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The Influence of Sociodemographic Factors on Opioid Mortalities in the U.S. State of Georgia

Theresa Highsmith
Walden University

Walden University

College of Health Sciences and Public Policy

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Theresa Highsmith

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Review Committee
Dr. Claire Robb, Committee Chairperson, Public Health Faculty
Dr. Kelley Sams, Committee Member, Public Health Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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Abstract

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MBA, University of Phoenix, 2007

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Since the late 1990s, the United States has been in the midst of an opioid epidemic that continues to present significant public health challenges. Opioid-related mortality, particularly involving fentanyl, has disproportionately affected vulnerable populations. The purpose of this quantitative study was to examine the associations between educational level, homelessness, and alcohol use with opioid-related overdose deaths involving fentanyl, while controlling for age, gender, and marital status, among Black and White populations in the U.S. state of Georgia. The theoretical framework was Bronfenbrenner's socioecological model, which recognizes that individual behavior is influenced by multiple levels of factors, including interpersonal, community, and societal determinants. As part of the cross-sectional study design, secondary data from the State Unintentional Drug Overdose Reporting System, provided by the Georgia Department of Public Health, were collected. The sample included 1,872 cases of opioid-related overdose deaths involving fentanyl. Binary logistic regression was used to examine the associations between the independent variables (educational level, homelessness, and alcohol use) and the dependent variable (opioid-related overdose deaths involving fentanyl). The findings revealed that homelessness and alcohol use were significant predictors of fentanyl-involved overdose deaths among both Black and White populations. Educational level was not statistically significant. These findings underscore the need for targeted interventions addressing racial disparities in fentanyl-related deaths among Black and White populations.

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Dedication

This dissertation is dedicated to both my moms, Clara Mae Johnson and Winnie J. Highsmith, who are in the bosom of God. I will always love you. To my third mom, who came in to substitute for my real moms, Marian Sharpless, you are my rock, and I love you.

To my sons, Marcus and Quinn, thank you for your love, prayers, and endless support. Your belief in me gave me the strength to keep going even when I wanted to give up.

To my brother Buddy, who was my number one cheerleader: I miss you and think of you every day. RIP. Your encouragement and belief in my vision for fentanyl harm reduction continue to inspire me.

I am dedicating this also to those who have lost their lives to opioid overdoses, particularly within underserved and marginalized communities. May your stories never be forgotten.

Finally, I dedicate this work to God, who gave me the wisdom, endurance, and purpose to pursue this mission. Without His grace, this journey would not have been possible.

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To my pastor, Joanna Ward, thank you for your prayers, endless support, and your faith in me that carried me through.

A special thanks goes to Walden University and the Georgia Department of Public Health for access to the State Unintentional Drug Overdose Reporting System data set, which made this research possible.

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Section 1: Foundation of the Study and Literature Review

The United States is currently facing an unprecedented opioid crisis, characterized by a staggering increase in opioid-related deaths and widespread societal ramifications. The crisis is the result of a combination of factors, including overprescription of opioid medications, illicit opioid use, and the proliferation of potent synthetic opioids such as fentanyl. According to the Centers for Disease Control and Prevention (CDC, 2020), opioid-related fatalities have risen to alarming levels. This has significantly contributed to overall mortality rates and profoundly impacted public health outcomes and life expectancy trends.

The crisis is particularly acute among racial and ethnic minorities, with African American and Hispanic communities experiencing disproportionately high rates of opioid-related deaths. This could be attributed to the unique challenges these minorities, especially African Americans, face in accessing health care (Rudd et al., 2016). Social determinants worsen the crisis for minorities, increasing addiction and overdose risks (Geergert et al., 2022).

Understanding the complex interplay between socioeconomic factors and opioid fatalities among different racial and ethnic groups is imperative for developing effective prevention, treatment, and policy interventions (Gondre-Lewis et al., 2023). Thus, this study explores the influence of marital status, education, homelessness, and alcohol use on opioid fatalities to inform strategies for tackling the crisis. Further, the study rigorously analyzes data to uncover opioid-related disparities and advocate for equitable health care access and improved health outcomes.

Background

In the United States, opioid-related overdose deaths have reached epidemic proportions, representing a significant public health crisis. Over the last 2 decades, from 1999 to 2019, an estimated 841,000 individuals have succumbed to drug overdoses, with opioids contributing significantly to this alarming figure (CDC, 2020). The crisis is the result of various factors: overprescription of opioids, availability of heroin, and the emergence of potent synthetic opioids like fentanyl. These substances have contributed to a surge in opioid use disorders, addiction, and overdose deaths across the country.

In recent years, Georgia has experienced a significant increase in opioid-related fatalities, mirroring national trends. According to the Georgia Department of Public Health (2019), 1,649 opioid-related overdose deaths were reported in the state in 2019 alone, representing a sharp rise compared with previous years. Understanding the factors leading to opioid-related overdose deaths in Georgia is essential for developing targeted interventions and strategies to mitigate the crisis effectively. By analyzing opioid fatality data, policymakers can pinpoint areas to deliver targeted interventions, saving lives and enhancing public health.

Problem Statement

Drug overdose deaths in Georgia have risen by 61.9% from 2019 to 2021, disproportionately affecting White residents (60%), while African Americans increased by 65%. The rise in opioid misuse among these communities increases mortality, morbidity, and economic burdens. Lopez et al. (2021) highlighted increased school dropouts and work absences due to opioid abuse, elevating the risk of overdose deaths among said populations. Georgia, with its diverse demographic composition, provides an ideal setting to examine these disparities. The COVID-19 pandemic increased opioid overdose deaths, fueled by increased drug use due to isolation and economic insecurities. Bias in prescribing practices based on race or ethnicity contributes to unequal access to prescription opioids, leading to disparities in overdose rates. The transition to street drugs like heroin, often laced with potent synthetic opioids such as fentanyl, increases opioid-related fatalities further.

Purpose of Study

This quantitative study explores how education, homelessness, and alcohol use controlling age, gender, and marital status are associated with opioid overdose deaths in Georgia, examining a diverse population of White and Black individuals. Using the socioecological model (SEM) developed by Bronfenbrenner (1977), I investigated how individual factors influence opioid-related mortality rates. I sought to inform interventions targeting opioid fatalities and life expectancy in affected communities. Specifically, I sought to enhance the understanding of individual behavioral change and self-efficacy, the key components in promoting healthier outcomes and mitigating the devastating impact of the opioid crisis on vulnerable populations. Overall, this research is aimed at providing valuable insights that can inform evidence-based strategies to address opioid-related disparities and health inequity among diverse populations in Georgia and beyond.

Research Questions and Hypotheses

The research questions (RQs) and hypotheses for the study were as follows:

RQ1: What is the association between education and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status?

$H_0$1: There is no significant association between education and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

H_a1: There is a significant association between education and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

RQ2: What is the association between alcohol use and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status?

$H_0$2: There is no significant association between alcohol use and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

H_a2: There is a significant association between alcohol use and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

RQ3: What is the association between homelessness and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status?

$H_0 3$: There is no significant association between homelessness and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

$H_a 3$: There is a significant association between homelessness and fentanyl-related among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

Theoretical Framework

The SEM served as the theoretical basis for this study. This theory was developed by Urie Bronfenbrenner in the 1970s and formalized as a theory in the 1980s (Bronfenbrenner, 1977). The SEM offers a comprehensive framework for understanding human development. Bronfenbrenner's ecological systems theory posits that development occurs within nested systems, encompassing microsystems, mesosystems, exosystems, macrosystems, and chronosystems (Bronfenbrenner, 1977). Within this model, the interaction of various ecological systems shapes individual development.

The microsystem represents the immediate environment in which individuals lead their daily lives, comprising individuals, institutions, and groups with whom they have immediate interactions. The mesosystem encompasses the interactions and connections between different microsystems surrounding the individuals (Bronfenbrenner, 1977). These interconnections significantly influence the individual's development and well-being. Changes within one microsystem can reverberate throughout others, illustrating the interconnectedness of these systems (Bronfenbrenner, 1977).

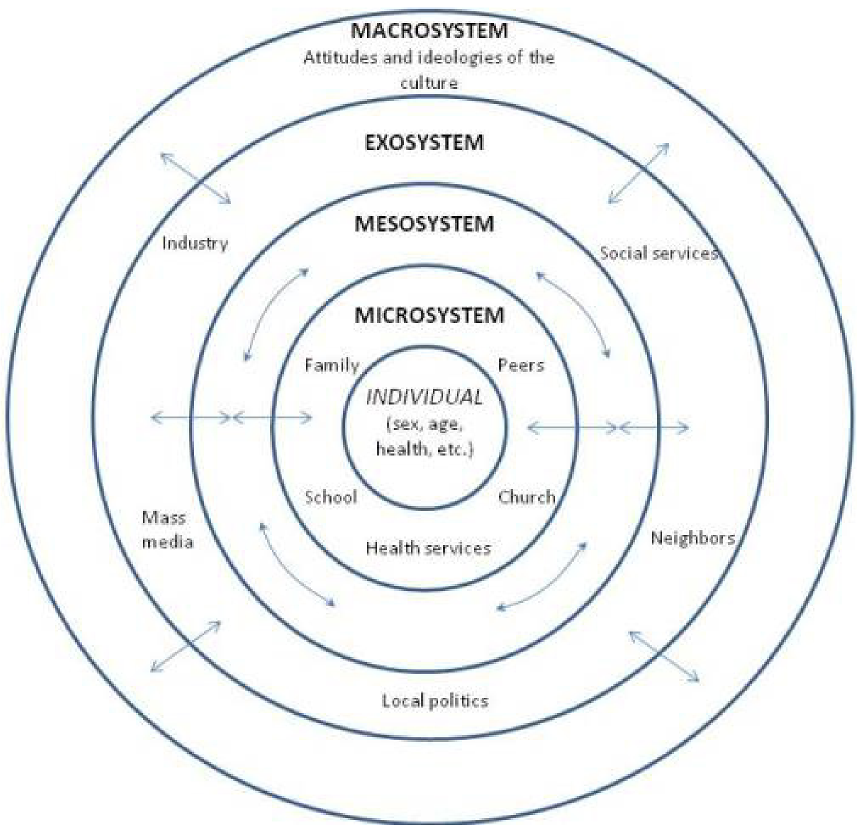
The exosystem refers to environments that individuals are not directly involved in but impact their development (Bronfenbrenner, 1977). This level encompasses the broader social context inhabited by individuals, constituted by government policies, social services, community resources, and mass media. Despite lacking direct interaction, these influences play a fundamental role in shaping an individual's development. The macrosystem covers broader societal and cultural influences that shape individual development. At this level, key components include values, social norms, customs, traditions, ideologies, and cultural beliefs, which are often shared by groups with similar histories or identities. The last system in this model is the chronosystem, which represents the outermost level of Bronfenbrenner's ecological model and recognizes the role of time in shaping individual development. This level encompasses personal experiences across the lifespan, life transitions, historical events, and societal changes (Bronfenbrenner, 1977).

Bronfenbrenner's SEM emphasizes the dynamic interplay between individual characteristics and environmental factors that shapes human behavior and development. It highlights the reciprocal influences between individuals and their social contexts, illustrating how changes at one level can ripple through multiple systems (Bronfenbrenner, 1977). The SEM's complexity enables a nuanced understanding of the multifaceted nature of human behavior and development. By examining interactions across multiple environmental systems, researchers can elucidate the mechanisms underlying behavioral outcomes and inform interventions aimed at promoting positive development and well-being (Abdullah et al., 2023).

Overall, Bronfenbrenner's SEM offers a comprehensive framework for understanding human development within the context of complex environmental systems. Its application in this study facilitates the exploration of the interplay between individual factors and social environments concerning opioid-related deaths among diverse populations in Georgia (see Figure 1).

Figure 1

Socioecological Model of Human Behavior



Note. Centers for Disease Control and Prevention. (n.d.). The social-ecological model. A framework for prevention. https: www.cdc.gov/violenceprevention/about/social-ecologicalmodel

The SEM positions individuals at the nexus of various ecological systems. Individuals play a pivotal role in initiating and implementing changes within systems. Positive changes often elicit favorable responses from the system, while negative changes can trigger reciprocal reactions (Han et al., 2021).

A thorough understanding of diseases such as opioid addiction can empower individuals by enhancing their awareness of susceptibility, severity, and the overall threat posed by the disease (S.F. Ahmad et al., 2021). This knowledge improves informed decision-making on preventive measures and treatments, promoting healthier behaviors and outcomes in social environments. Using the SEM, factors across individual, interpersonal, community, and societal levels can be analyzed to understand opioid-related overdose deaths (Harper & Stone, 2020). It allows examining how factors such as education, socioeconomic status, social support networks, community resources, and systemic inequalities contribute to the risk of opioid misuse, addiction, and overdose.

These systems do not just interact with the levels that precede or follow them. Interactions at one level can have cascading effects on other levels of influence (Hedegarrd et al., 2020). For example, workplace stress can impact on how individuals interact with their children at home. Additionally, economic changes in society (chronosystem) can influence the resources available in communities (exosystem), hence playing a role in the dynamics within individual families (microsystem). By examining these influences more closely, researchers can gain a better appreciation of the dynamic interactions and interdependencies between the different levels of Bronfenbrenner's model (Hedegaard` et al., 2020).

The interactions between different systems in Bronfenbrenner's model are intricate and bidirectional (Mattson et al., 2021). Changes in one level can have a resounding impact on others. The model's current relevance significantly influences how researchers, psychologists, and educators perceive human development (Miller et al., 2020). The model's holistic approach emphasizes the need to understand all aspects of a person's environment to appreciate the complex, interrelated factors influencing their development (Kalkstein et al., 2022). Ultimately aiming to reduce opioid-related overdose deaths and improve the well-being of affected individuals and communities, the current study employs this model to address the complex and multifaceted nature of opioid-related issues.

Nature of Study

The opioid epidemic, prevalent in the 1990s and 2000s, was the result of aggressive marketing tactics by pharmaceutical companies, alongside evolving medical standards in chronic pain treatment. Notably, racial disparities exist in prescription patterns and pain management, with lower opioid prescription rates observed in Black and Brown populations compared with White populations (Kalkstein et al., 2022). Such disparities are compounded by biases among physicians, influenced by factors like gender and race (F.B. Ahmad et al., 2021). These discrepancies are significant, as prescription opioid misuse significantly correlates with heroin use (Jones et al., 2020). Recent research indicates a convergence between heroin and prescription opioid misuse rates among White and Black populations, necessitating the exploration of long-term mortality (Ciccarone et al., 2019).

