know, made sure I knew everything as feedback, you know. I knew everything that I needed to know.

B3 - Eye contact

Participants also discussed the importance of clinicians maintaining eye contact during prenatal care consultations and other medical consultations. Some participants thought the clinician's body language, including eye contact with the patient, conveyed more to them about the clinician than the words used. They suggested that eye contact was a sign that their clinician was actively listening and interested in them as a person. Some patients discussed the interplay between their clinicians' computer use during prenatal care and their ability to make eye contact with patients. They discussed how their clinicians sometimes looked up from the computer to make eye contact with them, which made them feel important and heard. These pregnant people also saw eye contact as an approach used by their clinician to connect with them, which was relevant to building trust with their clinician. Participants shared multiple examples about the importance of eye contact from clinicians.

I: Can you tell me one thing that you feel that she did really well? I mean this is just in terms of the entire...

PT: I think she communicates really well.

I: What makes you feel that way?

PT: Um, just her manners, and she looks at you in the eye when she talks to you, you know.

I: What was she doing that made you realize that she was interested in what you were saying?

PT: She gave me eye contact...

She looked at me, when I talked, she listened, when I was done, she responded...

and she didn't say anything negative....

...It lets me know more, she's focused on my eyes, looking into my eyes and let me know that she isn't waving me off...

B4 - Rapport building through social talk and informal questions

Patient participants in our study indicated that clinicians' attempts to build relationships with patients was an important step towards reducing their anxiety and achieving positive patient-clinician interaction. Some participants described methods by which clinicians built rapport such as asking more than just medical questions and incorporating social discussions about their family, friends, hobbies, and other vital aspects of their lives. For participants in our study, rapport building involved the clinician attempting to get to know them as a person. One of the participants described this experience as follows: "...Like she asked about my son and how he was doing and all different types of stuff... She actually ended up remembering who I was from being with X, so... We had a nice conversation in there."

Participants also described that rapport building was facilitated by their clinicians having a friendly interaction style, having bubbly personalities, and laughing and joking easily with patients and any family members or friends that were present at the visit. Discussions around rapport building went hand-in-hand with participants' reports that it was important for clinicians to see patients as human. For them, rapport-building could help avoid clinicians' deindividuating and mechanization practices. Many participants said they felt comfortable with clinicians who attempted to build a connection or relationship with them, making them feel important and also a step towards clinicians earning the patient's trust.

... She made me, well, she, you know she introduced herself. Then when she came in um, we chatted a little bit. Just like, get to know basically, you don't find that often. And like I said, she made me feel comfortable throughout you know my, because I really don't find myself being comfortable with a lot of people....

So, she made me feel comfortable, you know, I opened up....

and I, she definitely earned my trust.

The excerpt below describes a participant's perspective of her clinician's communication behavior which provides a summary of the positive communication behaviors highlighted by other participants:

She was just a really sweet lady (laughs). She was really nice like she was very friendly and made me feel like you know because I am nervous about this you know what I mean. She made me feel really comfortable and like anything even if it was only happening to me like I shouldn't worry about it because like you know it happens, like everyone goes through it at some point or another, you know what I mean. So, she didn't make me feel singled out or embarrassed....
...She was just really smiley and like really she wasn't detached from the conversation. Like how I said about her question about drugs or alcohol were really routine like nothing else felt like routine to me like even though it really was. She was just she was you know just really smiley and really personable and always just laughing with us. She was just really nice like she connected you know.
...Yeah, it didn't seem like she was out the door onto her next patient. She actually really had the time to treat me.

4.3.4.2 Quantitative results

For the negative clinician communication behavior themes, a higher proportion of pregnant people who identified as Black/African American and Other Races discussed anticipating judgment from the clinician, feeling like a bad mother due to their substance use, expectation of CYF involvement if they disclosed substance use to their clinician, receiving limited information from their clinician, and rushed consultation while a higher proportion of White patients discussed experiencing judgment from their clinician (Table 25). In addition, a higher proportion of Black patients than White patients reflected on clinicians dehumanizing the patient.

Table 25 also shows that for positive clinician communication behavior themes, a higher proportion of patients who identified as White discussed clinicians listening attentively, eye contact and rapport building while a higher proportion of Black and Other Races patients highlighted clinicians expressing care and concern.

Analysis of any positive or any negative clinician communication behavior themes showed that a higher proportion of Black and Other Races patients discussed negative clinician communication behaviors (87% - Black patients, 100% - Other Races patients) as compared to positive clinician communication behaviors (74% - Black patients, 88% - Other Races patients). However, this was the reverse for patients who identified as White, with 96% of White patients discussing positive clinician communication behaviors and 75% discussing negative clinician communication communication behaviors, as shown in Table 26.

