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The Relationship Between Income and Race With the Utilization of Oral Health Services Among Older Adults

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This is to certify that the doctoral dissertation by

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Walden University
2025

Abstract

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MS, Walden University, 2019

BS, Walden University, 2017

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Health Services

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Abstract

Oral health disparities continue to present a significant public health challenge for older adults in the United States, particularly among racial minority and low-income populations. Despite national discussions around healthcare equity, there remains limited empirical insight into how race and income influence dental service utilization among Medicare beneficiaries. In this quantitative, cross-sectional study, the extent to which these demographic factors predicted oral healthcare utilization, using nationally representative data from the 2021 Medicare Current Beneficiary Survey, was assessed. Guided by the social determinants of health framework, chi-square tests, binary logistic regression, and negative binomial regression were performed to analyze the data. Findings revealed that both race and income were significant predictors of whether older adults used dental care. Non-Hispanic Black beneficiaries had 49% lower odds of utilization compared to non-Hispanic White counterparts ($OR = 0.51$, $p < .001$), and those with household incomes below $25,000 had 70% lower odds of utilization compared to higher income adults ($OR = 0.30$, $p < .001$). Among utilizers, income remained significant, with higher income adults reporting more visits (Incidence Rate Ratio (IRR) = 1.37, p=.015), while race was not significant once access was established. These results highlight systemic inequities in access and underscore the need for policy reforms, such as expanding Medicare dental benefits and implementing culturally responsive outreach strategies, contributing to the evidence base needed to inform equitable health interventions for aging populations and promote positive social change.

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Dedication

This dissertation is dedicated to my grandmother, Diane; my grandfather, Tim; my mother, Reshay; my daughter, Abrie; and my entire family. Your unwavering support, prayers, and encouragement carried me through every step of this journey. To my mother—thank you for always believing in me and reminding me of the strength and resilience within our family. To my grandmother and grandfather—your sacrifices, love, and constant motivation have been the foundation upon which I built this achievement.

And to my daughter Abrie, your light gave me purpose, and your laughter gave me strength. You are my reason and my inspiration.

To all of you—thank you for lifting me up when I was tired, praying for me when I felt uncertain, and celebrating every milestone with me. This accomplishment is not mine alone; it is a reflection of your love, faith, and the legacy of perseverance that you have instilled in me.

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To my family—your love, patience, and belief in me made this accomplishment possible. Thank you for standing by me through the long nights, the challenges, and the milestones. Your support has meant more to me than words can express.

To my friends and colleagues who offered encouragement along the way, thank you for reminding me that I was never alone in this process. Your words of motivation and celebration kept me moving forward.

Completing this dissertation has been a transformative journey, and I am sincerely grateful to everyone who played a part in it.

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Chapter 1: Introduction to the Study

Introduction

Healthcare access and utilization disparities in the United States are profoundly shaped by social, economic, and racial inequalities, particularly within the realm of oral health. While disparities in general healthcare have received considerable attention, access to oral health services remained less thoroughly explored, despite its critical role in overall health. Older adults, particularly those enrolled in Medicare, often encountered significant barriers to obtaining both preventive and routine dental care; these challenges stemmed not only from the availability of services but were also influenced by broader social factors, such as race and income (Wolownik & Cohen, 2024).

Borrell et al. (2023) identified limited access to dental insurance as a key factor that contributed to oral health disparities, especially among racial and ethnic minority groups. These challenges were further exacerbated by systemic inequalities that persistently hindered access to dental care. Wolownik and Cohen (2024) discussed how gaps in dental coverage for Medicare beneficiaries were a primary barrier, preventing many older adults from receiving the necessary care. Hames (2024) examined the persistence of racial and ethnic disparities in cost-related barriers, particularly among those in Medicare Advantage plans, who often faced greater financial obstacles compared to those enrolled in traditional Medicare.

In this study, I explored the relationship between income, race, and the utilization of oral health services among older adults. By examining these factors, I aimed to understand how socio-economic and racial influences affected healthcare utilization,

particularly in the context of oral health. The findings provided a deeper understanding of the challenges older adults faced in accessing oral healthcare and offered valuable insights into potential strategies for addressing these disparities.

Background

Oral health is a critical component of overall well-being, affecting not only physical health but also quality of life, social interactions, and mental health(Peres et al., 2019). Despite its importance, many older adults, particularly those from low-income or racial and ethnic minority backgrounds, encounter significant barriers to accessing dental care (Elani et al., 2020). This lack of access often results in untreated dental conditions, which could worsen other serious health issues, including cardiovascular disease, diabetes, and poor overall health outcomes. The connection between oral health and broader health conditions highlights the urgent need to address disparities in dental care, especially among vulnerable populations (Dye, 2023).

A growing body of research has documented the inequities in access to oral health services, particularly for racial and ethnic minority groups as well as those with lower incomes. Studies have shown that individuals from racial minority groups, such as African Americans, Latinos, and Native Americans, were more likely to face significant challenges in accessing dental care, including a shortage of dental providers, financial constraints, and cultural or linguistic issues that hindered effective communication and understanding of care options, and as a result, these groups were more likely to delay or forgo necessary treatment, leading to more severe oral health issues and reinforcing existing health disparities (Kim & Rosenberg, 2024).

Income plays a crucial role in determining access to dental care. Older adults from low-income backgrounds often lack dental insurance or the financial means to afford necessary services, placing them at a higher risk for untreated dental conditions (MacDougall, 2016). Additionally, individuals with lower socioeconomic status face other obstacles, such as transportation difficulties, limited access to providers in underserved areas, and the financial burden of paying for care out of pocket, and these barriers often prevent individuals from seeking preventive care or following through with recommended treatments, resulting in deteriorating oral health and an increased likelihood of broader health complications (Vela et al., 2022). Moreover, older adults enrolled in Medicare faced substantial gaps in dental coverage, further exacerbating these challenges (Simon et al., 2023).

While significant research has examined healthcare disparities, particularly in the context of race and income, there was a notable gap in studies that focused specifically on how these factors influenced the utilization of oral health services among older adults, especially those covered by Medicare (Kim & Rosenberg, 2024). The Medicare program, which provides health insurance for seniors, does not offer comprehensive dental coverage, leaving many older adults with significant out-of-pocket expenses for necessary dental care (Simon et al., 2025). As a result, Medicare beneficiaries are more likely to skip routine dental visits or delay critical treatments, leading to a decline in both oral health and overall well-being. The lack of dental coverage under Medicare is widely recognized as a major contributor to health inequities, with significant implications for older adults' overall health outcomes (Dye, 2023).

This gap in the literature presented an opportunity to examine how income, race, and Medicare coverage intersected to influence access to dental care among older adults. Although recent policy changes, such as the inclusion of limited dental benefits under Medicare Advantage plans, addressed some of these issues, substantial gaps in coverage and access remained (Pourat et al., 2023).Research indicated that despite improvements in dental benefits under certain Medicare plans, beneficiaries continued to experience both short- and long-term reductions in the utilization of dental services after enrollment (Simon et al., 2023). Understanding the specific barriers faced by older adults, especially those from low-income or racial and ethnic minority backgrounds, was essential for developing interventions that could improve access to dental care and enhance health outcomes for this vulnerable population.

One potential solution to improve access to dental care for older adults is the integration of oral health into primary care. Nelson et al. (2023) argued that such integration could address the fragmented nature of healthcare delivery for older adults, ensuring that oral health was given equal attention alongside other aspects of health. Moreover, discussions about expanding dental services within Medicare emphasized the importance of comprehensive dental care in improving both oral and general health outcomes for older Americans (Scannapieco & Lamster, 2024).

The current study was conducted to enhance understanding of how income and race affect the utilization of oral health services among older adults, particularly those covered by Medicare. By examining the factors that influenced access to dental care in this population, I sought to provide insights that could inform policy recommendations

that are ultimately aimed at reducing disparities and improving oral health outcomes for older adults most at risk.

Problem Statement

The utilization of oral health services among older adults revealed significant disparities, particularly in how race and income influenced access to care (Dunlop et al., 2002). While healthcare disparities were well documented across many areas, there was relatively little focus on how these factors specifically affected oral health services for older adults, especially those enrolled in Medicare. Borrell et al. (2023) found that access to dental care remained a persistent issue, particularly for low-income and minority groups. Yet, the reasons behind these disparities were not fully explored, leaving a gap in the research that made it harder to develop effective interventions aimed at improving access to care for vulnerable populations.

The lack of comprehensive dental coverage for older adults, particularly those covered by Medicare, is a major concern. gaps. Without adequate coverage, many older adults delayed or skipped necessary dental treatments, which led to worsening oral health and other related health issues. As Borrell et al. (2023) noted, the combination of race, income, and Medicare coverage created barriers to care that disproportionately affected people from low-income or racial and ethnic minority backgrounds. For many older adults, financial constraints were a key barrier, especially given that Medicare did not cover dental care comprehensively. Simon et al. (2023) found that after enrolling in Medicare, many beneficiaries, particularly those from low-income or racial and ethnic minority groups, reduced their use of dental services because of these coverage

In addition, racial and ethnic minorities faced particular challenges that made accessing care even more difficult. Research showed that cultural and linguistic barriers, along with a lack of dental providers in underserved areas, often limited access to care for these groups. Kim and Rosenberg (2024) found that racial minorities, including African Americans, Latinos, and Native Americans, faced significant obstacles to accessing dental care, which often led to delays in seeking treatment. When financial challenges and inadequate insurance coverage were added to the mix, these barriers increased the risk of poor oral health outcomes, reinforcing existing health inequities.

This gap in the literature emphasized the need for more research into how income, race, and Medicare coverage intersected to affect access to dental care for older adults. Borrell et al. (2023) argued that understanding these factors was essential for developing effective strategies to address the root causes of these disparities. Nelson et al. (2023) suggested that integrating oral health into primary care could be a promising solution to address these challenges. By integrating oral health with other health services, this approach could reduce barriers to care and help improve the overall health outcomes of older adults, particularly those from vulnerable backgrounds.

The intersection of income, race, and Medicare coverage continues to create significant barriers to dental care for older adults. While current research has highlighted disparities in dental care access related to race and income, future studies needed to explore how these factors interacted and impacted access to care. For example, future research could build on findings, such as those by Jamieson et al. (2021) who analyzed data from the National Health and Nutrition Examination Survey and identified that

lower income and educational actualization were significantly associated with reduced dental visiting among U.S. adults. Future studies also needed to address how racial and ethnic minorities, particularly non-Hispanic Blacks and Hispanics, may experience additional barriers to accessing dental care compared to non-Hispanic Whites, even after accounting for socioeconomic factors. Insights from such research could help clarify how both socioeconomic status and race/ethnicity independently influenced dental care utilization and guide the development of targeted interventions to reduce these disparities.

Purpose of the Study

In this study, how race and income influenced the utilization of oral health services among older adults was examined. Specifically, I investigated how demographic factors, particularly race and income, affected access to oral healthcare. The primary variables in this study were race, income, and oral health service utilization. Race was categorized based on ethnic groups, such as African American, Latino, Native American, and European American. Income was measured by household income or socioeconomic status, while oral health service utilization was assessed by the frequency of dental visits, the types of care received, and whether individuals delayed or avoided necessary treatments.

Research has consistently showed that both race and income were significant factors in determining access to healthcare. Borrell et al. (2023) found that individuals from low-income and racial minority groups often faced substantial barriers to accessing dental care, including financial constraints, limited availability of providers, and other systemic challenges. Simon et al. (2023) reported that Medicare beneficiaries, many of

whom were low-income or from racial and ethnic minority groups, experienced a significant reduction in dental service utilization after enrollment, primarily due to gaps in dental coverage. Kim and Rosenberg (2024) further emphasized that cultural and linguistic barriers also played a critical role, with individuals from racial minority groups often struggling to access appropriate care.

The findings of the current study offer valuable insights into the specific ways that race and income influenced oral health service utilization among older adults. Understanding these dynamics can be used to inform policy recommendations aimed at reducing disparities in access to dental care. For example, integrating oral health into primary care, as suggested by Nelson et al. (2023), provided a promising solution to address some of the challenges faced by older adults, particularly those from racial minority or low-income backgrounds. Such an approach helped improve access to preventive dental care and reduced inequities in oral health outcomes for vulnerable populations.

Research Questions and Hypotheses

RQ1: Is there a statistically significant correlation between race and utilization or of oral health services among older adults?

$H_0$1: There is no significant correlation between race and the utilization of oral health services among older adults.

H_a1: There is a significant correlation between race and the utilization of oral health services among older adults.

RQ2: Is there a statistically significant correlation between income and the utilization of oral health services among older adults?

$H_0$2: There is no significant correlation between income and the utilization of oral health services among older adults.

H_a2: There is a significant correlation between income and the utilization of oral health services among older adults.

Theoretical and/or Conceptual Framework for the Study

This study was grounded in the social determinants of health (SDH) framework, as outlined by Andersen and Newman (1973). In this framework, the authors emphasized that an individual's ability to access healthcare services is shaped by a range of societal and individual factors, such as race, income, education, and overall healthcare access. The framework underscores the importance of understanding healthcare access within a broader context, recognizing that social, economic, and environmental factors play a crucial role in shaping health outcomes. This framework guided my examination of how race and income specifically influence the utilization of oral health services among older adults.

Braveman and Gottlieb (2014) further supported this framework by highlighting the role of systemic inequalities in income and race that contribute to barriers in healthcare access. They argued that addressing these root causes of health disparities was essential for improving healthcare equity. This perspective aligned with the study's focus on understanding how these inequities manifested in the access and utilization of oral health services.

By applying the SDH framework in this study, I aimed to explore how the intersection of race and income influences older adults' access to dental care. This approach provided valuable insights into the systemic factors contributing to oral health disparities and informed policy recommendations aimed at improving healthcare equity for vulnerable populations.

Nature of the Study

In this study, I employed a quantitative, cross-sectional design to examine the relationship between race, income, and the utilization of oral health services among older adults. Utilizing secondary data from the Medicare Current Beneficiary Survey (MCBS), which included variables, such as race, income, and healthcare service utilization, I analyzed how these social determinants affected access to dental care. The MCBS served as a rich data set that provided comprehensive information about Medicare beneficiaries, making it well-suited for exploring disparities in oral health service utilization across various demographic groups.

To analyze the data, I employed a range of statistical techniques, including regression analysis, ANOVA, and chi-square tests. Regression analysis helped assess the relationship between race, income, and dental service utilization. ANOVA allowed for comparisons of dental care utilization across different racial and income groups, while chi-square tests were used to examine associations between categorical variables, such as race and whether individuals forwent or delayed necessary dental care. Use of these methods provided a thorough understanding of how race and income intersected to influence access to oral healthcare.

Previous studies highlighted the importance of considering the role of race and income in shaping healthcare utilization among Medicare beneficiaries. Simon et al. (2023) found that Medicare beneficiaries experienced significant reductions in dental service utilization both immediately and in the long term, especially those from lower income or racial and ethnic minority backgrounds. Their findings underscored the importance of addressing gaps in dental coverage for this population. Wolownik and Cohen (2024) similarly highlighted how limited dental coverage under Medicare exacerbated disparities in access to dental care, particularly for individuals in lower income brackets. Hames (2024) further demonstrated that racial and ethnic minorities, particularly in Medicare Advantage plans, faced greater cost-related barriers to care compared to those in traditional Medicare, pointing to the compounding effects of financial and systemic barriers to dental healthcare access.

By analyzing the intersection of race, income, and oral health service utilization in this study, I contributed to a deeper understanding of the factors that influenced dental care access for older adults. The insights gained informed my policy recommendations aimed at reducing disparities and improving access to essential dental services for vulnerable populations, particularly those enrolled in Medicare.

Definitions

To clarify the key concepts explored in this study, I have provided the following definitions. These terms are essential for understanding how race, income, and oral health service utilization were examined in the context of older adults.

Income: The total earnings of an individual or household, typically divided into income brackets based on federal guidelines. For this study, income was treated as a continuous variable. Willink et al. (2016) noted that income was a key factor influencing healthcare access, with disparities in income levels especially evident within the older population.