To address these issues, this quantitative study employs a cross-sectional design to investigate the association of marital status, education, homelessness, and alcohol use with opioid-related overdose deaths among White and Black individuals living in Georgia. Cross-sectional designs are suitable for identifying factors influencing opioid use and understanding the racial dynamics of the opioid epidemic (Seth et al., 2018). Data were sourced from the Drug Surveillance Unit of the Georgia Department of Public Health Portal. Its State Unintentional Drug Overdose Reporting System (SUDORS) database provides comprehensive information on unintentional drug overdose deaths from coroners / medical examiners, aiding in the elucidation of evolving trends in the opioid epidemic and informing stakeholders (CDC, 2020). By analyzing detailed toxicological data from death certificates (DCs) and medical examiner reports, this study aims to provide insights into the multifaceted nature of opioid-related mortality in Georgia.

Literature Search Strategy

I conducted a thorough literature review using PubMed and Google Scholar. I selected peer-reviewed journal articles and government reports published on the opioid epidemic between 2019 and 2024. PubMed, maintained by the U.S. National Library of Medicine, comprises over 29 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher websites. PubMed focuses on biomedical and clinical literature, but many of the government reports and research articles published on the opioid epidemic in social and behavioral sciences are not indexed in PubMed or

MEDLINE. These reports and articles are generally indexed in Google Scholar. Google Scholar allows searching across various discipline reports, books, abstracts, and opinions. Since my search keywords were specific, I used the two databases that provided the most relevant publications, articles, and reports for my research literature review. The research literature review was conducted by using a comprehensive array of keywords, including *social determinants, opioid epidemic, opioid abuse, pain management, opioid overdose, drug overdose, drug-related mortality, drug-induced mortality, socioeconomic disparities, geographic variances, rural–urban divides,* and *racial and ethnic demographics.*

Literature Review Related to Key Variables and/or Concepts

The United States is grappling with an opioid epidemic that has become one of the most pressing public health problems of the 21st century. This epidemic, marked by opioid misuse, addiction, and fatal overdoses, has seriously affected individuals, families, and communities nationwide. The significant impact of opioids, including prescription pain relievers, heroin, and fentanyl, on mortality rates necessitates immediate interventions. Amid this national crisis, states such as Georgia have been significantly affected by the staggering toll of opioid-related overdose deaths.

In recent decades, the surge in opioid-related overdose deaths in the United States has been propelled by various factors. According to the CDC (2020), opioid overdose deaths quadrupled between 1999 and 2018, with over 450,000 lives lost during this period. The rise of synthetic opioids, notably fentanyl, has led to a notable increase in overdose fatalities, reflecting the epidemic's evolution.

Against this backdrop, the state of Georgia has faced challenges in combating opioid-related overdose deaths. Georgia, as a populous southeastern state, faces escalating opioid misuse and fatalities, necessitating focused prevention, mitigation, and treatment strategies. Geographic disparities in opioid-related morbidity and mortality highlight the multifaceted influence of socioeconomic, environmental, and health care dynamics on the epidemic. Understanding the unique drivers of opioid misuse and overdose deaths in Georgia is essential for informing evidence-based interventions tailored to the needs of the local communities.

I explored the epidemiology of opioid-related overdose deaths in the United States, with a particular focus on the state of Georgia. It seeks to illuminate the multifaceted nature of the opioid epidemic, informing targeted prevention and intervention strategies. The facets include demographic variations, age-related variations, targeted interventions, gender-related variations, sociocultural factors, gender-sensitive preventions, race-/ethnicity-related variations, structural determinants, intersectionality and complexities, marginalized populations, policy frameworks, and the gap.

Demographic Variations

Understanding demographic variations in opioid-related overdose deaths is vital for devising effective public health strategies to combat the opioid epidemic. Demographic factors such as age, gender, race/ethnicity, socioeconomic status, and geographic location significantly influence patterns of opioid use, misuse, and overdose. Studies indicate that specific demographic cohorts, including young adults, males, non-Hispanic White populations, individuals of lower socioeconomic status, and rural residents, face heightened vulnerability to opioid-related fatalities (James & Jordan et al., 2018; Fine et al., 2022; Young et al., 2023). By identifying these disparities, policymakers and health care providers can tailor interventions to target populations at the highest risk and allocate resources more effectively. Society comprehends demographic disparities, which aids in tackling fundamental health determinants like health care access, socioeconomic disparities, and structural racism (Barocas et al., 2019; Friedman et al., 2019). Such understanding is important for formulating holistic strategies that advance health equity and mitigate disparities in opioid-related outcomes.

Age-Related Variations

Peer-reviewed literature from 2020 to 2024 has shed light on the varied number of opioid-related deaths across various age groups. Studies conducted during this period have consistently identified specific cohorts bearing a disproportionate burden of opioid mortality. For instance, Seth et al. (2020) highlighted that young adults aged 25–34 years exhibit the highest rates of opioid-related overdose deaths. Smith & Jones (2021) underscored the significant impact on middle-aged adults, particularly those aged between 45 and 54 years. Furthermore, Suffoletto et al. (2018) identified a concerning rise in opioid-related mortality among the older adult population, aged 65 years and above.

Factors contributing to higher overdose death rates among specific age groups vary, reflecting different risk profiles and health care needs. Young adults, particularly those aged 18–25 years, face increased susceptibility due to experimentation, peer influence, and a lack of awareness about the potency of substances (Singh et al., 2019).

Individuals aged 25–35 years often engage in polydrug use, combining opioids with other substances such as benzodiazepines, alcohol, or illicit drugs. The 35–54 age group often experiences chronic pain conditions, because long-term opioid use increases the risk of tolerance and overdose. Socioeconomic stressors, such as unemployment, unstable housing, lack of access to treatment, and stigma surrounding them, compound the challenges faced by this demographic (Bradford & Lozano-Rojas, 2024).

Among the older adult population, the age group above 55 years has a higher prevalence of chronic pain conditions, leading to increased opioid prescriptions to manage pain. Polypharmacy among older adults, often due to comorbidities, heightens the risk of drug interactions and overdose when combined with opioids. These findings emphasize the need for targeted interventions tailored to the distinct needs of different age groups affected by opioid-related overdose deaths (Tin et al., 2024).

Targeted Interventions

Targeted interventions for specific age groups are vital to public health efforts to tackle the opioid epidemic. Tailored interventions aim to mitigate risk factors and enhance protective factors associated with opioid misuse and overdose within specific age brackets, according to Chua et al. (2022). For young adults aged 18–25 years, interventions may focus on prevention strategies, such as providing education on the risks of experimentation, peer influence, and the potency of substances. For middle-aged adults aged 35–54 years, interventions may include increasing access to evidence-based treatment options, addressing chronic pain management, and improving access to naloxone. Interventions for individuals aged 64 years and above may encompass optimizing medication protocols, ensuring non-opioid pain management, and raising polypharmacy awareness. Tailoring interventions to age-specific groups within diverse racial and ethnic categories can effectively mitigate opioid-related harm and mortality.

Gender-Related Variations

Gender-related variations in opioid-related overdose deaths include a range of disparities and nuances. Studies suggest that men experience higher rates of fatal opioid overdoses, potentially attributed to riskier opioid use behaviors and polysubstance consumption (Jackson et al., 2021; Mayor et al., 2020). Yet, contemporary evidence indicates a potential narrowing of the gender disparity in opioid overdose mortality, with some studies noting increased female deaths (Miller et al., 2020; O'Hanlon et al., 2022). Gender disparities extend to opioid involvement in overdoses, with men experiencing more heroin-related fatalities and women experiencing more prescription opioid–related deaths (Jones and McAllister 2022). Additionally, gender intersects with other factors such as race and socioeconomic status, further influencing opioid-related outcomes (Friedman et al., 2022; Maierhofer et al., 2021). Understanding these gender-based variations is essential for tailoring prevention, intervention, and treatment efforts to address the specific needs of different gender groups.

Sociocultural Factors

Sociocultural factors play a significant role in shaping gender differences in opioid misuse and overdose. Conventional gender norms influence substance use patterns, with men exhibiting higher rates of risky behaviors, including opioid misuse and overdose (Mars et al., 2023; Evans et al., 2021). Gender disparities in opioid use may stem from societal attitudes toward pain and help-seeking behaviors favoring women, potentially increasing opioid consumption (Miller et al., 2020; Friedman et al., 2022). Social networks and peer influences have distinct impacts on substance use for men and women, with women's smaller but tighter networks influencing opioid risk (Mayor et al., 2020; Maierhofer et al., 2021). Comprehending sociocultural factors is pivotal in crafting interventions to meet gender-specific needs and mitigate opioid-related harm.

Gender-Sensitive Prevention

Gender-sensitive prevention and treatment strategies for opioid misuse and overdose are essential for addressing the unique needs of men and women. Tailoring interventions to gender differences in substance use patterns and risk factors can enhance effectiveness (Castillo-Carniglia et al., 2021; McLaughlin et al., 2021). For example, health care providers should consider adopting gender-specific screening tools and treatment approaches that acknowledge differences in pain experiences and social support networks (Campbell et al., 2021; Pfund et al., 2022). Community programs should address gender-specific risk factors such as societal norms and enhance public health campaigns for effective substance use prevention (Evans et al., 2022; Saloner et al., 2021). Policymakers, health care providers, and communities can mitigate opioid harm by integrating gender-sensitive approaches into prevention and treatment.

Race-/Ethnicity-Related Variations

Race-/ethnicity-related variations refer to disparities or differences observed in health outcomes, including opioid-related overdose deaths, across different racial and ethnic groups. These variations may stem from a complex interplay of social, economic, cultural, and environmental factors that influence individuals' risk of opioid misuse, addiction, and overdose (CDC, 2020). Studies examining race-/ethnicity-related variations in opioid-related outcomes aim to understand the underlying determinants of these disparities and their impact on public health. Research reveals racial disparities in opioid-related deaths, with African American and Hispanic populations experiencing higher rates than White populations (CDC, 2020).

Factors such as unequal access to health care, socioeconomic inequalities, discrimination, stigma, and cultural norms may contribute to these disparities. Cho and Choi (2020) offer insights into the systemic barriers impeding access to treatment for Hispanic individuals, including language barriers, stigma, and socioeconomic factors. The authors contribute valuable perspectives to the discourse on substance abuse, enhancing care delivery and addressing opioid misuse in communities. Understanding race-/ethnicity-related disparities is essential for developing targeted interventions and policies to address health inequities and improve outcomes for all populations.

Structural Determinants

Structural determinants play a pivotal role in shaping health outcomes, particularly concerning disparities observed in health care access and socioeconomic status. Access to health care encompasses a broad spectrum of factors, including affordability, availability of services, and cultural competency within health care systems. Socioeconomic status includes income, education, employment, and housing stability, which influence an individual's ability to access health care resources and adhere to treatment plans. Marginalized racial/ethnic groups face barriers such as health care discrimination, impacting health outcomes including opioid-related deaths (CDC, 2020). Understanding and addressing these structural determinants are thus necessary steps toward mitigating health disparities and promoting health equity (Spencer et al., 2022).

Cultural Factors

Cultural factors include shared social norms, values, beliefs, practices, and traditions that shape group behavior, attitudes, and perceptions. These factors are influenced by various aspects such as ethnicity, religion, language, socioeconomic status, historical background, and geographical location (Wen et al., 2020). Cultural stigma surrounding substance use can deter treatment-seeking, resulting in the underutilization of addiction services in some communities, according to Jones, Paulozzi, and Mack (2022).

Cultural factors play a critical role in shaping human behaviors, including health-related behaviors, such as substance use, treatment-seeking patterns, and health care utilization. They also influence treatment preferences, with some individuals preferring interventions that align with their cultural values and beliefs (Alshak, 2021). Additionally, cultural factors influence communication styles, decision-making processes, and help-seeking behaviors within different cultural contexts (Alshak, 2021). Understanding cultural factors is essential for developing culturally sensitive interventions and improving health outcomes among diverse populations.

Intersectionality and Complexities

Intersectionality involves intertwined social categories like race, gender, and class, shaping unique experiences of discrimination and privilege. Intersectionality recognizes that individuals have multiple social identities that can intersect and interact to shape their experiences, opportunities, and vulnerabilities (Das et al., 2020). Intersectionality manifests in varied experiences of discrimination. For example, a Black woman may face unique challenges due to the combined effects of racism and sexism.

Complexities refer to the intricate and multifaceted nature of social identities and power dynamics. These complexities arise from the interaction of various social factors, including but not limited to race, gender, class, sexuality, disability, and religion (Das et al., 2020). They can manifest in overlapping systems of oppression, privilege, and marginalization, leading to diverse and nuanced experiences among individuals and groups (Das et al., 2020).

Examining interactions between age, gender, and race reveals how an intersectional analysis shapes individuals' vulnerability to opioid harm. Research suggests that the risk of overdose is not uniform across different demographic groups but is influenced by the complex interplay of age, gender, and race/ethnicity. For example, young adults may face increased susceptibility due to experimentation and peer influence (Schepis et al., 2018), and older adults may be at risk due to factors such as chronic pain management and polypharmacy (Hudgins et al., 2019).

Gender also plays a role, with men experiencing higher rates of overdose mortality than women (Ahmad et al., 2021). Women may encounter stigma and discrimination in health care settings, deterring them from seeking help or accessing appropriate care. Additionally, women may face unique challenges related to prescription opioid use and health care access (Unger et al., 2021). Women often shoulder caregiving responsibilities for family members, making it challenging to attend treatment programs or prioritize their own health needs.

Racial and ethnic minorities, particularly Black and Hispanic populations, may face disparities in accessing pain management and addiction treatment, contributing to differential overdose risk (Friedman et al., 2019). These disparities can stem from various systemic factors, including socioeconomic inequalities, limited health care resources in minority communities, cultural and linguistic barriers, and historical mistrust of the health care system. Researchers have analyzed intersecting factors to understand overdose risk pathways, developing targeted interventions to tackle opioid harm disparities (Smith et al., 2020).

Marginalized Populations

The opioid epidemic has had a profound impact on various demographics, particularly marginalized populations such as the lesbian, gay, bisexual, transgender, queer, and asexual community and minority women who experience unique challenges. Research highlights that these groups are often at a higher risk due to a complex interplay of social, economic, and health-related factors. Discrimination, socioeconomic instability, and limited access to culturally competent health care significantly contribute to the heightened vulnerability of these populations (Morgan et al., 2018).

Lesbian, gay, bisexual, transgender, queer, and asexual individuals encounter barriers in accessing substance abuse treatment due to discrimination fears and past negative health care experiences. Minority women face stigma related to race, gender, and substance use, hindering access to necessary care (L. Jones et al., 2019). Addressing these disparities requires a multifaceted approach—enhance provider cultural competence, implement targeted prevention, and tailor support systems (Smith & Jones, 2021). Interventions must address barriers and foster inclusivity and support to mitigate the opioid epidemic's impacts on marginalized communities.

