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Relationship Between Opioid Treatment and Nonpharmacological Chronic Pain Management Interventions and Perceived Effectiveness of Managing Chronic Pain in African American Adults

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Walden University

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Bona C. Eze

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Walden University

2024

Abstract

Relationship Between Opioid Treatment and Nonpharmacological Chronic Pain
Management Interventions and Perceived Effectiveness of Managing Chronic Pain in
African American Adults

by

Bona C. Eze

DNP, MSN, Walden University, 2022

MPH, Aspen University, 2021

MBA, Southern Connecticut State University, Ongoing

BSc., University of Massachusetts Amherst, 2007

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Chronic pain impacts all areas of life for most Americans, but the issue is particularly salient among African Americans (AAs) as they face adverse pain outcomes. There is little understanding of pain management strategies used by AAs to inform pain management recommendations. The purpose of this study, guided by the COM-B model and biopsychosocial theory, was to determine if there were a relationships between opioid treatment and perceived effectiveness of managing chronic pain in AA adults who are 18 years and older as well as between nonpharmacological interventions (physical therapy, chiropractic care, talk therapy, self-management program, yoga, massage) and perceived effectiveness of managing chronic pain in this population using 2019 National Health Interview Survey data. Data from 2525 AA adults experiencing chronic pain were analyzed using ordinal logistic regression which showed there were statistically significant relationships between opioid treatment, physical therapy, and chiropractic care and perceived effectiveness of managing chronic pain for this population with small effects. There were no statistically significant relationships between talk therapy, massage, self-management, and yoga and perceived effectiveness of managing chronic pain in AA adults. Findings suggest AAs may use other and unidentified methods for managing chronic pain. Further research is required to determine these methods and assess their effectiveness in terms of improving pain management outcomes. Healthcare practitioners can use findings to address strategies AAs use to manage chronic pain, which will lead to positive social change.

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Dedication

I dedicate this project to my father, Elder Francis Aninafuzo Eze. Although he is no longer with us, I know that he would have been one of my greatest supporters, and extremely proud of this accomplishment.

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Chapter 1: Introduction to the Study

Chronic pain is a prevalent issue among adults seeking medical care in the United States, with estimated prevalence rates ranging between 11% to 40% (Cohen et al., 2021). Over 100 million Americans grapple with chronic pain annually (Meints et al., 2019). Furthermore, about 50 million Americans reported experiencing chronic pain daily or on most days, consequently impacting all areas of their lives (Yong et al., 2022). Many chronic conditions include pain as a significant component, and chronic pain itself is increasingly recognized as a standalone health concern (Cohen et al., 2021). Presence of chronic pain has negative consequences for individuals, their families, and society (Cohen et al., 2021). Chronic pain is associated with a range of mental and physical conditions and contributes to lost productivity and high costs of healthcare (Thurston et al., 2023). The impact of pain affects individuals across different ethnic and racial backgrounds in the United States. However, certain racial groups are more prone to experiencing adverse effects of pain compared to others (Morales & Yong, 2021). Minority groups, including African Americans (AAs) and Hispanic Americans, face disparities in terms of pain treatment with significant burdens of pain for AAs (Booker et al., 2019). Understanding strategies AAs employ to manage their pain, the relationship between opioid treatment and nonpharmacological pain management interventions, and perceived effectiveness of managing chronic pain in this population is essential for informing measures and interventions that are aimed at addressing the unequal pain burden within AA populations.

In Chapter 1, I present background information about opioid treatment and nonpharmacological pain management interventions and perceived effectiveness of these interventions among AAs with chronic pain. I discuss literature about prevalence of chronic pain as a social problem, implications of the social problem for health and quality of life of individuals living with chronic pain, and potential positive social change through enhanced understanding of dynamic and complex processes involved with management of chronic pain in the AA population. Furthermore, I identify the gap in knowledge concerning this topic. I developed a problem statement that includes a description of the social issue that I sought to address. Next, I identify the purpose of the study, followed by research questions and hypotheses. I discuss theoretical frameworks and explain assumptions underlying theories. Next, I address the nature of the study, definitions of terms, limitations, scope and delimitations, significance, and implications for social change.

Background

Chronic pain is a serious public health concern in the United States (Yong et al., 2022). Chronic pain is defined as pain that persists for 3 months or longer, regardless of the initial cause (Dowell et al., 2022). Chronic pain can sometimes result from an identifiable medical condition, injury, treatment, or inflammation, or it can be unexplained; the key feature is its extended duration beyond the typical healing timeframe (Dowell et al., 2022). In nursing practice, concepts play a crucial role in advancing evidence-based practice. According to McEwen and Wills (2019), concepts help understand a phenomenon. One main concept that I explored in my study was

chronic pain management interventions (opioid treatment and non-pharmacological) in the context of chronic pain in African American adults.

Opioid treatment and non-pharmacological approaches for treating chronic pain working together with their related concepts have goals to improve an individual's self-efficacy, positive behavior change, and overall quality of life (Coffee et al., 2024). In addition, Opioid and nonpharmacological chronic pain management interventions include physical therapy, chiropractic care, talk therapy, self-management programs, yoga, and massages, which positively improve capabilities of individuals and encourage positive behavior changes (Coffee et al., 2024). Chronic pain management refers to the various strategies and practices individuals use to care for their health and well-being (Casella, 2023). The Strategies and practices can include exercise, healthy eating, stress management, and medication (Casella, 2023). Chronic pain management may involve using pharmacological strategies such as opioids, as well as nonpharmacological strategies such as relaxation techniques, exercise, and seeking support from healthcare providers and other community members (Casella, 2023).

Other related concepts include self-efficacy, capability, motivation, opportunity, biological factors, psychological factors, and social factors. Self-efficacy refers to individual belief in one's ability to successfully perform specific tasks or behaviors (Mitchie et al., 2011). In the context of chronic pain management, self-efficacy relates to confidence in their ability to effectively manage pain. Self-efficacy can influence perceived effectiveness of different pain management approaches (Mitchie et al., 2011). Capability refers to individual potential or capacity to engage in certain behaviors or

activities (Mitchie et al., 2011). In the context of chronic pain management, capability can refer to physical and mental abilities that are required to engage in pain management approaches (Mitchie et al., 2011).

Motivation is another important concept that refers to internal or external factors that drive and direct individual behaviors. In the context of chronic pain management, this involves willingness and commitment to engage in pain management approaches (Mitchie et al., 2011). Opportunity refers to external circumstances or resources that enable individuals to engage in certain behaviors or activities. In the context of chronic pain management, this involves availability and accessibility of pain management approaches (Mitchie et al., 2011).

Biological, psychological, and social factors are important concepts in chronic pain management. Biological factors entail anatomical and physiological aspects of the body that influence chronic pain (Koukoulithras et al., 2021). Psychological factors refer to emotional, cognitive, and behavioral concepts that influence individual perceptions and management of chronic pain, such as catastrophizing and coping mechanisms (Koukoulithras et al., 2021). Social factors entail environmental influences that affect experiences with chronic pain, including social support, healthcare systems, and lifestyle and work factors (Koukoulithras et al., 2021).

While pain is a problem for all Americans, AAs face disproportionate effects (Knoebel et al., 2021; Yong et al., 2022). There is little understanding of pain management strategies used by AAs to help inform pain management recommendations

and improve the population's wellbeing, safety, and quality of life. AA adults experiencing pain require effective pain management strategies or approaches.

Problem Statement

Although researchers have investigated chronic pain management strategies, the topic was not explored because there was little literature regarding the relationship between opioid treatment and nonpharmacological chronic pain management interventions and perceived effectiveness of managing pain in African American adults. Thus, the specific research problem that I addressed was lack of comprehensive understanding regarding the relationship between opioid treatment and non-pharmacological chronic pain management interventions the perceived effectiveness of managing chronic pain in AA adults who were 18 and older.

Pain impacts the mind, body, and spirit (Nawai, 2019). Acute pain is pain that lasts for a couple of days or weeks but does not last more than 3 months. Pain that lasts for more than 3 to 6 months is considered chronic pain (Griffioen et al., 2020; Lavandhomme, 2017). According to Raja et al. (2020), pain is an unpleasant sensory and emotional experience that is associated with actual or potential tissue damage, or described in terms of such damage, including uncomfortable, unpleasant, and distressing sensations, feelings, or experiences. Over 100 million Americans experience chronic pain annually (Smith & Hillner, 2019). About 50.2 million American adults report pain daily or on most days (Yong et al., 2022). The United States spends about \$635 billion annually on pain treatment, higher than costs of treating cancer, diabetes, and heart disease (Morales & Yong, 2021). America's most common pain locations are back, hand,

knee, head, and foot pain (Yong et al., 2022). Although pain affects all Americans, the issue is particularly salient for non-Hispanic Blacks and AAs (Eze & McDonald, 2020). AAs and other minorities may particularly find it hard to manage their pain for several reasons, such as racial biases involving pain perception and treatment recommendations, as well as the multifaceted nature of pain in AA populations, which is usually complicated by medical comorbidities as well as spiritual, biopsychosocial, legal and financial determinants (Booker et al., 2023; Knoebel et al., 2021; Morales & Yong, 2021; Yong et al., 2022). Eze and McDonald (2020) found 47.9% of AA young adults may not consider seeking professional medical treatment regardless of reporting feeling pain. The specific research problem was that little was known about how AA adults who were 18 and older perceived effectiveness of chronic pain management interventions. I analyzed 2019 National Health Interview Survey (NHIS) data for more appropriate and effective pain management strategies that are tailored to specific needs and preferences of AAs.

Purpose of the Study

The purposes of this quantitative study were to determine if there were relationships between opioid treatment pain management interventions as well as nonpharmacological interventions and perceived effectiveness of managing chronic pain in AA adults who were 18 and older and (b) a relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Nonpharmacological interventions were analyzed separately in relation to perceived

effectiveness of managing chronic pain for this population. Independent variables were opioid and non-pharmacological chronic pain management interventions, including physical therapy, chiropractic care, talk therapy, self-management programs, yoga, and massages. The dependent variable was perceived effectiveness of managing chronic pain.

Research Questions and Hypotheses

I used the following research questions and hypotheses for this study:

RQ1: What is the relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀1: There is no relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a1: There is a relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ2: What is the relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀2: There is no relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a2: There is a relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ3: What is the relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀3: There is no relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a3: There is a relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ4: What is the relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AAA adults who are 18 and older?

H₀4: There is no relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a4: There is a relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ5: What is the relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀5: There is no significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a5: There is a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

RQ6: What is the relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀6: There is no relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

H_a6: There is a t relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ7: What is the relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀7: There is no relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a7: There is a relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in African American AA adults who are 18 and older.

I tested the association between the chronic pain management interventions used by African Americans and the perceived effectiveness of managing chronic pain using those interventions. The independent variables, opioid treatment, and non-pharmacological chronic pain management interventions were measured by the patient

report in the 2019 NHIS with dichotomous groups: “Yes” or “No”. On the other hand, the dependent variable, the perceived effectiveness of managing chronic pain was measured by patient-reported outcomes in the 2019 NHIS with the following categories: 1: very effective, 2: somewhat effective, 3: only a little effective, and 4: not at all effective.

Theoretical Frameworks for the Study

COM-B Model of Behavior Change

The conceptual framework that grounded this study was Michie et al.’s COM-B model of behavior change, which is used to explain relationships between capability (C), opportunity (O), and motivation (M) with behavior (B). According to the model, adjusting one or more components causes lasting and effective changes in behavior. For instance, changing perceived opportunity and capability can influence motivation to engage in a specific behavior (Timlin et al., 2021). Therefore, this leads to changed behaviors. A robust change process impacts determinants of behavior, leading to transitions from old to new competing behaviors. Outcomes reinforce new behaviors in the long term, thus creating sustainable behavior changes.

COM-B was used to explore the relationship between opioid treatment and perceived effectiveness of managing chronic pain among AA adults. Similarly, the model helped explore the relationship between non-pharmacological chronic pain management interventions and the perceived effectiveness of managing chronic pain in African American adults 18 years of age and older. The COM-B model helped explain the factors that may be influencing the use of and perceived effectiveness of different pain management strategies among African American adults. The model provided a

comprehensive framework to understand interplay between individual capabilities, environmental opportunities, and motivational factors in terms of shaping behavior and outcomes related to this topic.

