Determining the Risk Factors Associated with Poor Maternal Health in American Indian/Alaska Native Women: A Literature Review

University of Georgia

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Melissa Milliron

Dr. Coffman

Research Question: What are the risk factors that American Indian/Alaska Native women experience that impact maternal health?

Abstract

The high rates of poor maternal health outcomes in the United States compared to the rest of the world demonstrate the need for change. The racial disparities in maternal health seen within the United States emphasize the structural issues and social determinants of health at play. This literature review synthesizes 10 articles from Springer Link and PubMed, all articles focus on maternal health in the United States and include data on American Indian/Alaska Native women. Maternal mortality has become an increasingly popular topic in the United States because of such high rates in a developed country. However, data on American Indian/Alaska Native (AI/AN) women is harder to come by. This literature review investigates the risk factors affecting poor maternal health among AI/AN women. Findings of this study show that substance use, obesity and related diseases, and poor access to care are the biggest risk factors facing the AI/AN pregnant population. These findings also emphasize the impact that built environment, structural racism, and socioeconomic status have on health status and health outcomes. Data on the maternal mortality of Black women shows similar effects. By addressing one racial minority group, all others will start to benefit from the roll off. It has been found that the majority of maternal deaths in the United States are preventable. By addressing the structural inequalities that contribute to these poor maternal health outcomes, less AI/AN pregnant people would die from preventable causes.

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Introduction

In 2021 there were more than 3.6 million live births in the United States (Center For Disease Control, 2023). More than 1,200 maternal deaths occurred from these births (Center For Disease Control, 2023). This number has been increasing steadily since 2018, even though the number of live births has slightly decreased each year (Center For Disease Control, 2023).

The maternal mortality rate in the United States is far higher than that of any similarly large and developed country (Kaiser Family Foundation, 2024). The maternal mortality rate in 2021 was 32.9 deaths per 100,000 live births (Center For Disease Control, 2019). People of color are at a considerably higher risk for poor maternal health outcomes compared to their White peers (Kaiser Family Foundation, 2024). The rate of maternal mortality has been increasing in the United States regardless of medical advancements (Kaiser Family Foundation, 2024). The COVID-19 pandemic contributed to the lack of progress in bettering maternal health outcomes (World Health Organization, 2024). However, the stagnation in improving maternal health pre-dates the COVID-19 pandemic (World Health Organization, 2024).

Approximately 84% of pregnancy-related deaths are preventable (Center For Disease Control, 2024). Bleeding, infections, high blood pressure, delivery complications, and unsafe abortions account for 75% of maternal deaths (World Health Organization, 2024). There are many health system failures and social determinants of health that contribute to why women are dying from pregnancy-related causes (World Health Organization, 2024). One of the biggest factors that impact maternal health outcomes is race/ethnicity. The highest rates of uninsurance are among racial minorities. 20% of AI/AN, 20% of Hispanic, 13% of Native Hawaiian/Pacific Islander(NH/PI), and 13% of Black non-elderly women are uninsured (Kaiser Family Foundation, 2024). Racial minorities also have the highest rates of Medicaid usage, 34%, 24%, 26%, and 29%, respectively (Kaiser Family Foundation, 2024). Access to comprehensive

healthcare is important to all, but especially expecting mothers and their fetuses. Since racial minorities are more likely to use publicly funded programs, they are less likely to receive fully comprehensive care. These disparities can be seen through the maternal mortality rate of 69.3 per 100,000 live births for Black women, almost three time higher than that of White women (Center For Disease Control, 2023).

Racial disparities can be seen throughout much of the data collected on maternal health. This is seen through the data itself and the lack of information on the AI/AN population. Data is scarce because of the small AI/AN population size, accounting for only 1.1% of the U.S. population (U.S. Department of Health & Human Services, 2022). AI/AN women only make up 1% of women 19 years or older in the U.S. in 2022 (Kaiser Family Foundation, 2024). Much of the data surrounding maternal mortality focuses on the high rates among Black women when AI/AN women face similarly high rates (Kaiser Family Foundation, 2024). From 2017 to 2019 the pregnancy-related mortality rate of AI/AN women was 32 per 100,000 births (Kaiser Family Foundation, 2024). Comparatively, the pregnancy-related mortality rate for White women in the same period was 14.1 per 100,000 live births (Kaiser Family Foundation, 2024). This rate is 2.3 times greater for AI/AN women than White women, showing the racial disparities in pregnancy-related mortality. More research is needed to address the health disparities between women of color and White women that affect maternal health. Specifically, the gaps in knowledge regarding the AI/AN population need to be filled to address maternal health disparities.