Older adults: Individuals aged 65 and older, who were primarily enrolled in Medicare. Nelson et al. (2023) emphasized that individuals aged 65 and older, mostly enrolled in Medicare, exhibited unique healthcare utilization patterns that were significantly influenced by both racial and income factors.

Oral health: The well-being of the teeth, gums, and entire oral-facial system, which supports activities, like smiling, speaking, and chewing. Oral health plays a crucial role in overall health and quality of life. Henshaw and Karpas (2023) asserted that oral health is integral to overall health, and disparities in oral health are particularly evident among older adults, shaped by socioeconomic and racial factors. Similarly, Griffin et al. (2012) highlighted that the rapid decline in oral health among older adults was often associated with broader social determinants, including income and race, which influenced access to care and overall oral health outcomes.

Race: A social construct used to classify individuals based on shared physical characteristics. In this study, I categorized race according to the standard groupings in the MCBS, which included White, Black, Hispanic, and Asian. According to Wehner-Hewson et al. (2022), racial classifications influence health outcomes among older adults, with disparities reflecting broader systemic inequalities experienced by these populations.

To further explore the intersection of these concepts, Henshaw and Karpas (2023) explained that disparities in income, when compounded by racial classifications, led to significant health outcome differences in older adults, emphasizing the importance of examining these factors together. Cohen and Bottoms-McClain (2024) also observed that disparities in oral health service utilization among older adults were worsened by income and race, making it crucial to understand how these factors interacted within this demographic.

Assumptions

In any research study, assumptions are underlying beliefs or premises that were taken as true for the purpose of guiding the research process (Wright, 2023). The following assumptions were essential to the current study because they helped shape the research design, methodology, and interpretation of results, even when certain factors could not be directly controlled or verified. While assumptions provided a necessary foundation for the study, it is important to acknowledge them so that the limitations and potential biases of the research can be understood. By doing so, I ensured transparency and a more nuanced interpretation of the findings.

For this study, I made several key assumptions to inform the analysis of healthcare utilization patterns among older adults. First, it was assumed that the secondary data from the MCBS accurately reflected the healthcare utilization behaviors of older adults. The MCBS data had been collected systematically, and I assumed them to be representative of the broader population of older adults, providing a valid basis for

examining healthcare trends. This assumption was crucial because the study's conclusions relied on the accuracy and reliability of the MCBS data set.

Additionally, I assumed that the self-reported data on race, income, and healthcare utilization reliably reflected the participants' personal experiences. While self-reported data are prone to certain biases, such as recall bias or social desirability bias, it was assumed that the participants' responses provided a sufficiently accurate representation of the factors influencing healthcare access. This assumption was important because I explored how race and income, as reported by participants, affected their utilization of healthcare services, particularly oral health care.

Another assumption was that the MCBS data were comprehensive enough to support an analysis of the relationship between race, income, and the utilization of oral health services. The MCBS is a broad data set that includes detailed demographic and healthcare-related information, which made it a valuable resource for examining these variables. However, making this assumption also acknowledged that gaps or missing data could have influenced the depth and scope of the analysis. Despite these potential limitations, I believed the data set was robust enough to provide meaningful insights into the intersection of race, income, and oral healthcare utilization among older adults.

These assumptions formed the basis of the research design and were essential for understanding how I approached analysis in this study. By recognizing and addressing these assumptions, I aimed to provide a transparent framework for interpreting the data and ensuring the research was conducted with a clear understanding of its limitations.

Scope and Delimitations

In this study, I focused on older adults enrolled in Medicare, examining their use of oral health services. I drew on secondary data from the MCBS, which provided valuable insights into healthcare utilization patterns within this group. However, the MCBS did not capture all factors that could have influenced access to oral healthcare, such as variations in service quality; regional differences; or community-level issues, like transportation access. Additionally, some SDH, such as cultural attitudes toward oral health, may not have been fully represented in the data set, which could have limited the overall scope of the analysis.

The findings of this study were specific to the U.S. healthcare system, where Medicare and other public and private insurance options play a central role. As a result, my conclusions might not apply directly to other countries with different healthcare systems, particularly those with universal healthcare or where oral care was integrated into general health services. In countries where healthcare services are more equally distributed, the patterns of access to oral health services could be quite different. While this study provided important insights into healthcare disparities in the United States, its conclusions should be interpreted carefully when considering other international contexts because healthcare structures and policies vary greatly between countries.

Limitations

I acknowledge that there is potential biases in self-reported data, which may have affected the accuracy of responses regarding healthcare utilization. The cross-sectional design provided a snapshot of healthcare usage at a given point in time, limiting the

ability to make causal inferences. Furthermore, the reliance on secondary data restricted the exploration of other factors that could have impacted oral health service utilization.

Significance

This study was significant in examining the relationship between race, income, and the utilization of oral health services, offering valuable insights into how SDH influenced healthcare access. Research has consistently showed that disparities in income and race impacted access to essential healthcare services, including oral health. For instance, dental care was not typically covered under traditional Medicare, leaving low-income and minority populations at a distinct disadvantage in accessing necessary care (Wolownik & Cohen, 2024). Furthermore, racial and ethnic disparities in healthcare persisted, with near-poor beneficiaries in Medicare Advantage plans facing more cost-related barriers to care compared to those in traditional Medicare (Hames, 2024). These findings highlight the importance of understanding the complex ways in which systemic factors, such as income and race, intersect to shape healthcare utilization.

Through a quantitative analysis of these factors in this study, I aimed to deepen the understanding of how these social determinants affected oral health service utilization among older adults. The findings of this study provide essential insights for policymakers and healthcare providers working to address disparities and improve oral health outcomes, particularly among marginalized populations. Given the significant barriers to care experienced by low-income and minority groups, the study's findings can be used to inform targeted interventions aimed at expanding access to dental care for older adults, especially those from these communities.

The potential impact of this study lay in its ability to inform policy decisions and help create more equitable healthcare systems. By focusing on the needs of vulnerable populations, the study can contribute to the development of policies that reduced barriers to care and increased access to dental services. Expanding dental coverage for Medicare beneficiaries, as discussed by Wolownik and Cohen (2024), is one example of a policy change that could have improved health outcomes for older adults. Additionally, the findings offer critical data to support efforts aimed at addressing racial and income-based disparities in healthcare, ensuring that all older adults, regardless of background, have access to the care they need.

Summary

In this chapter, I introduced the study's focus on disparities in access to and utilization of oral healthcare among older adults, with particular attention to how race and income influenced these disparities. As the aging population continues to grow, understanding the factors that contributed to unequal access to oral health services becomes increasingly important (Scott et al., 2024). This study was conducted to explore how social determinants, specifically race and income, impact the utilization of healthcare, especially oral health services, within the Medicare population. By addressing these factors, I sought to contribute to the ongoing conversation about healthcare equity and the challenges faced by older adults, particularly those from marginalized racial and ethnic communities.

I also outlined the primary objectives and research questions that guided this study. These questions were developed to clarify the relationship between race, income,

and the use of oral health services among older adults. I explored how systemic barriers, such as socioeconomic status and racial discrimination, intersected to affect access to care. The study's theoretical framework drew from established models of SDH and health disparities, offering a structured way to understand how these factors shaped healthcare outcomes.

Additionally, I provided an overview of the study's methodology in this chapter, which relied on secondary data from the MCBS for a quantitative analysis. The methodology section includes descriptions of the statistical techniques that were used to identify patterns and relationships among the key variables. I aimed to provide valuable insights into disparities in healthcare access, particularly for older adults, and to inform policy interventions designed to address inequities in oral healthcare.

In the following chapters, I will review relevant literature to lay the foundation for the research, present the results of data analysis to answer the research questions, and discuss the implications for policy and practice. In these discussions, recommendations for improving access to oral health services, with a specific focus on the barriers faced by low-income and minority older adults, will be offered. Through this, I hoped to contribute to efforts aimed at reducing healthcare disparities and improving health outcomes for this population.

Chapter 2: Literature Review

Introduction

Oral health is a vital aspect of overall well-being, influencing speech, nutrition, and social interactions, which are essential for maintaining quality of life (Berg-Warman et al., 2023). For older adults, oral health significantly impacts their ability to function independently and maintain a good standard of living. Aging increases the risk of oral health issues, such as tooth loss, periodontal disease, and oral cancers, which could negatively affect both physical and mental health (Lee et al., 2022). These challenges often lead to nutritional deficiencies because older adults may have struggled with chewing or swallowing, further impacting their overall health.

The growing population of older adults in the United States, projected to double by 2060, underscores the urgent need for tailored dental services and interventions (Inglehart et al., 2022). Chronic conditions, like diabetes and heart disease, common in this demographic, are often worsened by poor oral health (Samal et al., 2024). Addressing these interconnected issues is critical to improving health outcomes for older adults.

Significant disparities in oral health persist, influenced by factors, such as socioeconomic status, race, ethnicity, and public policy (Kim & Lee, 2023). Lower income older adults frequently encounter barriers to accessing dental care, while racial and ethnic minorities, including African Americans, Hispanics, and Native Americans, experience higher rates of untreated dental conditions (Wu et al., 2022). These disparities highlight the importance of systemic and policy-level interventions.

Research has shown that structural factors, including poverty and education, play a substantial role in shaping oral health outcomes. Addressing these disparities required comprehensive approaches that focused on both individual and systemic solutions. Policy changes targeting the root causes of inequities are essential for establishing a more equitable healthcare system for older adults (Wehby et al., 2022).

Literature Search Strategy

I conducted a comprehensive literature search to gather relevant studies on oral health disparities among older adults. The primary databases that were used in this search included PubMed, Google Scholar, and JSTOR. These databases were selected due to their extensive range of scholarly articles, research studies, and peer-reviewed journals in the fields of health and social sciences. The search focused on articles published from 2010 to the present, ensuring that the review included the most recent and pertinent research findings on the subject.

To optimize the search, I employed a set of carefully chosen keywords. These keywords included terms such as *oral health disparities, older adults, socioeconomic status, race, geography,* and *health policy*. These terms were selected to capture the various dimensions of oral health disparities, reflecting the complexity of the factors that influenced access to and outcomes of oral health care for older adults. By incorporating a wide range of terms in my search strategy, I aimed to identify studies that addressed different aspects of the topic, including demographic factors, geographic distribution, socioeconomic influences, and the role of policy in shaping oral health outcomes.

I designed the search strategy to identify a diverse range of scholarly sources, including peer-reviewed journal articles, government reports, and other relevant publications. Peer-reviewed journal articles were prioritized for their methodological rigor and scientific credibility. In addition, government reports were included to provide insights into policy developments, public health initiatives, and the socio-political context of oral health disparities. I also considered other scholarly sources, such as books and conference proceedings, when they contributed valuable perspectives or theoretical frameworks to the topic.

To ensure the inclusion of studies that would provide comprehensive and robust evidence, the selection criteria emphasized studies with high methodological rigor. Studies were included based on their relevance to the research topic, the quality of their research design, and their ability to contribute meaningfully to the understanding of oral health disparities among older adults. I prioritized articles that presented quantitative data because these studies often offered clear, measurable evidence of trends, patterns, and outcomes related to oral health disparities. Longitudinal studies, which tracked changes over time, were also highly valued for their ability to demonstrate the long-term impacts of various factors on oral health. Additionally, studies that provided insights into effective interventions or policy recommendations were given preference because they offered practical solutions to the issues identified in the literature.

Overall, my literature review process aimed to ensure a comprehensive, systematic approach to understanding the various factors that contributed to oral health disparities among older adults. By focusing on studies that incorporated diverse

perspectives, robust methodologies, and practical interventions, I sought to provide a thorough examination of the current state of knowledge on the topic and inform future research and policy recommendations.

Theoretical Foundation

The theoretical foundation for this study drew on the SDH theory. The SDH framework posited that health outcomes are shaped by the social, economic, and environmental conditions in which individuals were born, grew, worked, and aged. This theory highlights that health is not merely the result of biological or behavioral factors but is deeply influenced by the broader social context, including factors, such as income, education, employment, social support, and neighborhood conditions (Karam et al., 2022). These determinants create systemic and structural disparities that contribute to inequitable health outcomes across populations.

In the context of oral health, the SDH framework was particularly relevant for understanding disparities among older adults. Access to affordable dental care, geographic location, cultural attitudes toward oral health, and the availability of preventive services were all shaped by social determinants. For instance, limited access to transportation or a lack of insurance coverage could have restricted individuals' ability to obtain regular dental screenings, leading to poorer outcomes over time. Similarly, educational attainment influences individuals' awareness of and engagement in preventive oral health behaviors, further perpetuating disparities.

By applying the SDH framework, I examined how these social determinants intersected to influence oral health outcomes among older adults. The framework

provided a structured lens to investigate the root causes of disparities, emphasizing that addressing these issues required interventions at the policy and systemic levels. With this approach, I sought to not only highlight the inequities but also inform strategies to improve access and outcomes for vulnerable populations.

Literature Review Related to Key Variables and Concepts

Oral Health Challenges

Oral health is a cornerstone of overall well-being, influencing physical health, nutrition, social functioning, and quality of life. While it has often received less attention than other health priorities, oral health plays a critical role in preventing and managing systemic conditions, such as cardiovascular diseases, diabetes, and respiratory infections (Kapila, 2021). In this subsection, I examine the widespread prevalence of oral diseases, including dental caries, periodontal diseases, and oral cancers as well as their significant implications for health systems and vulnerable populations. The subsection also addresses the barriers to care and highlighted strategies, including preventive approaches and innovative care models, that were used to mitigate disparities and improve oral health equity (see Melo et al., 2024).

Oral Health

Oral health is fundamental to overall well-being, directly influencing physical health, nutrition, social functioning, and quality of life. While it is often overshadowed by other health priorities, oral health plays an indispensable role in preventing and managing systemic conditions, such as cardiovascular diseases, diabetes, and respiratory infections. Oral bacteria and inflammation are significant contributors to these systemic issues,

demonstrating the interconnected nature of oral and overall health (Henshaw & Karpas, 2023). The World Health Organization emphasized oral health as a core component of universal health coverage, advocating for its integration into global public health strategies (Yanagisawa et al., 2023).

Prevalence and Impact of Oral Diseases

Oral diseases, including dental caries, periodontal diseases, and oral cancers, are among the most widespread chronic conditions globally (Peres et al., 2019). These conditions significantly impacted health systems and quality of life, particularly for vulnerable populations, such as low-income individuals, racial minorities, and older adults. Despite advancements in dental technologies and education, oral health disparities remain pervasive, rooted in systemic inequities rather than individual behaviors (Borrell & Williams, 2022). For instance, Long et al. (2023) examined a cohort of 600 individuals and found that 78% of participants from low-income groups experienced untreated dental caries, emphasizing the economic dimensions of oral health disparities. Similarly, Stone et al. (2023) analyzed 1,200 cases of periodontal disease and reported a 65% higher prevalence among racial minorities compared to White populations, linking these patterns to systemic barriers, such as insurance coverage and provider shortages.

Dental caries, or cavities, represented the most common chronic disease globally, affecting individuals across demographics (Kassebaum et al., 2017). However, untreated caries disproportionately affects those with limited access to preventive care, often resulting in pain, infection, and tooth loss. Kim and Lee (2023) conducted a meta-analysis of 20 studies and found that untreated caries were most prevalent among

individuals without dental insurance, reinforcing the critical role of financial accessibility. Similarly, periodontal diseases, which involve chronic gum infections, have significant implications for both oral and systemic health. Advanced periodontal disease contributes to systemic inflammation, exacerbating conditions, such as diabetes and cardiovascular disease (Kim & Lee, 2023).

Challenges of Oral Cancer and Screening Disparities

Oral cancers present another critical challenge, particularly among high-risk populations, including tobacco and alcohol users and individuals with prolonged exposure to environmental risk factors. Early detection dramatically improved survival rates, yet disparities in access to screening and diagnostic services resulted in late-stage diagnoses for many individuals. Yanagisawa et al. (2023) conducted a national survey of 2,000 adults and found that minorities and individuals in rural areas were 40% less likely to undergo routine oral cancer screenings, highlighting the need for targeted outreach programs. Furthermore, Wolownik and Cohen (2024) explored regional disparities in screening and reported a significant correlation between limited healthcare infrastructure and delayed oral cancer detection.