Table 25: Negative and Positive Clinician Communication Behaviors and Patterns by Patient Race

Type of Communication behavior	Themes and related concepts	Black/African Americans (n = 53)	White/Caucasians (n = 24)	Other (n = 8)	Total (n = 85)
Negative communication behavior	Judgement				
	<ul style="list-style-type: none"> Experienced judgement 	6 (11%)	7 (29%)	1 (13%)	14 (16%)
	<ul style="list-style-type: none"> Anticipation of judgement 	22 (42%)	9 (38%)	4 (50%)	35 (41%)
	<ul style="list-style-type: none"> Feel like a bad mother (Mother-blame) 	9 (17%)	2 (8%)	2 (25%)	13 (15%)
	<ul style="list-style-type: none"> Expectation of CYF involvement 	29 (55%)	12 (50%)	7 (88%)	48 (56%)
	Limited information	20 (38%)	8 (33%)	3 (38%)	31 (36%)
	Rushed communication	11 (21%)	3 (13%)	2 (25%)	16 (19%)
	Dehumanizing the patient	5 (9%)	1 (4%)	0 (0%)	6 (7%)
Positive communication behavior	Rapport building	19 (36%)	10 (42%)	3 (38%)	32 (38%)
	<ul style="list-style-type: none"> Comfort 				
	Expressing care and concern	25 (47%)	10 (42%)	4 (50%)	39 (46%)
	Attentive listening	11 (21%)	11 (46%)	1 (13%)	23 (27%)
		4 (8%)	4 (17%)	0 (0%)	8 (9%)

	<ul style="list-style-type: none"> Feeling of clinician being present 				
	Eye contact	9 (17%)	6 (25%)	1 (13%)	16 (19%)

Table 26: Any Negative and Positive Clinician Communication Behaviors and Patterns by Patient Race

Type of Communication behavior theme	Black/ African Americans (n = 53)	White/Caucasians (n = 24)	Other (n = 8)
Any negative communication behavior theme	46 (87%)	18 (75%)	8 (100%)
Any positive communication behavior theme	39 (74%)	23 (96%)	7 (88%)

4.3.5 Discussion and conclusion

Previous research has emphasized the importance of patient-clinician communication and its association with patient satisfaction with care, uptake and adherence to medical advice and treatment, and improved health outcomes. While other studies have explored patient-clinician communication during the prenatal period, to our knowledge, no previous research has investigated patient-clinician communication from the perspective of patients with a history of substance use in pregnancy, exploring findings by racial identities. This study explored patient-clinician communication from participants using substances during pregnancy who are at higher risk of adverse maternal and child outcomes and are also more likely to experience negative clinician behaviors due to their substance use.

Our study highlights clinician communication behaviors that were seen as negative by participants, including judgement, inadequate provision of information, rushed consultation, and dehumanizing the patient. These behaviors were also reported to act as barriers to substance use disclosure to the clinicians. Medical visits can be challenging for patients who may feel they need to relinquish control of their bodies or otherwise make themselves vulnerable to their clinicians. This feeling of impaired agency can be

worsened when clinicians do not treat their patients optimally as required for relationship-centered care. Our findings corroborate those from other studies exploring prenatal care experiences of pregnant people and barriers to prenatal care utilization, especially highlighting healthcare workers' judgment of pregnant people using substances during pregnancy and African American birthing people's report of clinicians making them feel like bad mothers.^{50,69,101,126,392,400,404-406}

Pregnant people require adequate information and education from their clinicians to ensure optimal maternal and child health outcomes, and this information is best provided during prenatal care. The provision of inadequate information by the clinician, a theme discussed more by Black and Other Race patients, could be due to the clinician's perception of the patients' worthiness for this information. Limited information sharing could also be an approach used by clinicians to have control over the information available to these pregnant people so as to exert power over their ability to participate in decision-making. Another negative communication behavior discussed by participants, dehumanizing patients, has been reported by some researchers as a behavior that has been adopted by some healthcare workers to reduce burnout and help them cope better with the pain they see.⁴⁰⁷ Unfortunately, dehumanization could lead to the loss of clinicians' empathy for patients.⁴⁰⁸

While more White patients described experiencing judgement from their clinician, Black and Other Race patients were more likely to mention experiences of the other negative communication behaviors from their clinicians including receipt of inadequate information, rushed consultations, and dehumanizing the patient. Black and Other Race patients were also more likely to describe anticipating clinicians' negative judgements and referral to child protective services if they disclosed of substance use.

It was interesting to note the similar pattern in the proportion of Black and Other Race participant's responses to the identified negative and positive clinician communication behaviors. As earlier discussed, Black and Other Race patients were more likely to report negative clinician communication behaviors and less likely to discuss positive clinician communication behaviors as compared to White patients. Most of the patients who identified as Other Race were mixed race usually with a Black parent, which suggests the

possibility of their clinicians assuming their race as being Black. In other words, it may be that all patients who are not White experience similar negative medical and life experiences, regardless of whether they identify as Black or Other Race.

Our findings that Black patients reported more negative communication behaviors might be due to perceptions resulting from a history of distrust of the healthcare system, linked to centuries of racial discrimination and medical experimentation on Black people in the United States—indeed, this perhaps accounts for the higher proportion of Black participants who described anticipating judgement compared to the smaller proportion who described experiencing judgement in their recorded visit with their obstetric clinician. However, our participants’ more frequent reports of negative communication behaviors could also be indicative of the racial disparities in clinician communication patterns that have been reported in other studies.^{299,312} For example, a quantitative analysis of clinicians’ counselling responses following disclosure of marijuana use in our parent study indicated that Black pregnant people were almost ten times more likely as their White counterparts to get punitive counseling, which involved discussions about legal ramifications of patients’ substance use as well as referrals to child protective services.³⁶³ Additionally, Black participants reports of looks and gestures of clinicians perceived as negative communication behavior could constitute repertoires of racism.^{102,409} The history of racial discrimination in the US and racial disparities in clinician communication patterns could have led to more Black pregnant people in our sample feeling more anxiety of and sensitivity to possible judgment or negative interactions with their obstetric clinicians.