Biopsychosocial Theory

For this study, I also used the biopsychosocial theory, which was introduced by George Engel in 1977. The theory is used to explain interconnectedness between biological, psychological, and social factors influencing perceptions, experiences, and management involved with health problems. The model helped address the relationship between opioid treatment and non-pharmacological interventions and the perceived effectiveness of managing chronic pain in African American adults. The theory specifically helped in terms of recognizing that chronic pain is influenced by biological, psychological, and social factors, and understanding these interactions was crucial for effective chronic pain management.

Biological factors are a key component of the biopsychosocial theory. The theory was used to explore opioid treatment and its impact on pain reduction, physical functioning, and overall wellbeing. This included addressing self-reported overall effectiveness of managing chronic pain among the AA adult population. Understanding biological mechanisms underlying chronic pain and effects of opioid treatment intervention helped inform evidence-based approaches to pain management.

Psychological factors are a fundamental component of the biopsychosocial theory. The framework helped explore the relationship between psychological non-pharmacological chronic pain interventions, such as Yoga, and their perceived

effectiveness in managing chronic pain in African American adults as the outcome.

Examining psychological aspects of pain management could lead to insights regarding unique needs and preferences of the AA adult population, leading to more tailored and effective interventions.

Social factors are also a key component of the biopsychosocial theory. The framework helped explore how non-pharmacological social factors, such as physical therapy and massage for pain, related to the perceived effective pain management outcomes in the African American adult population. Understanding the social and cultural context of pain management informed strategies for addressing disparities, promoting equitable access to care, and enhancing patient-centered approaches. I present more details on the theoretical frameworks in Chapter 2.

Nature of the Study

To address research questions in this quantitative study, I used a cross-sectional design with secondary data from the 2019 Centers for Disease Control and Prevention (CDC) NHIS survey. Cross-sectional studies are observational studies that involve analyzing data from a population at a single point in time (Wang & Cheng, 2020). They can be used to measure prevalence of health outcomes and describe features of a population (Wang & Cheng, 2020).

The dependent variable, perceived effectiveness of managing chronic pain, was measured using patient-reported outcomes on a Likert scale of one to four on the 2019 NHIS survey. According to Simon and Goes (2013), Likert-type scales can be treated as continuous data if they have at least five and preferably seven or more categories. The

fewer the number of points, the more likely data may depart from assumptions of normal distribution, which are required for tests of hypothesis (Simon & Goes, 2013). used a four-point Likert scale for the dependent variable. I conducted ordinal logistic regression, which was designed to analyze data using ordinal dependent variables. An ordinal variable is a categorical variable with ordered categories or levels, where categories have a meaningful order or hierarchy but intervals between them may not be equal (Burkner & Vourre, 2019). Perceived effectiveness of managing chronic pain was measured in terms of the following levels: one was very effective, two was somewhat effective, three was only a little effective, and four was not at all effective. Ordinal regression was used to model relationships between the ordinal dependent variable and independent variables.

Opioid treatment and nonpharmacological chronic pain management interventions were measured by asking participants if they used chronic pain management interventions, and their responses were recorded as yes or no. Nonpharmacological pain management interventions were physical therapy, yoga, chiropractic care, talk therapy, massage, and self-management. When determining relationships between opioid treatment and non-pharmacological chronic pain management interventions and perceived effectiveness of managing chronic pain in AA, ordinal regression was most suitable for data analysis in order to to handle ordered categorical response variables and assess the impact of predictors on ordinal outcome with less than five categories. My dependent variable had four categories, including 1: very effective, 2: somewhat effective, 3: only a little effective, and 4: not at all effective.

I gathered demographic variables of participants and presented demographic information as aggregate data. Demographic factors found in the 2019 NHIS dataset including sex, race, insurance status, and marital status were significantly associated with pain among American adults with chronic pain (Mullins et al., 2022). I provided background information about demographic variables in Chapter 2. In terms of the planned research design, I used secondary quantitative data; hence, I did not use any data collection instrument. The link to the original data source is <https://www.cdc.gov/nchs/nhis/2019nhis.htm>.

Definitions

Acute pain: Sudden onset pain that typically lasts for less than a week but can extend up to 3 months (Balgah & Atanga, 2022).

Chronic pain: Pain that lasts for 3 or more months which can be caused by an injury, inflammation, an existing medical condition, as well as idiopathic (Dowell et al., 2022).

Non-pharmacological interventions: Pain management techniques that do not involve medication (Tsegaye et al., 2023).

Opioid therapy: Pain management intervention involving use of opioids or narcotics (Marian et al., 2023).

Pain: Combination of distressing physical and emotional sensations that can be associated with actual or potential tissue damage (Raja et al., 2020).

Assumptions

I assumed NHIS data were collected using a representative random sample. I ensured the survey accurately represented the population of interest, which in this case was AA adults who were 18 and older with chronic pain. If the sampling method is biased, generalizability of findings may be limited (Lopez, 2022). I also assumed measures to assess chronic pain management interventions and perceived effectiveness of pain management interventions were valid and reliable. Valid measures accurately capture the concepts they intend to measure, while reliable measures yield consistent results over time (Lopez, 2022). It is essential to ensure survey questions and response options adequately captured nuances involved with chronic pain and its management, as well as individual perceptions of effectiveness.

Scope and Delimitations

This research entailed determining relationships between opioid treatment and nonpharmacological chronic pain management interventions and perceived effectiveness of managing chronic pain among AA adults who were 18 and older. The population of interest was African American adults 18 years and older with chronic pain as captured in the 2019 NHIS dataset (CDC, 2019a). I used data from the 2019 NHIS survey. I did not use any information other than the 2019 survey.

The COM-B model of behavior change, and biopsychosocial theory guided my study. I used the COM-B model to understand how factors like capability, opportunity, and motivation impact behavior changes among AA adults with chronic pain, and the biopsychosocial theory was used to understand the multifaceted nature of pain, and how

biological, psychological, and social factors interact to impact chronic pain in this population.

All information came from the 2019 NHIS dataset. Any missing data or limitations in surveys affected analysis and generalizability of results (Ericson et al., 2023). This was a cross-sectional survey, and data were collected at a single point in time. Therefore, I did not test for causal inferences or evaluation of long-term changes in chronic pain management interventions and their perceived effectiveness. Furthermore, I relied on self-reported data that were collected via survey responses. Self-reported data has a possibility of recall bias, which is a limitation that is associated with self-reporting measures (Ericson et al., 2023). Study findings were specific to the population in the 2019 NHIS survey. Generalizing results to other populations or periods was done with caution considering potential differences in terms of demographics and healthcare systems.

Limitations

The dataset may have limited variables. Despite the 2019 NHIS survey covering a wide range of health-related topics, some variables involved with primary chronic pain management interventions are missing. For example, nonsteroidal anti-inflammatory drugs (NSAIDs) as chronic pain management intervention variables were not included in the dataset despite being widely used in managing chronic pain. I only used variables that were present in the dataset. Another limitation is that 2019 NHIS data were cross-sectional. This allowed me to explore associations but not establish causality.

Significance

Results of my study may include new information about pain among African Americans which would help nurse practitioners and other healthcare providers understand perceived effectiveness of opioid treatment and nonpharmacological chronic pain management interventions among AAs. This will enhance understanding of how to assist AAs with treating their chronic pain. In addition, knowledge about effective chronic pain management interventions helps AAs know which strategies to use to manage their pain, which could reduce healthcare costs associated with chronic pain, decrease the need for additional chronic pain interventions, and improve their quality of life (Booker et al., 2023).

Results of my study included new information about addressing peers, community, and societal chronic pain. Chronic pain is a significant public health issue in the United States, impacting people's quality of life and overall well-being (Morales, 2021). African Americans are more likely to experience chronic pain due to disparities in terms of healthcare access as well as social, cultural, and economic factors (Booker et al., 2023). Applying the COM-B model to understanding chronic pain among African Americans helped to improve understanding of the challenges associated with chronic pain in the population and the development of targeted interventions that enhance capabilities, create opportunities, and motivate positive health behaviors.

Healthcare providers, caregivers, family members, and policymakers could leverage study findings to inform opioid treatment and nonpharmacological chronic pain management practices among African Americans. Study outcomes could also form the

basis of public awareness campaigns and advocacy efforts that are aimed at raising awareness of the impact of chronic pain on African American communities and effective interventions for addressing the issue (Knoebel et al., 2021). Furthermore, findings of my study could help reduce opioid treatment and nonpharmacological chronic pain management disparities in the United States. Healthcare policies and practices could be shaped by study findings to foster a greater understanding of what works for AAs concerning chronic pain management, ultimately leading to better management of pain in this population.

Summary

Chapter 1 included an introduction to the social problem of chronic pain, which is particularly salient for AAs (Eze & McDonald, 2020; Knoebel et al., 2021; Morales & Yong, 2021; Yong et al., 2022). The purpose of my study was to determine if there were a relationships between opioid treatment pain as well nonpharmacological management interventions and perceived effectiveness of managing chronic pain in AA adults who were 18 and older and (b) the relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Nonpharmacological interventions were analyzed separately in relation to perceived effectiveness of managing chronic pain in African American adults 18 years and older. I explained the foundation for the study by providing background information, identifying the gap in existing literature, and formulating research questions and hypotheses.

Furthermore, in Chapter 1, I provided details about the COM-B model of behavior change and biopsychosocial theory. I expanded on the study's key definitions, assumptions, scope and delimitations, limitations, and significance.

In Chapter 2, I present the literature review. which literature search strategies, theoretical foundations underpinning the study, and existing literature related to key concepts and variables.

Chapter 2: Literature Review

Little is known about how AA adults who are 18 and older perceive effectiveness of various chronic pain management interventions. Although pain affects all Americans, the issue is particularly salient for non-Hispanic Blacks and AAs (Eze & McDonald, 2020; Morales & Yong, 2021; Yong et al., 2022). Unlike their counterparts, AAs may particularly find it hard to manage their pain because of racial biases involving pain perceptions and treatment recommendations, as well as the multifaceted nature of pain in the AA population, which is usually complicated by medical comorbidities and spiritual, biopsychosocial, legal and financial determinants (Booker et al., 2023; Knoebel et al., 2021; Morales & Yong, 2021; Yong et al., 2022). I analyzed 2019 NHIS data to inform more culturally appropriate and effective pain management strategies that are tailored to African Americans' specific needs and preferences. The purposes of my study were to determine if there was (a) a relationship between opioid treatment pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older and (b) a relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Nonpharmacological interventions were analyzed separately in relation to perceived effectiveness of managing chronic pain in this population.

The burden of pain treatment in the United States is higher than the cost of treating heart disease and cancer, claiming about \$560 billion to \$635 billion annually.

\$261 to \$300 billion is spent on direct healthcare costs, \$95.2 to \$96.5 billion is lost on work hours that are missed due to pain, and \$190.6 to \$226.3 billion is lost due to lower wages caused by pain (Smith & Hillner, 2019). Although pain affects all Americans, the issue is particularly salient for non-Hispanic Blacks/African Americans. Unlike their counterparts, African Americans and other minorities may particularly find it hard to manage their pain because of reasons, such as racial bias in pain perception and treatment recommendations, and the multifaceted nature of pain in the African American population, usually complicated by patient medical comorbidities and a range of spiritual, biopsychosocial, legal and financial determinants (Booker et al., 2023; Knoebel et al., 2021; Morales & Yong, 2021; Yong et al., 2022;).

AAs' perceptions and use of opioid treatment and nonpharmacological chronic pain management interventions vary greatly from other ethnic groups in the United States (Booker & Herr, 2015; Drazich et al., 2022; Jones et al., 2008). Although literature exists highlighting some of the opioid treatment and non-pharmacological chronic pain management interventions African Americans use to manage their pain, effectiveness of pain management interventions among AAs is not well understood.