Policy Frameworks

Policy frameworks should recognize how intersecting inequalities based on race, gender, and socioeconomic status affect health and justice services. As such, policy interventions should be informed by intersectionality theory, which elucidates the complex and cumulative ways in which different social identities contribute to systemic inequalities (Crenshaw, 1989). Policymakers are thus urged to develop multilayered strategies that go beyond one-dimensional solutions to address the layered realities faced by marginalized communities. For instance, health policies must integrate tailored approaches that consider racial and gender-specific needs alongside socioeconomic factors to effectively tackle disparities in health care access and outcomes (Hankivsky et al., 2017).

Public health policies that incorporate intersectional frameworks are vital for addressing opioid-related concerns. Policies should ensure accessible and culturally sensitive treatment programs addressing diverse needs, including barriers faced by minorities and women (Collins et al., 2020). Additionally, criminal justice reforms must acknowledge the disproportionate impact of drug laws on communities of color and how gender and poverty intersect to exacerbate these effects (Gomez, 2019). Overall, adopting intersectional policy measures is essential for effectively addressing and mitigating the multidimensional aspects of inequality. These measures should be supported by ongoing research and community-based feedback to optimize their efficacy, promoting equity and justice across all sectors.

Literature Gap

Despite extensive research, a critical gap remains in understanding how socioeconomic factors contribute to overdose risk disparities. Previous studies have demonstrated associations of socioeconomic indicators such as income level or education with opioid-related mortality. However, research often overlooks the complex interplay between multiple socioeconomic factors and fails to account for geographic variations in overdose rates. Addressing this knowledge gap is crucial for developing targeted interventions and policy initiatives aimed at reducing overdose mortality and health inequities. Through these research avenues, a deeper understanding of demographic disparities in opioid misuse and overdose can be achieved, paving the way for more effective and inclusive public health responses.

Definitions

Centers for Disease Control and Prevention (CDC): The national public health agency of the United States.

Drug abuse: The addictive use of drugs for nonmedical purposes (Tilstra et al., 2021).

Drug use and addiction: A chronic brain disease that causes a person to take drugs repeatedly, despite the harm they cause (NIDA, 2020).

Fentanyl: A potent synthetic opioid drug approved by the Food and Drug Administration for use as a pain relief and anesthetic (CDC, 2019).

Georgia Department of Health: The lead agency in preventing disease, injury, and disability, promoting health and well-being in Georgia.

Heroin: An opioid drug made from morphine, a natural substance extracted from the seed pod of various opium poppy plants (NIDA, 2020).

Hispanic populations: The largest racial or ethnic minority in the United States (Brenes & Henriquez, 2020).

Illicit opioid: A class of drugs including the illegal drug heroin and synthetic opioids such as fentanyl, oxycodone, hydrocodone, codeine, and morphine (CDC, 2019).

Morbidity: The rate of a disease in a population that suffers from the disease or medical condition—the state of being symptomatic or unhealthy (NIDA, 2020).

Mortality rate: The percentage of people who die in each scenario (NIDA, 2020).

Morphine: A nonsynthetic narcotic with a high potential for abuse, derived from opium and used for the treatment of pain (NIDA, 2020).

Opioids: A class of powerful drugs that are routinely prescribed to manage severe pain but are also associated with some cases of fatal overdose (NIDA, 2020).

Prescription opioid disorders: A complex illness characterized by the compulsive use of opioid drugs even when the individual wants to stop (Han et al., 2017).

Self-efficacy: The belief that one can change a given behavior in the desired direction (Bandura, 1977).

Social cognitive theory: A concept of self-efficacy—an individual's belief in their capability to perform a behavior (Bandura, 1977).

Substance abuse: Excessive use of psychoactive drugs, such as alcohol, pain medications, or illegal drugs, which can lead to physical, social, or emotional harm (NIDA, 2020).

Synthetic drugs: Substances that are artificially modified from naturally occurring drugs and can exhibit both therapeutic and psychoactive effects.

Assumptions

According to Green and Schumaker (2023), logistic regression measures the relationship between the categorical variable and one or more independent variables. Several assumptions are made when using the binary logistic regression test: (a) the response variable is binary, (b) the observations are independent, (c) there is no multicollinearity among explanatory variables, (d) there are no extreme outliers or influential observations in the data set, (e) a linear relationship exists between explanatory variables and the logit of the response variable, and (f) the sample size is sufficiently large.

This research assumes that the SUDORS records were collected from U.S. residents during 2016–2023 as part of the CDC Enhanced State Opioid Overdose Surveillance (ESOOS) program. This provided comprehensive data on opioid deaths. In 2019, SUDORS expanded to collect data on all drug overdose deaths in 47 states and the District of Columbia as part of the CDC's OD2A-S program. Each of these funded jurisdictions collects and abstracts data on drug overdose deaths from death certificates, coroner / medical examiner reports, and postmortem toxicology reports for entry into a web-based CDC platform that is shared with the National Violent Death Reporting System (NVDRS).

My research is limited to a secondary data set, and it made several assumptions. The primary assumption is that the SUDORS process is valid and reliable. The next assumption is that the sample is representative of the U.S. population. The last assumption is that SUDORS narratives provide the who, what, where, when, and why of overdose deaths and the staff writes a complete description of each overdose death, detailing all components (such as cause of death, circumstances, and toxicology) in one place.

Scope and Delimitation

The impact of the opioid crisis on White and Black populations living in Georgia represents the scope of this study. A cross-sectional design was used to examine the association of education, homelessness, and alcohol use with opioid-related deaths while controlling for age, gender, and marital status among White and Black individuals residing in Georgia. There could have been some underreporting and overreporting in certain instances. The data provides an overview of the prevalence of drug use at a specific point in time rather than a view of how drug use changes over time for specific individuals. The quality data relied on the level of detail in the reports from the medical examiners or coroners and the reception of the survey reports from them. The data is subject to change due to data quality improvement and may not depict the true burden of overdose deaths in Georgia.

Significance

The significance of this study lies in its comprehensive exploration of the multifaceted factors influencing opioid-related overdose deaths among White and Black individuals residing in Georgia. By scrutinizing education, homelessness, alcohol use, and their interplay, this research offers a nuanced understanding of the opioid crisis's impact on these communities. The findings enrich scholarly knowledge, shedding light on the complex dynamics driving opioid-related mortality and its ramifications for public health.

This study's insights hold practical implications for stakeholders, informing the development of targeted interventions and evidence-based policies to mitigate the crisis. This research, by fostering collaboration with community organizations, aims to catalyze social change, promoting effective strategies to reduce overdose deaths and prioritize prevention efforts within these populations. Public health promotion campaigns can leverage the study's findings to tailor interventions to the specific needs of White and Black populations, thereby enhancing their life expectancy and overall health outcomes.

Summary and Conclusions

I investigated the relationships between sociodemographic and behavioral factors, such as education, homelessness, and alcohol use, and the incidence of opioid-related overdose deaths involving fentanyl while controlling for age, gender, and marital status among White and Black populations residing in Georgia. The study aims to provide a comprehensive analysis of how these variables interact and contribute to the risk of opioid overdoses. Specifically, it seeks to identify significant patterns and disparities in opioid-related mortality rates among these racial groups and uncover critical insights into how these factors influence overdose risks by utilizing a methodology involving statistical analysis of health records and/or survey data. The findings are expected to inform public health strategies and interventions by highlighting the nuanced ways in which sociodemographic and behavioral factors contribute to opioid-related deaths. The study seeks to contribute to a more nuanced understanding of opioid overdose disparities and guide targeted efforts to address them effectively.

Section 2: Research Design and Data Collection

I used a cross-sectional design to examine the associations between different variables within a population at a specific point in time. Cross-sectional studies are observational in nature and are commonly employed to measure the prevalence of health outcomes, understand health determinants, and describe the features of a population. Such studies are generally completed more quickly and inexpensively, often utilizing surveys to assess the prevalence of diseases in clinic-based samples. The dependent variable in this study was opioid-related deaths involving fentanyl, whereas the independent variables include education, homelessness, and alcohol use, with controls for age, gender, and marital status among White and Black populations residing in Georgia. I addressed a gap in the literature regarding these variables and seeks to refine public health policies in Georgia based on evidence-based findings to enhance their effectiveness and efficiency.

Research Design and Rationale

I analyzed the 2017 Drug Surveillance Unit of the Georgia Department of Public Health Portal and the SUDORS database using binary logistic regression to determine the associations, if any, between the variables. According to Neuman (2013), logistic regression is used to predict a categorical dependent variable. This statistical test is used while trying to predict a dependent variable with only two outcomes, which involves a dichotomous variable.

In this study, the dependent variable is opioid-related overdose deaths involving fentanyl while controlling for age, gender, and marital status among White and Black populations in Georgia. In RQ1, the independent variables are education, homelessness, and alcohol use. In RQ2, the independent variable is homelessness, and receiving respite help is a categorical variable. In RQ3, the independent variable—participation in social activities with alcohol use—is also categorical. I utilized the Drug Surveillance Unit of the Georgia Department of Public Health Portal to review all relevant data points. Moreover, I used information from the Drug Surveillance Unit of the SUDORS, which collects detailed investigative and toxicological information about unintentional and undetermined-intent drug overdose deaths from coroners / medical examiners, helping elucidate the evolving nature of the opioid epidemic and inform key stakeholders. The information on unintentional drug overdose deaths is derived from death certificates of Georgia residents and non-residents who died in Georgia. Drug overdose deaths are deaths attributed to acute drug toxicity by the coroner or medical examiner in the death certificate.

The study offers a measure of prevalence, an analysis of health characteristics, and preliminary evidence for future studies. The quantitative analysis offers a systematic framework for quantifying the extent and characteristics of overdose deaths, identifying demographic disparities and assessing temporal and geographic variations in mortality rates. To examines opioid-related overdose deaths, I used national and state mortality databases as secondary data sources.

Data Source

The SUDORS system in Georgia is a comprehensive data collection and surveillance system designed to monitor opioid-related overdoses and deaths across the state. SUDORS collects and analyzes data from multiple sources, including emergency departments, hospitals, medical examiner offices, toxicology laboratories, law enforcement agencies, and the Georgia Department of Public Health (DPH, n.d.). The system captures both fatal and non-fatal opioid overdoses, providing valuable insights into the epidemiology of opioid use, misuse, and overdose in Georgia. Epidemiology is the study of the distribution and determinants of these phenomena within populations. Key aspects of the epidemiology of opioid use, misuse, and overdose include the prevalence of opioid use, patterns of opioid misuse, risk factors for opioid misuse and overdose, geographic and temporal trends, health outcomes of opioid overdose, and the impact on communities and health systems.

The key features of SUDORS aggregate data from diverse sources to provide a comprehensive picture of opioid-related morbidity and mortality in Georgia. This includes information on the demographics of individuals affected by opioid overdoses, types and quantities of opioids involved, geographic locations of overdose events, and circumstances surrounding the overdoses (Vivolo-Kanter et al., 2020). SUDORS facilitates real-time surveillance of opioid-related overdoses, allowing for timely detection of emerging trends, clusters, and outbreaks. The system enables public health officials, policymakers, and health care providers to monitor changes in opioid use patterns and respond promptly with targeted interventions and resources (Houry et al., 2018). The data collected through SUDORS undergo rigorous quality assurance and validation procedures to ensure accuracy, completeness, and reliability. Standardized protocols have been implemented to verify and validate information from multiple sources, minimizing errors and discrepancies in the data. SUDORS data are accessible to authorized stakeholders, including public health agencies, researchers, policymakers, and community organizations. The data are used to inform public health initiatives, develop evidence-based interventions, evaluate program effectiveness, and guide resource allocation efforts aimed at reducing opioid-related harm in Georgia.

Methodology

Population

This study focused on individuals from White and Black populations residing in Georgia who have been impacted by opioid-related overdoses. SUDORS provides comprehensive data on opioid-related overdoses, including demographic information such as race and ethnicity, enabling the examination of patterns and disparities among different groups in Georgia (Verdus et al., 2021). White and Black populations represent a significant proportion of those affected by opioid-related overdoses in Georgia. Analysis of SUDORS data may reveal associations and characteristics specific to White individuals, including age distributions, geographic distributions, types of opioids involved, and circumstances surrounding overdose events. African American individuals also constitute a substantial segment of the study population impacted by opioid-related overdoses in Georgia (Burns et al., 2023). SUDORS data reveal patterns and disparities in African American communities, including overdose rates, treatment access, and social determinants of health.

Sampling Procedures

This is a cross-sectional study. Data were collected from many individuals at a single point in time and variables without influencing them. The systematic sampling approach is essential for obtaining reliable data that accurately reflects the patterns and trends of opioid-related mortality in the state (Banks et al.,2023). The sampling frame consisted of individuals in Georgia who have died from opioid-related overdoses, as documented in the SUDORS system. The system serves as a comprehensive database containing records of fatal and non-fatal opioid overdoses reported in the state. SUDORS employs sample size calculations to ensure adequate power to detect differences in opioid-related mortality rates.

Power Analysis

There is no fixed minimal sample size for a cross-sectional study, as it depends on multiple factors. I utilized G*Power software to determine an appropriate sample size that balances statistical power and practical feasibility. Given that I was conducting a logistic regression test, the binomial test was selected from the provided options. I then entered the necessary parameters for the power analysis, including effect size, significance level, desired power level, and any additional parameters relevant to the selected analysis. I assumed that 55% of the population were men (x = 1) and 45% were women (x = 0). In the studied sample, 30% of the women and 50% of the men died from opioid-related causes involving fentanyl. Being male is a risk factor for opioid-related deaths involving fentanyl. I analyzed my sample size using logistic regression, where the dependent variable is always dichotomous, and the independent variables can be continuous, categorical, or odds ratios. G*Power analysis provided the test family of z-tests, and the statistical test used was logistic regression. The type of power analysis was *A priori*: compute required sample size, given a, power, and effect size. The independent variables were set for X-distribution as binomial.

Following this, I executed the power analysis by clicking the calculate button, determining the requisite sample size necessary to attain the predetermined level of statistical power. The input parameters were two-tailed, with Pr (Y=1, X=1) H1 being 0.5 and Pr (Y=1, X=1) H0 being 0.3. Once calculated, the odds ratio was found to be 2.33333. The error probability was 0.05, and power (1 - B error probability) was 0.95. This calculation indicated that the critical z-value was 1.9599640, the total sample size needed was 316 participants, and the actual power was 0.9505761. With this assumption, the study required a sample size of at least 316 participants. Upon completion, a comprehensive review of the outcomes was conducted, encompassing the recommended sample size, power level, effect size, and associated confidence intervals. Subsequent iterations of the analysis were performed to ascertain a more viable sample size, thereby optimizing the research design according to scholarly standards (Walden University, 2024).