From a critical race perspective, our findings indicate the need for explicit consciousness that supports clinicians in looking beyond the information given by these people and understanding how racial and historical influences have impacted their decision-making related to substance use. Participants in our study explained reasons for their substance use and thought it was important for clinicians to understand their lived experiences and take these into consideration while communicating and providing care. Additionally, relationship-centered care for Black pregnant people from a critical race lens will involve

clinicians' employing approaches at "centering in the margins" by shifting their viewpoint from a majority group's perspective to that of the marginalized group.¹⁴⁴ Clinicians need to consider that Black patients' history of racism, experiences of discrimination, racial identity attitudes, and race-related feelings and thoughts could make their perception of a clinical encounter different from other racial groups. Therefore, clinicians need to ensure that the patient's perspective is understood.

Study participants also reported clinician communication behaviors that were favorable, promoted positive interaction between clinicians and patients, and facilitated in-depth discussions including substance use disclosure. These behaviors include expressing care and concern, attentive listening, making eye contact with the patient, and rapport building. Other studies that have explored clinician communication behaviors favored and desired by pregnant people in general and African American birthing people specifically during their obstetric care have reported similar findings of the importance of caring and creating ways for patients to be comfortable with their clinicians.^{62,127,410,411} Findings from our study, especially among Black patients, that specified positive clinician communication behaviors complement those from a study that explored clinician characteristics desired by African American birthing people.¹²⁷ The description of clinicians expressing care by participants' in our study signifies that this behavior extends beyond provision of professional care. It indicates that clinicians should ensure they integrate professional care with showing care and concern to patients. Additionally, clinicians' consistent use and focus on the computer during the consultation without pause was identified as a potential barrier to effective listening and eye contact from the clinician. Therefore, clinicians must find a balance between updating the patient's EMR on the computer while ensuring effective communication with the patient.

Behaviors recommended by our participants as positive clinician communication behaviors are intertwined. For example, participants discussed how clinicians' eye contact with the patient indicates active listening, could generate trust with the clinician, and were a step towards building relationships between clinicians and patients. Thus, establishing eye contact with their patients might be one of the best investments' clinicians can make, and it is free. Employing these positive clinician communication

attributes would improve prenatal care service delivery and reduce inequities in perinatal outcomes. Participants buttressed the importance of good clinician behaviors as they result in positive patient-clinician interaction, facilitate information exchange including perinatal illicit drug use disclosure, improve prenatal care utilization, encourage adoption of healthy behaviors substance use cessation, and adherence to medical advice.

It is important to note that Black patients' previous experiences of discrimination from clinicians and existing distrust of the healthcare system could affect the lens through which these patients perceived their obstetric visits and interactions described in this study. It is crucial to find ways to break this cycle and stop practices that caused Black patients' distrust of the healthcare system. Improving their perceptions of care and satisfaction with health care services are necessary steps toward improving healthcare utilization, medical adherences, and healthy behaviors, which will in turn to improve health outcomes and reduce maternal and child health inequities.

Our study is not without limitations. First, the study team recruited all pregnant participants and clinicians from prenatal clinics in urban neighborhoods in Pittsburgh, Pennsylvania. Thus, we cannot generalize our findings to other patient and clinician populations, health care systems serving rural or suburban populations, and other institutions with different substance use policies, including universal drug screening during pregnancy, legalization of marijuana, and policies surrounding the involvement of child protective services. Second, this is a post hoc analysis of qualitative interviews obtained as part of the original study focusing on substance use communication during the obstetric visit. The original interview guide and protocol did not contain any focus on race or intend to make comparisons based on participant race. Participants were not asked to reflect upon race, racism, or discrimination based on race. Additionally, we had not originally planned to quantify the qualitative codes and findings and recognize that this is not a usual approach for mixed-methods analysis. However, given the opportunity presented by the relatively large number of interviews and our desire to examine possible racial differences in perceptions, concerns, and experiences shared by participants without introducing our own biases, we felt that this method of

mixed-methods analysis was appropriate. Our goal with conducting both quantitative and qualitative analysis and integrating the results was to extend the breadth of our finding by exploring for potential racial patterns in our qualitative data. The mixed-method approach allowed us to examine and explain racial trends in the rich qualitative themes of negative and positive clinician communication behaviors. This mixed methods approach has also been utilized by other studies to investigate racial trends in qualitative data.^{412,413}

Despite these limitations, our findings create a starting point for other researchers to further explore patients' desired communication behaviors in a study with participants from varying races/ethnicities. Further research is needed to develop intervention to could assist clinicians with being race conscious and critically conscious, and to help them shift their viewpoint from that of the majority group's perspective to that of the marginalized group or groups, a concept known as centering in the margins.¹⁴⁴ This research also provides a unique and insightful opportunity to understand positive patient-clinician communication attributes during prenatal care consultations from the patients' perspectives. Furthermore, our findings provide information on clinician communication behavior that could facilitate substance use disclosure and more open discussions regarding prenatal substance use, an important element of assuring optimal prenatal care.

Research on this topic is needed to understand positive and negative clinician communication patterns, both verbal and non-verbal, to improve clinician communication behaviors during prenatal care, especially for oppressed populations. Researchers and communication experts have shown that clinicians can eliminate negative communication behaviors, and positive communication patterns can be learned and do not have to be inherent. Therefore, study findings can guide the development of clinician communication training materials for use in medical institutions and also guide the development of a respectful maternity care models and frameworks. Additionally, the utilization of these study findings could improve patient-clinician interactions, thereby improving maternal and child health outcomes and reducing these outcomes' inequities. Further research is needed to understand the effect of patients' and clinicians' demographic

characteristics on clinician and patient communication patterns. Additionally, more studies are necessary to understand the concept of relationship-centered care from different racial perspectives to address the racial disparities in prenatal care uptake and inequities in maternal health outcomes.