In Chapter 2, I provide a review of current and relevant scholarly sources regarding this topic. I explain literature search strategies I employed to identify relevant scholarly sources to ensure inclusion of current and credible research that contribute to understanding of pain management interventions for African Americans with chronic pain. I also address the COM-B model of behavior change and biopsychosocial theory. I

present an exhaustive literature review which is followed by identifying the gap in literature.

Literature Search Strategy

I searched the Walden University Library to access the following databases: EBSCOHost, Cochrane Library, National Library of Medicine, CINAHL, PsycINFO, Medline, and PubMed. All sources were published between 2019 and 2024. In addition, I searched Google Scholar to find additional literature sources by checking references pages for sources that were already obtained, which improved depth of the literature search while maintaining a high level of accuracy and efficiency. I also accessed secondary sources from web sites of governmental agencies, such as the CDC, NIH, Centers for Medicare & Medicaid Service, and U.S. Department of Health and Human Services. In addition, I used Zotero to list as well as add or edit citations, organize notes about relevant sources, and add or edit bibliographies, which improved efficiency of the literature review process.

I used the following keywords and terms for this study: *pain, chronic, acute, disease, African, American, Black, Non-Hispanic Black, management, manage, managing, adult(s), 18 years and older, interventions, effective, effectiveness, perceived, perception, pain areas, treatment, opioid treatment, nonpharmacological, opioid, yoga, massage, physical, talk, therapy, cope, coping, mechanism, self-efficacy, biopsychosocial, capability, motivation, opportunity, behavior, biological, psychological, wellbeing, healthy, health, and quality*. Three Boolean operators (and, or, not) were used to retrieve relevant research articles from databases. The operators used included “AND,” “OR” and

“NOT.” The operator “OR” helped broaden the literature search by including articles that contain any of the search terms. For example, searching for “pain management OR pain treatment” retrieved articles that discuss either pain management or pain treatment, expanding the scope of the search. The “AND” operator helped narrow down search results by requiring the specified search terms to be present in the retrieved documents, hence helping to focus or narrow down on desired information. For example, searching for “pain management AND effectiveness AND African Americans” retrieved articles that discussed pain management, the effectiveness of managing pain, and African Americans, ensuring a focused selection of literature on the target population. Finally, the operator “NOT” helped exclude specific concepts or terms from the search results. For example, searching “chronic pain NOT acute pain” helped retrieve articles related to chronic pain but not acute pain, providing a more specific set of literature about chronic pain.

In all, 80 articles were deemed potentially valuable for the literature review. The bulk of retrieved literature was published between 2019 and 2024. However, some older sources were fundamental to guide and inform the research topic and enhance understanding of key variables and related concepts. Literature included qualitative, quantitative, and mixed methods approaches. I focused on retrieving high-quality literature, which included peer-reviewed articles that were published in reputable journals as well as government website sources.

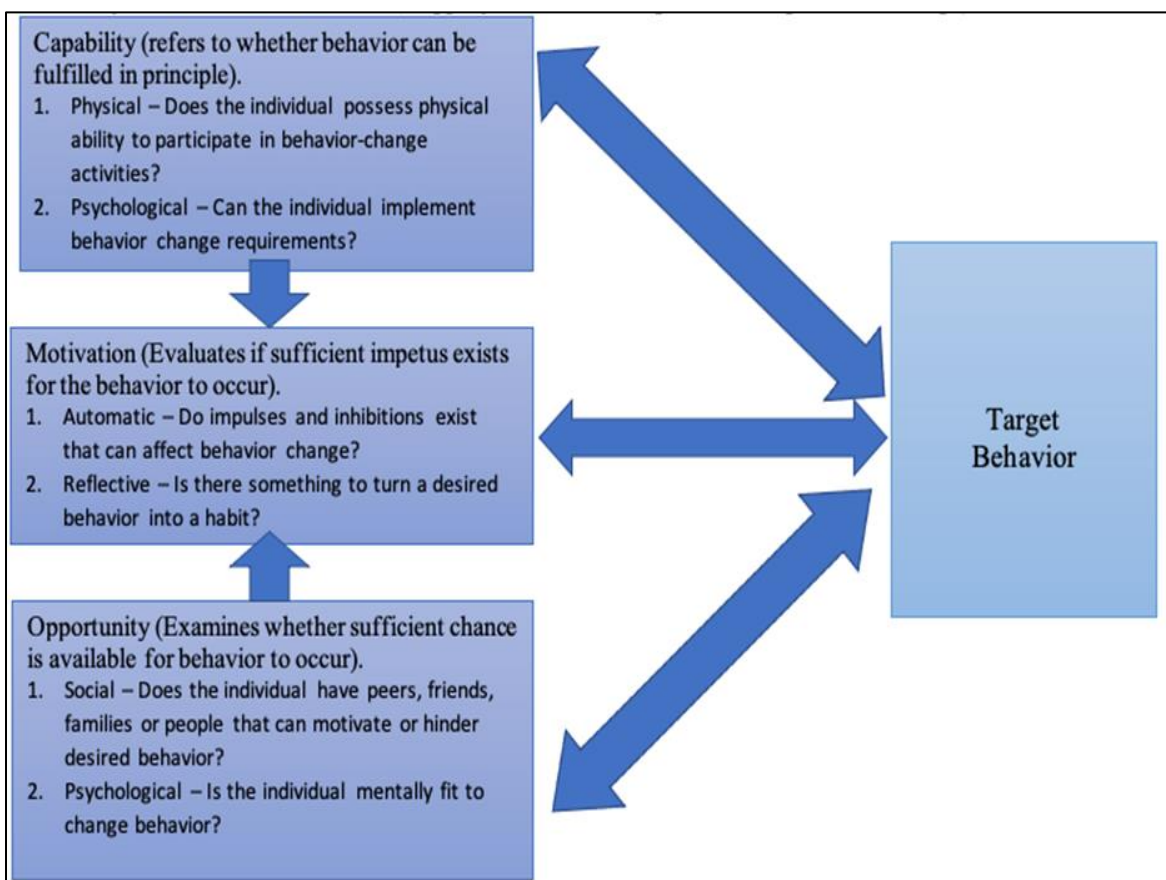
Theoretical Foundation

COM-B Model of Behavior Change

For this study, I used the COM-B model of behavior change. The COM-B model was used to understand the topic under study. I used this model to understand why AAs may not effectively manage their pain and inform interventions that could help them improve their effectiveness in managing this pain. Applying the COM-B model of behavior change helped me understand underlying factors impacting capability, opportunity, and motivation of African Americans to engage in effective pain management behaviors.

The COM-B Model of Behavior Change was developed by Michie et al. (2011) as a framework for understanding human behavior to help identify what individuals need to adjust to achieve an effective behavior change intervention. The COM-B Model of Behavior Change proposes that there are three components to any behavior (B): Capability (C), Opportunity (O), and Motivation (M). For an individual to perform a particular behavior, the individual must feel both psychologically and physically able to perform the particular behavior (C), have the physical and social opportunity for the behavior (O), and need or want to carry out the behavior more than other competing behaviors (M; Michie et al., 2011; see Figure 1).

Figure 1: COM-B Model of Behavior Change



As shown in Figure 1, capability (C) and opportunity (O) impact motivation (M), and all three (C, O, M) influence behavior change but are also influenced by the resultant behavior change (Michie et al., 2011). The individual components of the COM-B model can be broken down into smaller components. The capability of an individual refers to whether the individual has the abilities and skills required to engage in a particular behavior (West & Michie, 2020). Capability can be divided into psychological capability and physical capability. Psychological capability entails an individual's knowledge, stamina, skills, or psychological strength that can allow them to engage in a behavior-changing activity (Michie et al., 2011). On the other hand, physical capability entails a

person's physical stamina, skill, or strength to engage in a specific behavior-changing activity (Michie et al., 2011).

In the context of the COM-B model, opportunity (O) involves the extrinsic factors that make the execution of a particular behavior possible (Michie et al., 2011). The components of opportunity are physical opportunity and social opportunity. Physical opportunity entails opportunities within an individual's environment to engage in a particular behavior, for example, time, resources, and location (Michie et al., 2011). Social opportunity entails opportunities that occur from social factors, such as social cues and cultural norms that may enable or hinder behavior (Michie et al., 2011).

Motivation, in the context of the COM-B model, refers to the intrinsic processes within an individual that influence their decision-making processes and behaviors (Michie et al., 2011). Motivation can be further divided into reflective motivation and automatic motivation. According to Michie et al. (2011), reflective motivation involves an individual engaging in reflective processes, such as making plans and evaluating events that have passed. Automatic motivation entails unconscious processes that may impact human behavior, such as impulses, desires, and inhibitions (Michie et al., 2011).

Previous Application of COM-B Model of Behavior Change

An initial search of the literature revealed that the theory was applied in literature from 2011 to the present. The initial search for all studies in which the COM-B model of behavior change was used returned over 600 studies, articles, and cases. The literature search was narrowed to the COM-B model of behavior change and chronic pain. The following scholarly studies came up.

Ng et al. (2023) used the COM-B model of behavior change and the behavioral change wheel in a review study to understand the implementation of a biopsychosocial strategy for chronic pain management of musculoskeletal pain. The purpose of the study was to map established barriers and enablers affecting professionals' utilization of a biopsychosocial model to musculoskeletal pain against behavior change frameworks and to determine behavior change strategies to support and facilitate the adoption and improve musculoskeletal pain education. The COM-B model of behavior change helped Ng et al. (2023) map behavior barriers and enablers to help establish the best interventions for managing musculoskeletal chronic pain. The COM-B model of behavior change, alongside other frameworks including the Behavior Change Wheel and Theoretical Domains Framework, facilitated Ng et al. (2023) to develop a new framework called Behavior Change Technique Taxonomy (version 1), which can help healthcare professionals better utilize evidence-based interventions to understand biopsychosocial factors and implement interventions that promote better management of musculoskeletal chronic pain.

ElMokhallalati et al. (2018) investigated interventions to support the self-management of cancer pain using the COM-B model of behavior change to understand interventions that support effective cancer pain self-management. Whereas extant evidence concerning cancer pain self-management is not only heterogeneous but also varies greatly in outcome measures, delivery, content, and duration, the COM-B model helped ElMokhallalati et al. (2018) identify core components of capability, opportunity, and motivation that can support self-management behavior for cancer patients. As a

result, ElMokhallalati et al. (2018) created a taxonomy summarizing the main structure and key components of existing pain self-management interventions for cancer patients based on the COM-B framework.

Jenkins et al. (2018) used the COM-B model in a mixed methods study to develop an implementation intervention seeking to minimize non-indicated imaging for lower back pain, by targeting patient barriers and general medical practitioner barriers concurrently. The COM-B, alongside the Behavior Change Wheel, helped Jenkins et al. (2018) to determine behaviors requiring change and guide the initial design of an implementation intervention seeking to minimize non-indicated imaging for chronic lower back pain. Jenkins et al. (2018) conducted semi-structured interviews to collect relevant data to help determine facilitators and barriers to the successful implementation of their intervention in clinical practice. The results showed that patients, general practitioners, and experts supported most aspects of the intervention, and Jenkins et al. (2018) suggested improvement of their intervention through further research.

Webb et al. (2022) used the COM-B framework to guide their study and sought to identify the potentially adjustable facilitators and barriers to physical activity in individuals experiencing musculoskeletal chronic pain to influence the development of an intervention. Webb et al. (2022) included 12 studies for analysis (n=6: quantitative; n=2: qualitative; n=4: mixed). The COM-B model helped Webb et al. (2022) identify many interrelated factors that potentially hinder or facilitate physical activity in musculoskeletal chronic pain patients. The key barriers, as mapped by the COM-B model included physical capability associated with physical function and disease symptoms,

psychological capability associated with the knowledge of the specific importance of physical exercise and knowing how to exercise, and social opportunity associated with receiving tailored advice from professionals. In addition, the COM-B model helped Webb et al. (2022) map reflective motivation associated with beliefs about the harms or benefits of living an active lifestyle, and automatic motivation from self-efficacy to motivate an active lifestyle. The mapping was deemed important to designers to create appropriate interventions tailored to the COM-B model to achieve desired behavior change.