Given the severity of maternal mortality in the U.S., Examining the impact certain risk factors have on maternal health is necessary to address the U.S.' high rates of maternal mortality. This is specifically important because of the lack of research on maternal health among the

AI/AN population. It is also important because of rising maternal mortality among AI/AN women in the past 20 years (Huang et al., 2024). The author presents a literature review of articles from the databases Springer Link and PubMed. This study aims to identify the risk factors that impact American Indian/Alaska Native women's maternal health.

Methods

For this literature review, a search was conducted using the Springer Link and PubMed databases for information about the maternal health of AI/AN people. The Springer Link database offers materials from a vast range of disciplines including health sciences, and humanities and social sciences. Springer Link specifically publishes the Journal on Maternal and Child Health, which numerous articles for this review came from. Maternal and child health are such important topics in public health. PubMed is a database was developed and is maintained by the National Library of Medicine. It contains millions of articles from the biomedical and life sciences disciplines. Even though this database is more focused on medicine, information on risk factors was still able to be found. PubMed is a larger database than Springer Link. The detailed process of selecting articles from these databases can be seen in *Figure 1*.

For Springer Link, a search for "maternal health OR maternal mortality" yielded 10,000 results. The next search of "maternal health OR maternal mortality AND American Indian/Alaska Native" refined the search to 851 articles. To further narrow the search, a search of "maternal health OR maternal mortality AND American Indian/Alaska Native AND risk factor" produced 574 results. To exclude some articles from these results, the search "maternal health OR maternal mortality AND American Indian/Alaska Native AND risk factor NOT intervention" was conducted and yielded 231 results. One more refining search of "maternal health OR maternal mortality AND American Indian/Alaska Native AND risk factor NOT intervention

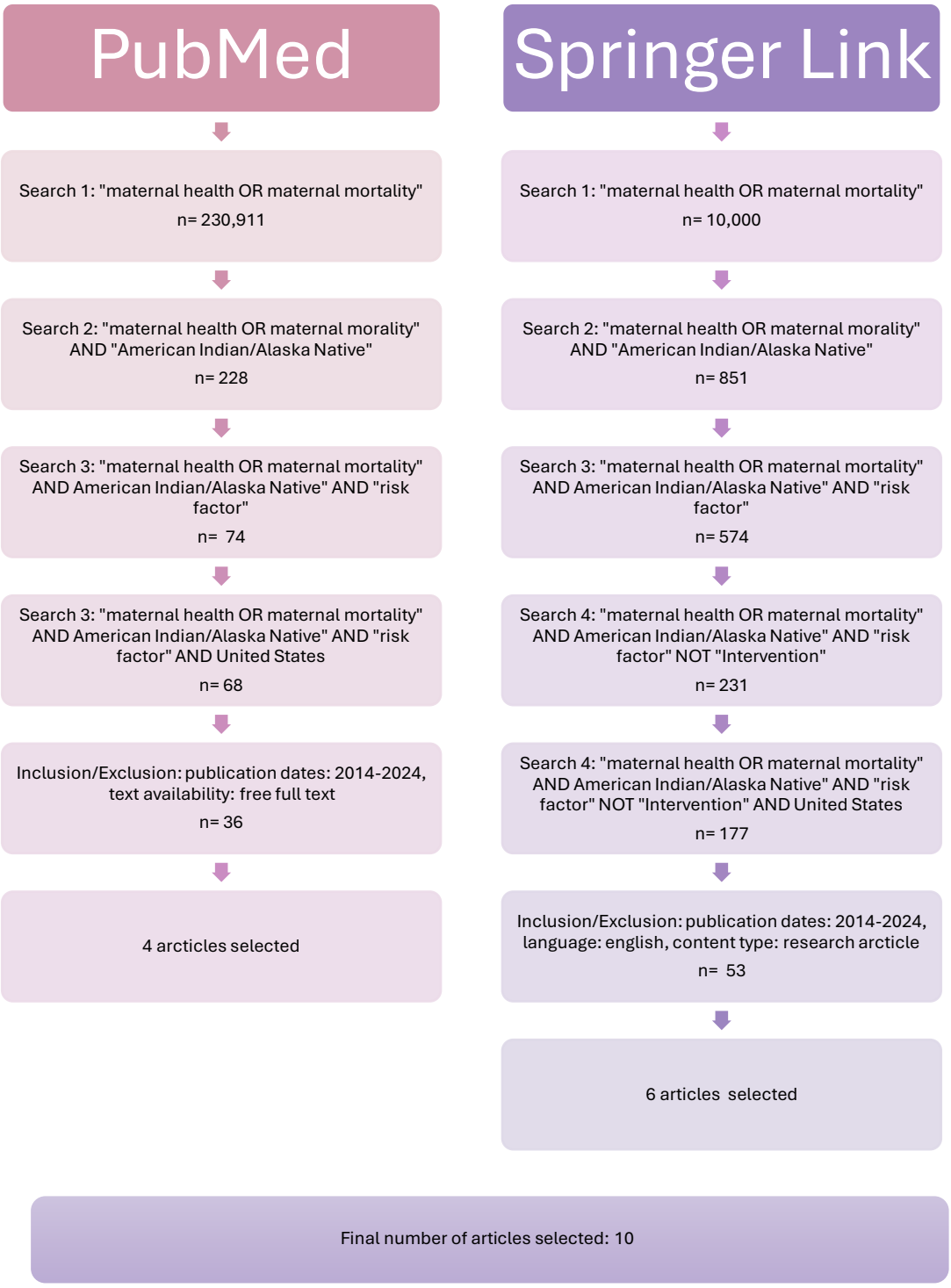
AND United States" was conducted and produced 177 items. The inclusion criteria of published between 2014 and 2024, written in English, and research article were applied and resulted in 53 results. 6 of the 10 articles used in this literature review came from the Springer Link database.