5.0 Discussion

Our first study, a quantitative research, measured racial differences in clinician communication behaviors during the initial obstetric visit and how these moderate racial disparities in the number of prenatal care visits attended by pregnant people in our sample. We found that Black pregnant people were more likely to experience stereotyping and inappropriate questions and comments, especially sexual stereotypes, than White pregnant people. Clinician communication behaviors, including rapport building, stereotyping, and judgment, did not significantly affect the racial differences in the number of prenatal care visits attended by our patient participants. Our second quantitative study measured racial differences in clinicians' illicit drug use testing in pregnant patients during the initial obstetric visit based on patients' current illicit drug use disclosure pattern. This study also measured racial differences in clinicians' reporting to child protective services following delivery for patients with positive urine drug test results at delivery. Our analysis showed that Black pregnant patients who disclosed current illicit drug use at the initial obstetric visit were more likely to have urine toxicology testing than their White counterparts. In addition, we found that clinicians referred a higher proportion of Black patients with positive drug test results to Children, Youth, and Families office than their White counterparts; however, we didn't detect an association between clinicians' referrals to child protective services and patients' race for patients who had positive illicit drug tests at delivery. We could attribute our quantitative findings of racial inequities in these patients' prenatal care to clinician's personally mediated racist practices that may occur consciously or unconsciously.

Our third study, a mixed-methods qualitative dominant research study, explored patients' perceptions of their clinicians' communication behaviors during the initial prenatal visit, including experienced and anticipated clinician communication behaviors. Furthermore, we examined for clustering of the identified positive and negative clinician communication behavior themes by patient's race using quantitative methods. The study participants described negative clinician communication behaviors as

including clinicians' judgment, provision of limited information, rushing through the prenatal visits, and making dehumanizing statements. Participants described these behaviors as features they didn't like by their clinicians and barriers to disclosing substance use in pregnancy. Participants also discussed clinician communication behaviors they perceived as ideal and that could facilitate patient substance use disclosure during prenatal care and patient-clinician relationships. These positive clinician communication behaviors included showing care or concern, attentive listening, making eye contact, and building rapport with the patient. Our quantitative analyses of these positive and negative clinician communication behavior themes showed that Black and Other Race pregnant people were more likely to discuss negative versus positive clinician communication behaviors than their White counterparts.

Our quantitative study results showing that Black pregnant people were more likely to receive stereotypical and inappropriate comments from their clinicians during their prenatal care is in tandem with our finding from the semi-structured interviews in which a higher proportion of Black patients reflected more on negative than positive clinician communication behaviors (experienced or anticipated during the prenatal care) as compared to White patients. Black patients in the qualitative study were more likely to discuss an expectation of clinicians' judgment and referral to child protective services due to prenatal substance use as compared to the White patients; our quantitative analysis of clinician communication behaviors and referral to child protective services found that Black patients were more likely to experience clinicians' judgment and referral to child protective services, however, these were not significant. Our quantitative findings of clinicians' discriminatory communication and urine toxicology testing patterns during the initial prenatal visit validate Black pregnant patients focus on negative clinician communication behaviors during the semi-structured interviews.

The higher proportion of Black pregnant patients discussing more negative than positive clinician communication behaviors during the qualitative interviews could also be due to previous discriminatory experiences in the healthcare setting and their distrust of the health care system due to the history of slavery and persistent racism in the United States. Our quantitative findings of a higher likelihood of stereotyping,

including sexual stereotypes and illicit drug use testing of Black patients in our study, highlight clinicians racially biased and inaccurate perceptions of hypersexuality of Black birthing people and higher prevalence of substance use by Black people. These findings also highlight the ingrained negative stereotypes of Black people in the US, which coincide with the institution of slavery. These negative stereotypes of Black people and anti-Black racism aim to foster White supremacy notions and have always profited White people. Until structural racism is no longer profitable to the majority group, it might be difficult to achieve widespread commitments to addressing racism.

In the healthcare setting, processes and policies within healthcare institutions and across society, such as White supremacy beliefs, could facilitate clinicians personally mediated racist practices. This bolsters the importance of designing and implementing strategies that address all levels of racism, including personally mediated, institutional, and structural racism. Our study highlights obstetric racism during interpersonal processes of maternal care and diagnostic testing and the misogynoir experienced by these pregnant patients. Unfortunately, our findings of racial inequities in obstetric care are not rare.

Our study findings are in concert with reports from other studies that have documented racial inequities in clinician communication patterns and diagnostic testing with Black people, including Black birthing people receiving worse care than their White counterparts. These studies have reported higher occurrences of racial discriminatory behaviors, stereotyping, and prejudices during maternal care of Black birthing people.^{50,102,187,269,333,414} Studies have also highlighted racial inequities in illicit drug use testing of birthing people with Black pregnant people more likely to be tested in the prenatal and peripartum setting despite reports of similar rates of substance use in pregnancy for Black and White pregnant people.^{110-112,359}