Rationale COM-B Model Framework

I chose the COM-B model of behavior change because of its wide utilization for understanding the connections and interrelationships between Capability (C), Opportunity (O), and Motivation (M) of interventions and Behavior (B) change. Specifically, the COM-B model provides a framework for understanding the perceived effectiveness of opioid treatment and non-pharmacological pain management interventions among African Americans with chronic pain. When establishing the relationship between opioid treatment and non-pharmacological chronic pain management interventions and the perceived effectiveness of managing chronic pain, capability involves the understanding of how the interventions work and their perceived effectiveness. The opportunity component entails the external resources and influences of African Americans that enable or hinder the use of chronic pain management interventions. The COM-B model helped me to understand the opportunities available to African Americans and how they influence their pain management behavior. Finally,

motivation involves the conscious and unconscious processes that drive pain management behavior. The COM-B framework assisted in understanding the approaches used by African Americans in managing chronic pain while establishing the connection between opioid treatment for chronic pain and non-pharmacologic interventions, including (1) physical therapy, (2) yoga, (3) chiropractic care, (4) talk therapy, (5) massage, and (6), self-management for chronic pain, and their perceived effectiveness in chronic pain management.

The COM-B framework helped understand behavior change by considering the interaction between capability (C), opportunity (O), and motivation (M). The independent variables fit into each component of the COM-B in specific ways. Opioid treatment encompasses motivation, opportunity, and capability elements. Under capability, opioid treatment requires an individual to understand safe medication use, proper storage of the drugs, and the potential side effects. In addition, the person should have an opportunity to access the drugs, and the motivation to maintain belief in the effectiveness of the medication amidst concerns about potential addiction challenges and withdrawal symptoms.

The non-pharmacologic interventions, including physical therapy, yoga, talk therapy, massage, chiropractic care, and self-management, entail various aspects of capability opportunity and motivation components. Under capability, all non-pharmacologic interventions require individuals to have understanding, physical capabilities, and skills. For example, a person who wants to engage in physical therapy should be capable of performing physical exercises that help manage pain and improve

their physical functionality. An individual who engages in Yoga intervention should be capable of learning and performing specific Yoga breathing exercises and poses that help manage pain. Individuals engaging in chiropractic care require the capability to receive and engage in spinal adjustments and manipulations. An individual engaging in talk therapy requires the capability to engage in therapeutic conversations and apply psychological strategies. Massage therapy requires an individual to have the capability to understand the specific massages and physical manipulation skills, whereas self-management interventions require the capability to understand and acquire the skills and self-efficacy strategies to manage and cope with chronic pain using various self-management interventions.

Opportunity plays a fundamental role in chronic pain management interventions. The opportunity to access opioid treatment is essential for all individuals who need to utilize the intervention. The affordability, healthcare system support, and geographical proximity to the accessibility of opioid treatment are fundamental when determining whether an individual can use the intervention. Non-pharmacologic interventions, including physical therapy, yoga, talk therapy, massage, chiropractic care, and self-management all require an individual to have the opportunity to access, afford, and receive relevant support while utilizing the interventions to manage chronic pain.

Motivation is an important component of the COM-B that determines whether individuals can use opioid treatment and non-pharmacologic interventions. Motivation concerning the use of opioid treatment concerns the perceived benefits and risks associated with using opioid treatment, as well as the personal values and goals of an

individual. Motivation plays a crucial role in the use of non-pharmacologic interventions. Individuals should have specific motivations for using the non-pharmacologic interventions, including personal values and goals, self-efficacy in engaging in the interventions, and confidence in one's ability to engage in and benefit from the behavior change. The COM-B model allowed for a comprehensive approach to this study, facilitating a deeper understanding of African Americans' perceptions of pain management interventions and their perceived effectiveness, laying the ground for making recommendations about chronic pain management interventions to help reduce the disparities in chronic pain management outcomes.

Biopsychosocial Theory

The biopsychosocial theory was another theoretical framework guiding my study. The biopsychosocial theory was first conceptualized in 1977 by George Engel in his paper, "The Need for a New Medical Model: A Challenge for Biomedicine." The model suggests that understanding an individual's medical condition does not just involve considering the biological factors but also the psychological and social factors (Engel, 1977). As such, the biopsychosocial model has three main components. The first component is "bio", which refers to physiological pathology (Engel, 1977). The second component is "psycho", which refers to the thoughts, emotions, and behaviors like fear, distress, attribution, and current coping methods (Engel, 1977). The third component of the model is "social", which refers to the socio-environmental, socio-economical, and socio-cultural factors, such as economics, family, and workplace issues that impact an individual's health and well-being (Engel, 1977).

According to Miaskowski et al. (2020), the biopsychosocial theory is used in understanding chronic pain with the view that chronic pain is a psychophysiological behavior pattern that cannot be classified into psychological, biological, or social factors alone. Miaskowski et al. (2020) suggested that physiotherapy for chronic pain should integrate all components of the biopsychosocial model of pain in treatment to address all factors comprising the chronic pain experience (see Figure 2).

Figure 2: Biopsychosocial Theory

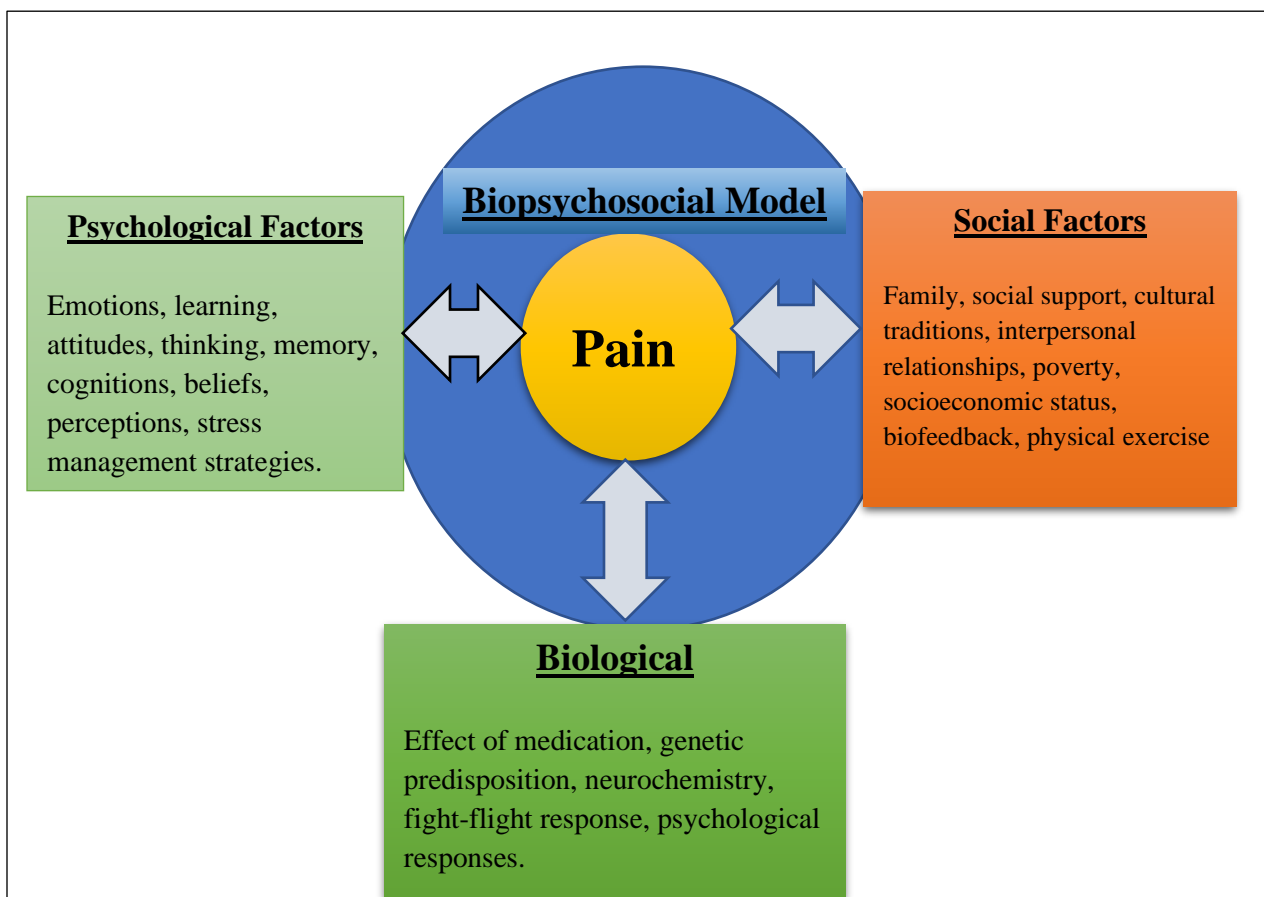


Figure 2 shows how biopsychosocial factors interact in chronic pain patients to help explain the perpetuation of the chronic pain condition and serve as a basis for planning the intervention programs. According to Dong and Backryd (2023), physiotherapeutic management of chronic pain patients should entail a clinical biopsychosocial assessment to help understand and explain the predominant mechanism of pain and psychosocial factors that may be adjusted for patients to improve their condition. The biopsychosocial model provides a framework to explain the somatic and medical factors associated with pain, cognitive and perceptions of pain, related emotional

factors, and behavioral factors (Dijk et al., 2023). In addition, the model provides a theoretical guide regarding the patient's social factors and motivations (Dijk et al., 2023). The patient's social factors and motivation factors were essential when understanding the patient's nature of chronic pain and designing a relevant intervention program to help address chronic pain. I tested the social aspect of COM-B theory using physical therapy as a social chronic pain management intervention. Physical therapy concentrates on social determinants of health, such as healthcare accessibility, socioeconomic status, and social isolation that can impact an individual's well-being.

Previous Application of the Biopsychosocial Theory

The biopsychosocial theory is one of the widely used theories to understand different parts of a person's story by considering biological, psychological, and social factors. An initial search for biopsychosocial theory returned over 2,000 articles. The search was then narrowed down to biopsychosocial theory and chronic pain and African Americans, limiting the period to between 2019 and January 2024. The following articles came up.

Baker et al. (2023) conducted a secondary quantitative research study seeking to understand the chronic pain perceptions in Black men using the biopsychosocial model. Baker et al. (2023) focused on determining the influence of specific physical, behavioral, and psychosocial health indicators in reporting pain among the target population. Secondary data were retrieved from a baseline sample of 321 Black men above 40 years old, who took part in a randomized, controlled Active and Healthy Brotherhood (AHB) research project. Findings from statistical analyses revealed that 22% of Black men

reported pain for more than 30 days. More than half of the sample employed (53%), married (54%), and earned above the federal poverty line (76%). Further multivariate analyses revealed that Black men who are more likely to report pain were unemployed, earned less income, and reported medical comorbidities (OR = 3.28, 95% CI (1.33, 8.06) in comparison to those who did not report pain. The biopsychosocial model played a fundamental role in helping to understand the unique experiences of Black men concerning pain, laying a foundation for appropriate pain management interventions in the population.

Overstreet et al. (2023) conducted a review study seeking to understand the biopsychosocial processes that underlie racial disparities in chronic pain using the biopsychosocial model. Overstreet et al. (2023) explored recent peer-reviewed studies published within the last ten years to understand the prevalence and burden of chronic pain on American society. Using the biopsychosocial model, Overstreet et al. (2023) determined that the unequal burden of pain in American society occurs as a result of the interplay among the biological, social, and psychological factors. As such, social determinants, such as income, lack of access to healthcare services, inability to use healthcare services, and education level impact chronic pain and the overall health of African Americans. The burden of pain is then exacerbated by exposure to diverse psychosocial stressors, such as race-based traumatic stress, perceived injustices, and marginalization (Overstreet et al., 2023). Furthermore, the burden of pain impacts the biological systems that modulate pain in African Americans, such as pain epigenetics and inflammation. The interaction of the psychological, biological, and social factors in the

biopsychosocial model shows how the cycle of undermanaged chronic pain persists among the African American population.