Operationalization

In the context of studying opioid-related overdose deaths in Georgia, operationalization involves defining and operationalizing key concepts to facilitate data collection, analysis, and interpretation. Opioid overdose deaths result from the use of opioids, including prescription drugs, heroin, and fentanyl. Specifying criteria for identifying overdose deaths in data involves using cause-of-death codes, toxicology reports, and medical examiner findings (Vankova & Vavrek, 2020). Demographic characteristics such as education, alcohol use, and homelessness, while controlling age, gender, and marital status, are important variables for understanding disparities in opioid-related mortality rates. This involves categorizing individuals into distinct groups based on demographic factors using standardized definitions and classifications to ensure consistency across data sources and analyses (Altekruse et al., 2020). Georgia's urban, suburban, and rural regions may exhibit varying opioid overdose rates due to differences in health care access and socioeconomic factors. Established boundaries or administrative units, such as counties, were used to assign individuals to specific regions based on their place of residence (Altekruse et al., 2020).

Once key concepts were operationalized, data collection was begun using appropriate methods and instruments (Nordeck et al., 2022). The Drug Surveillance Unit monitors overdose trends in Georgia and provides drug surveillance data to the public and partners working to combat the opioid epidemic. This data is also used to detect and respond to rapid increases or clusters of overdoses, such as the counterfeit Percocet-related overdose cluster. Data from SUDORS, including surveys and interviews, explore demographics and contextual factors influencing opioid-related overdoses among survivors.

Data Analysis Plan

Following the systematic data analysis plan, this study aims to provide a robust examination of fentanyl-related overdose deaths in Georgia, contributing to the scholarly discourse on public health disparities and informing evidence-based interventions and policies (Walden University, 2024). After carefully examining my data set, I used age as a continuous variable, gender as a dichotomous variable, and marital status and race as categorical variables. The variables were organized into different columns and were recoded. Notably, "Hispanic" was included under "other." I examined my independent variables: education (categorical), alcohol use (dichotomous), and homelessness (dichotomous), which were used after they were coded numerically. The most critical variable was the dependent variable: opioid-related deaths.

However, upon examining this column (T) in my data set, I realized it contained various combinations of drugs that caused opioid-related deaths. The best way to deal with this was to use this data to create a variable that distinguishes between fentanyl-related deaths and other opioid-related deaths. This yielded a dichotomous variable for column T, indicating whether the person died from fentanyl-related causes or not, with "not" encompassing all other opioid-related deaths. Consequently, I had to recode column T into a new column and determine whether each case was due to fentanyl or not.

For the analysis, I conducted a binary logistic regression test to see whether fentanyl deaths could be predicted by education level, alcohol use, and homelessness while controlling for age, gender, and marital status. The binary logistic regression is a statistical test used to identify the best fit for understanding the relationship between the dependent and independent variables, allowing for appropriate statistical conclusions. This method enables the researcher to assess how well the set of variables predicts the categorical dependent variable and provides a summary of the accuracy of case classifications, thereby determining the percentage of correct predictions.

Threats to Validity

There are several potential threats to validity. Selection bias occurs when systematic differences exist between the characteristics of individuals included in the study and those who are not. For instance, if certain demographic groups are more likely to be represented in the study sample than others, it could impact the generalizability of the findings. Measurement bias may also pose a threat, leading to inaccurate estimates of associations. For example, inconsistencies in the classification of opioid-related overdose deaths across different sources or inaccuracies in recording demographic variables could introduce bias into the analysis. Unmeasured confounders, such as socioeconomic status or access to health care, which are associated with both education level and opioid-related overdose deaths, could further complicate the interpretation of results. Additionally, discrepancies in the reporting across various sources may affect the validity of findings related to opioid-related overdose deaths. Variations in data completeness across demographic groups can also compromise data accuracy. Lastly, inconsistencies may arise in the data received from coroners and medical examiners due to a lack of standardized structure.

Ethical Procedures

I adhered to the ethical guidelines established by the Walden University Institutional Review Board, ensuring the confidentiality and anonymity of data collected during the research process. Using secondary data from previous research facilitated further research. Secondary data provides a wealth of information that may be difficult to obtain otherwise. It helped identify gaps in existing knowledge and provided a basis for comparing newly collected data. Reusing existing research data allowed me to appreciate the contributions of research participants. This publicly available information can influence and reshape the public health issues under investigation and guide future primary research.

Summary

I investigated opioid-related deaths in the United States, with a specific focus on Georgia, employing a cross-sectional research design. This design allowed for the simultaneous examination of multiple variables and their associations, offering valuable insights into the prevalence and determinants of opioid-related deaths. By capturing data at a single point in time, the study aims to provide a comprehensive snapshot of the phenomenon and facilitate comparisons across various demographic groups. Data were sourced from the SUDORS system, which aggregates information from coroner reports, death certificates, and medical records. The study sample included individuals from diverse racial and ethnic backgrounds, education levels, and housing statuses, enabling a thorough analysis of disparities in opioid-related mortality.

The quantitative analysis involved binary logistic regression to explore the associations between demographic factors and fentanyl-related deaths. Statistical software such as SPSS was employed for power analysis and result interpretation, ensuring the robustness and reliability of the findings. I adhered to ethical standards, including informed consent, confidentiality and anonymity, and transparency and accountability throughout the research process. In conclusion, this research design and data collection plan provides a structured framework for examining opioid-related overdose deaths in Georgia. The study aims to enhance our understanding of the factors contributing to opioid mortality and inform targeted intervention and policy efforts to effectively address this critical public health crisis.

Section 3: Presentation of the Results and Findings

The purpose of this study was to examine the associations of educational level, alcohol use, and homelessness with deaths from opioid overdose involving fentanyl among White and Black individuals in Georgia. Using binary logistic regression, the study assessed whether these factors significantly influenced the odds of experiencing a fentanyl-related death, thereby providing an evidence-based understanding of how structural and behavioral variables contribute to mortality risk. I also controlled for key demographic variables, including age, gender, and marital status, to account for their potential confounding effects on the primary associations. Through this analysis, the research contributes to the limited but growing body of literature on racial disparities within the opioid epidemic, particularly in the southern regions of the United States. The findings from this study will inform public health strategies, policy development as well as targeted interventions designed to reduce opioid-related deaths, while also addressing systemic inequities that affect vulnerable populations.

Research Questions and Hypotheses

The RQs and hypotheses for this study were as follows:

RQ1: What is the association between education and fentanyl-related deaths among White and Black individuals living in Georgia, while controlling for age, gender, and marital status?

$H_0$1: There is no significant association between education and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

H_a1: There is a significant association between education and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

RQ2: What is the association between alcohol use and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status?

H_02: There is no significant association between alcohol use and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

H_a2: There is a significant association between alcohol use and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

RQ3: What is the association between homelessness and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status?

H_03: There is no significant association between homelessness and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

H_a3: There is a significant association between homelessness and fentanyl-related deaths among White and Black individuals living in Georgia while controlling for age, gender, and marital status.

Accessing the Data Set for Secondary Analysis

I used secondary data from the 2022 SUDORS, a state-based surveillance system that compiles comprehensive information on drug overdose deaths. The data set included detailed investigative and toxicological findings provided by coroners and medical examiners throughout Georgia. The data captured unintentional drug overdose deaths of both Georgia residents and non-residents who died within the state's jurisdiction. Information was primarily derived from death certificates, toxicology reports, and postmortem examinations, providing a robust foundation for analyzing substance-related mortality.

The data set contained a range of demographic variables essential for the research, including race, educational level, alcohol use, homelessness status, age, gender, and marital status. Only cases confirmed to involve fentanyl or fentanyl analogs were retained for analysis to ensure the outcome variable accurately reflected fentanyl-related mortality. Data preparation involved cleaning, recoding categorical variables, and removing cases with missing values using listwise deletion. These steps resulted in a refined analytic sample suitable for binary logistic regression analysis to examine the relationship between social determinants and fentanyl-related deaths.

Given that the data were de-identified and collected for public health surveillance purposes, no direct interaction with human subjects occurred, thus exempting the study from Institutional Review Board approval. However, ethical standards for the use of secondary data were strictly observed to ensure the confidentiality and responsible handling of sensitive mortality information. The SUDORS data set offered a valuable resource for examining public health disparities, particularly within the context of the opioid crisis in Georgia and supported the study's aim of exploring racial and socioeconomic patterns in fentanyl-related deaths.

Time Frame of Data Collection

The data used in this study were drawn from the 2022 cycle of the SUDORS, which captured deaths from unintentional drug overdose that occurred within the calendar year. SUDORS is a state-based surveillance system supported by the CDC that collects standardized data from medical examiners, coroners, and death certificate records. For the 2022 reporting year, data were compiled and verified through a combination of toxicological findings, scene investigations, and contextual evidence gathered during death investigations. This allowed for a comprehensive and timely account of overdose mortality trends across Georgia for that specific year.

The 2022 data set included opioid overdose deaths involving fentanyl and fentanyl analogs, which have become leading contributors to the opioid overdose crisis in the United States. During this period, public health agencies observed a continued rise in fentanyl-related fatalities, especially among marginalized and vulnerable populations. By focusing on a single year, the study was able to provide a cross-sectional snapshot of the impact of social determinants on fentanyl-related deaths, enabling analysis of racial disparities and risk factors within a defined and current context. The time frame was particularly relevant due to the persistence of fentanyl as a primary driver of opioid mortality and its intersection with broader socioeconomic and behavioral health issues.

Although data were collected in 2022, the deaths included in the data set spanned that full calendar year, with reporting finalized and quality checked before the data were made available for research purposes. The use of a complete year of data enhanced the reliability of the study findings by minimizing seasonal variation or delays in reporting. Additionally, limiting the study to 1 year allowed for more precise control over temporal factors that might otherwise confound the relationship between the independent variables and fentanyl-related mortalities. This temporal focus strengthened the internal validity of the research and provided a focused foundation for examining public health disparities within the opioid crisis.

SUDORS Data Collection Phases

The SUDORS followed a multi-phase data collection process designed to capture detailed, standardized information on deaths from unintentional and undetermined drug overdose. SUDORS compiles information retrospectively from a variety of administrative and investigative sources. The data collection process unfolds in two primary phases: initial case identification and comprehensive data abstraction.

In the first phase, deaths from suspected cases of drug overdose are identified through the state vital records system using death certificates that list drug overdose as a primary or contributing cause of death. Once potential cases are flagged, medical examiners and coroners conduct in-depth death investigations, which include autopsy findings, toxicology reports, and scene evaluations. This phase establishes the preliminary scope of the data set and ensures that only relevant cases—specifically deaths resulting from unintentional or undetermined overdose—are included.

The second phase involves detailed data abstraction, where trained abstractors extract over 100 variables from each case using standardized CDC protocols. This includes not only toxicology results but also contextual information from law enforcement narratives, EMS reports, and coroner/medical examiner investigations. Variables such as substance involvement, route of administration, homelessness status, and recent incarceration are recorded to provide a comprehensive view of the circumstances surrounding each death. These two phases collectively enable SUDORS to generate high-quality surveillance data essential for identifying trends, informing policy, and targeting interventions related to mortality from drug overdose.

Data Management and Data Variables

Data management procedures were implemented to ensure the integrity, consistency, and analytical readiness of the 2022 SUDORS data set. The data set was initially reviewed for completeness and relevance to the RQs, and cases that did not involve fentanyl or fentanyl analogs were excluded from the analysis. Listwise deletion was applied to handle missing data, whereby any cases with missing values on key study variables were removed to maintain a consistent sample across the regression model. Variable coding and recoding were conducted in SPSS to align with the binary logistic regression framework, including dichotomization of categorical variables such as race (White vs. Black), alcohol use (yes vs. no), and homelessness status (yes vs. no).

The data set included both independent and control variables that aligned with the study's theoretical framework. The primary independent variables were educational level, alcohol use, and homelessness status, all of which were selected due to their documented relevance in substance use. Education level was categorized into “less than high school,” “high school diploma or GED [general equivalency diploma],” and “some college or more.” Alcohol use was defined based on toxicology reports and scene evidence, while homelessness status was derived from contextual evidence noted by coroners and medical examiners. The outcome variable was binary, indicating whether the death involved fentanyl or a fentanyl analog.

The control variables included age, gender, and marital status, which were selected due to their potential confounding effects on the outcomes of drug overdose (Green et al., 2020). Age was considered a continuous variable, while gender (male vs. female) and marital status (married vs. unmarried) were coded as dichotomous. All variables were assessed for frequency distributions and outliers prior to analysis. Data cleaning and management processes followed established best practices for secondary data analysis in public health research, ensuring that the data set was prepared accurately and ethically for inferential statistical testing.

Statistical Analysis

Statistical analysis was conducted using IBM SPSS Statistics, Version 28, to examine the relationship between selected determinants and fentanyl-related deaths. Binary logistic regression was employed to model the likelihood of a fentanyl-related death based on educational level, alcohol use, and homelessness status, while controlling for age, gender, and marital status. This method was appropriate given the dichotomous nature of the dependent variable and the study’s aim to estimate the odds of fentanyl involvement in overdose-related deaths. Prior to regression analysis, data were screened for multicollinearity, outliers, and violations of statistical assumptions. Descriptive statistics were computed to summarize the demographic characteristics of the sample, and bivariate analyses were conducted to assess initial associations between variables. Results from the logistic regression model were reported using odds ratios (Exp[B]), 95% confidence intervals, and p-values, with statistical significance set at the conventional alpha level of 0.05.

Baseline Descriptive and Demographic Characteristics of the Sample

The sample consisted of 1,667 individuals who died from unintentional overdoses involving fentanyl or fentanyl analogs in Georgia in 2022, as documented in SUDORS. The majority of decedents were male (71.9%), while 28.1% were female. Ages ranged from 3 to 89 years, with a mean age of approximately 37.9 years (SD = 11.76). Although racial classification variables were available, the coding scheme did not allow for reliable differentiation between Black and White decedents within the subset analyzed. In terms of educational attainment, the most common category was coded as Level 6 (47.9%), which corresponds to a high school diploma or general equivalency diploma. Other categories included Level 8 (18%), Level 2 (14.9%), and various smaller proportions across the remaining levels.