Although our study has reported some critical factors influencing clinicians' communication behaviors, toxicology screening decisions among clinicians depending on patients' disclosure patterns, and CYF involvement following delivery, it has certain limitations. First, the parent study selected clinical study sites known from prior research and reviews of medical documentation to have high substance use rates, given its focus on capturing substance use communication. This, then, could result in selection bias of both

patient and clinician participants. Additionally, the study sample's racial distribution is not a true reflection of the racial distribution of birthing people in Pittsburgh, Pennsylvania, where 20% of birthing people identify as Black/African American.³⁸⁸ However, the study sample's racial distribution reflects the racial presentation of the study's clinical sites. The study coordinators selected prenatal clinics which serve 50% or more pregnant people who rely on medical assistance. Second, the study team recruited all pregnant participants and clinicians from prenatal clinics in urban neighborhoods in Pittsburgh, Pennsylvania (Allegheny County). Thus, we cannot generalize our findings to other patient and clinician populations, health care systems serving rural or suburban populations, and other institutions with different substance use policies, including universal drug screening during pregnancy, legalization of marijuana, and policies surrounding the involvement of child protective services. Third, patients' and clinicians' awareness that the study team was recording the initial obstetric visit might have altered patients' disclosure patterns of substance use in pregnancy. However, none of the patient or clinician participants were aware of the study's focus on substance use conversations until debriefing discussions after the recorded visit (for patient participants) or at the end of their study participation (for clinician patients). Additionally, participants were aware that the study data's confidentiality was protected by a National Institutes of Health Certificate of Confidentiality, which would protect all study information from being used in any court of law against any of the participants. Also, when patient participants were asked immediately after the visit whether the audio recording affected their behavior, 98% reported that it did not. Patients and clinician participants were blinded to the study's substance use focus to minimize bias and maximize the study results' validity. A bioethicist and the University of Pittsburgh Institutional Review Board reviewed and approved the study's plan to blind study participants. Additionally, after the study team informed participants of the study's substance use focus, none of the study participants requested to withdraw voluntarily from the research, and they continued with other study phases.

Another limitation of the study is the late realization during the study period that child protective services referral data can only be retrieved from the infant's medical records, resulting in missing referral

data for some participants as they had completed the study and it was difficult to reach them to sign mailed consent forms. We had a limited sample size, especially for those who identified as other race/ethnicity. Finally, the mixed-method approach utilized for the qualitative interviews analysis was a post hoc analysis of these interviews. The original interview guide and protocol did not contain any focus on race or intend to make comparisons based on participant race. The interviewers did not ask participants to reflect upon race, racism, or discrimination based on race. Additionally, we had not originally planned to quantify the qualitative codes and findings and recognize that this is not a usual approach for mixed-methods analysis. However, given the opportunity presented by the relatively large number of interviews and our desire to examine possible racial differences in perceptions, concerns, and experiences shared by participants without introducing our own biases, we felt that this method of mixed-methods analysis was appropriate. Our goal with conducting both quantitative and qualitative analysis and integrating the results was to extend the breadth of our findings by exploring potential racial patterns in our qualitative data. The mixed-method approach allowed us to examine and explain racial trends in the rich qualitative themes of negative and positive clinician communication behaviors. Other studies have also utilized this mixed-methods approach to investigate racial trends in qualitative data.^{412,413}

Despite these limitations, our study highlights the relevance of advancing racial equity, especially in health care. The presence of clinicians' discriminatory and prejudiced practices during maternal care affects patient's satisfaction with care, utilization of healthcare services, and adherence to management, therefore contributing to the racial inequities in maternal health outcomes. There is, therefore, an urgent need to design and implement strategies to address all levels of racism to ensure equitable maternal health care and outcomes.

6.0 Conclusion

Our study aimed to measure racial differences in clinician communication patterns, diagnostic testing, and interventions during maternal care and explore patients' perceptions of their clinician's communication behaviors. We found racial inequities in clinician communication patterns and illicit drug use testing for patients who disclosed illicit drug use. We also found racial differences in reports of negative and positive communication behaviors by study participants during the semi-structured interviews. Black pregnant patients received poorer quality of care as they were more likely to be stereotyped and subjected to inappropriate comments by their clinicians than White pregnant patients. Black pregnant patients who disclosed illicit drug use during the initial obstetric visit were more likely to be tested than their White counterparts. These findings are in concert with our qualitative results in which Black patients reflected more on negative clinician communication behaviors than positive ones in contrast to White patients. Our study highlights the presence and exhibitions of clinicians' interpersonal racism during obstetric care.

Sadly, racism occurs in different US settings, including the justice and educational system and from individuals, institutions to government policies. The effects of slavery, the ideologies of White supremacy, and anti-Black racism persists and permeates the US several decades following the end of the enslavement of Black people and colonialism. These past histories and persistent structural, institutional, and interpersonal racism have placed Black people at a severe disadvantage with poorer access to and quality of housing, education, voting, justice, employment, and healthcare. Policies and processes from Black Codes and Jim Crow laws, redlining, voter suppression through voter identification laws to racial profiling continue to have adverse impacts on the physical, psychological and social well-being of Black people.

Widespread knowledge of certain events within the past few years in the US, such as racial inequities in the fatal police shootings of unarmed Black people, incarceration rates, COVID-19 morbidity, hospitalization, and mortality rates, the Black Lives Matter movement, and the recent US Capitol riot has

spurred the need to name racism and allowed for the exploration of its effect and strategies to address racism and ensure social justice. These events have also provided a means for White people to understand the role historical and present racism and not race plays in the lives of a Black person better. In addition, it has also provided an avenue for White people, especially aversive racists, to self-explore their implicit racial biases, monitor their behaviors, and learn how to be anti-racist. These steps and other strategies are also crucial in the healthcare setting, especially in maternal care, with the widening racial gap in maternal morbidity and mortality rate.