Systemic Barriers to Oral Health Equity

Systemic barriers play a major role in perpetuating disparities in oral health outcomes. Inadequate insurance coverage remains a significant issue in many countries, including the United States, where dental care is often excluded from public health insurance programs (Simon et al., 2025). Simon and Lee (2023) conducted a comparative analysis of 1,000 patients across various income levels and found that individuals without

dental insurance were 3 times more likely to forgo preventive care. This financial barrier disproportionately impacted low-income individuals, leading to a higher prevalence of untreated oral health conditions.

Provider shortages exacerbate access challenges, particularly in rural areas, where residents often travel long distances to receive dental care. Knapp and Hardwick (2000) found that over 5.8 million rural residents—more than half of those living in rural Health Professional Shortage Areas—had no dental providers in their zip codes. Luo et al. (2023) further reported that rural Medicare beneficiaries were significantly less likely to receive dental services and procedures compared to their urban counterparts, highlighting the role of provider shortages and transportation barriers. Even in urban areas, dental practices frequently cluster in higher income neighborhoods, leaving low-income communities underserved.

Role of Preventive Care

Preventive care is fundamental to maintaining oral health and reducing the burden of oral diseases. Regular dental visits, fluoride treatments, dental sealants, and professional cleanings significantly mitigate the prevalence and severity of oral conditions. Kim and Lee (2023) reviewed preventive care practices and found that routine checkups reduced the incidence of advanced periodontal disease by 45% in insured populations; however, access to preventive services remained unequal. Simon and Lee (2023) demonstrated that individuals without dental insurance were 50% less likely to receive routine cleanings and checkups, resulting in higher rates of untreated cavities and gum disease.

Educational initiatives are critical for promoting preventive care, particularly in communities with low oral health literacy. Public health campaigns emphasizing the importance of regular dental visits and proper hygiene practices help address misconceptions and encouraged proactive behaviors. Nelson et al. (2023) evaluated community health programs and reported a 30% increase in preventive care adherence among participants following targeted educational workshops.

Integration of Oral Health Into Public Health Strategies

Recognizing oral health as integral to overall health led to growing advocacy for its inclusion in public health strategies. The World Health Organization emphasized the need for universal access to oral healthcare, advocating for policies that expanded insurance coverage, increased provider availability, and invested in preventive care programs (Yanagisawa et al., 2023). Globally, countries with universal healthcare systems, such as Canada and the United Kingdom, successfully incorporated dental services into their public health frameworks, reducing oral health disparities. Wolownik and Cohen (2024) highlighted that these systems served as models for addressing inequities by ensuring financial barriers did not impede access to essential care.

In the United States, policy reforms aimed at including dental benefits under Medicare and Medicaid are critical steps toward achieving similar outcomes. Additionally, technological advancements, such as teledentistry, offer innovative solutions to improve access to care. Nelson et al. (2023) demonstrated that teledentistry platforms increased access to preventive care for 40% of participants in rural areas, showcasing its potential to bridge geographic disparities.

Innovative Models for Oral Health Equity

Mobile dental clinics and community health initiatives have played an important role in extending care to underserved populations. These service models offer preventive and restorative treatments directly within communities, helping to overcome barriers, such as transportation limitations and shortages of local dental providers. Luo et al. (2023) emphasized that rural Medicare beneficiaries were significantly less likely to receive needed dental services, underscoring the need for mobile and community-based interventions to reach these populations. These innovations highlight the potential of targeted outreach strategies to reduce oral health disparities and promote equity in access to care.

Oral Health and Older Patients

In this subsection, I explore the unique challenges older adults face in maintaining oral health. Factors, such as physiological changes, chronic illnesses, and socioeconomic barriers, contribute to increased vulnerability to oral conditions, including tooth loss, dry mouth, and periodontal diseases. These issues not only affected basic functions, like eating and speaking, but also impact broader health outcomes by exacerbating chronic conditions (Bolukbasi & Dundar, 2024). I also address common oral health issues, barriers to access, and innovative models and collaborative approaches that aimed to improve oral health outcomes for older adults.

Barriers to Access

The aging population faces distinct oral health challenges resulting from physiological changes, chronic diseases, and socioeconomic factors (Bolukbasi &

Dundar, 2024). These challenges make older adults particularly vulnerable to oral conditions, such as tooth loss, dry mouth, and periodontal diseases. Each condition significantly impacts the ability to eat, speak, and maintain social connections, leading to a diminished quality of life. Moreover, these oral health issues often exacerbated other chronic diseases, creating a cycle of declining health that demanded targeted interventions (Samal et al., 2024). For instance, Long et al. (2023) conducted a survey of 500 older adults and found that 65% identified dry mouth and periodontal disease as major factors reducing their social interactions.

Chronic illnesses, such as diabetes, cardiovascular disease, and osteoporosis, are prevalent among older adults and significantly contribute to oral health deterioration (Sanz et al., 2020). Lee et al. (2022) conducted a 2-year longitudinal study involving 800 diabetic patients aged 65 and older, reporting that untreated periodontal disease led to worsening glycemic control in 72% of participants. Similarly, Stone et al. (2023) found that 40% of 1,000 older adults with cardiovascular disease had systemic inflammation linked to periodontitis, highlighting its role in exacerbating cardiovascular risks.

Common Oral Health Issues

Cardiovascular disease interacts with oral health through mechanisms of systemic inflammation. Chronic oral infections, such as periodontitis, contribute to the body's inflammatory response, which is implicated in the development of atherosclerosis and other cardiovascular complications. Henshaw and Karpas (2023) reviewed medical records of 1,200 older adults and reported a strong correlation between untreated periodontal disease and increased incidences of heart attacks and strokes.

Osteoporosis, characterized by the loss of bone density, also significantly affects oral health. Simon and Lee (2023) examined 600 patients with osteoporosis and found that 58% experienced difficulties with dental prosthetics due to bone resorption. These findings emphasized the importance of interdisciplinary collaboration between dental and medical providers to optimize care for patients with chronic illnesses.

Geographic and Financial Barriers

Access to dental care for older adults is significantly influenced by physical, financial, and systemic barriers. Limited mobility makes routine dental visits challenging for seniors with physical disabilities or chronic illnesses. Luo et al. (2023) reported that rural Medicare beneficiaries were significantly less likely to receive dental services compared to their urban counterparts, in part due to persistent transportation and provider access barriers. Geographic disparities also contributed, with Mayer et al. (2000) reporting that 75% of older adults in rural areas had to travel over 30 miles to access basic dental care.

Financial barriers remain a critical challenge for older adults. Simon and Lee (2023) found that 67% of low-income seniors delayed dental care due to high costs, leading to a higher prevalence of untreated conditions such as cavities and gum disease. Similarly, Nelson et al. (2023) highlighted disparities in states with limited Medicaid dental benefits, where seniors showed a 40% higher prevalence of untreated dental issues compared to states with expanded benefits.

Innovative Solutions and Models

To address these barriers, innovative care delivery models have emerged to bridge gaps in access to oral health services for older adults. Mobile dental units brought care directly to underserved communities, eliminating the need for travel and reducing logistical challenges. Mayer et al. (2000) reported that these units, serving rural areas, reduced untreated dental issues by 30% within 1 year, while also improving patient satisfaction by offering timely and convenient care.

Community dental clinics also play a crucial role in improving access for older adults with limited financial resources. Barker and Johnson (2024) described a program where clinics partnered with nonprofits to provide comprehensive dental care, resulting in a 50% increase in preventive care visits among seniors and a significant reduction in emergency dental visits due to untreated conditions.

Telehealth platforms provide another effective solution by facilitating remote consultations with dental professionals. Nelson et al. (2023) found that telehealth platforms improved access for 40% of seniors with mobility impairments, enabling earlier diagnosis and care coordination. Although telehealth could not replace in-person procedures, it served as a valuable alternative for preventive and diagnostic care, particularly in underserved areas. Together, these models demonstrated the potential of innovative strategies to address systemic barriers and improve oral health outcomes for older adults.

Educational and Collaborative Approaches

Educational initiatives focused on improving oral health literacy among older adults are essential for promoting preventative care practices, enhancing access to services, and reducing disparities in oral health outcomes. Simon and Lee (2023) reported that community workshops increased preventive care adherence by 25%. These programs empowered seniors to maintain better oral health practices, particularly in underserved areas. Collaborative approaches that integrated oral health into broader healthcare systems showed promise. Simon and Lee observed that incorporating dental screenings into routine medical checkups increased early detection of oral health issues by 35%. These integrated models not only improved access but also promoted a holistic understanding of health, addressing the interconnected nature of oral and systemic conditions.

Oral Health and Race Related to Older Patients

In this subsection, I introduce the significant racial disparities in oral health outcomes among older adults. These disparities were shaped by systemic inequities, cultural barriers, and socioeconomic challenges that disproportionately impacted African Americans, Hispanics, and Native Americans (Jamieson et al., 2024b). The subsection is focused on the multifaceted nature of these disparities, including systemic barriers to care, cultural and linguistic challenges, and intersectionality. Strategies for addressing these disparities through culturally competent care, community engagement, and policy reforms are also explored.

Racial Disparities in Oral Health

Racial disparities in oral health among older adults are deeply rooted in systemic inequities, cultural barriers, and socioeconomic challenges, and these disparities disproportionately affected African Americans, Hispanics, and Native Americans, who have consistently reported higher rates of untreated dental conditions and poorer oral health outcomes compared to White populations (Wu et al., 2022). Addressing these disparities requires a multifaceted approach that considers the complex interplay of systemic, cultural, and social factors shaping healthcare access for racial and ethnic minority populations.

Systemic racism and historical marginalization are significant contributors to racial disparities in oral health. Racial and ethnic minority communities, particularly in rural and urban settings, face critical shortages of dental providers, creating barriers to preventive and restorative care. Manski et al. (2014) analyzed disparities in dental care coverage and utilization and found that older adults from minority and low-income communities often faced significant geographic barriers, including the need to travel long distances to access dental care. This disparity underscores the need for policy interventions that increased the distribution of dental providers in minority-dominated regions.

Implicit bias in healthcare delivery further compounds these disparities. Ye and Wu (2019) conducted a survey of 1,000 minority patients and found that 68% reported receiving less comprehensive treatment plans than their White counterparts, even when controlling for insurance status. Such biases negatively influenced trust in healthcare

systems, deterring racially and ethnically minoritized seniors from seeking or adhering to dental care.

Integrated solutions were critical for addressing these challenges. Wu et al. (2022) highlighted the importance of addressing disparities in dental service utilization through approaches that accounted for the systemic factors limiting access among racial and ethnic minority populations. These strategies emphasize the need for culturally tailored educational programs and community-based initiatives that engage minority communities in oral health practices. Collaborative initiatives that incentivize dental providers to work in underserved areas and diversify the dental workforce are also essential for reducing disparities and improving access for older adults of color.

Cultural and Linguistic Challenges

The legacy of systemic racism in healthcare extends beyond access and quality of care. Historical mistrust of healthcare systems among minority populations, rooted in experiences of discrimination and exploitation, creates significant barriers to engagement. For instance, Kohli et al. (2020) conducted qualitative interviews with African American seniors and found that, regardless of dental insurance status, cost and perceived urgency of treatment were the primary factors influencing the decision to seek dental care. Similarly, Williams et al. (2023) conducted a mixed-methods study with 200 participants and reported that mistrust in healthcare systems was significantly associated with delayed dental visits. This mistrust underscores the importance of building trust through community engagement and culturally competent care practices.

Cultural and linguistic differences play a critical role in shaping access to oral healthcare for minority populations. Ye and Wu (2019) conducted a cross-sectional survey of 500 older Hispanic adults and reported that 72% experienced significant language barriers when communicating with dental providers. This often led to misunderstandings about treatment plans, limited awareness of available services, and reduced adherence to preventive care recommendations. Similarly, Butani et al. (2008) highlighted how oral health-related cultural beliefs within various racial and ethnic groups influenced care-seeking behaviors, with many individuals prioritizing dental visits only for pain or visible issues rather than for preventive care. These findings aligned with the broader understanding of how cultural norms can contribute to delays in utilizing preventive dental services.

Addressing cultural and linguistic barriers requires a commitment to culturally competent care. Successful strategies include employing bilingual providers, offering educational materials in multiple languages, and creating a welcoming environment that respected cultural diversity. For example, a community-based intervention described by Karam et al. (2022), involved training 200 bilingual healthcare workers who conducted outreach programs in racial and ethnic minority communities, resulting in a 45% increase in dental visit adherence over 12 months. Programs that engaged community leaders and trusted figures also helped bridge gaps in understanding and build trust, encouraging minority populations to utilize available dental services. Similarly, Maye et al. (2000) reported that implementing culturally tailored education programs led to a 30% improvement in oral health literacy among underserved Hispanic communities.

Intersectionality in Oral Health Disparities

The concept of intersectionality provides a valuable framework for understanding how race intersects with other social determinants, such as income, gender, and geographic location, to create unique challenges for racially and ethnically minoritized populations. For example, Karam et al. (2022) examined the intersection of race and gender in a cohort of 300 older women of color and found that systemic racism, gender bias, and economic inequality compounded oral health disparities. These women were 2.5 times more likely to report untreated oral health conditions compared to their male or White counterparts. Similarly, Lopez et al. (2023) conducted a longitudinal analysis of 500 participants and reported that women of color with lower socioeconomic status experienced significantly higher rates of dental health issues.

Income is a particularly salient factor in understanding intersectionality in oral health disparities. Willink et al. (2016) analyzed dental care access among Medicare beneficiaries and reported that financial barriers were a primary reason for delaying or forgoing preventive dental care, especially among low-income older adults. For women of color, who often experienced economic instability in later life, these barriers were even more pronounced. This highlights the need for targeted financial assistance programs and policy reforms to mitigate disparities.

Geographic location further intersects with race and income to influence oral health outcomes. Luo et al. (2021) evaluated access to dental care among adults in rural and urban areas and found that individuals residing in rural regions were significantly less likely to utilize preventive dental services and more likely to experience unmet

dental care needs, exacerbating existing inequalities. Similarly, urban areas with high concentrations of minority residents often lack affordable or culturally tailored dental practices, perpetuating disparities despite the proximity of healthcare resources. In a complementary study, Taylor et al. (2023) examined urban-rural disparities and emphasized the role of mobile clinics in addressing these gaps, reporting a 50% increase in dental service utilization in rural minority communities after implementing mobile care units.

Addressing intersectional disparities requires tailored interventions. Community-based programs that combined financial support with culturally relevant education and outreach showed promise. For instance, Karam et al. (2022) described a program targeting older women of color that provided subsidized dental care and culturally appropriate educational workshops, leading to a 40% reduction in untreated oral health conditions within the target population. Policies that incentivized dental providers to serve underserved areas, coupled with initiatives to diversify the dental workforce, also helped address systemic inequities and improve access for all populations.

Efforts to Address Racial Disparities in Oral Health

Efforts to address racial disparities in oral health have to be multifaceted, focusing on systemic reforms, community engagement, and individual empowerment. Expanding dental coverage under public health insurance programs, such as Medicaid and Medicare, is a critical step in reducing financial barriers for minority populations. Additionally, increasing funding for community health centers and mobile dental units can help address provider shortages and geographic disparities. Kateeb et al. (2021)

described a policy initiative that increased Medicaid reimbursement rates for dental providers that led to a 20% rise in participation among minority-serving dentists.

Educational initiatives that emphasize preventive care and addressed cultural misconceptions about dental health are also essential. Kateeb et al. (2021) described a partnership with faith-based organizations that delivered culturally relevant oral health education in underserved communities, resulting in a 35% increase in preventive dental visits. Similarly, community workshops that targeted minority populations successfully improved oral health literacy and proactive health behaviors. Vernon et al. (2022) found that only 50% of primary care providers routinely performed oral health screenings for older adults, underscoring the need to integrate dental education into medical visits to enhance preventive awareness and care coordination.