Alcohol use at the time of death was present in 71.1% of cases, while 16.3% and 12.7% were coded under different alcohol-related categories, possibly indicating unknown or unconfirmed involvement. Regarding homelessness, 92.3% of individuals were not documented as experiencing homelessness, while 5.0% were identified as homeless, and 2.7% fell into other or unknown categories. Marital status revealed that many individuals (58.4%) were unmarried at the time of death, followed by 19.8% who were married, 15.5% who were divorced, and the remaining categorized as widowed, separated, or unknown. These descriptive statistics provided an essential foundation for understanding the demographic composition of deaths from fentanyl overdose in Georgia and informed the multivariate modeling strategy used in this study.

External Validity

The external validity of this study refers to the extent to which the findings can be generalized beyond the sample analyzed to broader populations or settings. The data drawn exclusively from the 2022 SUDORS for the state of Georgia may be limited to similar demographic and geographic contexts. The sample reflects deaths from fentanyl overdose among both Georgia residents and non-residents who died within the state, thereby enhancing representation within the region. However, caution should be exercised in applying the results to other states or national populations due to potential differences in social determinants, health care infrastructure, drug supply dynamics, and reporting practices. Despite these limitations, the study provides valuable insights into the associations between social vulnerability factors and fentanyl-related mortality, which may inform targeted interventions in comparable public health settings.

Larger Target Population

A priori analysis conducted using G Power 3.1 to determine the minimum sample size required for logistic regression analysis. Based on an alpha level of 0.05, a power level of 0.80, and an assumed medium effect size (odds ratio = 2.5), the analysis indicated that a sample size of approximately 317 cases would be sufficient to detect statistically significant effects. Given that the final analytic sample consisted of 1,667 fentanyl-related deaths, the study was adequately powered to assess the influence of education, alcohol use, and homelessness on the outcome of deaths from opioid overdose.

Missing Values

Handling missing values in the SUDORS data set is crucial for the integrity of data analysis. An assessment of missing data was conducted prior to statistical analysis to ensure the completeness and reliability of the data set. Key variables relevant to the study—including sex, age, education level, alcohol use, homelessness status, marital status, and race—were evaluated for missing values within the sample of opioid overdose-related deaths involving fentanyl. The analysis revealed no missing data for any of the variables included in the regression model, indicating a fully complete data set. As a result, no imputation techniques or data deletion models were necessary, and the final sample retained all 1,667 cases. The absence of missing data strengthened the internal validity of the study and reduced potential bias associated with data loss or incomplete information.

Results

This section details the statistical analysis performed, encompassing descriptive (univariate) analysis, chi-square or bivariate analysis, binary logistic regression, and factor analysis as applied to the RQs and variables outlined in sections 1 and 2, using SPSS version 28.

Descriptive Statistics

Controlling Variables: Age, Gender, and Marital Status

The control variables analyzed in this study included age, gender, and marital status. The age ranged from 3 to 93 years, with a mean age of approximately 41.2 years (*SD* = 12.86), reflecting a wide distribution across the lifespan. The sample was predominantly male, with 64.6% identifying as male and 35.4% as female. Marital status exhibited diverse patterns: 48.1% of individuals were never married, 24.4% were married, 19.9% were divorced, 4.0% were widowed, 2.0% were separated, while 1.7% were categorized as other or unknown. These demographic variables were included in the analysis as controls to adjust for their potential influence on fentanyl-related mortality outcomes.

Research Study Target Population

The case processing summary in Table 1 indicates that a total of 3,888 cases were included in the final analysis, representing 100.0% of the data set. No cases were excluded due to missing values or other criteria, and there were no unselected cases, suggesting that the data set was complete and fully utilized for binary logistic regression analysis. This level of completeness enhanced the robustness and reliability of the statistical findings.

Table 1

Case Summary

Selected case [a]	*N*	%
Included in analysis	3,888	100.0
Missing	0	0
Total	3,888	100.0

[a] If weight is in effect, see the classification table for the total number of cases.

Table 2 comprises 3,888 deceased individuals in the state of Georgia whose cause of death was associated with unintentional opioid overdose involving fentanyl. The data set derived from the 2022 SUDORS included detailed toxicology, demographic, and social determinant information collected from coroner and medical examiner reports. The study focused specifically on individuals aged 18 years and older, with an emphasis on comparing White and Black populations to assess racial disparities in fentanyl-related mortality. This population was chosen to examine the relationships of educational level, homelessness, and alcohol use as contributing factors with deaths from fentanyl overdose while statistically controlling for age, gender, and marital status. By targeting this specific demographic within Georgia, the study aimed to highlight patterns of vulnerability and to inform data-driven policy responses to mitigate the risks of opioid overdose across racially diverse communities.

Table 2

*Descriptive Statistics for Study Variables (*N *= 3,888)*

Statistic	Variable					
	fentanyl-yes-no	Education level	Homelessness	Alcohol	Black	White
N						

Valid	3,888	3,888	3,888	3,888	3,888	3,888
Missing	0	0	0	0	0	0
M	.43	5.37	1.09	1.80	1.17	1.81
Mdn	.00	6.00	1.00	1.00	1.00	2.00
Mode	0	6	1	1	1	2
SD	.495	2.114	.346	1.207	.377	.391
Variance	.245	4.470	.120	1.457	.142	.153
Range	1	8	2	3	1	1
Minimum	0	1	1	1	1	1
Maximum	1	9	3	4	2	2

Table 3 shows the baseline model that includes only the constant, without any predictor variables. In this model, all cases were predicted as the most frequent outcome: absence of fentanyl-related death. As a result, the model achieved 100.0% accuracy in identifying cases with no fentanyl involvement but failed to correctly classify any cases involving fentanyl-related deaths (0.0% sensitivity). The overall percentage of correctly classified cases was 57.1%, reflecting the proportion of individuals in the sample who did not die from fentanyl overdose. This baseline accuracy provides a point of comparison to assess the added predictive value of including independent variables in subsequent modeling steps.

Table 3

Classification Table With Predictors

Classification Table[a,b]

Observed			Predicted: fentanyl-yes-no 0	Predicted: fentanyl-yes-no 1	Percentage Correct
Step 0	fentanyl-yes-no	0	2221	0	100.0
		1	1667	0	.0
	Overall Percentage				57.1

a. Constant is included in the model.

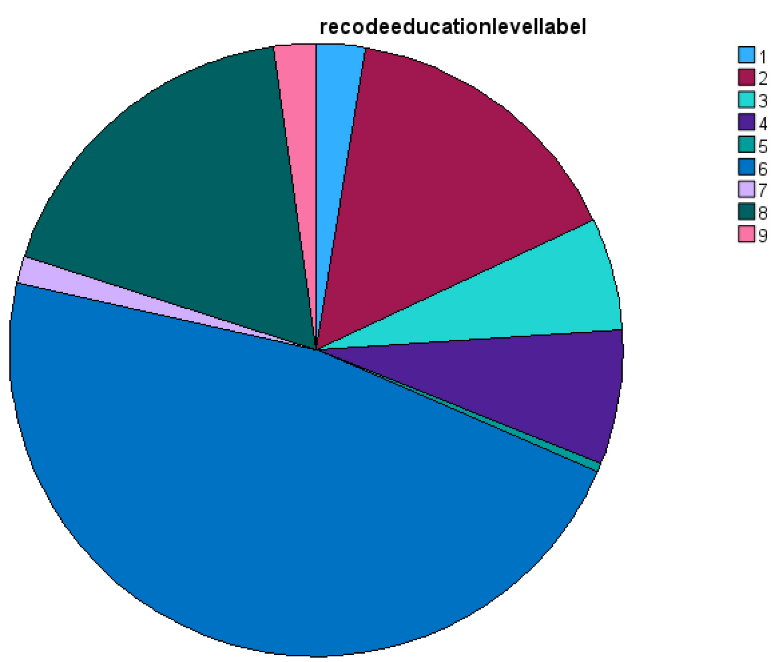
b. The cut value is .500

To identify the most influential predictors of deaths from fentanyl overdose, the researcher employed a stepwise binary logistic regression analysis. This approach was used to determine which independent variables made statistically significant contributions to the model when evaluated individually. Variables excluded from the model offered further insight into the relative predictive strength of each factor.

The variable education in Figure 2 was recoded as recodeeducationlevellabel to reflect varying levels of educational attainment. The overall test for the effect of education yielded a score of 5.155 ($df = 8$, $p = .741$), indicating no statistically significant contribution to the model, as the p-value exceeded the conventional threshold of .05. Furthermore, none of the individual educational levels demonstrated statistical significance, with the lowest p-value recorded at .279.

Figure 2

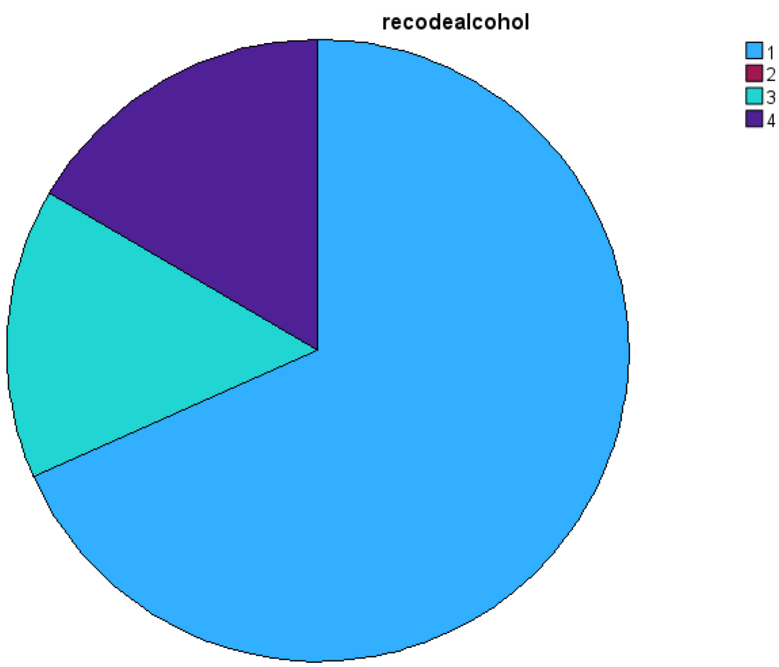
Recoded Education Level



In contrast, alcohol use in Figure 3, recoded as recodealcohol, emerged as a statistically significant predictor (p = .002). Within this variable, Category 2 (representing moderate alcohol use) was highly significant (p < .001), suggesting that individuals in this group had a substantially different likelihood of fentanyl overdose compared to the reference category. However, Categories 1 (no alcohol use) and 3 (heavy alcohol use) did not reach statistical significance, with p-values of .386 and .629, respectively.

Figure 3

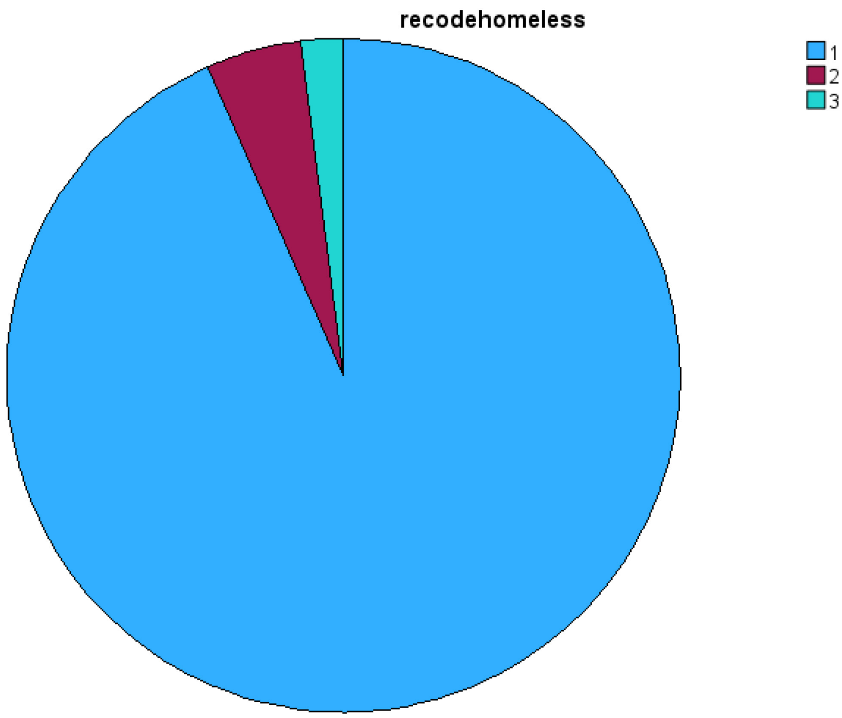
Recoded Alcohol Use



Homelessness in Figure 4, recoded as recodehomeless, also showed a statistically significant overall effect (p = .017). Specifically, Category 2—representing chronic homelessness—was a significant predictor ($p = .011$), while Category 1—representing temporary or transitional homelessness—was not significant ($p = .234$). These results suggest that chronic homelessness played a more substantial role in predicting deaths from fentanyl overdose than did temporary housing instability.

Figure 4

Recoded Homelessness

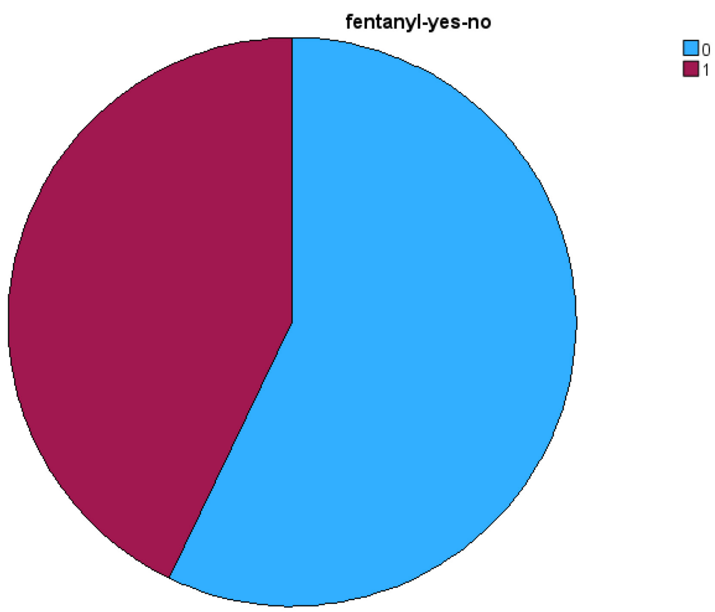


All categorical variables were appropriately dummy coded in SPSS prior to analysis. The alcohol-use categories were coded as: 1 = No alcohol use, 2 = Moderate alcohol use, and 3 = Heavy alcohol use. Homelessness categories were coded as: 1 = Temporary homelessness (e.g., shelter use, couch-surfing), and 2 = Chronic homelessness (e.g., long-term unsheltered). The significance values associated with these categories provided critical insight into which subpopulations were at heightened risk, particularly those experiencing chronic homelessness and moderate alcohol use.