For PubMed, a search for "maternal health OR maternal mortality" produced 230,911 articles. To refine the search, a search of "maternal health OR maternal mortality AND American Indian/Alaska Native" reduced the results to 228 articles. The next search "maternal health OR maternal mortality AND American Indian/Alaska Native AND risk factor" yielded 74 articles. One more refining search of "maternal health OR maternal mortality AND American Indian/Alaska Native AND risk factor AND United States" produced 68 results. The inclusion criteria of published between 2014 and 2024 and full text available were applied to generate 36 articles. 4 of the 10 articles used in this literature review came from the PubMed database.

Inclusion/Exclusion Criteria

In both databases, similar inclusion and exclusion criteria were applied. To be included in this literature review articles had to be published between 2014 and 2024, full text was available, it was available in English and focused on the maternal health of AI/AN women. Articles that were excluded did not have sufficient data on AI/AN women, focused on other minority populations or generalized data across racial groups.

Figure 1: Article Selection Process



Results

Maternal health disparities can be seen across racial groups in the United States, especially among AI/AN women. The ten research articles reviewed present three main risk factors for the poor maternal health outcomes of AI/AN women. The first finding was that rates of substance use, specifically cigarette smoking while pregnant were highest among AI/AN women. The second finding was that obesity affects many AI/AN women and leads to a variety of other health conditions related to pregnancy. The third finding was that poor access to care impacts the maternal health of AI/AN women. *Table 1* provides a more detailed review of the ten research articles reviewed.

Substance Use

Substance use, specifically cigarette smoking, is a primary concern for AI/AN pregnant people. Smoking during pregnancy endangers both the life of the mother and fetus (Azagba et al., 2020). AI/AN women are more likely to smoke during pregnancy than all other races reviewed (Azagba et al., 2020). There was a 15% prevalence among the population reviewed (Azagba et al., 2020). Some of this high rate might be explained by the impact of historical and generational trauma (Satter et al., 2021). Women, specifically Native women have been experiencing violence and trauma for decades (Satter et al., 2021). Trauma influences individual behaviors, such as substance use and abuse (Satter et al., 2021). AI/AN women also report the highest number of stressful life events in the year before delivery (Yakubu et al., 2023). AI/AN people are face significantly higher risks to their health during and after pregnancy than the general population (Glover et al., 2024).

Obesity

Research shows that obesity is a significant concern for AI/AN maternal health. AI/AN pregnant people face higher rates of severe maternal morbidity (SMM) than their White counterparts (Roese et al., 2023). Increased risk of SMM includes induction of labor, maternal transfusion, and ICU admission (Thompson & Suter, 2020). Data from a Washington State study looking at singleton live births found that 27.6% of AI/AN mothers were overweight and 28.3% were obese (Zamora-Kapoor et al., 2016). When controlling for all factors other than BMI, AI/AN women have 17% increased risk of developing pre-eclampsia (Zamora-Kapoor et al., 2016). However, when BMI was controlled for, there was no significant difference in risk between AI/AN and White women (Zamora-Kapoor et al., 2016). It can be deduced that the biggest risk factor of pre-eclampsia to AI/AN pregnant people is being overweight or obese.