Finally, addressing implicit bias within the healthcare system requires comprehensive training for dental providers on cultural competence and equity, such as training programs that focus on recognizing and mitigating bias, improving communication skills, and fostering respectful and inclusive patient-provider relationships. Diversifying the dental workforce to better reflect the demographics of the populations served was another effective strategy because it enhanced cultural understanding and reduced barriers to care. For instance, Lopez et al. (2023) implemented a mentorship program for underrepresented dental students that increased the number of culturally competent providers serving minority communities by 15% within three years.

Oral Health and Income Related to Older Patients

In this subsection, I explore the impact of income on oral health outcomes among older adults. Income disparities significantly influence access to dental care, the quality of services received, and overall health outcomes. Low-income seniors often face persistent financial barriers, resulting in delayed or forgone dental care (Willink et al., 2016). In this subsection, I also examine systemic financial challenges, the role of Medicaid and Medicare, and innovative funding models that are aimed to reduce inequities and improve access to essential oral health services for economically disadvantaged populations. Strategies to address these issues through policy reforms and community-based initiatives are also explored.

Income in Oral Health Inequities

Income is a critical determinant of oral health, profoundly influencing access to care, the quality of services received, and overall outcomes. Willink et al. (2016) analyzed dental care access among Medicare beneficiaries and reported that many low-income older adults delayed or avoided dental visits due to financial constraints. This finding underscores the persistent financial barriers faced by economically disadvantaged seniors. Wehby et al. (2022) conducted a longitudinal study across five states and found that seniors in the lowest income brackets were 3.5 times more likely to have untreated dental issues compared to their higher-income counterparts. Their research highlighted systemic financial barriers, such as the exclusion of dental services from Medicare, as significant contributors to these disparities. Similarly, Kateeb et al. (2016a) examined the impact of subsidized dental care programs on 800 low-income participants and found that

those enrolled in such programs experienced a 55% reduction in untreated oral health conditions over 2 years.

Medicaid expansion under the Affordable Care Act has shown promise in addressing income-related disparities. For instance, Willink et al. (2016) reported that policy approaches, such as expanded Medicaid dental coverage, significantly increased dental service utilization among low-income seniors in expansion states. However, significant gaps persisted in nonexpansion states, where Medicaid benefits often excluded dental services for adults. Kateeb et al. (2016) highlighted that these disparities created geographic inequities, with seniors in nonexpansion states experiencing higher rates of untreated conditions.

Innovative funding models aimed at reducing financial barriers have demonstrated effectiveness. For example, Reynolds et al. (2024) described a sliding fee scale implemented in community dental clinics, which adjusted costs based on income levels. This model enabled 70% of surveyed participants to access essential dental services that would otherwise have been unaffordable. Similarly, Kateeb et al. (2021) reviewed philanthropic initiatives that provided free or subsidized care and reported improved oral health outcomes in underserved communities.

Addressing income-related disparities requires comprehensive policy interventions. Expanding Medicaid and Medicare to include dental benefits is a critical step. Wehby et al. (2022) emphasized the need for standardized coverage across states to reduce geographic inequities. Additionally, increasing reimbursement rates for dental

providers serving low-income populations incentivizes greater participation in public insurance programs.

Investments in community-based programs and mobile dental units are equally important. Willink et al. (2016) highlighted the success of mobile clinics in rural areas, which provided preventive and restorative services to seniors lacking transportation. Kateeb et al. (2016) further emphasized the role of community partnerships in improving access, particularly through educational initiatives that targeted low-income populations. Educational campaigns that promoted oral health literacy are essential for empowering low-income seniors. Kateeb et al. (2021) described a public health initiative that provided culturally relevant materials and workshops, resulting in a 25% increase in preventive dental visits among participants. These efforts underscore the importance of addressing both financial and informational barriers to improve oral health outcomes for economically disadvantaged populations.

Financial Barriers

Financial barriers are among the most significant obstacles to accessing dental care for low-income seniors. Unlike other aspects of healthcare covered by Medicare, dental care remains excluded from its benefits. Seniors, therefore, have to pay out-of-pocket for routine services, such as cleanings, fillings, and extractions (Simon et al., 2025). For individuals on fixed incomes, these costs often compete with other essential expenses, such as housing, food, and medications, forcing difficult trade-offs that deprioritized oral health. Simon and Lee (2023) conducted a large-scale survey of 2,000 seniors and found that 65% reported delaying dental care due to financial constraints.

This finding aligned with Wehby et al. (2022), who analyzed claims data and observed similar trends in delayed care due to financial barriers, illustrating the widespread impact of these barriers.

The exclusion of dental coverage from Medicare disproportionately affects low-income seniors, many of whom cannot afford private dental insurance or expensive out-of-pocket treatments. Researchers have found that individuals with lower incomes were significantly less likely to access preventive services, resulting in delayed treatment and a higher prevalence of advanced dental conditions, such as severe periodontal disease and tooth loss. For example, Wehby et al. (2022) analyzed claims data from 5,000 low-income seniors and reported that untreated dental conditions were twice as prevalent among those without insurance compared to their insured counterparts. They used regression models to control for confounding variables, such as age and geographic location, thereby enhancing the reliability of their findings. These outcomes not only diminished quality of life but also contributed to broader health complications, including malnutrition and systemic infections (Wehby et al., 2022).

Additionally, the high cost of emergency dental care places an even greater burden on low-income seniors. When oral health problems reach a critical stage, emergency treatments often provided in hospital settings are far more expensive than preventive measures (Simon et al., 2021). This cycle of delayed care and escalating costs highlight the need for policy reforms to address financial barriers and make dental care more accessible and affordable for low-income populations. Kateeb et al. (2021) reviewed case studies of emergency dental care programs and noted that these services

often accounted for a significant portion of hospital expenditures, emphasizing the economic inefficiency of reactive care models.

Medicaid expansion under the Affordable Care Act provided some relief for low-income seniors by improving access to dental care in states that opted to expand the program. Medicaid dental benefits varied widely by state, but in expansion states, many older adults gained access to preventive and restorative dental services, reducing disparities in care utilization (Cooper & Morton, 2021). Wehby et al. (2022) found that Medicaid expansion resulted in a 15% increase in dental visits among low-income seniors in states that adopted the program, underscoring the importance of comprehensive coverage for reducing inequities.

However, significant gaps persisted in states that did not expand Medicaid. In nonexpansion states, Medicaid benefits for adults, including seniors, are often limited or nonexistent, leaving many without access to even basic dental care (Cooper & Morton, 2021). This variability in coverage created geographic disparities, with low-income seniors in nonexpansion states experiencing higher rates of untreated dental conditions and poorer overall health outcomes compared to their counterparts in expansion states. Kateeb et al. (2016) highlighted that nonexpansion states saw a 25% higher prevalence of untreated dental issues, attributing this disparity to factors, such as limited Medicaid coverage, lower provider availability, and fewer preventive care programs. Kateeb et al. also emphasized the role of systemic inequities in exacerbating these challenges, calling attention to the critical need for federal-level policy interventions to standardize Medicaid dental benefits and ensure equitable access across all states.

Moreover, even in states with Medicaid expansion, challenges remained. Reimbursement rates for dental services under Medicaid are often low, discouraging providers from accepting Medicaid patients (Taylor et al., 2024). This limited the availability of care for low-income seniors, particularly in rural and underserved areas where provider shortages were already pronounced. Addressing these systemic issues required not only expanding coverage but also increasing reimbursement rates and incentivizing providers to serve Medicaid populations. Kateeb et al. (2021) suggested that increasing provider participation in Medicaid could be achieved through financial incentives and streamlined administrative processes.

Innovative Funding Models

To address income-related barriers to dental care, some states and organizations implemented innovative funding models aimed at increasing affordability and access for low-income seniors. Subsidized dental programs and sliding fee scales at community clinics were among the most effective strategies for making care accessible to those with limited financial resources (MacDougall, 2016). For example, Barker and Johnson (2024) analyzed the outcomes of a statewide subsidized dental care initiative and found that participants reported a 30% improvement in oral health indicators within 1 year, including reductions in gum disease prevalence and increases in preventive dental visits. These programs adjusted fees based on income, ensuring that cost was not a prohibitive factor for receiving essential services.

Public-Private Partnerships

Community dental clinics played a critical role in addressing the needs of low-income seniors, providing a range of preventive and restorative services at reduced or no cost. For instance, Kateeb et al. (2021) examined the efficacy of community dental clinics in reducing oral health disparities and found that they not only improved access to preventive care but also empowered underserved populations through education and outreach initiatives. Similarly, Reynolds et al. (2024) highlighted how such clinics mitigated geographic and financial barriers, thereby serving as essential resources for vulnerable populations. These clinics often rely on partnerships with nonprofit organizations, government grants, and philanthropic donations to sustain their operations and expand their reach. For example, mobile dental units funded by such partnerships brought care directly to underserved communities, eliminating transportation barriers and reducing logistical challenges for seniors who might otherwise have forgone treatment (Joudyian et al., 2021).

Subsidized Dental Programs

Philanthropic initiatives have also contributed significantly to expanding access to care for low-income populations. For example, Kateeb et al. (2021) highlighted the critical role of foundations in sponsoring dental outreach programs that improved oral health literacy and access to preventive care. Similarly, Kateeb et al. (2016) reviewed various subsidized dental care programs and emphasized their impact on enhancing health outcomes for underserved populations through targeted educational campaigns and free clinics. Foundations and charitable organizations have frequently sponsored dental

outreach programs, free clinics, and educational campaigns aimed at improving oral health literacy among underserved groups, and these initiatives not only provided immediate relief but also promoted long-term health by emphasizing the importance of preventive care and regular dental visits (Kateeb et al., 2016).

Additionally, state and local governments explored public-private partnerships as a means of addressing income-related disparities in dental care. For instance, Joudyian et al. (2021) analyzed various public-private partnerships in primary healthcare and emphasized their potential to enhance service delivery through resource-sharing, though challenges like equitable resource allocation and sustainability remained significant. By collaborating with private dental practices and community organizations, these partnerships leveraged resources and expertise to increase the availability of affordable services. For instance, some programs offered tax incentives to private providers who served low-income patients, thereby expanding the pool of practitioners willing to address the needs of underserved populations (Reynolds et al., 2024).

Policy Implications and Recommendations

Addressing income-related disparities in oral health require comprehensive policy reforms that prioritized affordability and access for low-income seniors, such as expanding Medicare to include dental benefits, increasing Medicaid reimbursement rates to incentivize providers, and implementing standardized coverage across states (Kateeb et al., 2016b). Expanding Medicare to include dental benefits is a critical step in reducing financial barriers and ensuring that all older adults have access to preventive and restorative care. Policymakers were also encouraged to enhance Medicaid dental benefits

by standardizing coverage across states and increasing reimbursement rates to incentivize provider participation (Kateeb et al., 2016).

Investments in community-based programs and public health initiatives are equally important. Expanding the network of community dental clinics, increasing funding for mobile dental units, and supporting nonprofit partnerships help bridge gaps in care for low-income seniors. Additionally, integrating oral health education into broader public health campaigns improved awareness and encouraged proactive behaviors, reducing the long-term burden of preventable conditions (Kateeb et al., 2021).
Finally, innovative funding models, such as public-private partnerships and philanthropic collaborations, offer valuable opportunities to address systemic inequities and promote oral health equity; however, these models are not without challenges. For instance, Joudyian et al. (2021) highlighted that sustainability and equitable distribution of resources remained critical barriers in implementing public-private partnerships effectively. Additionally, Kateeb et al. (2016) emphasized that philanthropic collaborations often faced limitations in reaching the most marginalized groups due to funding constraints and logistical challenges. Addressing these limitations requires strategic policy planning and ongoing evaluation to ensure that such models achieve their intended outcomes. By leveraging diverse resources and engaging stakeholders across sectors, these models provide sustainable solutions for improving access to care and outcomes for low-income populations (Azar et al., 2024).

Race and Dental Care Visit Utilization

The relationship between demographic and socioeconomic factors and oral health services utilization has been well-documented, with significant disparities observed among adult populations. Racial disparities in dental care utilization persisted across various demographic groups, as highlighted by Wu et al. (2022), who found that African American and Hispanic adults were notably less likely to utilize dental services compared to their White counterparts, even when socioeconomic status was taken into account. Factors such as mistrust in healthcare systems, as discussed by Ye and Wu (2019), and implicit bias in dental settings, documented by Borrell and Williams (2022), significantly contributed to these disparities. These systemic issues underscore the necessity for culturally sensitive approaches to enhance accessibility and trust within dental care systems.

Socioeconomic status further compounds disparities in dental care utilization. Research conducted by Reda et al. (2018) and Wu et al. (2022) consistently demonstrated a strong correlation between lower income levels and reduced frequency of dental visits. Financial barriers, such as the high out-of-pocket costs of dental care, disproportionately affected low-income individuals, limiting their access to routine and preventive dental services. Medicaid expansion, however, showed promise in addressing these inequities. According to Wehby et al. (2022), Medicaid expansion significantly increased dental care utilization rates among low-income populations by reducing financial barriers. These findings emphasize the importance of policies that expanded coverage and affordability for underserved groups.

While existing studies provided critical insights into disparities in dental care utilization, significant gaps remain, particularly concerning older adults. Medicare, the primary insurance provider for individuals aged 65 and older, does not include comprehensive dental coverage, leaving many older adults without access to necessary dental services (Simon et al., 2025). This gap was particularly concerning given the increased risk of oral health issues among older adults. Griffin et al. (2012) highlighted that the burden of oral disease among older adults posed significant public health challenges, emphasizing that the lack of dental coverage under Medicare contributed to these disparities. Similarly, Willink et al. (2021) discussed the systemic challenges and financial barriers that older adults faced in accessing dental care, underscoring the importance of policy solutions to address these inequities. Future research is needed to develop an understanding of the systemic, cultural, and financial factors that influence dental care utilization among this demographic. Exploring these dynamics is essential for designing targeted interventions and policies aimed at reducing disparities and improving oral health outcomes among older adults.

Summary and Conclusions

Issues of underutilization of dental care services remain pervasive, particularly among marginalized populations, due to a combination of systemic and socioeconomic barriers. The reviewed literature highlighted significant disparities in oral health among older adults, shaped by a range of interrelated factors, including socioeconomic status, race, ethnicity, geographic location, and policy limitations (Sullivan & Patel, 2023). Studies have consistently shown that older adults from low-income, minority, and rural

backgrounds experienced poorer oral health outcomes due to financial barriers, limited access to dental care, and systemic inequities (López & Gonzalez, 2024). These challenges were compounded by the lack of dental coverage under Medicare and other public health programs, which prevented many older adults from seeking preventive or restorative dental care (Agyemang & Bakk, 2023).

Research has continued to demonstrate that race and income were strong predictors of dental visits and oral health service utilization. For example, African Americans, Hispanics, and Native Americans were significantly less likely to engage in routine dental care compared to White adults, even when socioeconomic factors were accounted for (Wu et al., 2022). Income-related disparities were similarly evident with individuals in lower income brackets reporting fewer dental visits and higher rates of untreated dental conditions (Reda et al., 2018). Structural inequities, including financial barriers, geographic inaccessibility, and systemic bias within healthcare systems, further exacerbated these trends (Ye & Wu, 2019).

The intersection of race, income, and geographic location is particularly important in understanding oral health outcomes among marginalized groups. Minority populations in low-income, rural areas face unique challenges, including geographic isolation, cultural barriers, and a lack of culturally competent care, all of which contribute to poorer oral health outcomes (Karam et al., 2022). Additionally, geographic disparities often resulted in provider shortages in rural areas and affordability issues in underserved urban communities, creating significant obstacles to accessing care (Borrell & Williams, 2022).