Bakhshaie et al. (2022) conducted a narrative review seeking to understand the psychosocial predictors of chronic musculoskeletal pain outcomes and their determinants using the biopsychosocial model among Black individuals. The results of the review revealed that Black communities face disproportionate effects from chronic musculoskeletal pain; however, little is known about the psychological predictors of chronic musculoskeletal pain outcomes and their contextual determinants in the population (Bakhshaie et al., 2022). A narrative review of extant literature showed major conceptual models previously mentioned in research by Bakhshaie et al. (2022) explaining the connections in psychological responses to pain among Black individuals experiencing chronic musculoskeletal pain. The results of the narrative review revealed that the biopsychosocial model, alongside the socioecological model and cumulative stress model, played an important role in many current literatures to show the connection between disproportionate distribution of the pain burden and psychiatric diagnoses, unique coping strategies, pain-related perceived ethnic/racial discrimination, pain-related perceived injustice, and expectations and preferences associated with seeking and obtaining pain care.

Additionally, Cohen et al. (2021) used the biopsychosocial model to help understand the burden, best practices, and new advances in the area of chronic pain in the United States. Cohen et al. (2021) categorized chronic pain as nociceptive and neuropathic. According to Cohen (2021), the common chronic pain conditions leading to

disability or hindering productivity among Americans include musculoskeletal disorders, back pain, and neck pain. The biopsychosocial model provided a guide to understanding the conditions of musculoskeletal disorders, back pain, and neck pain better by presenting symptoms as the denouement of a dynamic interaction between psychological, biological, and social factors. According to Cohen et al. (2021), the biopsychosocial model helps medical practitioners understand that the biological, social, and psychological factors are bidirectional, which is fundamental when designing interventions to assist patients cope with chronic pain.

Rationale for Biopsychosocial Theory

Biological, psychological, and social factors influence chronic pain in African Americans (Knoebel et al., 2021). The biopsychosocial model guided the study's investigation of how biological, psychological, and social factors interact to influence the outcomes of chronic pain interventions. The biological factor that was included in my regression model was opioid treatment for 12 months. The biopsychosocial framework provided a guide for me to explore the relationship between opioid treatment and its impact on pain reduction, physical functioning, and overall well-being. The outcome included self-reported overall effectiveness of managing chronic pain in the African American adult population. Understanding the biological mechanisms underlying chronic pain and the effects of opioid treatment intervention would help inform evidence-based approaches to pain management.

Psychological factors are a fundamental component of the biopsychosocial model (Baker et al., 2023). The framework helped explore the relationship between

psychological non-pharmacological chronic pain interventions, such as talk therapy, self-management, and Yoga, and their effectiveness in managing chronic pain in African American adults as the outcome. Examining the psychological aspects of pain management could provide insights into the unique needs and preferences of individuals in the African American adult population, leading to more tailored and effective interventions. Similarly, social factors were a key component of the biopsychosocial model.

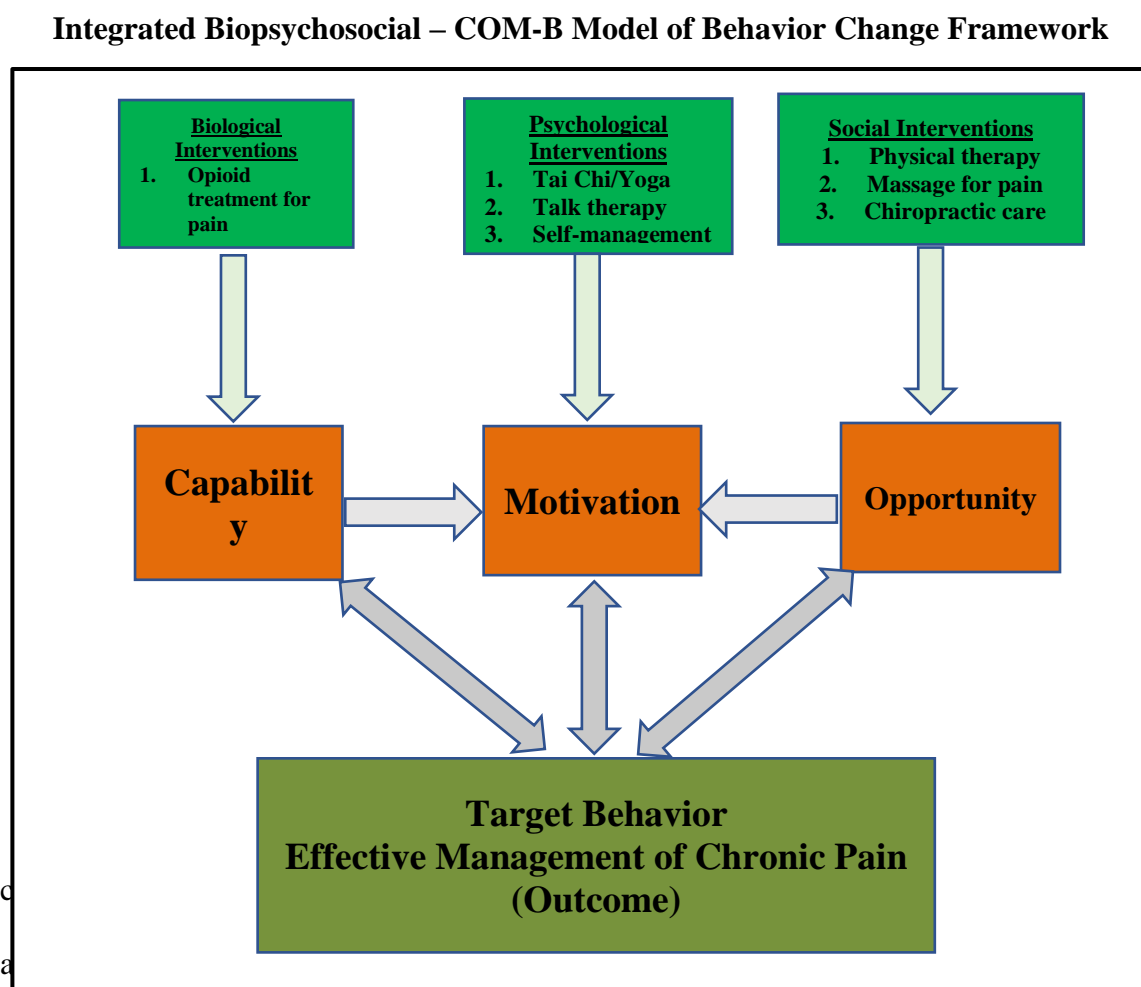
The biopsychosocial framework helped explore how non-pharmacological social factors, such as chiropractic care, physical therapy, and massage for pain, related to effective pain management outcomes in the African American adult population. Physical therapy could be considered as both a biological and social chronic pain management intervention. Biologically, physical therapy entails using different exercise techniques and modalities focused on reducing pain, improving modality, and promoting physical healing (Chapman et al., 2022). My study considered physical therapy as a social chronic pain management intervention because physical therapy concentrates on social determinants of health, such as healthcare accessibility, socioeconomic status, and social isolation that can impact an individual's well-being. Understanding the social context of pain management informed strategies for addressing disparities, promoting equitable access to care, and enhancing patient-centered approaches.

Integrating Biopsychosocial and COM-B Theories

The biopsychosocial theory and the COM-B model of behavior change guided this study. The combined model illustrated how factors within the biopsychosocial

domains of an individual (biological, psychological, and social) could affect their capabilities, opportunities, and motivations to engage with pain management interventions as per the COM-B model of behavior change. The interaction between the biopsychosocial theory and the COM-B model of behavior change then influenced the perceived effectiveness of managing chronic pain in the individual as the outcome (see Figure 3).

Figure 3: Integrated Biopsychosocial and COM-B Model of Behavior Change



appropriate categorization and description of pain (Maciel et al., 2019). The potential

pain treatment therapies include opioid treatment and non-pharmacological interventions (Maciel et al., 2019). The focus of this study is chronic pain for both opioid treatment and non-pharmacologic modalities used in the 2019 NHIS survey.

In Figure 3, the integrated framework of Biopsychosocial theory and the COM-B model of behavior change considers the multidimensional interplay between the biological, psychological, and social factors of the Biopsychosocial theory and their influence on capability, motivation, and opportunity in the COM-B model of behavior change. Ultimately, the engagement between the biopsychosocial theory and the COM-B model of behavior change influences the perceived effectiveness of managing chronic pain. The perceived effectiveness of managing chronic pain using biological intervention, such as opioid treatment, was measured on a scale of 1 to 4 with the following levels. 1 – “very effective”, 2 – “somewhat effective”, 3 – “only a little effective”, and 4 – “not at all effective” (CDC, 2019a, p. 430).

On the other hand, psychological factors can influence the motivation of an individual to engage in chronic pain management behavior (Cho et al., 2021). Catastrophizing thoughts can impact treatment compliance, thus impacting reflective motivation (Cho et al., 2021). Learned helplessness can impact self-efficacy, which eventually influences chronic pain management behavior. In addition, low self-esteem can impact the automatic motivation of an individual to engage in chronic pain management behavior (Cho et al., 2021). Psychological pain management interventions African Americans apply to manage their pain include Yoga, talk therapy, and self-management of chronic pain. The perceived effectiveness of managing chronic pain using

psychological interventions, including Yoga, talk therapy, and self-management of chronic pain, was measured on a scale of 1 to 4 with the following levels. 1 – “very effective”, 2 – “somewhat effective”, 3 – “only a little effective”, and 4 – “not at all effective” (CDC, 2019a, p. 430).

In addition, social factors play a fundamental role in influencing the opportunity of an individual to engage in chronic pain management behavior. Social factors may impact chronic pain management (Kai et al., 2020). I measured the perceived effectiveness of managing chronic pain using social chronic pain management interventions, such as chiropractic care, massage for pain, and physical therapy. The perceived effectiveness of managing chronic pain using social interventions was measured on a scale of 1 to 4 with the following levels. 1 – “very effective”, 2 – “somewhat effective”, 3 – “only a little effective”, and 4 – “not at all effective” (CDC, 2019a, p. 430).

Applying the integrated Biopsychosocial theory and the COM-B model of behavior change in this study helped provide a comprehensive view of the multifactorial, interdependent influences of the biological, psychological, and social factors at play impacting the perception of chronic pain in African Americans. The integrated model acknowledges the multidimensional nature of chronic pain that involves biological, psychosocial, and social influences. Understanding biopsychosocial factors contributing to disparities in chronic pain outcomes in African Americans was important because it would help determine barriers and facilitators, leading to more targeted interventions to address those disparities. In addition, understanding the multifactorial influences

impacting chronic pain can provide a more comprehensive understanding of the complex nature of chronic pain in African Americans and the current interventions for chronic pain, guiding the development of interventions that address the unique challenges facing African Americans experiencing chronic pain. Finally, researching the relationship between chronic pain management interventions and their perceived effectiveness in African American adults using an integrated model contributed to promoting equity in pain management.

I considered using Imogen King's goal attainment theory and Orem's self-care theory but chose not to because Imogen King's goal attainment theory does not explicitly address the integration of opioid treatment and non-pharmacological interventions. While patient goals might include pain management, Imogen King's goal attainment theory did not offer a specific framework for analyzing the effectiveness of various chronic pain management intervention combinations. I did not use Orem's self-care theory because it has a limited scope of interventions. Orem's self-care theory emphasizes self-directed interventions, such as exercise and diet led by patients themselves, but it offered less emphasis on exploring the interactions and effectiveness of combined opioid treatment and non-pharmacological approaches, which was a key focus of my research. In addition, Orem's self-care theory had a limited explanation of perceived effectiveness. Although the theory focuses on self-care behaviors, it does not delve deep into how those behaviors translate into the perceived effectiveness of pain management. Understanding the perception required considering the complex interplay of individual and psychosocial factors, which was not fully captured by Orem's framework.

Concepts of Pain Management

Pain is a subjective experience that is influenced to varying levels by social, biological, and psychological factors (Raja et al., 2020). Pain can differ widely in duration, quality, and intensity, and has adverse pathophysiologic meanings and mechanisms. Hence, defining the concept of pain precisely and concisely can be challenging. In the context of this study, the definition of pain is coined on the IASP's definition of pain, which recognizes pain as a psychological measure instead of a physical measure (Raja et al., 2020). When understanding the meaning of pain, an individual's experience and perception of pain must be respected. People can express their pain through verbal communication; however, the inability to communicate pain does not negate the possibility that an individual is experiencing pain (Raja et al., 2020; Dowell et al., 2022).