Additionally, cardiovascular disease is the second leading cause of death in the AI/AN women (Sharma et al., 2023). More than 60% of AI/AN women enter pregnancy with suboptimal cardiovascular health (Sharma et al., 2023). This can lead to the development of cardiovascular disease in the future, as well as adverse outcomes for the mother and fetus (Sharma et al., 2023). The most recent data from the Pregnancy Mortality Surveillance System shows cardiomyopathy accounted for 14.5% of AI/AN pregnancy-related deaths (Sharma et al., 2023). Other cardiovascular complications accounted for 11% of AI/AN pregnancy-related deaths (Sharma et al., 2023). One of the biggest risk factors for developing heart disease is obesity (Sharma et al., 2023). Obesity can lead to other risk factors such as diabetes and hypertension (Sharma et al., 2023). AI/AN pregnant people have the highest rates of gestational diabetes when compared to White, Black, and Hispanic pregnant people (Anderson et al., 2016).

Access to Care

Literature routinely mentioned Medicaid and other federally funded programs that are utilized by AI/AN mothers. Poor access to care is a struggle that many Americans face. AI/AN pregnant people use government-funded healthcare programs more frequently than their White counterparts (Roese et al., 2023). About two thirds of AI/AN pregnant people are enrolled in Medicaid insurance as well as Women, Infants, and Children (WIC) (Zamora-Kapoor et al., 2016). WIC is a federally funded program ensuring the nutrition of women, infants, and children (Zamora-Kapoor et al., 2016). Only one third of their counterparts were enrolled in these programs (Zamora-Kapoor et al., 2016). Almost two thirds of White pregnant people have private insurance (Jiang et al., 2023). AI/AN pregnant people are more likely to live in rural counties than their White counterparts (Roese et al., 2023). This is a significant predictor of SMM because of the distance from hospitals and specialists (Roese et al., 2023). AI/AN women typically have less access to care and receive prenatal care later in their pregnancies (Anderson et al., 2016). Another factor that influences access to care is education. Less educational attainment is associated with poorer health outcomes because of lower salaries which reduce the ability to pay for care. AI/AN pregnant people have the lowest educational attainment when compared to White, Black, and Hispanic pregnant people (Anderson et al., 2016). 60% of AI/AN pregnant women receive a high school or less than high school education (Anderson et al., 2016). This limits the types of jobs AI/AN pregnant women can obtain, and subsequently their use of public insurance programs. AI/AN people are less likely to report that they experienced a trusting relationship with a medical provider or receive identity-related respectful care (Glover et al., 2024). This decreases the likelihood that they will seek out care and can lead to poor maternal health outcomes.

Table 1 Detailed Summary of Articles Reviewed

	Author(s)	Year	Article Title and Journal	Purpose of Article	Sample Info	Type of Research	Research Findings	Limitations of Article
1	Anderson, K. G., Spicer, P., & Peercy, M. T.	2016	Obesity, Diabetes, and Birth Outcomes Among American Indians and Alaska Natives *Maternal and Child Health Journal*	To analyze the relationships between type 2 diabetes, gestational diabetes, and BMI with several adverse birth outcomes among American Indian/Alaska Native women compared to other racial groups	Type 2 diabetes prevalence 14.1% among AI/AN population 8.7% babies born at a high birth weight	Population-based retrospective sample	AI/AN people have higher rates of overweight and obesity compared to White or Hispanic. Type 2 diabetes and gestational diabetes have the highest rate among AI/AN women. Macrosomia (high birth weight) is most common among AI/AN women.	Data on birth certificates have varying levels of accuracy and specificity. The data is cross-sectional so caution must be exercised when examining causality.
2	Azagba, S., Manzione, L., Shan, L., &King, J.	2020	Trends in smoking during pregnancy by socioeconomic characteristics in the United States, 2010–2017	To examine prevalence of smoking during pregnancy among demographic subgroups.	15% prevalence of smoking during pregnancy	Retrospective sample	Prevalence of smoking during pregnancy is highest among AI/AN women.	Miscarriages are not recorded as births. Pregnancies that did not reach fetal