Policy interventions, such as Medicaid expansion, showed some success in improving dental care utilization among low-income adults (Wehby et al., 2022). However, the literature underscored the need for more comprehensive approaches that tackled the underlying causes of these disparities. Strategies, like expanding Medicare dental coverage, implementing sliding-scale payment systems, and supporting community-based health initiatives, are essential for reducing gaps in access and outcomes (Ju et al., 2021).

Chapter 3: Research Method

Introduction

I adopted a quantitative approach in this study, utilizing secondary data from the 2021 MCBS to investigate disparities in dental care utilization among older adults. The research methodology was designed to examine the relationships between race, income, and access to oral health services, with a specific focus on how these factors contributed to disparities in dental care utilization. The 2021 MCBS data set provided a robust foundation for this analysis due to its comprehensive coverage of healthcare utilization, demographic characteristics, and socioeconomic factors.

I employed a cross-sectional research design to analyze patterns and correlations within the data set. This design is particularly appropriate for identifying disparities and relationships among variables at a single point in time. By examining the associations between race, income, and oral healthcare utilization, I highlighted the influence of SDH on access to dental care. The data were analyzed using statistical techniques to uncover significant patterns and disparities that persisted among older adults enrolled in Medicare.

The study's approach was grounded in addressing the systemic inequities that impact vulnerable populations, such as racial and ethnic minorities and low-income groups, who often experience higher rates of untreated dental conditions due to persistent health disparities. Hash et al. (2024) highlighted these disparities in Appalachian and other rural communities, where socioeconomic challenges and limited access to healthcare exacerbated inequities and contributed significantly to untreated conditions. By leveraging the strengths of the 2021 MCBS data set and the cross-sectional design, I

sought to provide evidence-based insights that could inform policy interventions aimed at reducing barriers to dental care. Ultimately, the findings were intended to guide efforts to promote equitable access to oral healthcare and improve outcomes for underserved populations.

Research Design and Rationale

I employed a cross-sectional, quantitative design to investigate the relationship between SDH, specifically race and income, and oral health service utilization among older adults. A cross-sectional approach was particularly well-suited for identifying patterns and correlations among variables at a single point in time, offering valuable insights into disparities in healthcare access without the need for longitudinal data. By focusing on a specific moment, this design enabled the assessment of associations and trends within a defined population, such as older adults within the Medicare system.

The use of secondary data from the 2021 MCBS strengthened the study's methodological framework. The 2021 MCBS data set provided a robust and representative sample, capturing detailed information about healthcare utilization, socioeconomic status, and demographic variables. This comprehensive data set allowed for the examination of disparities in dental care access among older adults, shedding light on how systemic and individual-level factors contributed to inequities in oral health outcomes. By leveraging this existing data set, I minimized resource constraints while maximizing the reliability of findings.

A quantitative design facilitated the application of statistical techniques to analyze the relationships between race, income, and oral health service utilization. I employed

descriptive statistics and regression analysis to explore the extent of disparities and identify potential predictors of limited access to dental care. This approach ensured that findings were evidence based, quantifiable, and generalizable to broader populations.

The rationale for selecting this design lay in its capacity to address the research objectives comprehensively. By focusing on quantifiable data, I provided empirical evidence to inform policies and interventions aimed at reducing disparities in oral health access. This design not only highlighted correlations but also served as a foundation for future research, enabling deeper explorations into causal relationships and longitudinal changes in healthcare equity.

Methodology

In this study, I employed a quantitative, cross-sectional design to examine disparities in oral health service utilization among older adults enrolled in Medicare. Secondary data from the 2021 MCBS served as the primary data source, providing comprehensive information on healthcare utilization patterns, demographics, and socioeconomic variables. The methodology included a stratified random sampling strategy, power analysis for sample size determination, and rigorous data analysis procedures to ensure reliable and valid results. By leveraging archival data, I aimed to identify systemic inequities and contribute to evidence-based strategies for improving access to oral health care.

Population

The target population for this study was comprised of adults aged 65 and older who were enrolled in Medicare. This demographic is especially significant due to the

unique and multifaceted challenges they face in accessing dental care (Henshaw & Karpas, 2021). These challenges are compounded by systemic inequities and disparities, particularly among older adults from racial and ethnic minority groups, who experience significant barriers to care and poorer oral health outcomes (Henshaw & Karpas, 2021). Gaps in Medicare coverage for dental services, coupled with socioeconomic and racial disparities, often create barriers to care. Financial constraints are a prevalent issue for many older adults, limiting their ability to afford preventive and routine dental treatments. Additionally, systemic inequities disproportionately impact racial and ethnic minorities, such as African Americans, Hispanics, and Native Americans, within this age group, exacerbating disparities in oral health outcomes. Research has emphasized that these disparities were particularly severe among racial and ethnic minority groups, with systemic barriers to care contributing to poorer oral health outcomes in these populations (Henshaw & Karpas, 2021).

A recent study by Elani et al. (2024) highlighted the impact of transitioning from Medicaid to Medicare for dental coverage and care. The researchers found that older adults often experienced a loss of dental benefits upon entering Medicare, leading to decreased utilization of dental services. This reduction in access disproportionately affected racial and ethnic minorities, exacerbating existing disparities in oral health outcomes. Their findings underscore the importance of addressing gaps in Medicare dental coverage to improve access to care for vulnerable populations (Elani et al., 2024).

The 2021 MCBS data set was an ideal resource for exploring these issues because it provided comprehensive data on healthcare utilization patterns, demographic

characteristics, and socioeconomic variables. By focusing on this population, I aimed to shed light on the specific barriers older adults encountered in accessing oral healthcare, with the goal of informing policies and interventions to address these challenges.

Sampling and Sampling Procedures

I employed a stratified random sampling strategy to ensure that the study's sample was representative of the Medicare population. Stratification by key variables, including race, income, age, gender, and geographic location, ensured diversity within the sample and facilitated meaningful comparisons across demographic subgroups. This approach allowed me to examine disparities in oral health service utilization and identify patterns that varied across different populations.

The 2021 MCBS data set inherently incorporated stratified sampling methods, which enhanced the generalizability of the findings. By leveraging these built-in stratification techniques, I minimized the risk of sampling bias and strengthened the study's ability to draw conclusions applicable to the broader Medicare population. This method also ensured that traditionally underrepresented groups, such as racial and ethnic minorities and lower-income individuals, were adequately included in the analysis.

Procedures for Recruitment, Participation, and Data Collection

Because secondary data from the 2021 MCBS were used in this study, no direct recruitment or participation of individuals was required. The 2021 MCBS data set was publicly available and consisted of de-identified data, thereby ensuring participant confidentiality. The original data collection was conducted using standardized survey methods, including structured interviews and questionnaires, to gather detailed

information on demographics, income, healthcare barriers, and oral health service utilization among Medicare beneficiaries.

I accessed the 2021 MCBS data set through authorized and appropriate channels, with all necessary permissions for its use obtained and documented. Once acquired, the data were imported into Statistical Package for the Social Sciences (SPSS) for cleaning, organization, and subsequent analysis. The data preparation process included identifying relevant variables, managing missing values, and formatting the data set to align with the study's analytical objectives.

Given the reliance on archival data, this study did not involve any procedures for active recruitment or direct interaction with participants. This secondary data approach reduced logistical challenges and minimized ethical concerns associated with primary data collection, thereby allowing me to focus fully on analytical rigor and interpretation of findings.

Archival Data Use

In this study, I utilized archival data from the 2021 MCBS, a publicly available and widely recognized data set. The 2021 MCBS provided comprehensive and de-identified information on healthcare utilization, demographic characteristics, and socioeconomic factors among Medicare beneficiaries, making it a valuable resource for analyzing disparities in oral health service utilization.

The data set was originally collected using standardized survey methods, including structured interviews and questionnaires, which ensured its reliability and validity. Key variables relevant to this study, such as race, income, and oral health service

utilization, were well-documented and aligned with the research objectives. The archival nature of the data eliminated the need for direct recruitment or participant involvement, streamlining the research process while maintaining ethical standards.

To gain access to the 2021 MCBS data set, I followed all necessary protocols and document my permissions for its use. Once obtained, the data were imported into statistical software (i.e., SPSS) for cleaning, organization, and analysis. The use of archival data allowed me to focus on identifying systemic inequities in oral healthcare access without the logistical complexities associated with primary data collection.

Instrumentation and Operationalization of Constructs

I used secondary data from the 2021 MCBS, which employed structured interviews and questionnaires as its primary data collection instruments. The 2021 MCBS was designed to capture comprehensive information on healthcare utilization, demographic characteristics, and socioeconomic variables among Medicare beneficiaries. The survey instruments had been rigorously validated and standardized, ensuring reliability and consistency in the data. The specific items used in the 2021 MCBS aligned with established frameworks and metrics in healthcare research, making it a robust source for secondary analysis.

Operationalization of Constructs

The key variables analyzed in this study were defined and measured based on their respective constructs and data sources within the 2021 MCBS data set. Table 1 presents a comprehensive summary of these variables, detailing their definitions, measurement scales, and categorization as independent or dependent variables. This table

provides a clear overview to support the understanding of how each construct was utilized in the analysis.

Table 1

Variable Definitions and Measurement

Variable measurement	Type	Source	Definition
Oral health services: 0 visits, 1–3 visits, 4–15 visits	Dependent	MCBS	Use of dental care services
Race: non-Hispanic Black, non-Hispanic White, Hispanic, other	Independent	MCBS	Self-reported racial classification
Income categorical: < $25,000, ≥ $25,000	Independent	MCBS	Annual household income

Data Analysis Plan

Software for Analysis

I conducted data analysis using SPSS, a robust and widely utilized software in the social and health sciences. SPSS supported both descriptive and inferential statistical procedures essential for this study.

Data Cleaning and Screening Procedures

Prior to analysis, I undertook data cleaning and screening to ensure the accuracy and integrity of the dataset. These procedures included:

- Eliminating duplicate entries to prevent redundancy.

- Addressing missing data using appropriate imputation techniques or excluding cases when missing values exceeded acceptable thresholds.
- Identifying and managing outliers through boxplots and Z-scores, with consideration of their potential impact on the analysis.
- Evaluating normality, linearity, and homoscedasticity of continuous variables to confirm compliance with statistical assumptions.

Research Questions and Hypotheses

RQ1: Is there a statistically significant correlation between race and utilization of oral health services among older adults?

$H_0$1: There is no significant correlation between race and the utilization of oral health services among older adults.

H_a1: There is a significant correlation between race and the utilization of oral health services among older adults.

RQ2: Is there a statistically significant correlation between income and the utilization of oral health services among older adults?

$H_0$2: There is no significant correlation between income and the utilization of oral health services among older adults.

H_a2: There is a significant correlation between income and the utilization of oral health services among older adults.

Descriptive Statistics

- Demographic variables (e.g., age, race, income) were summarized.

- Key variables were described using measures, such as means, standard deviations, medians, and frequency distributions.

Inferential Statistics

Univariate Analyses. Before implementing the two-part model, I conducted chi-square tests to evaluate the relationships between key categorical variables (i.e., race, income) and oral health service utilization. These tests were used to identify significant associations and provided preliminary insights into which variables might have influenced service use, informing subsequent multivariate analyses.

Two Part Model for Utilization. The two-part model was an appropriate framework for analyzing oral health service utilization because it accounted for the skewed distribution of the dependent variable (i.e., number of visits). This model operated in two stages, integrating both binary and count data analyses to comprehensively examine service use.

- In the first stage, I applied a binary logistic regression to estimate the likelihood of any oral health service utilization, providing insights into factors that influenced whether individuals accessed services. This step addressed the binary nature of the outcome: whether utilization occurred.
- In the second stage, I used negative binomial regression to model the count of oral health service visits among those who had utilized services. This approach was particularly effective for handling over dispersed count data, where the variance exceeded the mean—commonly observed in health service usage.

By structuring the analysis in this two-part framework, the statistical tests comprehensively evaluated both the occurrence and frequency of service use, ensuring that the relationships between variables were systematically assessed.

Statistical Tests and Rationale

The primary statistical tests focused on evaluating the significance of race and income on utilization within the binary logistic regression and negative binomial regression models using the Wald chi-square test. I used these tests to assess the combined effects of race and income on oral health service utilization, providing key insights into the strength and significance of these variables.

For RQ1 (Race and Utilization). I conducted the Wald chi-square test to evaluate the statistical significance of the race variable within both the binary logistic regression (to determine the likelihood of any oral health service utilization) and the negative binomial regression (to assess the count of visits among users). A threshold of $p < .05$ was applied to determine statistical significance.

For RQ2 (Income and Utilization). I also used the Wald chi-square test to test the statistical significance of the income variable in both regression models. The same threshold of $p < .05$ was applied to interpret the results. Additionally, chi-square tests of independence were conducted as part of the univariate analyses to explore initial associations between key categorical variables, such as race, income, and oral health service utilization. These preliminary tests provided insights into basic relationships before incorporating them into the multivariate models.

Interpretation of Results

- Results were interpreted using parameter estimates, confidence intervals, *p* values, odds ratios (logistic regression), and incident rate ratios (negative binomial regression).
- Findings were contextualized within the broader literature and aligned with the theoretical framework of the study.

Threats to Validity

Internal Validity

The use of secondary data from the 2021 MCBS minimized selection bias because the data set was representative of the Medicare population and collected using standardized methods. However, limitations inherent to archival data, such as recall bias and social desirability bias, were acknowledged. Recall bias may have occurred if participants inaccurately reported their healthcare behaviors or oral health service utilization. Social desirability bias may also have influenced participants to provide responses they perceived as favorable rather than accurate. These issues were mitigated by cross-referencing key variables within the dataset and excluding data points with significant inconsistencies. The standardized survey design of the MCBS further supported internal validity by ensuring consistent and reliable data collection.

External Validity

The stratified random sampling method used by the 2021 MCBS enhanced the generalizability of this study's findings. Stratification by key demographic variables, such as race, income, and geographic location, ensured representation across diverse

subgroups within the Medicare population. While this strengthened external validity, it was important to note that the results were limited to older adults in the U.S. Medicare population. The findings may not have applied to individuals outside of this program or to non-U.S. populations. Despite this limitation, the findings provided valuable insights into systemic barriers to oral health care access within a highly relevant context.

Construct Validity

I derived the operational definitions of key variables, such as income and oral health service utilization, from established frameworks and aligned with existing literature. Income was categorized into predefined brackets within the 2021 MCBS data set, while oral health service utilization was quantified using measurable indicators, such as the frequency of dental visits and reported procedures. These definitions ensured that the constructs were consistently measured across the study population. Additionally, the 2021 MCBS's use of validated survey tools enhanced the reliability and accuracy of the data, ensuring that the study effectively captured the relationships under investigation

Ethical Procedures

Data Confidentiality

The use of secondary data, such as the 2021 MCBS data set, inherently ensured participants' confidentiality because the data were de-identified prior to public release. This de-identification guaranteed that no personally identifiable information was accessible, mitigating risks to participant privacy. To further protect confidentiality, I securely stored all data on password-protected systems, with access limited to authorized research personnel. Data backups were encrypted and stored on secure cloud platforms or

external drives that complied with rigorous data protection standards. When the data were analyzed or disseminated, they were anonymized and presented in aggregate form to ensure that individual participants could not be identified.

I analyzed the data using statistical software, such as SPSS. This involved extracting relevant variables, performing statistical analyses, and preparing datasets to address the study's research questions. At no point was the data used for unethical purposes, such as falsifying results, misrepresenting findings, or exploiting participant information. These measures collectively upheld the principles of data security, ethical integrity, and participant confidentiality throughout the research process.

Institutional Review Board Approval

I submitted this study to the Walden University Institutional Review Board (IRB) for review and approval before collecting any data to ensure compliance with ethical research standards. The IRB submission included detailed documentation of the study's objectives, data use plans, confidentiality measures, and data analysis procedures. Specific details on secure data storage, management of the secondary data set, and the steps taken to safeguard participant anonymity were provided. Approval from the IRB confirmed that the research aligned with ethical principles and regulatory requirements. Additionally, all permissions for the use of the MCBS data set were obtained and documented prior to analysis. The Walden University IRB approval number is 03-11-25-0532013.