The concept of pain is often categorized into acute pain or chronic pain (Balgah & Atanga, 2022). Acute pain is considered sudden on onset and may last for a short period, usually less than seven days but may last up to thirty days or three months (Griffioen et al., 2020; Balgah & Atanga, 2022). On the other hand, chronic pain lasts beyond the normal tissue healing time, considered beyond three months (Griffioen et al., 2020; Balgah & Atanga, 2022). The pathophysiology of acute pain entails nociceptive pain that happens after or during an injury to joints, skin tissue, or viscera. The body reacts to acute pain by following the pain pathway, which entails "transduction, conduction, transmission, perception and modulation" (Balgah & Atanga, 2022, p. 2). On the other hand, the pathophysiology of chronic pain entails increases in pain intensity, which leads

to a prolonged reaction of the C-fiber nociceptors, causing the body to release substances into the synaptic gap (Balgah & Atanga, 2022). The present study focused on the concept of chronic pain.

The management of chronic pain is another important concept in this study. There are different chronic pain management strategies, which can be broadly classified into pharmacologic and non-pharmacologic (Dowell et al., 2022). Pharmacologic interventions entail the use of different medical interventions to target biological components of pain to manage chronic pain, including using analgesics, opioids, antidepressants, and anesthetics (Dowell et al., 2022). On the other hand, non-pharmacologic interventions entail a range of therapies that can help in chronic pain management (Dowell et al., 2022).

The choice of a chronic pain management intervention relies on different factors, including medical recommendations, personal choices, cultural and spiritual values, social environment, and economic status, among others (Dowell et al., 2022). When selecting pain management interventions, the top priority should be choosing options that effectively reduce pain, enhance the quality of life and function, and support recovery while minimizing reliance on opioids and their potential side effects (Dowell et al., 2022). Therefore, patients can select opioid treatment, non-pharmacological interventions, or combine both and non-pharmacologic interventions.

Literature Review Related to Key Variables and Concepts

I conducted an exhaustive review of current research studies within the last five years about the perceived effectiveness of chronic pain management interventions among

African American adults. I included some studies that were over five years old but are important as these studies provide crucial background information about the theoretical frameworks and statistical or historical trends concerning the social problem of chronic pain.

Chronic Pain

The International Association for the Study of Pain (IASP) council's current definition of pain is "An unpleasant sensory and emotional experience associated with or resembling that associated with actual or potential tissue damage" (Raja et al., 2020, p. 1976). Pain can be categorized into two main groups: acute and chronic. Griffioen et al. (2020) defined acute pain as pain that persists for a few days or weeks but does not last more than three months. On the other hand, chronic pain is that which persists for more than three to six months (Lavad'homme, 2017; Griffioen et al., 2020). The following review narrows on the social problem of chronic pain in the context of African American adults 18 years and older, and their perceived effectiveness of different chronic pain management interventions.

Chronic pain, which lasts for three to six months or more, is a debilitating condition that impacts an individual's daily life activities and works for many adults in the United States (Rikard et al., 2023). Chronic pain has been associated with other critical social problems in public health, such as substance abuse and misuse, depression, higher risk of suicide, and Alzheimer's disease and associated dementias (Rikard et al., 2023). A 2016 U.S. chronic pain surveillance report revealed that about 50 million adult Americans experience chronic pain (Smith & Hillner, 2019; Rikard et al., 2023). Smith

and Hillner (2019) established that the national cost of pain in the United States is higher than the cost of treating heart disease and cancer. Americans spend about \$560 billion to \$635 billion yearly on treating pain, where \$261 billion to \$300 billion goes to direct healthcare costs, \$95.2 billion to 96.5 billion is lost on work hours missed due to pain, and \$190.6 billion to 226.3 billion is lost due to lower wages caused by pain (Smith & Hillner, 2019). The burden of chronic pain is particularly salient for African Americans (Eze & McDonald, 2020; Knoebel et al., 2021).

There is growing evidence suggesting disparities in chronic, non-malignant pain and related conditions' prevalence, management, progression, and outcomes in non-Hispanic Blacks in America. According to Knoebel et al. (2021), chronic, non-malignant pain is a type of chronic pain that is not related to cancer and persists for three or more months. Whereas chronic pain is a complex, multifaceted condition usually complicated by an individual's medical comorbidities and a set of complex spiritual, social, psychological, biological, legal, and financial determinants, the complexities are exacerbated by other factors including provider bias, patient's race, and systemic barriers, which all intersect and culminate in disparate outcomes (Knoebel et al., 2021). The phenomenon of pain can be explained by the biopsychosocial model. For African Americans, documented results from experimental models about racial differences in the perception of pain and response to pain suggest pain disparity between African Americans and other races (Basbaum et al., 2009; Knoebel et al., 2021). For example, African Americans have significantly lower pain tolerance levels that result in more intense pain and unpleasantness compared with non-Hispanic White participants

(Campbell et al., 2005; Knoebel et al., 2021). The significant difference is attributed to differences in pain processing and modulation and can be linked to genetic polymorphisms, which likely contribute to difficulties in managing chronic pain in the African American population (Knoebel et al., 2021).

African Americans experiencing chronic pain use diverse strategies to manage their pain in different areas. A study conducted by Eze and McDonald (2020) revealed that African Americans primarily experience pain in the head ($n=19$, 20.2%) and the back ($n = 22$, 23.4%), with moderate pain intensity ($M = 4.5$, $SD = 1.79$). Other common pain areas include the knee, foot, tooth, and hip (Yong et al., 2022). Pain interferes with African Americans' sleep, walking, general activity, working, and enjoying life (Eze & McDonald, 2020). Despite the pain interference, African Americans rarely use pharmacological pain treatments, such as opioid treatment, with most of them considering the use of other unspecified chronic pain treatment and management strategies (Eze & McDonald, 2020). Booker et al. (2020) found that African Americans dealing with osteoarthritis chronic pain used other methods, such as sharing pain with others, adjusting to pain, and trusting God to heal pain as pain management strategies. Some of the pain management interventions risk undertreatment of chronic pain, which can lead to other adverse outcomes, such as depression, reduced quality of life, and dysfunction (Booker et al., 2020; Eze & McDonald, 2020).

The adverse outcomes in chronic pain among African Americans can also be explained by the influence of race and the opioid epidemic in the United States. According to Knoebel et al. (2021), historical trends of opioid use between 1993 and

2009 revealed that the rate of opioid prescription to White Americans (16/100,000) as compared to African Americans (7/100,000) is disparate (Knoebel et al., 2021). The opioid prescription rates directly correlate with overdose rates for White Americans (15/100,000) and African Americans (5/100,000) (Knoebel et al., 2021). Whereas Blacks are underprescribed opioids for pain treatment, evidence suggests that synthetic opioids use in the United States is on the rise at 79% (95% CI, 50% to 112%) for Whites and at 107% (95% CI, -15% to 404%) for the Blacks, respectively (Alexander et al., 2018; Knoebel et al., 2021). The sharp contrast between opioid prescription in the United States and synthetic opioid abuse, especially among African Americans, might suggest that opioid use among African Americans may be a result of shortfalls in affordability, accessibility, or evaluation and management of pain (Alexander et al., 2018; Knoebel et al., 2021; Morales & Yong, 2021). Furthermore, some minority communities may encounter structural barriers and limited availability of opioids for pain treatment due to medication deserts, which contribute to disparities in access to treatment (Knoebel et al., 2021). Disparities in opioid pain treatment access may explain the opioid epidemic in the United States, especially among African Americans.

Managing Chronic Pain in African Americans

The incidence of chronic pain, compared with other diseases, is high in the United States. A cohort study conducted by Nahin et al. (2023) using the 2019-2020 National Health Interview Survey (NHIS) for adults showed that chronic pain rates, incidence, and persistence are high in the United States. For instance, the chronic pain incidence rate in the United States is about 12.0 cases per 1,000 persons, and for individuals with baseline

chronic pain, the persistence rate of chronic pain is 462.0 cases per 1000 persons (Nahin et al., 2023). Nahin et al.'s (2023) findings reiterate the high chronic pain burden in the adult population of the United States and the imperative need to manage pain early.

Groenewald et al. (2022) used the 2019 National Health Interview Survey (NHIS) data to conduct a cross-sectional study investigating some of the chronic pain management strategies used by Americans. Groenewald et al. (2022) selected the NHIS dataset because it acts as the principal information source on the health of civilian, noninstitutionalized U.S. population for the government. Furthermore, pain management questions appeared in the NHIS surveys for the first time in 2019. Evidence from Groenewald et al.'s (2022) cross-sectional study revealed that among 31,916 participants, 3,483 were non-Hispanic Blacks. The pain management techniques used by adults in the United States included in the survey were opioids, occupational, physical, or rehabilitative therapies, psychotherapeutic interventions, self-management, and other methods of managing chronic pain that were not captured in the survey (Groenewald et al., 2022). About 54.7% (95% CI, 53.1% - 56.3%) of Americans with chronic pain only utilized non-pharmacologic chronic pain management interventions (Groenewald et al., 2022). On the other hand, about 10% (95% CI, 9.9% - 11.6%) used both opioid and non-pharmacologic chronic pain management interventions (Groenewald et al., 2022). Only 4.4% (95% CI, 3.8% - 5.1%) utilized opioids for chronic pain management, whereas over 30% (95% CI, 33.9% - 36.9%) of Americans did not indicate any of the options in this dataset which did not include non-opioid medications over the last three months (Groenewald et al., 2022).

While chronic pain is one of the most widely researched topics in the United States, the topic is complex and remains understudied among African Americans, with little evidence on managing chronic pain among the population. Existing evidence shows that African American adults with a history of chronic pain are less likely than Whites to receive a pain diagnosis or prescription for chronic pain (Anderson et al., 2009). In addition, Blacks are less likely (46%) than Whites (72%) to seek pain treatment. Similarly, Eze and McDonald (2020) found that about 47.9% of Black young adults did not use pain treatment at all regardless of feeling chronic pain. Furthermore, more than half of African Americans (53%) prefer managing their pain using other unspecified methods (Eze & McDonald, 2020).

Although African Americans are less likely to seek pain treatment or use pain management strategies, evidence suggests that they are more likely to face increased severity of chronic pain (Meints et al., 2019; Polcari et al., 2023). African Americans are more likely to experience comorbidities in chronic pain (58%) than White Americans (28%) (Polcari et al., 2023). Chronic pain comorbidities contribute to decreased pain treatment and management (Brodin et al., 2020; Polcari et al., 2023). In addition, chronic pain comorbidities, such as increased stress levels, may contribute to the increased severity of chronic pain in the population (Slopen et al., 2011). African Americans may experience greater sensitivity to chronic pain compared to non-Hispanic Whites; however, the sensitivity is partially mediated by pain catastrophizing (Meints et al., 2019). Pain catastrophizing refers to a negative cognition associated with the belief that the pain experienced by an individual will most likely result in the worst possible

outcome (Petrini & Arendt-Nielsen, 2020). Furthermore, African Americans residing in a nursing home were found to be 20% less likely to report excruciating daily pain when compared with White nursing home residents (Mack et al., 2018). Therefore, the ability to report pain or seek pain treatment and management strategies among African Americans impact chronic pain management outcomes in the population.

Demographics Characteristics of Chronic Pain Patients

Previous studies demonstrate demographic disparities within the prevalence and treatment of chronic pain (Mullins et al., 2022). Extant evidence suggests that chronic pain is more prevalent among populations with lower educational attainment and socioeconomic status (Mullins et al., 2022). Furthermore, evidence suggests that chronic pain is more prevalent among older adults, and Hispanic adults and non-Hispanic Black adults are more likely than non-Hispanic White adults to experience severe chronic pain (Mullins et al., 2022). According to Zajacova et al. (2021), socioeconomic disparities in pain outcomes have been increasing between 2002 and 2018.