Pregnancy is a critical period in a birthing person's life, and it is essential that birthing people receive high-quality care that is equitable, relationship-centered, culturally appropriate, and sensitive to the patients' needs. High-quality prenatal, perinatal, and postnatal care that comprises these attributes will increase patient satisfaction with care, adequate utilization of healthcare services, patients' willingness to discuss sensitive issues with their clinicians, and foster uptake and adherence to healthy behaviors and proposed therapies. These would help improve maternal health outcomes and reduce racial inequities in perinatal outcomes.

This country can only achieve high quality and equitable maternal care through the commitment of various stakeholders, including clinicians, healthcare institutions, and policy makers, to implement strategies to address personally mediated, institutional, and structural racist practices. These strategies include clinician's self-reflection and self-awareness of their racial prejudices and discriminatory behaviors and how these behaviors play out in their interactions with patients, including communication, diagnostic testing, and therapeutic management; clinicians then need to monitor and address these behaviors appropriately. There is also a need to reform medical education to discontinue attributing the Black race to disease and instead provide in-depth explanations of the role of historical and contemporary racism in placing the Black populace at higher risk for certain diseases such as hypertension and diabetes, as well as include courses and books that integrate content on racism, race, health, disease and racial equity into the curriculum.⁴¹⁵ Medical schools and healthcare institutions should incorporate training on cultural

competency, cultural humility, word use, antiracism, and relationship-centered care, including a critical race perspective into their medical curriculum and continuing education programs or grand rounds.^{142,146,193,335-337} These institutions should implement ways to ensure these trainings are put into practice and evaluated for their impact on patient's satisfaction with care and health outcomes.

Furthermore, healthcare institutions should promote and embed diversity, equity, and inclusion practices. These practices will include diversifying the healthcare workforce to support patient-clinician racial concordance, which has been found to improve quality of care, satisfaction with care, and adoption and adherence to clinical management, and Black infant mortality.^{179,209,214,311,339} Healthcare institutions also need to review their physical environments for features such as advertisements or posters that promote stereotypical messages and might make patients feel a sense of non-belonging. Healthcare institutions should also adopt standardized protocols for healthcare provision to reduce racial disparities in care processes and improve outcomes.

At the public policy level, more policymakers at the national, state, and local levels should start by accepting and declaring racism as a public health crisis and then developing, implementing, and evaluating strategies to address structural racism. In addition, Congress should pass and fully fund new and existing anti-racism legislation, such as the Anti-Racism in Public Health Act, to support public health research and investment into understanding and eliminating structural racism. CDC has also declared racism as a public health crisis and launched a web page on racism and health to promote efforts addressing racism.⁴¹⁶ Policymakers, therefore, need to fund and encourage CDC's efforts to facilitate discussions on the effect of racism on health and proffer potential solutions to address structural racism and promote workplace diversity. Other strategies include developing collaboratives at the federal, state, and local agencies made up of diverse groups to create, implement and evaluate evidence-based initiatives to address structural racism. Furthermore, policymakers need to make additional efforts towards facilitating the training and employment of people of color in the healthcare setting.

All of these strategies would also go a long way in resolving internalized racism. Implementing these strategies at all these levels could help reduce the racial inequities in not only maternal, neonatal, and child health care and outcomes but health outcomes in other medical disciplines.

Appendix A: Excel template

		Participant ID			Clinician communication behavior assessed
Responses		Questions	Response	Notes	
Yes/No	1	Did patient have to wait for the provider for greater than 5minutes?			
In minutes	1a	If yes, how many minutes			
Yes/No	2	Provider introduces self			
Yes/No	3	Provider gives preview of meeting within the first few minutes			
Yes/No	4	Presence of partner, family including children, friend etc. in the consultation room			
Yes/No	5	Provider asks if pregnancy is planned			
Yes/No	6	Provider asks if pregnancy is desired			
Yes/No	7	Provider assumes pregnancy is desired			
		If pregnancy is not desired			
Yes/No/N/A	7a	Patient asks for abortion services			
Yes/No/N/A	7b	Provider offers abortion services			
Provider/Patient/N/A	7c	Who commenced the discussion about abortion services first			
Yes/No	8	Provider asks about substance use			
Yes/No	9	Patient admits to substance use			
		If yes, which type (include both past and present)			
Yes/No/N/A	9a	Cigarette/tobacco smoking			
Yes/No/N/A	9b	Alcohol			
Yes/No/N/A	9c	Marijuana			
Yes/No/N/A	9d	Others (list)			
		If yes to substance use disclosure continued			
Yes/No/N/A	9e	Provider skims through substance use queries without asking if the patient needs help with cessation			
Yes/No/N/A	9f	Provider asks patient how they can help or assist with substance use reduction or cessation			