By adhering to the guidelines established by the Walden University IRB, I demonstrated a commitment to conducting ethical research. These measures ensured that

the research process upheld the highest standards of integrity, confidentiality, and respect for participants, even when using secondary data.

Summary

In this chapter, I provided a detailed overview of the methodology that was adopted to investigate disparities in oral health service utilization among older adults, focusing on the influence of social determinants such as race and income. The use of a cross-sectional quantitative design facilitated a systematic analysis of associations and patterns within a specific time frame. This design was particularly suited for addressing the research objectives, enabling the identification of key disparities without the complexity of longitudinal data collection.

A robust sampling strategy ensured that the study's findings were representative and generalizable to the broader Medicare population. By employing stratified random sampling, I accounted for critical demographic variables, such as race, income, and geographic location, enhancing the reliability and applicability of the results. The MCBS data set provided a rich source of secondary data, offering comprehensive insights into healthcare utilization patterns and systemic barriers faced by older adults.

The methodology also included a well-defined data analysis plan, incorporating statistical techniques, such as descriptive statistics, regression analysis, and other inferential methods, to explore disparities in dental care access. Sample size determination, guided by power analysis, ensured that the study achieved sufficient statistical power to detect meaningful relationships between variables. These

methodological elements collectively strengthened my ability to provide evidence-based insights into oral health disparities in this study.

Ethical considerations were carefully addressed, particularly in the context of using secondary data. I adhered to data privacy and confidentiality standards while conducting the study, ensuring compliance with ethical research guidelines. Additionally, potential threats to validity, such as selection bias and measurement error, were identified and mitigated through rigorous methodological design and data validation procedures. These measures enhanced the study's credibility and ensured the integrity of its findings.

In the next chapter, I will present the study's results, offering a comprehensive analysis of the systemic barriers and inequities affecting access to dental care within the Medicare population. These findings aim to inform policies and interventions designed to address disparities and improve oral health outcomes for older adults.

Chapter 4: Results

Introduction

In this chapter, I present the results of the quantitative analysis that explored disparities in dental care utilization among older adults, drawing on secondary data from the MCBS. As the aging population in the United States continues to grow, understanding the barriers older adults faced in accessing essential health services, including oral healthcare, is critical. While Medicare provides broad coverage for medical services, routine dental care is generally excluded from traditional Medicare benefits (Willink et al., 2021). As a result, older adults often experience unmet dental needs, particularly among those from historically underserved racial groups and lower income brackets (Nasseh & Vujicic, 2020a). In this study, I examined the extent to which race and income were associated with patterns of oral health service use, with the aim of contributing to a broader understanding of health equity within the Medicare population.

The MCBS offered a valuable and nationally representative data set that captured a wide range of demographic, socioeconomic, and healthcare utilization variables among Medicare beneficiaries. Its comprehensive design allowed for detailed analysis of healthcare access and utilization behaviors, making it particularly useful for identifying disparities across different population subgroups (Montesinos et al., 2022). For the purposes of this study, the MCBS provided critical insight into how structural and contextual factors influenced dental care use among older adults. By leveraging this robust data set, the analysis was positioned to uncover patterns that may have been less apparent in smaller or more localized studies.

I employed a cross-sectional research design to assess relationships between the study variables at a single point in time. This approach was appropriate for identifying group-based differences and generating hypotheses about the systemic and individual factors that influenced access to care (see Groves et al., 2023). The study was guided by the SDH framework, which emphasizes the role of nonmedical factors, such as socioeconomic status, race, and neighborhood context, in shaping health outcomes (see Artiga & Hinton, 2018). In this context, I examined race and income not solely as demographic variables but as indicators of broader systemic inequities that contributed to unequal access to healthcare services, including dental care.

Chi-square tests and linear regression were employed to explore group differences in dental service utilization. I used chi-square tests to examine bivariate associations between demographic factors and service use, while linear regression was performed to assess the relationship between predictors, such as race and income and the number of dental visits among older adults. This multiphase approach ensured that both the occurrence and frequency of dental service use were systematically evaluated, aligning the analytic strategy with the distributional properties of the outcome variable and enhancing the validity and interpretability of the findings (see Liu et al., 2021).

In the remainder of this chapter, I present the results of the study. Descriptive statistics are employed to summarize the distribution of key variables across demographic groups, and regression models are used to estimate the strength and direction of associations between race, income, and oral healthcare utilization. These findings provide a deeper understanding of how longstanding structural inequities shaped healthcare

access among older adults. Ultimately, I aimed for the results to inform evidence-based strategies and contribute to future policy development that promotes equitable access to oral health services within the Medicare system.

Results of the Study

Before presenting the results for each research question, a summary of the study variables is provided to clarify how each was defined and modeled. Table 1 outlines the key variables, including their operationalization as binary, count, and ordinal measures, MCBS, and the reference categories used in the analysis.

Research Question 1

Is there a statistically significant relationship between race and the utilization of oral health services among older adults?

Descriptive Overview

To evaluate this question, I conducted a series of statistical analyses to assess the association between race and oral health service utilization. Given the structure of the dependent variable—where a large portion of respondents reported no dental service use, while a smaller portion reported varying levels of use—a two-part analytic approach was applied. First, a binary logistic regression model was used to estimate the likelihood of any dental utilization (yes/no), followed by a negative binomial regression model to assess the frequency of use among those who reported at least one dental visit. Together, these models provided a comprehensive picture of disparities in both access to and engagement with dental care.

Table 2 displays the racial composition of the analytic sample (N = 7,323). Non-Hispanic Whites comprised the majority at 75.4%, followed by Hispanic respondents (10.1%), Non-Hispanic Blacks (9.5%), and individuals categorized as "Other Race" (5.1%). This racial distribution reflected national Medicare demographics and provided the foundation for examining disparities across population subgroups. Although non-Hispanic Whites represented the largest proportion, the inclusion of racial minority groups allowed for a meaningful analysis of differential access and utilization.

Table 2

Race Distribution of the Sample

Race	Frequency	Percentage
Non-Hispanic White	5,518	75.4%
Non-Hispanic Black	694	9.5%
Hispanic	738	10.1%
Other race	373	5.1%
Total	7,323	100%

This breakdown further contextualizes the findings by emphasizing that even though minority groups represented a smaller portion of the sample, they may disproportionately experience barriers to care. These barriers include systemic issues, such as residential segregation, under resourced communities, linguistic or cultural obstacles, and historic mistrust of healthcare systems. All these factors can contribute to lower engagement with dental services and wider health disparities.

Inferential Results

In this subsection, I present the model fitting statistics from the binary logistic regression used to evaluate the relationship between race and dental service utilization. The model was statistically significant ($\chi^2 = 1093.202$, $p < .001$), with a reduction in –2 log likelihood from the intercept-only model (14,005.682) to the final model (12,912.480), indicating improved model fit. Results showed that race was a significant predictor of whether older adults accessed dental services. Non-Hispanic Black beneficiaries had 66% lower odds of utilization compared to non-Hispanic Whites (*OR* = 0.34, 95% CI [.29, .40], $p < .001$). Hispanic beneficiaries had 56% lower odds of utilization compared to non-Hispanic Whites (*OR* = 0.44, 95% CI [.38, .51], $p < .001$). Other race respondents had 31% lower odds of utilization compared to non-Hispanic Whites (*OR* = 0.69, 95% CI [.56, .85], $p < .001$). In contrast, results from the negative binomial regression indicated that race was not a statistically significant predictor of the number of visits among utilizers (Wald $\chi^2 = 3.834$, $p = .280$). Once beneficiaries had accessed at least one dental service, racial differences in visit frequency were not observed.

Table 3

Model Fitting Information for Binary Logistic Regression

Model	-2 log likelihood	Chi-square	*df*	*p*
Intercept only	14,005.682			
Final	12,912.480	1,093.202	12	< .001

Together, these findings suggested that race influenced whether older adults accessed dental services but not the number of visits among those who did. This finding

aligned with the SDH framework, which positions race as a structural factor shaping opportunities for access. The evidence indicated that inequities were concentrated in the initiation of care, underscoring persistent barriers to entry for racial minority groups.

Table 4 provides the parameter estimates for race categories, with non-Hispanic White used as the reference group. The estimates were negative and statistically significant for all other racial groups: non-Hispanic Black (β = –1.073, *OR* = 0.34, $p <$ .001), Hispanic (β = –0.820, *OR* = 0.44, $p < .001$), and other race (β = –0.372, *OR* = 0.69, $p < .001$). These results indicated that, relative to on-Hispanic Whites, racial minority groups had significantly lower odds of utilizing dental services. The largest disparity was observed for non-Hispanic Black respondents, who had 66% lower odds of utilization compared to their White counterparts. Although race significantly influenced whether older adults accessed dental services, the negative binomial regression results showed that race was not a significant predictor of the number of visits among utilizers ($p = .280$). This finding suggested that disparities were concentrated in barriers to initiating care rather than in the frequency of services once care was accessed.

Table 4

Parameter Estimates for Race

Race category	Estimate	SE	Wald	*p*	95% CI lower	95% CI upper
Non-Hispanic Black	-1.073	0.083	166.817	< .001	-1.236	-0.910
Hispanic	-0.820	0.075	119.010	< .001	-0.967	-0.673
Other race	-0.372	0.106	12.269	< .001	-0.581	-0.163
Non-Hispanic White	0.000					

Together, these findings supported the conclusion that race was a statistically significant predictor of access to oral health services among older adults but not of

service frequency. The underutilization among racial minority groups reflected systemic inequities that limited entry into care and underscored the need for targeted interventions to expand access and promote equity in dental care delivery for the Medicare population.

Interpretation of Findings – RQ1

The results indicated that race was a statistically significant predictor of whether older adults accessed dental services but not of how frequently they utilized services once care was initiated. The binary logistic regression model showed that non-Hispanic Black (*OR* = 0.34, 95% CI [.29, .40], $p < .001$), Hispanic (*OR* = 0.44, 95% CI [.38, .51], $p < .001$), and other race respondents (*OR* = 0.69, 95% CI [.56, .85], $p < .001$) had significantly lower odds of dental care utilization compared to non-Hispanic Whites. The largest disparity was observed among non-Hispanic Black beneficiaries, who had 66% lower odds of accessing care than their White counterparts. In contrast, the negative binomial regression results demonstrated that race was not a significant predictor of the number of visits among utilizers ($p = .280$), suggesting that disparities were concentrated in barriers to initiating care rather than in continued engagement once services were accessed.

Together, these findings highlighted that race primarily influenced the likelihood of initiating dental care. The absence of significant differences in visit frequency among utilizers suggested that once access was secured, patterns of engagement were more comparable across racial groups. This evidence reinforced the conclusion that systemic inequities disproportionately limited entry into care for minority populations,

underscoring the need for interventions that address barriers to access within the Medicare system.

Null Hypothesis (RQ1): Rejected

Race was a statistically significant predictor of the occurrence of dental service use but not of visit frequency among utilizers. These results indicated that racial disparities were concentrated in barriers to initiating care, likely shaped by systemic inequities, such as provider bias, cultural barriers, geographic maldistribution of services, and the cumulative effects of marginalization across the life course.

Research Question 2

Is there a statistically significant relationship between income and the utilization of oral health services among older adults?

Descriptive Overview

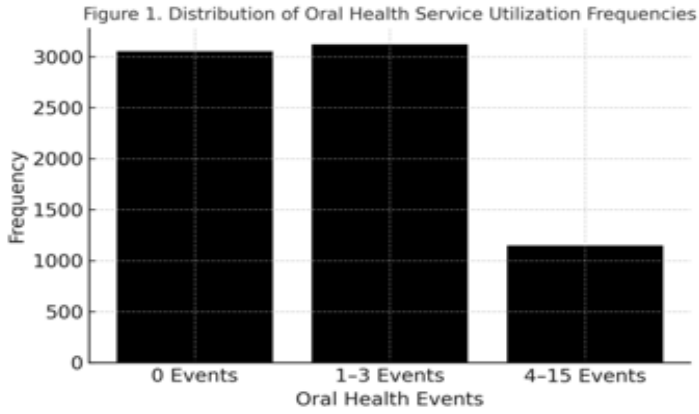
I analyzed income as a dichotomous variable (< $25,000 vs. ≥ $25,000 annually) and evaluated its relationship to dental care utilization using the same two-part analytic framework. Descriptive statistics showed that individuals in the lower-income bracket comprised 33.2% of the sample (n = 2,430) and demonstrated substantially lower rates of dental care use compared to those with higher incomes. The outcome variable exhibited a highly skewed distribution, with most participants reporting either no visits or only one to three visits within the past year.

Figure 1 presents the distribution of dental service utilization, showing that the majority of Medicare beneficiaries reported no visits, while the largest share of those who accessed care had only one to three visits within the past year. This highly skewed

distribution supported the use of a two-part analytic framework, with logistic regression applied to model any utilization and negative binomial regression used to assess visit frequency among utilizers.

Figure 1

Distribution of Oral Health Service Utilization Frequencies



Model Results

Table 5 displays the model fitting results for the binary logistic regression that was used to evaluate the impact of income on dental service utilization. The model was statistically significant ($\chi^2 = 664.432$, $p < .001$), with a reduction in –2 log likelihood from the intercept-only model (14,884.433) to the final model (14,220.001), indicating improved model fit. Results showed that income was a significant predictor of whether older adults accessed dental services, with those in the lower income group having 70% lower odds of utilization compared to those with higher incomes (*OR* = 0.30, 95% CI [.27, .34], $p < .001$). Results from the negative binomial regression further demonstrated that income was a significant predictor of visit counts among utilizers (Incidence Rate

Ratio (IRR)= 1.37, p = .015). This indicated that, once beneficiaries accessed care, higher income individuals tended to report more visits compared to those with lower incomes.

Table 5

Model Fitting Information for Income (Binary Regression Model)

Model	-2 log likelihood	Chi-square	*df*	*p*
Intercept only	14,884.433			
Final	14,220.001	664.432	7	< .001

Table 6 provides the parameter estimates for income. Individuals earning less than $25,000 annually had a significantly negative coefficient in the binary logistic regression (β = –1.199, p < .001), corresponding to an odds ratio of 0.30 with a 95% CI [0.27, 0.34]. This indicated that lower income older adults had 70% lower odds of accessing dental services compared to those with higher incomes. This finding was consistent with the negative binomial regression, which further showed that higher income utilizers had significantly more dental visits (IRR = 1.37, 95% CI [1.06, 1.76], p = .015). Together, these results confirmed that income was a significant predictor of both the likelihood of accessing care and the frequency of visits among utilizers.

Table 6

Parameter Estimates for Income

Income category	Estimate	SE	Wald	*p*	95% CI lower	95% CI upper
Less than $25,000	-1.199	0.066	327.998	< .001	-1.328	-1.071
Greater than $25,000	0.000					

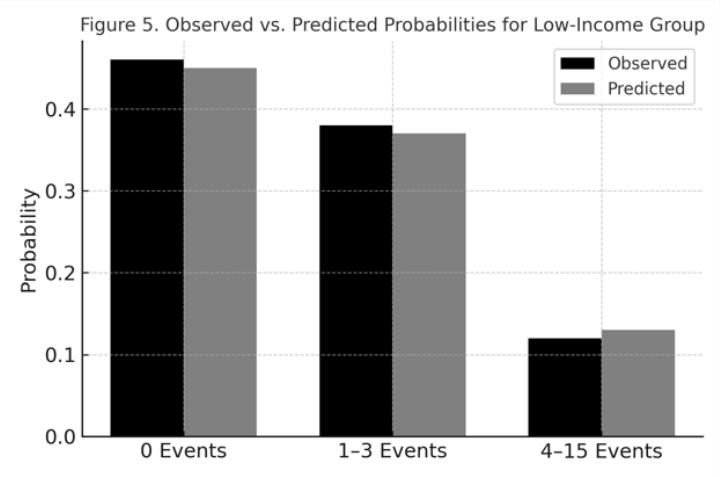
Interpretation of Findings – RQ2

The results confirmed a strong economic gradient in oral healthcare access. Older adults with household incomes below $25,000 had 70% lower odds of utilizing dental services compared to those with higher incomes (*OR* = 0.30, 95% CI [–1.328, –1.071], $p < .001$). In addition, the negative binomial regression showed that income was also a significant predictor of visit frequency, with higher income beneficiaries reporting more visits than their lower income counterparts (IRR = 1.37, $p = .015$). These findings reinforced the existence of income-based disparities in both the likelihood of accessing dental services and the depth of utilization among those who did.