			BMC Pregnancy and Childbirth		among AI/AN women. 7.2% of birthing women report being a smoker.		Prevalence of smoking during pregnancy is highest among women with a high school diploma, GED, or less.	viability were not recorded.
3	Glover, A., Holman, C. & Boise, P	2024	Patient-centered respectful maternity care: a factor analysis contextualizing marginalized identities, trust, and informed choice *BMC Pregnancy and Childbirth*	To increase understanding of patient centered maternal health care from patients' perspective and identify potential improvements.	6% of Montana's population AI/AN. 16.5% report food insecurity.	Online survey	Increased social marginalization associated with less respectful and autonomous care.	Feelings and emotions are hard to quantify/standardize. Perceptions of experiences are highly subjective.
4	Jiang, W., Chen, W. & Li, D.	2023	Racial and ethnic disparities in the incidence, healthcare utilization, and outcomes of retained placenta among delivery hospitalizations in the United States, 2016–2019 *BMC Pregnancy and Childbirth*	To investigate the recent data surrounding retained placenta and the outcomes associated with it.	0.78% birthing persons identified with retained placenta in whole study. 1.43% birthing persons identified to be Native	Population-based retrospective sample	Native American mothers have the highest rate of retained placenta. Those who delivered with retained placenta were associated with higher in	Patients could not be followed over time to see if they experienced further side effects once being discharged. There may have been mistakes in recording/coding data in the system.

					American with retained placenta.		hospital mortality and longer hospital stays.	
5	Roese, N., Lan, C.W., Tirumala, K., S, Joshi.	2024	Community-Level Factors are Predictors of Severe Maternal Morbidity Among American Indian and Alaska Native Pregnant People in the Pacific Northwest in a Multilevel Logistic Regression *Maternal and Child Health Journal*	To understand the barriers to care face by AI/AN pregnant people than lead to higher rates of severe maternal morbidity.	64.48% primarily pay for medical care through Medicaid. 32.88% uninsured.	Multilevel logistic regression	Rates of severe maternal morbidity are 2 time higher in AI/AN pregnant people compared to White pregnant people. AI/AN people more likely to live in rural counties with low median income and high rates of bring uninsured.	Race may have been misclassified on documents because self-identification leaves room for interpretation. Limited to sever maternal morbidity that occurred at birth, does not include events after discharge.
6	Satter, D. E., Mercer Kollar, L. M.,	2021	American Indian and Alaska Native Knowledge and Public Health for the Primary Prevention of Missing or Murdered Indigenous Persons	To gain a better understand of the impact violence has on the physical and mental health of AI/AN people.	75% of AI/AN people do not live on reservations, they live in urban, suburban, and rural places.	Retrospective sample	AI/AN people live 5.5 years less than the average American. AI/AN people may be at increased risk	Data on violence and crime against AI/AN people is limited because of self-reporting.

			National Library of Medicine		Trauma influences substance misuse and mental health issues.		for violence because of adverse childhood experiences.	
7	Sharma, G., Kelliher, A., Deen, J., Parker, T., Hagerty, T., Choi, E. E., DeFilippis, E. M., Harn, K., Dempsey, R. J., Lloyd-Jones, D. M.,	2023	Status of Maternal Cardiovascular Health in American Indian and Alaska Native Individuals: A Scientific Statement from the American Heart Association *American Heart Association*	To better understand the impact of cardiovascular disease on the AI/AN population, specifically in pregnant people.	Rates of cardiovascular disease are at least 12% in the AI/AN population and believed to be underreported. AI/AN are 50% more likely to be diagnosed with cardiovascular disease than White counterparts.	Retrospective cohort study	Cardiovascular disease is the leading cause of pregnancy related deaths in the U.S. Cardiovascular disease is the leading cause of death among AI/AN people.	Small sample size studied. Disease states are believed to be underreported in this population.
8	Thompson, J.A., Suter, M.A.	2020	Estimating racial health disparities among adverse birth outcomes as deviations from the population rates	To further understand the impact of race and ethnicity on adverse birth outcomes.	Children of AI/AN women have 2 times the risk of having the following birth defects, spina bifida,	Retrospective cohort study	AI/AN women had an increased risk of developing gestational diabetes, gestational hypertension,	The database does not include information related to cesarean delivery. Information on preterm delivery was not available.