Yes/No/N/A	9g	Provider instructs patient on how they can reduce or stop substance use			
Yes/No	10	Provider talks about CYF			
Yes/No	11	Provider sounds judgmental			Judgment
		If yes, which of the following is the subject of being judgmental			
Yes/No/N/A	11a	Patient commencing prenatal care late			
Yes/No/N/A	11b	Patient's substance use habit			
Yes/No/N/A	11c	Patient's health conditions such as sickle cell disease/trait, diabetes			
Yes/No/N/A	11d	Patient's sexual habits			
Yes/No/N/A	11e	Others (explain including other patient characteristics or patient's social network characteristics or habits)			
		If yes to provider sounds judgmental continued, which of the following is the evidence of being judgmental			
Yes/No/N/A	11f	A change in provider's tone			
Yes/No/N/A	11g	Provider asks about substance use (whether one type or all) more than once or repeatedly			
Yes/No/N/A	11h	Provide asks about certain conditions such as sickle cell disease/trait more than once or repeatedly			
Yes/No/N/A	11i	Provide asks about patient's habits such as sexual partners etc. more than once or repeatedly			
Yes/No/N/A	11j	Makes negative assumptions about patient (If yes, record time/s it occurred and include statement under observation)			
Yes/No/N/A	11k	Others (explain)			
Yes/No	12	Provider asks for patient's race			
Yes/No	13	Provider states patient's race without asking (assumes)			
Yes/No	14	Provider asks about the race of the patient's partner/father of the baby			
Yes/No	15	Provider assumes the race of the patient's partner/father of the baby			
Yes/No	16	Provider uses medical terminology without explaining what it means			
Yes/No	17	Provider explains laboratory tests to be done			
Yes/No	18	Provider seems to pressure patient to carry out certain laboratory investigations or tells the patient they will do the test without suggesting or asking			
Type/N/A	18a	If yes, which type			
Yes/No	19	Recommends/Asks about a need for referral to social worker or other social services including WIC			

Yes/No/N/A	20	If yes, explains services patient could get from the social worker and other social services including WIC			
Yes/No	21	Refers to social worker or other social services including WIC without asking if the patient needs the service			
Yes/No	22	Provider seems to be listening actively to the patient			
Yes/No	23	Patient has complaints or concerns			Dismissiveness
		If yes, provider			
Yes/No/N/A	23a	Provider addresses patient's complaints or concerns immediately			
Yes/No/N/A	23b	Provider addresses patient's complaints or concerns later in the consultation			
Yes/No/N/A	23c	Provider minimizes patient's complaints or concerns			
Yes/No/N/A	23d	Provider ignores patient's complaints or concerns			
Yes/No	24	Provider asks patient about birth control/family planning method plan following delivery			
Yes/No	25	Provider assumes patient would want or is interested in birth control/family planning method post delivery			
N/A	25a	If yes, indicate the type of birth control/family planning method suggested by provider			
Yes/No	26	Provider explains possible adverse symptoms and signs that require calling or visiting the hospital or provider including fetus not moving, consistent cramping, and heavy bleeding			
Yes/No	27	Provider asks patient about their mental health history			
Yes/No	28	Provider discusses depression in pregnancy or postpartum depression, both in past and present pregnancies			
Yes/No	29	Patient discloses history of mental health problems			
		If yes, which			
Yes/No/N/A	29a	Anxiety			
Yes/No/N/A	29b	Bipolar disorder			
Yes/No/N/A	29c	Depression			
Yes/No/N/A	29d	Postpartum depression			
Yes/No/N/A	29e	Other (please give details)			
		If yes to patient discloses mental health problems			
Yes/No/N/A	29f	Patient says their mental health problem/s is/are currently being managed			

Yes/No/N/A	29g	Provider asks patient for how mental health problems are currently being managed or for past management			
Yes/No/N/A	29h	Provider provides medical or non-medical advice or management for mental health issues			
Yes/No	30	Provider uses jargon or colloquial language such as baby daddy			
Yes/No	31	Notice a negative change in provider's tone which can't be categorized as being judgmental			
	31a	If yes, what caused/led to the change? (record time and explain/ N/A)			
Yes/No	32	Provider talks about or explains how to keep the same provider throughout prenatal care (continuity of care)			
		If yes, which			
Yes/No/N/A	32a	Patient would like continuity of care (use same provider throughout pregnancy)			
Yes/No/N/A	32b	Patient does not want continuity of care (use same provider throughout pregnancy)			
Yes/No/N/A	32c	Patient does not respond to the discussion about continuity of care			
Yes/No	33	Presence of discriminatory language/ stereotypical assumptions			Stereotyping
Yes/No	34	Provider asks or says something inappropriate			Inappropriate talk
Yes/No	35	Provider talks about the plan to conduct drug screening			
		If yes, which			
Yes/No/N/A	35a	Patient does not disclose substance use			
Yes/No/N/A	35b	Patient is no longer using substances			
Yes/No/N/A	35c	Patient discloses current substance use			
Yes/No	36	Provider asks if patient has any new partner (even if asked with regard to sexually transmitted dx (STD/STI) history)			Stereotyping
Yes/No	37	Provider asks patient or partner if partner has other children outside their relationship (even if asked for genetic history)			
Yes/No/N/A	38	For patients with more than one kid, provider asks if they are all from the same father			
Yes/No	39	Provider asks if patient has one partner or more than one partner (even if asked with regard to sexually transmitted dx (STD/STI) history)			
Yes/No	40	Provider asks for total number of lifetime partners			
Yes/No	41	Provider rushes through consultation which could be by saying okay or gotcha or other statements to rush the patient			
Often/Sometimes/No	42	Provider interrupts patient			