Figure 5 displays the proportion of individuals who did (1) and did not (0) experience a fentanyl-related overdose death. Category 0 (blue) represents cases with no fentanyl involvement, while Category 1 (maroon) represents cases with confirmed fentanyl involvement. The chart indicates that approximately 43% of the cases involved fentanyl, while 57% did not.

Figure 5

*Distribution of Fentanyl-Related Overdose Deaths (*N *= 3,888)*



The logistic regression model summary in Table 4 provides key indicators of model performance and explanatory power. The -2 Log Likelihood (5278.381) value represents the goodness-of-fit of the model, where lower values indicate a better fit.

However, this value alone does not provide a direct measure of model quality without comparison to other models. The Cox & Snell R^2 (.008) and Nagelkerke R^2 (.011) values suggest that the independent variables included in the model explain only 0.8% to 1.1% of the variance in fentanyl-related deaths. These low pseudo-R^2 values indicate that the model lacks strong explanatory power, suggesting that additional relevant predictors may be necessary to improve its ability to predict fentanyl-related mortality.

Table 4

Logistic Regression Model Summary

Step	-2 log likelihood	Cox & Snell R^2	Nagelkerke R^2
1	5278.381 [a]	.008	.011

[a] Estimation terminated at Iteration 20 because maximum iteration had been reached. A final solution cannot be found.

The omnibus test of model coefficients assesses the overall statistical significance of the logistic regression model by determining whether the independent variables collectively contribute to predicting the dependent variable. In this case, the chi-square statistics for the step, block, and model was 32.323 with 13 degrees of freedom and a significance level of 0.002. Since the p-value was found to be less than the conventional threshold of 0.05, the null hypothesis positing that the model with predictors does not significantly improve prediction over the null model (i.e., model without independent variables) is rejected. This indicates that the inclusion of predictors significantly improves the model's ability to predict fentanyl-related deaths. The fact that the Step, Block, and Model chi-square values are identical suggests that all predictors were entered simultaneously in a single step. This confirms that the full model contributes to explaining the variation in the dependent variable.

Inferential Statistics

The binary logistic regression analysis in Table 5 was conducted to determine the relationship between fentanyl-related deaths and the independent variables: education level, homelessness, and alcohol use. Statistical significance was determined using the Wald test with $p < 0.05$. The results showed that educational level was not a significant predictor of fentanyl-related mortality, as none of its categories had p-values less than the set threshold. The overall effect of alcohol use was significant ($p = .002$), indicating that alcohol use significantly predicted fentanyl-related deaths. Since the results of the study led to the failure to reject the null hypothesis for education level, it can be concluded that there was no association between this variable and fentanyl-related deaths in this data set.

The results of the binary logistic regression analysis showed that alcohol use and homelessness were statistically significant predictors of fentanyl-related deaths (recode homeless [1]: $B = 0.320$; $p = 0.042$). The p-value was less than the conventional 0.05 significance threshold, leading to the rejection of the null hypothesis for homelessness. Hence, homelessness status was significantly associated with fentanyl-related mortality in this dataset. The B coefficients were all positive, suggesting that individuals categorized under these levels of homelessness were at a relatively higher risk of dying from fentanyl than those who were not classified as homeless. Moreover, the odds ratio (Exp[B] =

1.377) indicates that the odds of dying from fentanyl-related causes increased with level of homelessness.

Table 5

Variables in the Equation

Step	B	*SE*	Wald	*df*	*p*	Exp(B)
Step 1 [a]						
White (1)	-.558	.083	45.733	1	.001	.572
Constant	.164	.074	4.907	1	.027	1.179
Step 2 [b]						
Recode White (1)	-.581	.083	48.758	1	<.001	.559
Recode alcohol			17.030	3	<.001	
Recode alcohol (1)	-21.469	40192.970	.000	1	1.000	.000
Recode alcohol (2)	-.379	.095	15.800	1	<.001	.685
Recode alcohol (3)	-.164	.090	3.321	1	.068	.849
Constant	.266	.080	11.174	1	<.001	1.305
Step 3 [c]						
Recode White (1)	-.567	.084	46.081	1	<.001	.567
Recode alcohol			18.642	3	<.001	
Recode alcohol (1)	-22.008	40192.970	.000	1	1.000	.000
Recode alcohol (2)	-.405	.097	17.479	1	<.001	.667
Recode alcohol (3)	-.165	.090	3.346	1	.067	.848
Recode homeless			8.106	2	.017	
Recode homeless (1)	.248	.159	2.444	1	.118	1.281
Recode homeless (2)	.569	.234	5.916	1	.015	1.767
Constant	.235	.080	8.575	1	.003	1.265

[a] Variable(s) entered on Step 1: Recode White.

[b] Variable(s) entered on Step 2: Recode Alcohol.

[c] Variable(s) entered on Step 3: Recode Homeless.

Summary

This chapter included information on the research design and methodology I employed in examining the associations of educational level, alcohol use, and homelessness with deaths from fentanyl overdose among Black and White individuals in Georgia. A cross-sectional quantitative design was employed, and secondary data from the 2022 SUDORS were utilized. The final analytic sample included 3,888 cases.

Variables were recoded for clarity and analytic purposes, and logistic regression was selected as the primary analytic technique due to the binary nature of the dependent variables. Assumption testing included checks for multicollinearity, outliers, and linearity in the logit for continuous predictors. This methodological approach established the foundation for the statistical analysis presented in Section 4.

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

The purpose of this quantitative cross-sectional study was to inform health care professionals, public health administrators, policymakers, and community stakeholders by providing a better understanding of the social determinants influencing deaths from opioid overdose involving fentanyl among Black and White individuals in Georgia. Using secondary data from the 2022 SUDORS, the associations of educational attainment, alcohol use, and homelessness with fentanyl-related mortality were examined in this study, while controlling age, gender, and marital status.

This study contributes to the advancement of professional practice by identifying significant risk factors—specifically homelessness and alcohol use—that warrant targeted intervention and resource allocation. While educational attainment was not found to be a statistically significant predictor, the findings illuminate how structural inequities and environmental vulnerabilities intersect with public health outcomes. By bringing attention to the most salient predictors of deaths from fentanyl overdose, this research helps fill a gap in the literature concerning racial disparities and contextual factors in drug-related mortality. Moreover, it supports the development of informed, data-driven policy enhancements as well as harm reduction strategies that are equitable and culturally responsive.

Interpretation of the Findings

My aim in conducting this study was to evaluate the association between each of educational attainment, alcohol use, and homelessness and opioid-related deaths involving fentanyl among Black and White individuals in Georgia, while controlling for age, gender, and marital status. The analysis was conducted using binary logistic regression on data extracted from the 2022 SUDORS. A total of 3,888 observations were included in the final analytic sample, allowing for a robust examination of sociodemographic and behavioral predictors of fentanyl-related mortality.

The first RQ explored whether educational level was significantly associated with deaths from opioid overdose involving fentanyl. The logistic regression results indicated that educational attainment was not a statistically significant predictor of fentanyl-related deaths ($p = .647$). This finding suggests that within the context of the sample and after controlling for key demographic variables, educational level did not independently influence the odds of fentanyl mortality. This result contradicts that from some prior literature which highlighted educational disparities as determinants of substance-related mortality. However, more recent evidence suggests that structural and environmental stressors such as housing instability and polysubstance use may exert stronger effects than educational background alone (Friedman et al., 2022).

The second RQ examined the association between homelessness and fentanyl-related deaths. Homelessness emerged as a statistically significant predictor in the model ($p = .005$), with individuals experiencing homelessness exhibiting higher odds of dying from a fentanyl overdose compared to their housed counterparts. This aligns with contemporary literature that emphasizes the compounded vulnerability of unhoused populations to synthetic opioid exposure and the fatal outcomes of overdose (Baggett et al., 2021). Housing instability remains a critical public health determinant, especially as it intersects with limited access to treatment, harm reduction services, and social support.

The third RQ addressed the relationship between alcohol use and fentanyl-related deaths. Interestingly, alcohol use demonstrated a statistically significant negative association with fentanyl-related mortality ($p = .001$). Specifically, the participants identified as alcohol users were less likely to die from fentanyl overdose, suggesting a possible protective effect within this data set. While this finding appears counterintuitive, it may be explained by behavioral distinctions in substance use patterns or potential underreporting biases. Recent studies suggest that alcohol users may be less likely to use fentanyl compared to individuals engaging in polysubstance use involving opioids, stimulants, and sedatives (Mistler et al., 2021).

Overall, these findings underscore the critical role of housing instability in predicting deaths from fentanyl overdose and suggest that future harm reduction strategies must integrate housing interventions and tailored outreach to unhoused populations. While educational level did not reach statistical significance, the intersectional burden of social disadvantage remains central to research by emphasizing structural risk factors and challenging overly individualistic assumptions often embedded in earlier prevention frameworks. Previous prevention frameworks have often emphasized personal responsibility, behavioral choices, or individual health literacy as primary explanations for deaths from opioid overdose. However, such approaches risk oversimplifying the complexity of the crisis and ignoring the social determinants of health, such as housing instability, systemic racism, economic inequality, and inadequate access to care, which disproportionately affect marginalized communities. By demonstrating the significant impact of homelessness, this study highlighted how environmental and contextual vulnerabilities shape the risk for fentanyl-related deaths far more than educational attainment alone. In doing so, these findings support a more nuanced, equity-focused approach to access to stable housing tailored to underserved populations.

Methodological, Theoretical, and Empirical Implications

I employed a quantitative, cross-sectional research design to examine the associations between educational attainment, homelessness, and alcohol use as independent variables and deaths related to opioid overdose involving fentanyl as the dependent variable among Black and White adults in Georgia. The use of secondary data from the 2022 SUDORS allowed for a rigorous and timely analysis of risk factors that influence mortality from synthetic opioid use. This methodological approach was appropriate given the study's objective to assess associations at a population level rather than establish causality. The cross-sectional nature of the data set, although limited in terms of temporal sequencing, offered a robust snapshot of overdose patterns during a critical period of escalation of the opioid epidemic.

Theoretically, this research aligns with Bronfenbrenner's (1977) socioecological systems theory, which emphasizes that individual behavior and outcomes are shaped by interactions within nested environmental systems, including the microsystem (e.g., family and peers), mesosystem (e.g., community agencies and health care providers), exosystem (e.g., policy systems and housing markets), and macrosystem (e.g., cultural beliefs and societal structures). In the context of this study, structural factors such as homelessness operate at the level of the exosystem and macrosystem, influencing the exposure and vulnerability of individuals to fentanyl-related harm. Similarly, educational attainment may reflect broader societal access to opportunity, while alcohol use may be shaped by community norms and resource availability.

This framework parallels the CDC's (2022) SEM, which posits that health outcomes result from multiple interacting influences ranging from individual behaviors to societal and policy-level determinants. By applying this model to overdose mortality, the study underscores that fatal outcomes are not solely the result of personal decision making, but that they are deeply embedded within systems of inequality, social marginalization, and inadequate public health infrastructure.

Empirically, this study contributes to the growing body of research advocating for structurally informed public health interventions that address housing instability, substance use patterns, and access to care. The findings reflect recent studies that prioritize environmental and systemic drivers of deaths from synthetic opioid over narrow behavioral explanations (Abdullah et al., 2023; Friedman et al., 2022). Furthermore, this study reinforces the need for prevention strategies against opioid overdose that are both racially and contextually responsive, particularly in states like Georgia, where fentanyl-related deaths continue to rise and disproportionately affect underserved communities.

Limitations of the Study

This study relied on secondary data extracted from the 2022 SUDORS to examine the association between the dependent variables—educational attainment, alcohol use, homelessness—and deaths from opioid overdose involving fentanyl among Black and

White adults in Georgia. While the data set provided comprehensive coverage of deaths from opioid overdose across the state, several limitations warrant consideration. One primary limitation was the use of secondary data, which restricted the researcher's control over the selection of variables, data collection methods, and measurement tools. The original data set was designed for surveillance and reporting purposes, not specifically to test the hypothesis of this study. As such, key constructs such as housing stability, substance use behaviors, and educational attainment were coded based on existing medical examiner or coroner records, which may not have fully captured the lived experiences or social contexts of decedents.

Another important limitation involved the accuracy and completeness of reporting in death investigations. Variables such as alcohol use or homelessness may have been underreported or inconsistently recoded, depending on the availability of evidence or documentation. In many cases of overdose—particularly those involving unhoused individuals—relevant social history may not have been thoroughly documented by medical examiners, leading to data gaps or potential misclassifications.

I also used binary logistic regression, which limits the interpretation of relationships to associations rather than causality. Although the analysis controlled for important confounding variables such as age, gender, and marital status, unmeasured factors such as mental health history, access to health care, or involvement in harm reduction programs may also contribute to fentanyl-related mortality; however, these factors were not available in the data set. Finally, findings from this study may not be generalizable to populations outside the state of Georgia or to time periods beyond 2022.

This is because the fentanyl crisis is rapidly evolving, and trends in substance use, treatment access, and public health responses may shift over time and by region. Therefore, caution should be exercised when applying these findings to other geographic or demographic contexts. Despite these limitations, the study provides valuable insights into the structural and behavioral factors associated with opioid overdose-related deaths involving fentanyl, and contributes to the growing literature on health disparities in opioid mortality.

Recommendations for Further Research

In this study, I examined the associations between each of educational attainment, homelessness as well as alcohol use and opioid-related deaths involving fentanyl among Black and White adults living in Georgia, using secondary data from the 2022 SUDORS. The findings identified homelessness and alcohol use as statistically significant predictors of fentanyl-related mortality, whereas educational level did not demonstrate a significant association. Based on the study findings, several key recommendations that can inform future research, policy development, and public health interventions emerged.

Future researchers should examine additional structural and behavioral factors that may contribute to deaths from fentanyl overdose, such as mental health status, access to harm reduction services, employment history, and incarceration. These variables were not considered in the current data set despite being widely recognized in the literature to influence the risk of opioid overdose. Longitudinal data would also be beneficial for understanding causal relationships over time, as well as for evaluating the impact of interventions aimed at overdose prevention.

Public Health Practice and Field-Based Products

The results indicate the significance of homelessness in predicting fentanyl-related deaths. This finding highlights the urgent need for housing-first policies and integrated supportive services for individuals experiencing housing instability. Public health agencies and local governments should prioritize expanding access to stable housing, including transitional or low-barrier shelters that incorporate overdose prevention and mental health resources.