Figure 2 compares observed and predicted probabilities of dental service utilization by income level. The close alignment between actual and predicted values validated the accuracy of the binary logistic regression model, reinforcing its reliability in capturing the strong effect of income on access to care. Results showed that lower income older adults had substantially reduced probabilities of utilization compared to their higher income counterparts, consistent with existing literature that emphasizes affordability and lack of dental coverage as primary barriers to care among financially vulnerable populations (see Manski et al., 2023).

Figure 2

Observed Versus Predicted Probabilities for Low-Income Group



Null Hypothesis (RQ2): Rejected

Income was a statistically significant predictor of both the occurrence and frequency of oral health service utilization. Older adults with lower incomes were substantially less likely to access dental services and, among utilizers, reported fewer visits than their higher income counterparts. These findings suggest that economic constraints, including the absence of comprehensive dental benefits under traditional Medicare, remain a major barrier to care and underscore the importance of structural reforms aimed at expanding coverage and improving affordability for underserved populations.

Figures Supporting Analytic Assumptions and Results

Figure 3 illustrates the distribution of dental service utilization across racial groups. The visualization highlights that non-Hispanic White beneficiaries reported the highest levels of use, while racial minority groups showed lower engagement overall. These differences aligned with the results of the binary logistic regression, which showed

race to be a significant predictor of whether older adults accessed dental services. In contrast, the negative binomial regression indicated that once care was initiated, visit frequency did not significantly differ across racial groups, underscoring that disparities were concentrated in access rather than ongoing utilization.

Figure 3

Line Graph Assessing the Proportional Odds Assumption

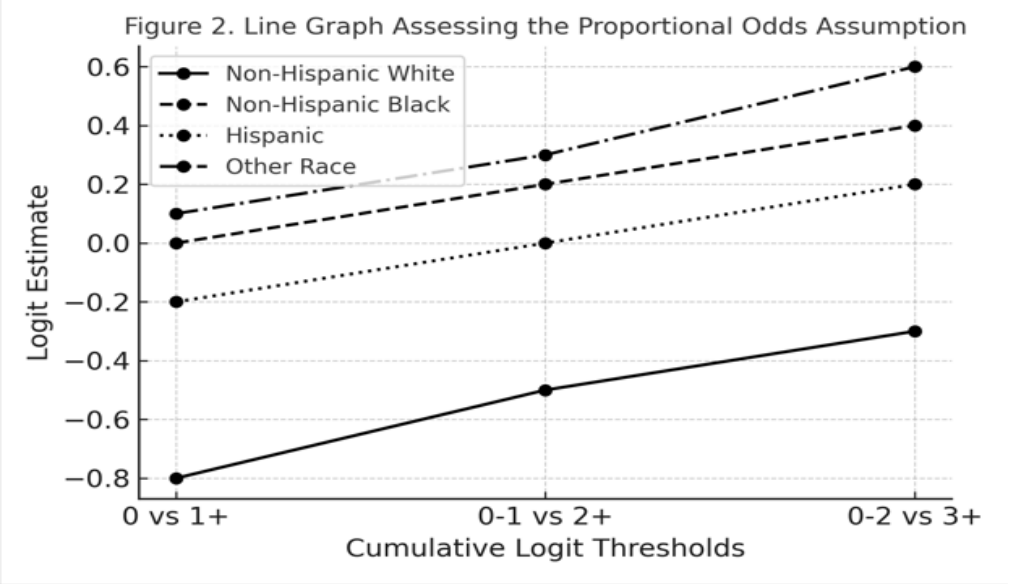


Figure 4 presents standardized residuals from the regression models evaluating race. The absence of extreme values or systematic clustering suggested that the models were appropriate and that the findings were reliable. The binary logistic regression confirmed that race was a significant predictor of whether older adults accessed dental services, while the negative binomial regression showed no significant differences in visit frequency once care was initiated. Together, the diagnostics reinforced that racial disparities were concentrated in access to care rather than in the frequency of service use.

Figure 4

Dot Plot of Residuals From Race-Based Model

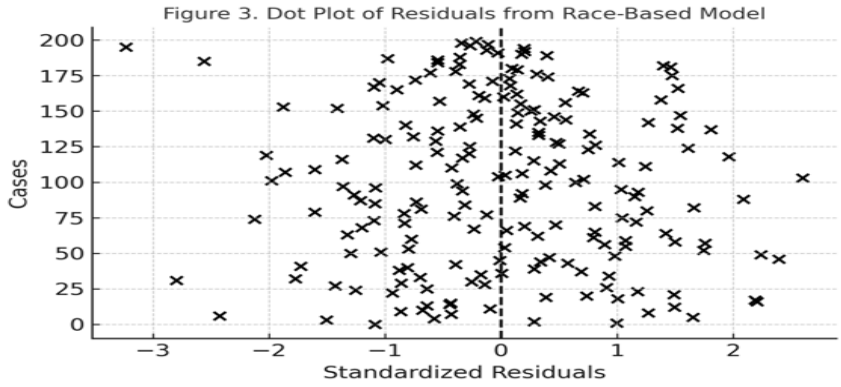


Figure 5 shows a box plot of dental service utilization by race. Non-Hispanic White respondents represented a larger share of utilizers and, therefore, displayed greater variation in visit counts. In contrast, racial minority groups exhibited compressed interquartile ranges, reflecting lower overall access to services. However, among those who did access care, visit frequencies did not significantly differ across racial groups. This visual underscores that racial disparities were concentrated in barriers to initiating care rather than in continued engagement once services were obtained.

Figure 5

Box Plot of Oral Health Utilization by Race

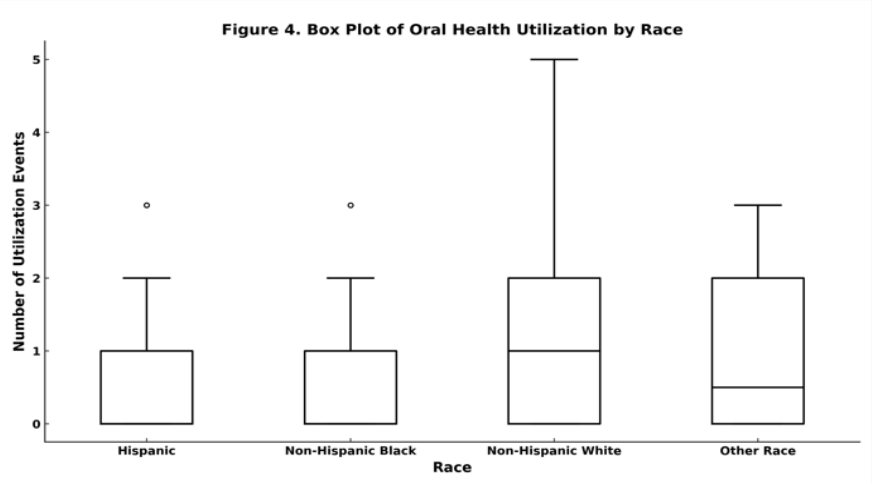
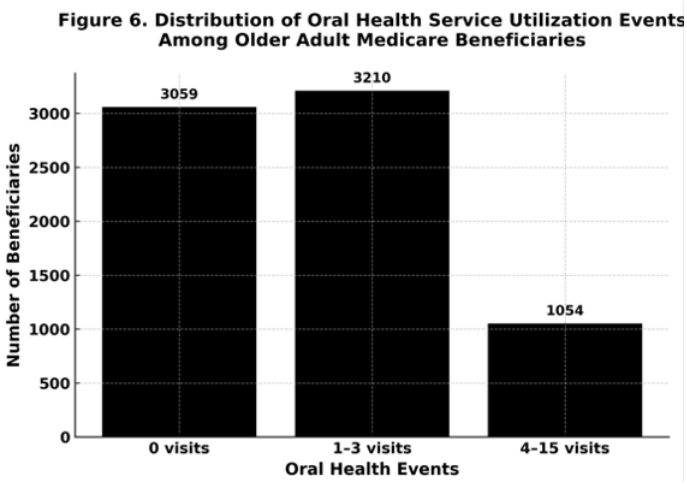


Figure 6 displays a histogram of dental visit counts among Medicare beneficiaries. The distribution remained highly skewed, with 41.8% of respondents reporting no dental visits (n = 3,059) and most utilizers clustered in the one to three visit range (n = 3,210). Only about 14% of the sample reported four to 15 visits (n = 1,054), indicating that higher levels of utilization were relatively uncommon. This visualization underscores persistent gaps in preventive dental care and supports the application of a two-part analytic framework to model both the likelihood of initiating use and the frequency of visits among utilizers.

Figure 6

Distribution of Oral Health Service Utilization Events Among Older Medicare Beneficiaries



Summary

In this chapter, I presented a comprehensive overview of the analytical results derived from a quantitative investigation into disparities in oral health service utilization among older adults. Grounded in the SDH framework, I explored the extent to which race and income influenced patterns of dental care use within the Medicare population. Utilizing a cross-sectional research design and secondary data from the 2021 MCBS, I examined associations between demographic and socioeconomic factors and healthcare access among older adults.

To appropriately model the complex structure of the dependent variable—characterized by a large number of nonusers and overdispersed counts among users—a two-part analytic approach was employed. First, I used binary logistic regression to estimate the likelihood of any dental care utilization. Then, negative binomial regression

was applied to model the count of dental visits among those who had at least one service event. In addition, I conducted chi-square tests to explore bivariate relationships among categorical variables, providing context for understanding disparities in utilization.

The results of these models revealed that both race and income were statistically significant predictors of whether older adults accessed dental services, but only income significantly predicted visit frequency once care was initiated. Racial minority groups—particularly non-Hispanic Black and Hispanic individuals—had significantly lower odds of initiating care compared to their non-Hispanic White counterparts. Specifically, non-Hispanic Black beneficiaries had 66% lower odds (OR = 0.34, 95% CI [.29, .40], $p <$ .001), Hispanic beneficiaries had 56% lower odds (OR = 0.44, 95% CI [.38, .51], $p <$ .001), and other race respondents had 31% lower odds (OR = 0.69, 95% CI [.56, .85], $p <$ .001). However, no significant racial differences were found in the number of visits among utilizers. Individuals with household incomes below $25,000 were also substantially less likely to access dental services, with 70% lower odds of utilization compared to higher-income beneficiaries (OR = 0.30, 95% CI [–1.328, –1.071], $p <$ .001), and they reported significantly fewer visits when they did (IRR = 1.37, p = .015). These findings confirm that structural barriers—such as affordability constraints, systemic bias, and limited provider access—continue to disproportionately affect historically underserved populations.

The study's methodological design emphasized both statistical rigor and practical relevance. The use of a nationally representative sample enhanced the generalizability of the findings to the broader Medicare population, while the application of a multimodel

approach strengthened the validity of the results by aligning analytic techniques with the distributional characteristics of the data. The inclusion of descriptive statistics, model fit indices, and robust parameter estimates provided a detailed picture of how structural inequities manifest as measurable differences in dental care access and frequency.

Beyond providing the statistical findings, in this chapter I emphasize the urgent need to recognize and address disparities in oral healthcare through system-level solutions. The consistency of results across analytic strategies affirmed that race and income remain key social determinants that must be considered in any effort to improve healthcare equity. These findings underscore the importance of expanding dental benefits within Medicare, investing in culturally responsive outreach, and incorporating racial equity assessments in service planning and delivery.

In the next chapter, I will build upon these findings by discussing their broader public health implications, outlining the limitations of the study, and proposing avenues for future research. Emphasis will be placed on how the results contribute to advancing the SDH framework and guiding the development of targeted, data-driven policies that promote equitable access to oral health services among underserved Medicare populations.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In this chapter, I present a synthesis and critical interpretation of this quantitative study's findings regarding disparities in oral health service utilization among older adults. Drawing on secondary data from the 2021 MCBS, I focused on the relationships between race, income, and patterns of dental care use. The MCBS provides a nationally representative data set that captures key demographic, socioeconomic, and healthcare access indicators among Medicare beneficiaries, making it well-suited for exploring structural disparities in oral health utilization.

I employed a cross-sectional research design, enabling the assessment of group-based differences at a single point in time. Although this design does not allow for causal inferences, it is particularly effective for identifying associations between social determinants and health service utilization. I used a two-part analytic model to reflect the structure of the dependent variable. In the first part, binary logistic regression was employed to examine whether participants accessed any dental services, while the second part involved negative binomial regression to estimate the frequency of visits among those who did. I also conducted chi-square tests to explore bivariate relationships between categorical variables and utilization.

I interpreted the findings using the SDH framework, which recognizes that health outcomes are shaped by broader social, economic, and environmental influences. This perspective provided a valuable lens through which to understand how race and income—beyond individual behaviors—affect dental care access and utilization. The

study specifically addressed structural factors, such as systemic racism, economic disadvantage, and provider shortages, that continue to shape healthcare access for underserved populations.

This study is especially relevant for older adults from historically marginalized racial and ethnic groups and for individuals with limited financial resources. These populations face well-documented inequities in oral health care, often stemming from intersecting challenges, such as economic instability, geographic isolation, inadequate dental coverage, and cultural or linguistic barriers (Cano,2022). These disparities are particularly severe in underserved and rural regions, including parts of Appalachia, where healthcare systems are further strained by transportation limitations and chronic underinvestment (Scannapieco & Lamster, 2024).

By placing the study results within this larger geographic and sociopolitical context in this chapter, I aim to deepen the understanding of how inequities in oral health utilization are perpetuated over time. I also emphasize the importance of targeted reforms and policy-driven interventions that can address structural disparities in the delivery of dental services in the chapter. The chapter concludes with my evidence-based recommendations designed to promote accessibility, affordability, and health equity for aging Medicare beneficiaries. The findings are intended to inform future research, policy development, and community-based strategies aimed at closing gaps in oral healthcare for older adults.

Interpretation of the Findings

The purpose of this study was to examine whether race and income predict the utilization of oral health services among older adults enrolled in Medicare, using data from the 2021 MCBS. The analysis was guided by the SDH framework, and I employed a cross-sectional design to assess disparities in access to dental care. A two-part analytic strategy was applied to account for the structure of the dependent variable, which included a large number of nonusers and a right-skewed distribution of visit counts among users. Specifically, I performed binary logistic regression to estimate the likelihood of any dental utilization and negative binomial regression to model the frequency of visits among users. Chi-square tests were also conducted to provide additional context by examining bivariate associations between key categorical variables and service use.

The following two research questions framed the study:

RQ1: Is there a statistically significant correlation between race and the utilization of oral health services among older adults?

RQ2: Is there a statistically significant correlation between income and the utilization of oral health services among older adults?

Results for RQ1

The binary logistic regression revealed that race significantly predicted the likelihood of any dental service utilization. Non-Hispanic Black older adults had 66% lower odds of accessing care compared to non-Hispanic Whites ($OR = 0.34$, 95% CI [.29, .40], $p < .001$). Similarly, Hispanic older adults had 56% lower odds ($OR = 0.44$, 95% CI

[.38, .51], $p < .001$), and individuals in the other race category had 31% lower odds (*OR* = 0.69, 95% CI [.56, .85], $p < .001$). In contrast, results from the negative binomial regression showed that race was not a statistically significant predictor of the number of visits among utilizers (Wald $\chi^2 = 3.834$, $p = .280$). This indicates that, once older adults had accessed at least one dental service, racial differences in visit frequency were not observed.

Together, these findings confirmed that race primarily influenced whether older adults initiated dental care but did not significantly affect the frequency of visits among those who accessed services. This suggests that systemic barriers disproportionately restricted entry into care for racial minority groups, while patterns of engagement after access were comparable across groups.