Yes/No	43	Provider discusses intimate partner violence			
	43a	If yes, why? (record time and explain/N/A)			
Yes/No	44	Provider offers or discusses prenatal genetic screening and testing (not testing for sickle cell trait/disease or cystic fibrosis) - usually an USS and amniocentesis for Downs syndrome			
Yes/No	45	Provider provides an explanation of normal symptoms in pregnancy or expected outcomes and what patients might expect as their pregnancy develops such as when one will start feeling the baby kick or spotting or cramping after a pelvic exam			
Yes/No	46	Provider provides a preview of planned medical examination			
Yes/No	47	Provider provides a walkthrough of the physical exam as it is occurring such as I'm going to insert a speculum it might feel cold, I'm going to use 2 fingers etc.			
Yes/No	48	Provider explains what patients should expect in future prenatal care visits			
Yes/No	49	Provider asks if the patient has any questions			
Really well/Yes/Somewhat/No	50	Presence of small talk or patient rapport building			Rapport building
In minutes +/- hours	51	Consultation time (if patient waited for provider, subtract patient's wait time from total consultation time)			Visit duration
	51a	Comments on consultation time			
	52	Other observations (explain with time)			

Appendix B: Interview Guide

Before we begin, do I have your verbal permission to audio record our conversation? Do you have any questions before we begin the interview? Okay, great. As we begin, remember that there are no “right or wrong” answers, and all of the information you share with us will be kept confidential and will not be shared with your healthcare clinician.

As I said before, we are interested in talking to you about tobacco/alcohol/drug use and about your attitudes and beliefs about substance use during pregnancy. We are also interested in your thoughts regarding talking to your healthcare clinician about substance use during pregnancy. For each of the following questions, please reflect on the last prenatal visit you had with your healthcare clinician.

1. Expectations/Perceptions of visit

- What were your expectations or what were you expecting at your first OB appointment? Were your expectations met, why or why not?
- What did you think of the overall visit?

2. Attitudes and beliefs toward disclosure

- What do other people tell you regarding talking to your health care clinician about using tobacco/alcohol/drugs during pregnancy?
- Why do you think health care clinicians ask about tobacco/alcohol/drugs?
- What are the things that would make you want to talk with your healthcare clinician about previously using/currently using tobacco/alcohol/drugs?
- What are the things that would keep you from talking to your healthcare clinician about previously using/currently using tobacco/alcohol/drugs?

- What types of concerns would you have regarding the disclosure of past or present substance use to your clinician?
- Which concern is most important to you?
- Can you tell me a little bit about that?
- What makes it different when you talk to us and tell us about your substance use, than telling your healthcare clinician about it?
- Tell me about what made you feel comfortable (or not comfortable) disclosing or telling the clinician about your drinking, smoking or drug use. You disclosed to me, what made that easier?
- When we told you about the topic of the study and the collection of the urine test, how did that make you feel? How do you feel about the topic of our study?
- Ranking of substances – ask pt. to rank smoking, alcohol and other drugs (marijuana, cocaine, heroin, etc.) Which do they think are worse? Why?

3. Outcomes

- What positive things might happen in the future if you talked to your doctor about previously using/currently using tobacco/alcohol/drugs?
- What negative things might happen in the future if you talked to your doctor about previously using/currently using tobacco/alcohol/drugs?
- Tell me about how these things influence whether you are willing to talk with your healthcare clinician about previously using/currently using tobacco/alcohol/drugs?

Now let's listen to some of your last prenatal visit you had with your healthcare clinician. (*Listen to the audio recording, focused on substance use screening discussion*)

4. Perceptions of screening

- What did you think about how your healthcare clinician brought up the subject of tobacco/alcohol/drug use with you?
- After listening to this part of the discussion again, what did you like about how your healthcare clinician communicated with you about tobacco/ alcohol/drug use?
- What suggestions would you give to clinicians on how to talk about tobacco/alcohol/drug use during pregnancy?
- What could the clinician have said or done differently that would have been helpful for you personally?

Smoking Additional Questions

- (If mother is multiparous) Did the way you handled your smoking during your first pregnancy effect your smoking during this pregnancy?

Methadone Patient Questions

- Did you convert at Magee?
- How did that go?
- Tell me a little bit about your conversion experience.
 - Did you see the same or different clinician when you converted and for your NOB?
 - If it was the same clinician, explain a bit about your experience with them inpatient and for the NOB.
- What do you think about methadone and about being on it? How do other people (including your healthcare clinician) react when you tell them that you are on methadone?

- We've notice that patients who are on methadone typically tell their clinician during their NOB appointment without being asked if they are on methadone or have a history of drugs. Can you help us understand this and patients disclose without being asked?
- What are your plans for after your baby is born (regarding taking methadone)? What does this mean in terms in the context of your addiction? How does being on methadone change the way you look at yourself?

5. Communication with healthcare clinician

- What did you like about this healthcare clinician?
- Can you tell me one thing that the healthcare clinician did very well?
- What didn't you like about this healthcare clinician?
- Can you tell me one thing that you think s/he could do better?
- (If applicable) Did having a third party in the exam room with you, influence your disclosure of smoking, alcohol or drugs to your healthcare clinician?

FOR PATIENTS WHO HAVE DISCLOSED DRUG USE only

Explain to the participant that we are going to use a screening questionnaire with them that asks about their drug use, and that this is an instrument that doctors could use to ask them about their current and/or past drug use. Inform them that we'd like to answer the question as they would for their clinician and then we will be asking them more about their thoughts and opinions about the questions.

Have the patient complete the DAST 10 questions. When they are done, ask the patient the following questions.

- What did you think of the screening instrument? What did you like/dislike about it and why?
- Is there a better way for clinicians to ask about drug use? Tell me a little about that.

6. Closing

- Is there anything else you would like to add that we did not discuss?

[TURN OFF AUDIORECORDER]

Thanks again, Ms. _____. Do you have any questions? OK, thank you for your time.

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