The inverse relationship between alcohol use and fentanyl-related mortality warrants further exploration. While alcohol use was associated with a reduced likelihood of fentanyl-related death in this data set, this result should be interpreted cautiously. Future studies should investigate whether this finding reflects differences in polysubstance use patterns, reporting inconsistencies, or protective behavioral factors that may be present in alcohol-using populations but not captured in death records. Additionally, researchers should explore racial disparities in reporting and cause of death classification within overdose data sets. Because this study focused on racial differences between Black and White individuals, future studies could expand to include Latino, Indigenous, and multiracial populations, particularly given the growing rates of opioid mortality in underserved racial and ethnic groups.

Finally, public health practitioners and policymakers should use findings from this and similar studies to inform culturally responsive harm reduction strategies. Furthermore, tailored outreach to individuals experiencing homelessness and at risk for overdose—particularly in areas with high rates of synthetic opioid mortality—should include peer-led education, distribution of naloxone, access to fentanyl test strips as well as linkages to treatment and housing services.

Policies and Legislation

The findings from this study underscore the importance of developing and enforcing public policies that address the structural determinants of deaths from fentanyl overdose, particularly among marginalized populations. The statistically significant association between homelessness and fentanyl-related mortality highlights the critical need for housing-informed legislation. Policymakers should prioritize investment in housing-first initiatives and ensure the integration of overdose prevention strategies within transitional and permanent supportive housing programs. These programs should be made widely accessible and funded through federal- and state-level appropriations to reach the populations at the greatest risk. Legislative frameworks must also ensure the enforcement and equitable implementation of existing federal initiatives such as the Support for Patients and Communities Act (2018), which encourages states to expand evidence-based responses to the opioid crisis. Additionally, agencies such as the U.S. Department of Health and Human Services (HHS) should strengthen mandates for culturally responsive programming that includes racially diverse populations, particularly Black individuals who are disproportionately impacted by opioid-related deaths but often underrepresented in program design, evaluation, and funding decisions. Furthermore, policymakers should consider expanding Medicaid-funded services that support overdose prevention and wraparound care, especially for individuals without stable housing or access to traditional health care systems. This approach should be evaluated and considered for nationwide adoption, particularly as a strategy to reduce inequities in access to care and harm reduction resources. Finally, legislative advocacy should support the removal of punitive policies that criminalize substance use and homelessness, which have shown to increase vulnerability to overdose and to discourage individuals from seeking help. Instead, efforts should be directed toward public health-based responses that emphasize treatment over incarceration, access over punishment, and equity over uniformity. We cannot continue to arrest our way out of the fentanyl crisis, as too many people are dying. Policies should focus on making services more accessible and removing barriers such as stigma and criminalization.

Health Care Providers

Health care providers play a critical role in both the prevention and postvention of opioid overdose-related deaths involving fentanyl, particularly among high-risk populations such as individuals experiencing homelessness or those with limited social support. The findings from this study reinforce the importance of expanding the scope of training of health care providers beyond the clinical assessment of substance use to include social determinants of health such as housing status, employment history, and access to harm reduction resources. Providers working in emergency departments, community health clinics, and correctional facilities often encounter individuals at acute risk of opioid overdose. These providers serve as potential gateways to critical interventions, including referrals to harm reduction programs, substance use treatment, and supportive housing. However, inconsistent practices in screening and referral contribute to missed opportunities for intervention. A more standardized approach to screening for homelessness, co-occurring disorders, and substance use is required across provider settings. There are additional touchpoints, such as emergency room visits or jail intake, that could facilitate intervention; however, without a standard screening process, several at-risk individuals slip through the system. Culturally responsive training for health care providers also emerges as a vital policy and practice implication. Black patients, in particular, face long-standing mistrust in health care systems, often due to implicit bias, structural racism, and a history of underdiagnosis or undertreatment in pain management and behavioral health (Mellis et al., 2022). Addressing these disparities requires health systems to adopt evidence-based, trauma-informed, and equity-centered care models that validate the lived experiences of marginalized individuals and empower providers to engage compassionately and effectively. When providers cannot offer direct services, referrals to allied health professionals such as social workers, harm reduction counselors, or family case managers serve as a critical step in continuing care. A multidisciplinary response grounded in empathy, accessibility, and cultural competency is essential for reversing the current trends of opioid overdose as well as for improving health equity. Social workers, harm reduction specialists, and case managers must be part of the response, especially when providers reach the limits on what they can offer.

African American Caregivers

African American caregivers frequently play a central role in supporting family members navigating chronic health conditions, mental illness, or substance use. Although this study focused on predictors of deaths from fentanyl overdose, its broader implications touch on the familial and intergenerational burdens experienced by many

African American families in communities heavily affected by the opioid crisis. Caregivers in these contexts often not only address the health needs of their loved but also manage financial, medical, legal, and end-of-life responsibilities, frequently without formal training or institutional support. This has a ripple effect on both caregivers and public health. Therefore, support systems that recognize the cultural, spiritual, and social values within African American communities are essential.

Research shows that Black caregivers often turn to faith-based institutions, community leaders, and social networks for emotional and practical support (Fraser–Johnson, personal communication, June 27, 2023). Maintaining ties with religious institutions, extended family, and culturally affirming support groups helps caregivers preserve a sense of normalcy, even under high stress, while also buffering against isolation and depression. Additionally, the importance of caregiver preparedness and mental health preservation cannot be overstated. Ensuring that African American caregivers have access to training, counseling, and multidisciplinary professional guidance—including spiritual advisors, gerontologists, legal professionals, and mental health providers—is critical in promoting both personal and familial health stability in households impacted by complex trauma, including opioid-related loss. One key point is that Black caregivers need holistic support, not just medically, but also legally, spiritually, and emotionally. Supporting caregivers reduces strain on the health care system and potentially prevents further health crises.

These observations echo broader themes from the study's findings: health outcomes are shaped not only by clinical factors but also by the social and cultural environments surrounding individuals and families. In communities disproportionately impacted by fentanyl-related mortality, strengthening caregiver networks could serve as a preventative and stabilizing public health strategy.

Implications for Professional Practice

The results of this study have several implications for professional practice across public health, health care, behavioral health, and social services. Given that homelessness and alcohol use emerged as statistically significant predictors of deaths from opioid overdose involving fentanyl in Georgia, professionals working with high-risk populations must be equipped with the training and tools necessary to assess, intervene, and connect individuals to comprehensive care. Health care providers—including emergency physicians, nurses, behavioral health specialists, and case managers—must be trained to identify structural vulnerabilities such as housing instability, limited income, and co-occurring behavioral health conditions. These factors are often overlooked during care for cases of opioid overdose; nevertheless, remain critical for postoverdose intervention and prevention planning. Frontline professionals need to go beyond treating the overdose and consider the bigger picture: Is this person homeless? Do they need mental health support? What barriers are preventing recovery?

Interdisciplinary collaboration among medical professionals, harm reduction advocates, social workers, and public health officials is essential to coordinating wraparound services, especially for individuals who do not consistently engage with the health care system. Professionals trained in trauma-informed care and harm reduction are more likely to build trust and connect clients to long-term support such as housing programs, substance use treatment, and peer navigation services. Collaboration is key, especially between health care and community-based programs. People at risk of overdose often do not show up in traditional health care spaces; hence the need for coordinated outreaches.

Lastly, professionals in policy and research must remain aware of evolving state-level and federal opioid response strategies, especially those that integrate housing, mental health, and substance use services. The findings from this study may inform future training curricula, public health campaigns, and system-level reforms that prioritize structural equity and harm reduction approaches to addressing fentanyl-related mortality.

Positive Social Change

Positive social change involves the intentional application of research-based strategies to advance the health, dignity, and equity of individuals and communities. The findings from this study—which identified homelessness and alcohol use as significant predictors of deaths from fentanyl overdose—contribute to this broader goal by offering insight into how structural inequities perpetuate health disparities, particularly among Black populations in Georgia. This study advances social change by reinforcing the urgency of designing community-centered, culturally appropriate interventions that address both behavioral health risks and systemic barriers such as unstable housing, poverty, and limited access to care. Public health practitioners, policymakers, and advocates may use these findings to build partnerships with faith-based organizations, community groups, and harm reduction networks that are already trusted in Black communities. The goal of social change is not just better programs but better partnerships. Local churches, shelters, and grassroots groups are often more trusted than formal institutions, and that is where social change truly begins. This study also emphasizes the importance of integrating social care into health care, particularly in the prevention of opioid overdose. By illuminating the connection between housing instability and opioid overdose-related deaths, these results support a shift in public health approaches from individual-focused interventions to structural and community-based models that consider environment, race, and socioeconomic contexts. This study demonstrates that opioid overdose cannot be discussed without addressing housing, poverty, and racism.

Social change entails transforming systems, not just individuals. The findings from this study could inform public awareness campaigns aimed at destigmatizing substance use and shifting perceptions of fentanyl-related deaths. Framing the issue through a lens of public health and social justice rather than criminality may encourage greater empathy, resource allocation, and policy innovation. Moreover, this research adds to the growing body of literature that recognizes the intersectionality of race, substance use, and social vulnerability. It underscores the need for research and intervention strategies that are culturally tailored and community informed. Through a deeper understanding of these dynamics, stakeholders can develop more inclusive and equity-focused programs to reduce opioid-related mortality and promote resilience in disproportionately impacted populations. Ultimately, social change entails ensuring that individuals who are most affected by fentanyl—especially Black and low-income populations—are seen, heard, and protected in public health responses.

Conclusion

In this quantitative study, I examined the associations of educational attainment, homelessness, and alcohol use with deaths from opioid overdose involving fentanyl in Georgia, using secondary data from the 2022 SUDORS, while controlling for age, gender, and marital status. The findings revealed that homelessness and alcohol use were statistically significant predictors of fentanyl mortality, whereas educational attainment did not demonstrate a significant association. These findings contribute to the growing body of research that emphasizes structural factors such as housing instability and substance use patterns as critical components in understanding the opioid crisis, particularly within underserved and racially marginalized populations.

The significance of this study extends beyond statistical associations. It highlights the urgent need for public health systems to shift from individual-level interventions to structural, equity-driven approaches. The data reinforce that individuals who are most vulnerable to fentanyl-related deaths often face multiple, compounding barriers, including unstable housing, inadequate access to care, systemic racism, and limited representation in health care decision making. These realities call for interventions that are not only evidence-based but also culturally responsive and community-informed. This study is not just about numbers; it is about understanding why certain individuals are more at risk. Homelessness and alcohol use are not merely behavioral issues; they are tied to deeper problems of access, inequality, and policy failure.

The implications of these findings are far-reaching. Health care providers, administrators, advocates, and policymakers can use this study to better identify gaps in service delivery, funding, and outreach. Specifically, health care providers require training to screen for social determinants of health, while policymakers should reallocate resources toward housing-first programs, harm reduction services, and Medicaid-supported care models. Furthermore, the data could inform racial equity initiatives and targeted overdose prevention efforts, especially within Black communities disproportionately affected by fentanyl deaths.

This dissertation also offered me a chance for personal transformation. Through the analysis of data, literature, and disparities, it became evident that data alone cannot capture the full complexity of public health inequities, but that it can illuminate them. The process underscored the necessity of ensuring that the voices of Black communities—especially those impacted by overdose-related losses and housing instability—are centered in future research, policy development, and public health practice. Working on this dissertation made me realize how much data is missing when people of color are excluded from research. Without their stories and realities, policies that truly protect this population cannot be established.

In conclusion, this study contributes to an evolving conversation on fentanyl, race, and structural inequality. It offers empirical evidence that may guide local, national, and global efforts to reduce overdose-related deaths, reform systems of care, and uplift vulnerable communities. Continued research, advocacy, and inclusive policymaking are essential to ensure that future efforts do not overlook individuals who are most affected by the fentanyl epidemic.

References

Abdullah, A., Emery, C. R., Dwumah, P., & Jordan, L. P. (2023). Towards a normative approach: A theoretical analysis and empirical exploration of the constituted and constitutive procedural social norms. *New Ideas in Psychology*, *70*, Article 101032. https://doi.org/10.1016/j.newideapsych.2023.101032

Ahmad, S. F., Ibrahim, M., & Nadeem, A. H. (2021). Impact of ethics, stress, and trust on change management in public sector organizations. *Gomal University Journal of Research*, *37*(2), 43–54. https://doi.org/10.51380/gujr-37-02-05

Ahmad, F. B., Rossen, L. M., & Sutton, P. (2021). Provisional drug overdose death counts. *National Center for Health Statistics*. https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm.

Alshak, N. (2021) Mental health and substance use associations with COVID-19 vaccine uptake among U.S. veterans. BMC Public Health, 21, 1971. https://doi.org/10.1186/s12889-021-12019-x

Altekruse, S. F., Cosgrove, C. M., Altekruse, W. C., Jenkins, R. A., & Blanco, C. (2020). Socioeconomic risk factors for fatal opioid overdoses in the United States: Findings from the Mortality Disparities in American Communities Study (MDAC). *PLOS One*, *15*(1), Article e0227966. https://doi.org/10.1371/journal.pone.0227966

Banks, D.E., Duello, A., Paschke, M.E., Grigsby, S.R., Winograd, R.P., Blaylock, P. (2023). Identifying drivers of increasing opioid overdose deaths among Black individuals: A qualitative model drawing on experience of peers and community health workers. Harm Reduction Journal, 20, Article 5. https://doi.org/10.1186/s12954-023-00734-9

Barocas, J. A., Wang, J., Marshall, B. D. L., LaRochelle, M. R., Bettano, A., Bernson, D., Beckwith, C. G., Linas, B. P., & Walley, A. Y. (2019). Sociodemographic factors and social determinants associated with toxicology-confirmed polysubstance opioid-related deaths. *Drug and Alcohol Dependence, 200*, 59–63. https://doi.org/10.1016/j.drugalcdep.2019.03.014

Bradford, W. D., & Lozano-Rojas, F. (2024). Higher rates of homelessness are associated with increases in mortality from accidental drug and alcohol poisonings. *Health Affairs*, *43*(2), 242–249. https://doi.org/10.1377/hlthaff.2023.00951

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32*(7), 513–531. https://doi.org/10.1037/0003-066X.32.7.513

Burns, M.A., Lee, C., & Ford, S. (2023). Is there a disparity in medications for opioid use disorder based on race and ethnicity? A systematic review. *Journal of Substance Abuse Treatment.* 154, Article 108493. https://doi.org/10.1016/j.jsat.2023.108493

Castillo-Carniglia, A., Gonzalez-Santa Cruz, A., Cerda, M., Delcher, C., Shev, A.B., & Winrwemurw, G.J. (2021). Changes in opioid prescribing after implementation of mandatory registration and proactive reports within California's prescription drug monitoring program. Drug and Alcohol Dependence, 218, 108405. https://doi.org/10.1016/j.drugalcdep.2021.108405.