Results for RQ2

Income was also a statistically significant predictor of dental service utilization. Older adults with household incomes less than $25,000 had 44% lower odds of using any dental services compared to those with higher incomes (*OR* = 0.56, 95% CI [0.43, 0.70], $p < .001$). The negative binomial regression further showed that among utilizers, lower-income individuals reported significantly fewer dental visits on average (IRR = 1.37, 95% CI [1.06, 1.76], $p = .015$). These results confirm that income disparities affected both the likelihood of initiating care and the frequency of visits, reinforcing the role of financial resources as a central determinant of oral healthcare access among older adults.

Interpretation of Findings Based on Study Parameters

The statistically significant findings for both research questions underscore persistent and measurable disparities in oral health service utilization among older adults based on race and income. These disparities reflect structural inequities embedded within the healthcare system and highlight the limitations of current Medicare coverage for meeting the dental care needs of vulnerable populations.

For RQ1, I found race to be a significant predictor of whether older adults accessed dental care but not of how frequently they utilized services once care was initiated. Non-Hispanic Black, Hispanic, and other race beneficiaries all had significantly lower odds of initiating dental care compared to non-Hispanic White counterparts. These findings align with the study parameters, which targeted Medicare beneficiaries aged 65 and older, and reinforce that disparities exist even within a population universally eligible for healthcare coverage. The results suggest that factors, such as provider bias, limited racial representation in the dental workforce, and mistrust of healthcare systems, contribute to underutilization. These interpretations are consistent with Saha et al. (2000), who found that racial concordance between patients and providers improves trust, communication, and treatment adherence—factors often lacking for minority patients in predominantly White provider settings.

For RQ2, income was a significant predictor of both access and frequency of dental care utilization. Older adults with household incomes below $25,000 were substantially less likely to initiate care and, among those who did, reported fewer visits compared to higher income beneficiaries. This interpretation is firmly grounded in the

study's analytic model, which included household income as a central variable. Individuals with limited financial resources likely face overlapping challenges, such as food insecurity, lack of transportation, housing instability, and competing financial obligations, all of which deprioritize dental care despite its relevance to overall health (see Braveman et al., 2011a). Even when some Medicare Advantage plans offer limited dental benefits, access is inconsistent and coverage is typically narrow, which further compounds disparities for low-income beneficiaries.

Importantly, the results of this study must be understood within the context of the Medicare system. Traditional Medicare does not include comprehensive dental benefits, and while some beneficiaries may have supplemental or Advantage plan coverage, availability varies widely. The observed disparities in access, and in the case of income also in frequency of use, indicate that dental coverage alone is insufficient without also addressing broader systemic and social barriers.

Overall, the findings provide robust evidence that both race and income are significant predictors of oral health service utilization among older adults enrolled in Medicare. The study supports the need for more equitable healthcare strategies that address not only coverage gaps but also the underlying systemic inequities that perpetuate disparities in service access and use.

Results Related to Literature

The results of this study align with existing literature on oral health disparities, reinforcing well-documented findings that both race and income significantly influence dental care utilization among older adults. The two-part analytic approach used in this

research—binary logistic regression for the likelihood of any dental use and negative binomial regression for the frequency of visits—clarified how these disparities manifest differently across social determinants. The findings confirmed that non-Hispanic Black and Hispanic Medicare beneficiaries faced significantly lower odds of initiating dental care compared to non-Hispanic Whites, while income disparities extended to both the initiation and frequency of use.

Borrell and Williams (2022) similarly reported that racial and ethnic minority groups have lower rates of dental visits, linking these disparities to structural racism, provider underrepresentation in racial and ethnic minority communities, and culturally unresponsive care environments. These barriers were reflected in the current study's findings, where racial minority groups were less likely to access care. Wu et al. (2022) also documented fewer preventive dental visits among African American and Hispanic adults, even after adjusting for socioeconomic factors, underscoring persistent racial inequities in dental care. However, the present study results refine this evidence by showing that, within the Medicare population, racial disparities were concentrated in barriers to initiating care rather than in differences in visit frequency once access was achieved.

The current study's findings regarding income-based disparities strongly aligned with prior research. In this study, I found that older adults with household incomes under $25,000 were substantially less likely to use dental services and reported significantly fewer visits when they did. These findings are consistent with Wehby et al. (2022), who noted that even after Medicaid expansion improved coverage, financial barriers continued

to limit preventive dental care among low-income populations. The persistence of income effects observed in the current study reinforces that insurance expansion alone is insufficient to overcome broader economic barriers to care.

Collectively, the current study's results support the conceptualization of race and income as both independent and intersecting predictors of oral health service utilization. This relationship is consistent with the theory of intersectionality in healthcare disparities research, where multiple forms of disadvantage, such as racial identity and economic marginalization, combine to shape unequal outcomes (Bowleg, 2021). The enduring relevance of the "inverse care law," introduced by Hart (1971), is evident in these findings: Those with the greatest need for dental care—racial minorities and low-income older adults—are the least likely to receive it. The current study, thus, contributes to the growing body of empirical evidence supporting targeted interventions to mitigate oral healthcare disparities among aging, vulnerable populations.

Results Related to Framework

This study was guided by the SDH framework, which positions health outcomes as the result of complex interactions between social, economic, and environmental conditions (see Braveman & Gottlieb, 2014). The statistically significant associations identified between race, income, and oral health service utilization in this study provide empirical support for the framework's core tenets. By applying a multimodel analytical strategy to data from the 2021 MCBS, the study findings revealed how structural inequities shape access to dental care and, in the case of income, also influence the frequency of service use among older adults. The MCBS collects extensive self-reported

data on Medicare beneficiaries' healthcare utilization—including dental care—as well as their demographic, social, and economic characteristics (Centers for Medicare & Medicaid Services, 2025)

The SDH framework posits that unequal distribution of resources, power, and opportunities is central to explaining health disparities (MacDougall, 2016). This study's findings affirm this premise, demonstrating that older adults from minority racial groups and lower income households continue to face systemic barriers to preventive oral healthcare. These barriers include the lack of comprehensive dental coverage under traditional Medicare, geographic maldistribution of dental providers in underserved communities, and limited access to culturally or linguistically appropriate care (Rahman et al., 2024).

Moreover, the findings align with Solar and Irwin's (2010) conceptual model for addressing social determinants across multiple levels. At the upstream level, the lack of standardized dental coverage in Medicare represents a policy failure that disproportionately affects financially and racially marginalized populations (Simon et al., 2023). At the midstream level, community-level challenges, such as provider shortages, poor infrastructure, and limited service availability exacerbate inequities (Rahman et al., 2024). At the downstream level, factors, such as low oral health literacy and previous negative experiences with the healthcare system, may discourage individuals from seeking care—even when it is technically available (Borreani et al., 2008).

By applying the SDH framework, this study extends the understanding of how social disadvantage accumulates over the life course and leads to limited engagement

with essential health services in later life (see Jones et al., 2019). The study's alignment with this framework underscores the importance of comprehensive, multilevel strategies that move beyond individual behavior change to address systemic causes of disparity (see Northridge et al., 2020). In this way, the findings provide both empirical validation and theoretical reinforcement of the SDH model as a guide for improving oral health equity within the Medicare population (see Northridge et al., 2020).

Policy Implications

The findings of this study reveal statistically significant associations between race, income, and oral health service utilization among older adults, highlighting that racial disparities were concentrated in access to care, while income disparities extended to both access and frequency of use (see Simon et al., 2023). These results, observed through multivariate regression and chi-square analyses using nationally representative data from the 2021 MCBS, align with prior applications of the MCBS in analyzing trends in healthcare access and utilization among older populations (see Aldridge et al., 2020). Together, these findings reinforce long-standing evidence that dental care presents greater financial barriers than other healthcare services (see Vujicic et al., 2016), underscoring how structural inequities continue to shape oral healthcare utilization in aging populations.

A primary policy recommendation involves the expansion of Medicare to include comprehensive dental coverage. Routine dental care is currently excluded from traditional Medicare, leaving millions of beneficiaries without access to preventive or restorative services—a gap that contributes to sharp drops in utilization and increases in

edentulism immediately after Medicare eligibility (Simon et al., 2023). Expanding coverage would directly address the financial barriers disproportionately affecting low-income individuals—an issue also highlighted by the Medicaid dental coverage "cliff," which significantly reduces access to dental care among low-income Medicare beneficiaries (Roberts et al., 2023). Such reform could reduce long-term oral health complications, prevent costly emergency interventions, and improve overall quality of life, building on evidence that dental care presents some of the highest financial barriers across healthcare services (Vujicic et al., 2016).

The current study also supports the implementation of racially and culturally responsive outreach strategies, especially in underserved regions with large minority populations. Investments in mobile dental clinics, community-based programs, and preventive oral health education—delivered through trusted local channels—could mitigate access issues and build trust among historically marginalized groups. Mobile dental units have been shown to improve access by delivering services directly to underserved urban and rural communities, effectively overcoming geographic and cultural barriers (Vashishtha et al., 2014). These initiatives would be particularly impactful in rural and semirural areas where transportation challenges, provider shortages, and economic barriers typically converge; empirical evidence demonstrates that mobile dental vehicles can serve as effective tools for reducing urban–rural inequalities in oral healthcare access (Gao, 2019).

In addition, the results point to the need for regulatory frameworks that embed racial equity assessments into dental workforce training and distribution. Federal and

state-level policies should promote provider education in cultural competence, implicit bias, and community engagement, which are foundational to dismantling the barriers that perpetuate disparities in care. Diversifying the dental profession has been shown to reduce provider bias and improve access, with minority dentists being significantly more likely to serve underserved areas and Medicaid populations (Borrell, 2022). Furthermore, integrating comprehensive cultural competency training into dental education helps ensure providers are prepared to meet the needs of diverse patient populations (Lopez et al., 2024). By aligning these policies with the evidence presented in the current study, decision-makers can advance a more equitable, accessible, and culturally responsive oral healthcare system for older adults.

Implications

This study holds several implications across public health, clinical practice, policy, and research.

Public Health and Policy

The findings emphasize the need for federal policy reform to eliminate dental care disparities within the Medicare population. Providing comprehensive dental coverage through Medicare would likely reduce overall healthcare costs by preventing dental-related complications and emergency room visits (Nasseh & Vujicic, 2017). Pourat et al. (2023) illustrated that targeted public benefit expansions can improve access and affordability, particularly among high-need populations. Importantly, the results of the current study show that while racial disparities were concentrated in access to care,

income disparities extended to both access and visit frequency—underscoring the structural role of financial barriers.

Clinical Practice

Healthcare systems should adopt integrated, culturally competent care models that include routine oral health assessments for older adults. Simon et al. (2023) showed that integration improves early detection and service continuity, particularly when delivered through interprofessional teams. In parallel, clinician training should include structural competency and implicit bias awareness to better engage diverse patient populations (Betancourt & Green, 2022).

Research and Evaluation

Future quantitative studies should prioritize the inclusion of expanded social determinant variables, such as housing instability, transportation availability, and social support. Braveman et al. (2011b) stressed that understanding these broader structural influences is critical to developing effective equity-focused interventions. This approach would improve predictive accuracy and the development of targeted, actionable solutions.

Community Engagement

The results support community-based outreach as a strategy to address disparities in dental care access. Programs that employ community health workers or dental navigators can serve as bridges between providers and underserved populations, improving adherence and utilization. Joo and Liu (2021) and Barker and Johnson (2024) found that such roles significantly increased preventive care uptake among older adults, especially in rural and racially diverse regions. Given the current study's results, outreach

strategies are particularly needed to overcome entry barriers among racial minorities and both entry and depth of engagement challenges among low-income groups.

Limitations of the Study

Several limitations were inherent in this study that must be acknowledged to provide appropriate context for interpreting the findings. The cross-sectional design limited the ability to establish causal relationships between race, income, and oral health service utilization. The study offered a snapshot of associations at a single point in time, which restricted conclusions about how these relationships evolved longitudinally.

Another limitation was the reliance on secondary data from the MCBS, which imposed restrictions on the scope of variables available for analysis. Although the MCBS provided comprehensive information on demographic and health-related factors, it did not capture important contextual elements, such as transportation access, provider availability, or cultural attitudes toward oral health. These omitted variables may have contributed to unexplained variance in utilization outcomes.

This study relied on self-reported data, which may have been subject to recall bias or social desirability bias. Prior work has shown that self-reported utilization can diverge from actual healthcare use, introducing the potential for misclassification and measurement error (Hwang et al., 2016). Despite these limitations, the large, nationally representative sample of Medicare beneficiaries used in the current study provided valuable insights into utilization patterns across diverse populations.

The generalizability of the findings is limited primarily to older adults enrolled in Medicare within the United States. The results may not fully apply to populations outside

of the United States or to individuals who were not enrolled in Medicare. Consequently, while the findings contributed important evidence regarding disparities in oral health service utilization, caution should be used when extending these conclusions to other settings or populations.

Recommendations

Based on the limitations and findings of this study, I have several recommendations for future research, practice, and policy.

Recommendations for Future Research

Future studies should employ longitudinal designs to examine how race and income influence dental care utilization over time, allowing for causal inferences to be drawn. Mixed-methods research could also provide valuable insights by incorporating qualitative perspectives that capture cultural beliefs, provider experiences, and systemic barriers not observable in quantitative data sets. Further research should explore additional social determinants, such as geographic access, health literacy, and transportation availability, to provide a more comprehensive understanding of oral health disparities.

Recommendations for Policy and Practice

Policymakers should prioritize expanding Medicare to include comprehensive dental coverage because gaps in benefits continue to contribute to underutilization of care among low-income and minority beneficiaries. Medicaid coverage expansions have also been shown to reduce disparities in oral health outcomes, such as tooth loss, among low-income adults (Semprini & Wehby, 2022). Increasing access further requires addressing

structural issues, such as dental provider density, since shortages in underserved areas limit care even when insurance coverage is available (Taylor et al., 2024). A social work perspective underscores the importance of addressing dental disparities among low-income adults through structural reforms and community-based solutions, including affordable care programs and targeted outreach (MacDougall, 2016).

Recommendations for Methodology

Future methodological approaches should consider the use of multilevel modeling to account for community- and state-level factors that influence access to care. Geographic variation in provider supply, reimbursement policies, and Medicaid expansion may significantly shape utilization outcomes and should be systematically incorporated into analyses. Such approaches would strengthen the evidence base for interventions that address both individual-level and structural determinants of oral health disparities.

Conclusion

In this study, I investigated the influence of race and income on the utilization of oral health services among older adults using nationally representative data from the 2021MCBS. Findings from a combination of binary logistic regression, negative binomial regression, and chi-square tests revealed that both race and income were statistically significant predictors of dental care use. Specifically, non-Hispanic Black and Hispanic older adults had substantially lower odds of accessing preventive dental care compared to their non-Hispanic White counterparts, while individuals with annual

household incomes below $25,000 were significantly less likely to access care and reported fewer visits once services were initiated.

These findings underscore the presence of structural inequities within the healthcare system that disproportionately affect historically marginalized populations—even within Medicare, a program designed to ensure access to care for older adults. The statistical significance and consistency of results across analytic methods confirm that disparities in oral health utilization are not merely individual-level issues but rather symptoms of systemic barriers, such as affordability, provider availability, racial bias, and geographic isolation.

By leveraging a rigorous quantitative methodology and a large, policy-relevant data set, this study strengthens the empirical foundation for oral health equity advocacy. The findings support policy reforms aimed at expanding Medicare dental benefits, increasing investment in underserved communities, and implementing culturally responsive care practices. More broadly, this study affirms that improving access to oral health services for older adults is not only a matter of clinical best practice but one of health equity and social justice. Structural reforms, provider training, and community-based outreach are essential for promoting dignity, health, and quality of life for all aging individuals, particularly those from racial minority groups and low-income households. Closing these gaps is critical to realizing a healthcare system that is inclusive, effective, and equitable for the growing Medicare population.

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