			BMC Pregnancy and Childbirth		gastroschisis; limb reduction defect, cleft lip, and cleft palate.		and hypertension eclampsia. AI/AN infants had an increased risk of birth defects.	
9	Yakubu, R.A., Ajayi, K.V., Dhaurali, S., Carvalho, K., Kheyfets, A., Lawrence, B.C., & Amutah-Onukagha, N.	2023	Investigating the Role of Race and Stressful Life Events on the Smoking Patterns of Pregnant and Postpartum Women in the United States: A Multistate Pregnancy Risk Assessment Monitoring System Phase 8 (2016–2018) Analysis *Maternal and Child Health Journal*	To examine the relationship between smoking while pregnant or postpartum and experiencing stressful life events.	19% of AI/AN women reported smoking in the last 3 months of pregnancy. AI/AN women reported the highest number of stressful life events in the year before birth.	Population-based surveillance system	There is significant associating between stressful life events and smoking. There is higher smoking prevalence among the AI/AN population.	Only 5 states were analyzed so findings cannot be generalized to entire country. Pregnancies that did not result in live birth were omitted from the study.
10	Zamora-Kapoor, A., Nelson, L. A., Buchwald, D. S., Walker, L. R., & Mueller, B. A.	2016	Pre-eclampsia in American Indians/Alaska Natives and Whites: The Significance of Body Mass Index	To understand the prevalence of pre-eclampsia in AI/AN populations compared to White, and the potential	33% of AI/AN women of reproductive ages are obese.	Retrospective cohort study	AI/AN women had a higher rate of pre-eclampsia when controlling all	Some records lack data on BMI, limits the sample size. If respondents did not report their race,

			Maternal and Child Health Journal	effects obesity has on developing pre-eclampsia.	43% of AI/AN people have a normal BMI.		factors other than BMI. When adjusted for BMI racial differences decreased, suggesting that BMI influences developing pre-eclampsia.	staff may have misclassified them on reports.

Discussion

Understanding the risk factors that contribute to poor maternal health and SMM is important to the health of current and future pregnant people. Focusing on populations with higher rates of SMM and poor maternal health like AI/AN pregnant people can help to address the root of the problem. The risk factors addressed can determine what programs will be most beneficial to the population.

The literature review discusses how substance use during pregnancy, obesity and its related conditions, and poor access to care affect the health of AI/AN pregnant people. The findings regarding substance use support the idea that more emphasis should be placed on the negative health outcomes of smoking, especially during pregnancy. The research on obesity shows that it contributes to many negative health outcomes in all populations but needs to be controlled in the AI/AN population. The findings related to poor access to care show that AI/AN pregnant people need access to affordable, quality, and culturally competent care to prevent poor maternal health outcomes.

Maternal mortality rates have decreased globally in recent decades except for in the United States where rates have been increasing (Huang et al., 2024). Maternal mortality in the United States varies significantly by race with Black women experiencing the greatest number of maternal deaths (Huang et al., 2024). Black women are less likely to have insurance, be taught to use properly use contraceptives, and access to prenatal care (Huang et al., 2024). Black women are more likely to experience unintended pregnancies and chronic health conditions (Huang et al., 2024). These factors are structural and a result of social determinants of health that lead to higher rates of SMM (Huang et al., 2024). Similar social determinants of health are what affect the poor maternal health of AI/AN women as well.

Limitations

The primary limitations of this literature review are the small number of articles that were reviewed and the lack of AI//AN specific data. This literature review only included ten articles. This is not enough to cover the broad scope of maternal health across a population. This limited research may have skewed the data presented by not reviewing aspects such as income and age that also affect maternal health. Additionally, the available data on maternal health of AI/AN women is limited. More research needs to be conducted on the population to address all factors at play. Some of the articles focused on AI/AN populations in specific states, which makes the data ungeneralizable to other AI/AN populations.

Further Research

More research and data are required to understand the full breadth of risk factors that affect maternal health and SMM. More work can be done to study specific AI/AN populations and what affects their health outcomes. Most current articles only have a small section to discuss AI/AN pregnant people. Comprehensive research on AI/AN expecting mothers would strengthen the current body of data to help determine what programs should be designed to improve maternal health. Comparing the lifestyles of healthy expectant mothers to those with worse health status or outcomes would more clearly show the risk factors for poor maternal health. Overall, further research on AI/AN pregnant people can show what aid is needed to decrease instances of SMM.

Conclusion

Increasing the health status of AI/AN pregnant people is an important step to increasing maternal health status across the United States. This literature review examined ten articles from

the Springer Link and PubMed data bases to determine the risk factors to poor maternal health outcomes among AI/AN mothers. The study found that substance use during pregnancy, obesity and related diseases, and poor access to care are the main risk factors to poor maternal health outcomes. These findings can be used to develop public health programs that will inform AI/AN women what they should do to promote a healthy pregnancy. They can also be used to increase access to care in necessary communities.

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