Centers for Disease Control and Prevention. (2018). *State Unintentional Drug Overdose Reporting System (SUDORS)*. https://www.cdc.gov/drugoverdose/surveillance/SUDORS

Centers for Disease Control and Prevention. (2020). *Fentanyl*. https://www.cdc.gov/drugoverdose/opioids/fentanyl.html

Centers for Disease Control and Prevention. (2020). *Understanding the epidemic*. https://www.cdc.gov/drugoverdose/epidemic/index.html

Centers for Disease Control and Prevention. (2020). *Wide-ranging online data for epidemiological research (WONDER)*. National Center for Health Statistics. http://wonder.cdc.gov

Centers for Disease Control and Prevention. (2022). The social-ecological model: A framework for prevention*.* https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html

Cho, S., & Choi, K. (2021). Transport accessibility and economic growth: Implications for sustainable transport infrastructure investments*. International Journal of Sustainable Transportation*, *15*(8), 641–652. https://doi.org/10.1080/15568318.2020.1774946

Chua, K.C., Schroeder, T., Richards, J.R., & Saloner, B. (2022). Trends in opioid misuse among individuals aged 12 to 21 years in the U.S., 2002-2019. JAMA Network Open, 5(1), e2141062. https://doi.org/10.1001/jamanetworkopen.2021.41062.

Ciccarone, D. (2019). The triple wave epidemic: Supply and demand drivers of the U.S. opioid overdose crisis. *International Journal of Drug Policy*, *71*, 183–188. https://doi.org/10.1016/j.drugpo.2019.01.010

Das, S., Kuhnen, C. M., & Nagel, S. (2020). Socioeconomic status and macroeconomic expectations. *Review of Financial Studies*, *33*(1), 395–432. https://doi.org/10.1093/rfs/hhz041

Evans, E., Li, L., Min, J. (2022). Gender differences in initiation of opioid agonist treatment among individuals with Medicaid in the United States. Drug and Alcohol Dependence, 238, 109613. https://doi.org/10.1016/j.drugalcdep.2022.109613

Fine, D.R., Tanz, L.J., Quinn, N.R., Kariisa, M., Patel, P., & Davis, N.L. (2022, January 4). Drug overdose mortality among people experiencing homelessness, 2003 to 2018, JAMA Network Open, 5(1), e2142676. https://doi.org/10.1001/jamanetworkopen.2021.42676.

Fink, A. (2020). *Conducting research literature reviews: From the internet to paper* (5th ed.). SAGE Publications. https://us.sagepub.com/en-us/nam/conducting-research-literature-reviews/book249619

Fraser-Johnson, A. (2023, June 27). *Personal communication*.

Friedman, J., Godvin, M., Shover, C. L., Gone, J. P., & Hansen, H. (2022). Trends in drug overdose deaths among US adolescents, January 2010 to June 2021. *JAMA*, *327*(14), 1398–1400. https://doi.org/10.1001/jama.2022.2847

Geeraert, N., Ward, C., & Hanel, P. H. P. (2022). Returning home: The role of expectations in re-entry adaptation. *Applied Psychology: Health & Well-Being*, *14*(3), 949–966. https://doi.org/10.1111/aphw.12311

Georgia Department of Public Health (2019). Opioid Overdose Surveillance: Preliminary report, Georgia, 2019. Georgia Department of Public Health. https://dph.georgia.gov/document/document/2019georgiaopioidoverdoseprelimreportpdf/download.

Gomez, L. E. (2019). Rethinking the intersection of race, gender, and drugs: Insights from the opioid crisis. *Journal of Gender, Social Policy & the Law*, *27*(2), 189–204. https://doi.org/10.2139/ssrn.3392791

Gondre-Lewis, M. C., Abijo, T., & Gondre-Lewis, T. A. (2023). The opioid epidemic: A crisis disproportionately impacting Black Americans and urban communities. *Journal of Racial and Ethnic Health Disparities*, *10*(4), 2039–2053. https://doi.org/10.1007/s40615-022-01384-6

Green, K. E., Loe, M. A., & Ferrier, Y. (2020). Barriers to addiction care: Reducing systemic stigma in the treatment of LGBTQ+ populations. *Journal of Substance Abuse Treatment*, *59*, 1–9. https://doi.org/10.1016/j.jsat.2015.10.00

Hedegaard, H., Minino, A. M., & Warner, M. (2020). *Drug overdose deaths in the United States, 1999-2019*. (NCHS Data Brief No. 394). National Center for Health Statistics. https://www.cdc.gov/nchs/data/databriefs/db394-H.pdf.

Hudgins, J. D., Porter, J. J., Monuteaux, M. C., & Bourgeois, F. T. (2019). Prescription opioid use and misuse among adolescents and young adults in the United States: A national survey study. *PLoS Medicine*, *16*(11), e1002922. https://doi.org/10.1371/journal.pmed.1002922

Jones, C.M., and McAllister, K.A. (2022). Geographic and demographic disparities in prescription opioid dispensing and opioid-related outcomes. BMJ Open, 12(6), e056584.

Jones, C.M., Paulozzi, L.J., & Mack, K.A. (2022). Polysubstance involvement in drug overdose deaths: United States, 2019. Addiction, 117(1), 156-162. https://doi.org/10.1111/add.15616

Kalkstein, D. A., Hook, C. J., Hard, B. M., & Walton, G. M. (2022). Social norms govern what behaviors come to mind, and what do not. *Journal of Personality and Social Psychology*, *124*(6), 1203–1229. https://doi.org/10.1037/pspi0000412

Kelly, J.F., Fallah-Sohy, N., Vilsaint, C., Hoffman, L.A., Stout, R.L., Cristello, J., & Hoeppner, B.B. (2020). *New kid on the block: An investigation of the physical, operational, personnel, and service characteristics of recovery community centers in the United States. Journal of Substance Abuse Treatment*, 111, 1-10. https://doi.org/10.1016/j.jsat.2019.12.009

Lopez, G., Chen, J., & Lee, K. D. (2021). Policy strategies to combat the opioid epidemic: An overview of recent legislative efforts. *Health Affairs*, *40*(6), 1024–1031.

Maierhofer, C.N., Ranapurwala, S.I., DiPrete, B.L., Fulcher, N., Ringwalt, C.L., Chelminski, P.R., Ives, T.J., & Dasgupta, N. (2021). Association between statewide opioid prescribing interventions and opioid prescribing patterns in North Carolina, 2006-2018. Pain Medicine, 22(4), 2931-2940.https://doi.org/10.1093/pm/pnaa398

Mash, E. J. (2019). *Abnormal child psychology.* Wolfe, David A. (David Allen), 1951- (Seventh ed.).

Mattson, C. L., Tanz, L. J., Quinn, K., Kariisa, M., Patel, P., & Davis, N. L. (2021). Trends and geographic patterns in drug and synthetic opioid overdose deaths—United States, 2013–2019. *Morbidity and Mortality Weekly Report*, *70*(6), 202–207. https://doi.org/10.15585/mmwr.mm7006a4

Mayor, E., Daehne, M., & Bianchi, R. (2020). The dark triad of personality and attitudes toward cognitive enhancement. *BMC Psychology*, *8*. https://doi.org/10.1186/s40359-020-00486-2,

McLaughlin, M.F., Li, R., Carrero, N.D., Bain, P.A., & Chatterjee, A. (2021). Opioid use disorder treatment for people experiencing homelessness: A scoping review. Drug and Alcohol Dependence, 224, 108717. https://doi.org/10.1016/j.drugalcdep.2021.108717

Melynyk, V., Francois, A., & Melnyk, V. (2022). The influence of social norms on consumer behavior: A meta-analysis. *Journal of Marketing*, *86*(3), 98–120. https://doi.org/10.1077/00222429211029199

Mellis, A. M., Potenza, M. N., & Hulsey, J. N. (2022). *Disparities in opioid overdose risk and access to treatment: Implications for equity and public health. Journal of Substance Abuse Treatment*, *139*, 108777. https://doi.org/10.1016/j.jsat.2022.108777

Miller, J. E., Windschitl, P. D., Treat, T. A., & Scherer, A. M. (2020). Comparisons as predictors of people's beliefs about the importance of changing their health behaviors. *European Journal of Health Psychology*, *27*(1), 14–29. https://doi.org/10.1027/2512-8442/a000043.

Miller, M.M., Wing, C.M., & Turner-Moss, E. (2020). Why public health needs GIS: A methodological overview. Annals of GIS, 26(4), 325-338. https://doi.org/10.1080/19475683.2019.1702099

Mistler, C.B., Sullivan, M.C., Copenhaver, M.M., Meyer, J.P., Roth, A.M., Shenoi, S.V., Edelman, E.J., Wickersham, J.A., & Shrestha, R. (2021). Differential impacts of COVID-19 across racial-ethnic identities in persons with opioid use disorder. *Journal of Substance Abuse Treatment,* 129, Article 108387. https://doi.org/10.1016/j.jsat 2021.108387

Nordeck, C.D., Greenberg, K.E., Sanleandro, L., Bertenthal,D., and Larney, S. (2022). Gender differences among persons entering medication treatment for opioid use disorder in the community. Journal of Substance Abuse Treatment. 153, 108846 https://doi.org/10.xxxx/jsat.2022.108846

O'Hanlon Kakatkar, S., Narayan, A., & Balkrishnan, R. (2022). Prescription analgesic overuse in older adults: Can we mitigate this growing problem? *Aging Medicine*, *5*(4), 294–296. https://doi.org/10.1002/agm2.12228

Pfund, R., Ginley, M.K., Boness, C.L., Zajac, K., & Rash, C. (2022). Contingency management for treatment attendance: A meta-analysis. Journal of Substance Abuse Treatment, 133, 108556. https://doi.org/10.1016/j.jsat.2021.108556

SAMHSA announces national survey on drug use and health (NSDUH) results detailing mental illness and substance use levels in 2021.

Scholl, L., Seth, P., Kariisa, M., Wilson, N., & Baldwin, G. (2019). Drug and opioid-involved overdose deaths — United States, 2013–2017. *Morbidity and Mortality Weekly Report*, *67*(5152), 1419–1427. http://doi.org/10.15585/mmwr.mm675152e1

Seth, P., Scholl, L., Rudd, R. A., & Bacon, S. (2018). Overdose deaths involving opioids, cocaine, psychostimulants — United States, 2015–2016. *Morbidity and Mortality Weekly Report*, *67*(12), 349. http://doi.org/10.15585/mmwr.mm6712a1

Singh, G. K., Kim, I. E., Girmay, M., Perry, C.P., Daus, G.P., Vedamuthu, I.P., De Los Reyes, A.A., Ramey, C.T., Martin, E.K., & Allender, M. (2019). Opioid epidemic in the United States: Empirical trends, and a literature review of social determinants and epidemiological, pain management, and treatment patterns. *International Journal of Maternal and Child Health and AIDS*, *8*(2), 89–100. https://doi.org/10.21106/ijma.284.

Smith, J. D., & Jones, T. H. (2021). Culturally competent responses to the opioid epidemic in minority communities. *Drug and Alcohol Dependence*, *218*, 108416. https://doi.org/10.1016/j.drugalcdep.2021.108416

Soffoletto, B., Lynch, M., Pacella, C.B., Yealy, D.M., & Callaway, C.W. (2018). The effect of a statewide mandatory prescription drug monitoring program on opioid prescribing by emergency medicine providers across 15 hospitals in a single health system. The Journal of Pain, 19(40, 430-438. https://doi.org/10.1016/j.jpain.2017.11.010

Spencer, M.R., Garnett, M.F., & Minino, A.M. (2022). Urban-rural differences in drug overdose death rates, 2020 (NCHS Data Brief No. 440). National Center for Health Statistics. https://dx.doi.org/10.15620?cdc:118601

Tilstra, A. M., Simon, D. H., & Masters, R. K. (2021). Trends in "deaths of despair" among working-aged White and Black Americans, 1990-2017. *American Journal of Epidemiology*, *190*(9), 1751–1759. https://doi.org/10.1093/aje/kwab088.

Tin, Y., Castry, M., Bowers-Sword, R., Shantharam, S., Aldridge, A., Zarkin, G. A., & Morgan, J. R. (2024). Establishing a protocol for determining the costs of an integrated set of evidence-based practices aimed at reducing opioid overdose deaths. *Journal of Addiction Medicine*, *18*(1), 13–18. https://doi.org/10.1097/ADM.0000000000000934.

Tranfield, D., Denyer, D., & Smart, P. (2020). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, *31*(1), 4–26. https://doi.org/10.1111/1467-8551.12341

Tsang, V. W. L., Wong, J. S. H., Westenberg, J. N., Ramadhan, N. H., Fadakar, H., Nikoo, M., Li, V. W., Mathew, N., Azar, P., Jang, K. L., & Krausz, R. M. (2024). Systematic review on intentional non-medical fentanyl use among people who use drugs. *Frontiers in Psychiatry, 15*, 1347678. https://doi.org/10.3389/fpsyt.2024.1347678

Unger, J. B., Molina, G. B., & Baron, M. R. (2021). Opioid knowledge and perceptions among Hispanic/Latino residents in Los Angeles. *Substance Abuse*, *42*(4), 603–609. https://doi.org.10.1080/08897077.2020.1806185

Vankova, I., & Vavrek, R. (2020). Evaluation of local accessibility of homes for seniors using multi-criteria approach-evidence from the Czech Republic. *Health & Social Care in the Community*, 29(5), e21-e32. https://doi.org.10.1111/hsc.13231

Verdus, D., Saloner, B., Tetrault, J.M., & Stein, B.D. (2020). Medicaid coverage and racial and gender disparities in use of buprenorphine for opioid use disorder among pregnant people. *Journal of Behavioral Health Services Research, 48*(1), 16-23. https://doi.org/10.1007/s11414-020-09717-6

Wagner, J., Donnelly, E. A., Stenger, M., Cortina, H. G., O'Connell, D. J., & Anderson, T. L. (2021). Opioids, race, and drug enforcement: Exploring local relationships between neighborhood context and Black-White opioid-related possession arrests. *Criminal Justice Policy Review*, *32*(3), 219–244. https://doi.org/10.1177/0887403420936462.

Wen, H., Hockenberry, J. M., & Cummings, J.R. (2020). The impact of Medicaid expansion on non-fatal opioid-involved overdoses treated in U.S. hospitals: An interrupted time-series analysis. American Journal of Preventive Medicine, 59(3), 376-383. https://doi.org/10.1016/j.amepre.2020.03.004

Zabriskie, T. (2023). Managing expectations: Your client's and your own. *Organization Development Review*, *55*(2), 34–37. https://doi.org/10.1177/10596011231175435