Mullins et al. (2022) conducted a cross-sectional study seeking to understand the contemporary disparities in chronic pain outcomes based on demographics using the available 2019 NHIS data. Mullins et al. (2022) calculated the national-level estimates of chronic pain prevalence over multiple demographic categories. The study findings revealed that the distribution of chronic pain prevalence was statistically significant according to various demographic factors, including sex, race, insurance status, and marital status (Mullins et al., 2022). Demographic factors entailing annual household income and the number of adults in the respondent's family are important socioeconomic

factors impacting chronic pain management (Rikard et al., 2023). I will gather the demographic variables of the participants and present the demographic data as aggregate data.

Perceived Effectiveness of Chronic Pain Management Interventions

African Americans, more than any other ethnic group in the United States, experience disparate and adverse pain outcomes (Alexander et al., 2018; Booker et al., 2020; Eze & McDonald, 2020; Knoebel et al., 2021; Morales & Yong, 2021). Therefore, it is imperative to understand what strategies African Americans use to manage their chronic pain. In addition, it is pertinent to review the perceived effectiveness of those chronic pain management interventions to help address the disparate and adverse outcomes.

Opioid Treatment Intervention for Chronic Pain Relief

While most patients with chronic pain are more likely to receive some pharmacologic chronic pain management interventions, African Americans are less likely to receive any (CI: 97%-98%, 66.6%) compared with non-Hispanic Whites (CI: 97%-98%, 71.1%) (Mack et al., 2018). The pharmacologic pain treatment interventions in African Americans include nonsteroidal anti-inflammatory drugs (NSAIDs), acetaminophen, anticonvulsants, antidepressants, musculoskeletal agents, anxiolytics, opioids, and other drugs (Dowell et al., 2022). The most used drugs are NSAIDs and opioids (Dowell et al., 2022). According to Yazdanshenas et al. (2016), the frequency of NSAIDs prescription was “Ibuprofen (30%), Naproxen (14%), Meloxicam (14%), and high dose of Aspirin (13%)” (p. 2118). For opioid medication, the most used drugs were

Hydrocodone (65%) and Acetaminophen/Hydrocodone combination (15%)

(Yazdanshenas et al., 2016). The participants who take other drugs apart from opioids and NSAIDs considered using Prednisone (32%) and Tramadol (61%) (Yazdanshenas et al., 2016).

In the United States, the administration of opioid medications for pain is controlled (FDA, 2023). The treatment is issued both for acute and chronic pain treatment. According to the Food and Drug Administration Agency [FDA] (2023), some medicines such as opioids are dangerous and must be used according to the physician's prescription only (FDA, 2023). In addition, pharmacists, caregivers, and patients must ensure safe storage of the medication to keep the medicine safe on shelves and at home (FDA, 2023). The regulation of opioids is to prevent abuse or misuse of the drugs, which can cause addiction and harm (Oloruntoba et al., 2024). Despite physicians being more unlikely to prescribe opioids to African Americans as compared to other racial groups, African Americans are less likely to misuse prescription drugs than other racial groups (Johnson-Jennings et al., 2020; Oleruntoba et al., 2024).

The 2019 NHIS survey, which contains the first questions about chronic pain in the United States, includes information about opioids as the only pharmacological chronic pain treatment intervention (Rikard et al., 2023). The dataset does not consider other pharmacological interventions used in pain management, hence limiting the analysis only to opioids. As a result, the present research relying on the 2019 NHIS survey data will only analyze the use of opioids for chronic pain management. Furthermore, previous research on pharmacological chronic pain interventions does not

provide information about the perceived effectiveness of the interventions in African Americans to manage chronic pain. As a result, the present study will seek to understand the perceived effectiveness of opioids in managing chronic pain for African Americans.

Nonpharmacological Interventions for Chronic Pain Relief

African Americans employ a range of non-pharmacological chronic pain management interventions. A study conducted by Drazich et al. (2022) revealed that many African American women with chronic pain perceive pain as a precursor to depression. Physical limitation caused by pain translates into emotional and mental suffering, which ultimately affects other parts of life (Smith & Hillner, 2019; Drazich et al., 2022). Black women suffering from pain stated that they could not see pain, and the pain was not visible to other people (Drazich et al., 2022). As a result, pain was perceived as spiritual suffering because it caused suffering, self-isolation, sleepless nights, sadness, mental health problems, and others could not see or share the suffering (Drazich et al., 2022). The nature of pain forced African American women to consider spiritual interventions as a strategy for chronic pain management. Treating pain and depression as “spiritual” pain helped the women cope because they prayed about their pain to receive healing, share their frustrations about the pain with God, and have hope that they would be okay (Drazich et al., 2022).

African Americans may push through and live through pain without seeking medical attention at all. According to Eze and McDonald (2020), about half (47.9%) of African American young adults did not consider using any pain management interventions for their chronic pain. Similarly, Drazich et al. (2022) found that African

American women with chronic pain expressed that their pain would be present on most days, therefore, they should push themselves through and live through the pain. The African American women chose to quiet their pain by compartmentalizing it into the back of their minds and pushing through pain every day without seeking other pain management interventions (Drazich et al., 2022). Furthermore, African Americans may feel that medications are not worth the risk of treating pain because they will have to use them repeatedly (Drazich et al., 2022). Despite the debilitating nature of chronic pain, African Americans may choose to push through and live through their chronic pain instead of seeking pain management interventions.

African Americans may consider support groups and changes in behavior to deal with chronic pain. Behavior changes entail individuals with chronic pain forcing themselves to engage in activity as a coping strategy for pain (Drazich et al., 2022). For example, individuals who are actively involved in doing something may not have the time to think about their pain (Drazich et al., 2022). In addition, African Americans with chronic pain may join support groups to talk about their pain, which helps in pain management. African Americans may find it difficult to discuss their pain with family members and close friends because their family or friends would feel uncomfortable (Park et al., 2014). As a result, support groups were a safe space for discussing pain matters with individuals who have a similar experience.

Cultural beliefs and behavior systems influence chronic pain management interventions in African Americans. African Americans may not talk about their pain because they believe that words have power and that what one speaks may come into

existence (Robinson, 2015). The belief in the power of words may cause African Americans to suppress their pain, fail to acknowledge it, or attempt to cope by simply ignoring it (Jones et al., 2008; Robinson-Lane & Booker, 2017; Drazich et al., 2022). Furthermore, culture may hinder African Americans from using words that clearly express their pain because using certain words may be considered a spiritual or cultural taboo (Booker & Herr, 2015). As a result, the individuals may resort to other methods of managing chronic pain instead of using common pharmacological chronic pain interventions, such as opioid treatment.

Self-management strategies are common among African Americans experiencing chronic pain. Eze and McDonald (2020) found that about 53% of African American young adults with chronic pain preferred to self-manage their pain using other unspecified methods. Similarly, Morales and Yong (2021) expressed those disparities in pain treatment among African Americans may be caused by using other pain management interventions not well understood in mainstream medicine. Bhimani et al. (2017) also acknowledged the prevalent use of self-management and other pain management strategies among African Americans to treat chronic pain. Whereas literature acknowledges that African Americans use self-management and other methods of managing chronic pain, very few studies are seeking to find out what “other” methods of managing chronic pain entail.

A study conducted by Park et al. (2014) revealed that physicians frequently recommended physical therapy and nonaquatic exercise for chronic pain management in African Americans. However, African Americans mostly considered nonaquatic exercise

for chronic pain management (Park et al., 2014). African Americans, more than any other ethnicity, were more likely to use prayer for chronic pain management (Park et al., 2014; Drazich et al., 2022). Furthermore, African Americans indicated low use of psychological chronic pain management interventions (Park et al., 2014).

In the 2019 NHIS cross-sectional survey, a range of non-pharmacological chronic pain interventions for the civilian, noninstitutionalized United States population were captured. The survey contains data about non-pharmacological interventions, including other methods for pain, self-management for pain, meditation for pain, massage for pain, yoga for pain, support groups for pain, talk therapy for pain, chiropractic care for pain, and physical therapy for pain (Rikard et al., 2023). Whereas previous research has examined some of the non-pharmacological chronic pain management interventions in the African American population, the studies lack depth about the perceived effectiveness of those interventions. Thus, this study sought to use the non-pharmacological chronic pain management interventions in the 2019 NHIS survey to understand the perceived effectiveness of the non-pharmacological interventions for managing chronic pain in African American adults.

Summary and Conclusions

The purpose of this study was to determine if there is (a) a relationship between opioid treatment pain management interventions and the perceived effectiveness of managing chronic pain in African American adults 18 years and older, and (b) a relationship between non-pharmacological interventions and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Chronic pain is

a complex and multifaceted condition that lasts 6 months or more and impacts all areas of life (Knoebel et al., 2021).

Managing chronic pain was perceived in terms of opioid treatment and nonpharmacological chronic pain management interventions. Michie et al.'s COM-B model of behavior change was used to explore the relationship between opioid treatment and non-pharmacological chronic pain management interventions and their perceived effectiveness in managing chronic pain behavior. The model included a comprehensive framework to understand interplay between individual capabilities, environmental opportunities, and motivational factors in terms of shaping behavior and outcomes related to chronic pain management in AA adults. Furthermore, I used Engel's biopsychosocial model to include the biological, psychological, and social factors, and understanding these factors was crucial for perceived effectiveness of chronic pain management.

I used the 2019 NHIS survey to fill a gap by providing information regarding the relationship between opioid treatment and nonpharmacological chronic pain management interventions and perceived effectiveness in terms of managing chronic pain in AA adults. Information may be used to guide necessary adjustments in terms of management of chronic pain to help reduce disparate outcomes and improve quality of life for this population. In Chapter 3, I discuss the methodology for my study that guided analysis of the 2019 NHIS dataset.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to determine if there is (a) a relationship between opioid treatment pain management interventions and the perceived effectiveness of managing chronic pain in African American adults 18 years and older, and (b) a relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Nonpharmacological interventions were analyzed separately in relation to perceived effectiveness of managing chronic pain in African American adults 18 years and older.

In Chapter 3, I provide a thorough description of the study design, including the research methodology, population, selection of participants, sample size considerations, procedures for using secondary data, and instrumentation and operationalization of constructs. In addition, I discuss the data analysis plan, threats to validity, and ethical procedures.

Research Design and Rationale

I used a cross-sectional design with secondary data. According to Wang and Cheng (2020), cross-sectional studies are observational studies that involve analyzing data for a population at a single point in time. In healthcare, cross-sectional studies help understand determinants of health, prevalence of healthcare outcomes, and features of populations (Wang & Cheng, 2020). I analyzed cross-sectional secondary data to

understand the relationship between opioid treatment and nonpharmacological chronic pain management interventions and perceived effectiveness of managing chronic pain in AA adults who were 18 and older. Secondary data were collected from the NHIS in 2019.

Variables

Independent variables for this study were opioid treatment and nonpharmacological chronic pain management interventions since opioid treatment was the only pharmacological chronic pain management intervention in the 2019 NHIS questionnaire. There were several nonpharmacological chronic pain management interventions in the 2019 NHIS. These were physical therapy, chiropractic care, talk therapy, self-management, yoga, and massages (CDC, 2019a). All nonpharmacological independent variables were labeled as dichotomous (yes/no) because respondents were asked, “Over the past three months, did you use any of the following to manage your pain?” (CDC, 2019a, p. 421 – 427). The opioid treatment independent variable was also dichotomous. Examples included hydrocodone, Vicodin, Norco, Lortab, oxycodone, OxyContin, Percocet, and Percodan. If you are not sure, please tell me the name of the drug and I can look it up.” (CDC, 2019a, p. 310).

The dependent variable was perceived effectiveness of managing chronic pain. Survey questions were answered by respondents in the NHIS survey was, “Over the past three months, how effective do you think you were in managing your pain?” (CDC, 2019a, p. 430). Pain management includes prescription opioid pain relievers or any nonpharmacological chronic pain management interventions (physical therapy, chiropractic care, talk therapy, self-management, yoga, and massage) in the past 3

months. The dependent variable was measured using an ordinal scale from one to four, with one being very effective, two being somewhat effective, three being only a little effective, and four meaning not at all effective. I reverse-coded variables to help avoid confusion during interpretations of findings.

I also gathered demographic variables of participants and presented them as aggregate data. Demographic variables included sex (SEX_A), age (AGEP_A), level of education (EDUC_A), annual household income (FAMINCTC_A), health insurance status (HICOV_A), and number of adults in respondents' families (PCNTADLT_A) who were perceived as sources of social support (see Appendix A). Demographic data helped me understand characteristics of the population, which was fundamental for understanding and interpreting results from analysis of independent and dependent variables.

Rationale

The cross-sectional research design was used for analysis of the 2019 NHIS dataset. The research design was suitable for data analysis because data were collected at one point in time, which was in 2019. This helped answer the seven research questions for the study, which were:

RQ1: Is there a significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀1: There is no significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a1: There is a significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ2: Is there a significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀2: There is no significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a2: There is a significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ3: Is there a significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀3: There is no significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a3}: There is a significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ4: Is there a significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AAA adults who are 18 and older?

H₀₄: There is no significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a4}: There is a significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ5: Is there a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀₅: There is no significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a5}: There is a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

RQ6: Is there a significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀6: There is no significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

H_a6: There is a significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ7: Is there a significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀7: There is no significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a7: There is a significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

I relied on secondary data, and no significant time and resource constraints impacted the study. I sought to understand associations between chronic pain management interventions (opioid and nonpharmacological) and perceived effectiveness of managing chronic pain. Therefore, a cross-sectional design was most appropriate.

Methodology

Population

The target population for this study were African American adults, 18 years and older who experience chronic pain. Chronic pain is one of the key reasons American adults seek medical care, and it is linked to opioid dependence, reduced quality of life, and poor mental health (Eze & McDonald, 2020; Zelaya et al., 2020; Cohen et al., 2021; Knoebel et al., 2021). While 1 in 5 American adults experience chronic pain, the problem is particularly salient for African Americans who experience adverse outcomes (Eze & McDonald, 2020; Mullins et al., 2022). According to Zelaya et al. (2020), about 19.3% of African Americans experience chronic pain in the United States, whereas 7.4% of the population experience high-impact chronic pain. According to the federal census, 46.8 million individuals in the United States identified as African Americans in 2020 (United States Census Bureau, 2020). Therefore, about 19.3% or 9.03 million African American population experience chronic pain, and about 7.4% or 3.46 million African American population experience high-impact chronic pain in the United States.

Sampling and Sampling Procedures

The current study relied on 2019 NHIS secondary data. 12,078 (37.93%) of the participants in the survey indicated that in the past 3 months, they often felt pain some days (CDC, 2019a, p. 157). 2,609 (8.19%) of the participants in the survey noted that in the past 3 months, they felt pain on most days, and 4,575 (14.37%) of the participants in the survey indicated that they felt pain every day (CDC, 2019a). 38 (0.12%) of the participants refused to respond to the question, whereas 12,042 (37.82%) of the

participants indicated that they had never felt pain in the past three months (CDC, 2019a). The participants who experienced pain some days, most days, and every day in the past three months were perceived to experience chronic pain since by the definition of chronic pain, the pain should last three months or more (CDC, 2019a). The present study focused on the 3,592 African Americans who participated in the survey and experienced chronic pain (See Appendix B).

I used African American adults, 18 years and older in the 2019 NHIS sample who reported experiencing pain lasting 3 months or more. The 2019 NHIS questionnaire was redesigned to ensure that the collected data better met the needs of data users. The 2019 NHIS questionnaire redesign targeted to improve the measurement of covered health topics, reduce respondent burden by shortening the length, harmonize overlapping content with other federal health surveys, establish a long-term structure balancing periodic and ongoing topics, and incorporate advances in survey measurement and methodology (CDC, 2019b).

The sample in the 2019 NHIS adult survey (aged 18 years and older) was randomly selected from 50 states and the District of Columbia at the time of the interview (CDC, 2019b). The inclusion criteria for the target participants entailed considering civilian noninstitutionalized individuals with fixed household addresses, including residents of households and noninstitutional group quarters, such as rooming houses, homeless shelters, and group homes (CDC, 2019b). I included only AA women who declared that they were not pregnant. The survey's exclusion criteria entailed excluding individuals without a fixed household address, including the transient persons not living

in shelters, the homeless not living in shelters, active-duty military personnel, and civilians living in long-term care facilities and military bases (CDC, 2019b). The survey also excluded individuals living in correctional facilities and US citizens living in foreign countries (CDC, 2019b). The survey was conducted using a face-to-face data collection format and follow-ups were made using telephone interviews. The survey was designed to be nationally representative (CDC, 2019b).

G*Power Analysis

I conducted an a priori power analysis using G*Power software (version 3.1.9.4) to determine the sample size for use in the present study (Kang, 2021). I selected the statistical test to z-tests – logistic regression. The inputs help determine the required sample size for data analysis. I selected an odds ratio of 1.86 because odds ratios of 1.22, 1.86, and 3.00 can be considered small, medium, and large, respectively (Olivier et al., 2017). The 1.86 odds ratio from ordinal logistic regression will point to an 86% higher odds of the outcome per predictor unit increase, which is a clinically meaningful effect size. I chose a two-tailed analysis with the significance level of $\alpha = 0.05$, and power level = .80 which yielded a sample size of 138 participants (See Table 1).

Table 1 G*Power Analysis

- Thursday, April 04, 2024 -- 06:30:30

z tests – Logistic regression

Options: Large sample z-Test, Demidenko (2007) with var corr

Analysis: A priori: Compute required sample size

Input:

Tail(s)	=	Two
Odds ratio	=	1.86
Pr(Y=1 X=1) H0	=	0.2
α err prob	=	0.05
Power (1- β err prob)	=	0.80

	R ² other X	= 0
	X distribution	= Normal
	X parm μ	= 0
	X parm σ	= 1
Output:	Critical z	= 1.9599640
	Total sample size	= 138
	Actual power	= 0.8025218

I used all African American participants experiencing chronic pain present in the 2019 NHIS dataset because they were more than the minimum desired sample size for this study, which was 138 with an actual power of 0.8025. Considering all the participants in the survey helped improve the generalizability of the findings on the African American population experiencing chronic pain. The available NHIS 2019 data were adequate for analysis.

Procedures For Using Archival Data

I accessed the 2019 NHIS secondary data to examine African Americans who experienced chronic pain. Based on the CDC definition that chronic pain persists for at least three months, participants who experienced pain some days, most days, or every day over the past three months were considered to experience chronic pain. I focused on 3,592 African American participants from the survey who met the criteria for chronic pain.

The 2019 NHIS dataset is an open-access resource, which implies that the public can access it freely for use. The data have been collected by the National Center for Health Statistics (NCHS) for the CDC since 1957. In 2019, the NHIS questionnaire received an upgrade that incorporated advances in survey methodology and coverage of

health topics. I accessed the data and its codebook from the CDC website. There were no special permissions required to access the data since it was an open-access resource.

Instrumentation and Operationalization of Constructs

The 2019 NHIS data that I analyzed were collected using the CDC's 2019 NHIS redesigned questionnaire. Unlike the previous questionnaires, the redesigned 2019 NHIS questionnaire was improved to collect additional family-level content, including detailed demographic information, health status, health conditions, health insurance, functioning and disability, health care access and use, health-related behaviors, health services utilization, and mental health (CDC, 2019c). The independent variables included opioid treatment and non-pharmacological chronic pain interventions (including (1) physical therapy for pain, (2) chiropractic care for pain, (3) talk therapy for pain, (4) self-management program for pain, (5) yoga for pain, and (6) massage for pain (CDC, 2019a). The dependent variable was the perceived effectiveness of managing chronic pain.

Questions about pain and pain management interventions were incorporated into the 2019 NHIS for the first time in 2019 (CDC, 2019c). The 2019 NHIS dataset is an open-access resource, which implies that the public can access it freely for use so there are no special permissions required to access the data. The US government, through the National Center for Health Statistics (NCHS) for the Centers for Disease Control and Prevention (CDC), has used the NHIS questionnaire to collect data on Americans since 1957. I accessed the data and its codebook from the CDC website.

The independent variables were opioid treatment and non-pharmacological chronic pain management interventions included in the 2019 NHIS. Data on opioid

treatment were collected by asking the question: “During the past 12 months, have you taken any opioid pain relievers prescribed by a doctor, dentist, or other health professional? Examples include hydrocodone, Vicodin, Norco, Lortab, oxycodone, OxyContin, Percocet, and Percodan. If you are not sure, please tell me the name of the drug and I can look it up” (CDC, 2019a, p. 310). The participants responded either “Yes” or “No.

Nine non-pharmacological chronic pain management interventions were listed in the questionnaire, which were (1) physical therapy for pain, (2) chiropractic care for pain, (3) talk therapy for pain, (4) self-management program for pain, (5) yoga for pain, (6) massage for pain, (7) meditation for pain (8) support groups, and (9) other methods for treating pain (CDC, 2019a). For the non-pharmacological interventions, the participants were asked to respond to the following question: “Over the past three months, did you use any of the following to manage your pain?” (CDC, 2019a, p. 421 – 429). The participants responded either “Yes” or “No” for each non-pharmacological chronic pain management intervention. I recoded the variable to “Yes” = 1 and “No” = 0.

In this study, I included six out of the nine non-pharmacological independent variables present in the 2019 NHIS dataset, which were (1) physical therapy for pain, (2) chiropractic care for pain, (3) talk therapy for pain, (4) self-management program for pain, (5) yoga for pain, and (6) massage for pain. I did not include the remaining three variables of meditation for pain, support groups, and other methods for treating pain for specific reasons. I did not include meditation for pain because there was no sufficient literature to support meditation as a chronic pain management intervention in African

Americans. I did not use the support group independent variable because it can be considered both a psychological and social chronic pain management intervention (Choi et al., 2022; Franqueiro et al., 2023). The last variable of, other methods, for managing chronic pain was excluded because I could not exclusively classify it as biological, social, or psychological in the biopsychosocial theory. Therefore, I included six independent variables in this study, including (1) physical therapy for pain, (2) chiropractic care for pain, (3) talk therapy for pain, (4) self-management program for pain, (5) yoga for pain, and (6) massage for pain, as captured in Chapter 2 Figure 3 – The Integrated Biopsychosocial - COM-B Model of Behavior Change framework.

The dichotomous independent variables were analyzed in this study using ordinal logistic regression analysis. Inferential analyses were conducted for all seven research questions, whereby the first research question focused on opioid chronic pain treatment intervention, and the remaining six research questions focused on non-pharmacological chronic pain management interventions.

On the other hand, the dependent variable was the perceived effectiveness of managing chronic pain. The variable data were collected by asking the question: “Over the past three months, how effective do you think you were in managing your pain? Would you say very effective, somewhat effective, only a little effective, or not at all effective?” The responses were ordinal in nature, with 1 = “very effective”, 2 = “somewhat effective”, 3 = “only a little effective”, and 4 = “not at all effective” (CDC, 2019a). The question was asked to the sample adult participants who had chronic pain and used a prescription opioid pain reliever in the past three months or any of the other

non-pharmacological chronic pain management interventions. The ordinal dependent variable in this study was analyzed using ordinal regression analysis.

Data Analysis Plan

I analyzed the data analysis using IBM's SPSS software (version 29) (IBM Corp., 2019). The 2019 NHIS provided a .csv dataset format of the survey responses, which was compatible with the SPSS software. The dichotomous independent variables and ordinal dependent variables could be analyzed using ordinal logistic regression to help investigate the relationship between them. However, it was important to note that the focus of the analysis was association and not causation because the study used cross-sectional data.

Before conducting data analysis, I cleaned the data by removing unwanted variables, validating data types, and standardizing the data for analysis. I reverse-coded the order of the responses in the outcome variable, the perceived effectiveness of managing chronic pain, from 1 = "very effective", 2 = "somewhat effective", 3 = "only a little effective", and 4 = "not at all effective" to 1 = "not at all effective", 2 = "only a little effective", 3 = "somewhat effective", and 4 = "very effective", to facilitate proper interpretation of the analysis findings. Whereas the G*Power analysis (See Table 1) showed that at least 138 participants were required to achieve the desired power in the data, the study considered using all African Americans in the sample who experienced chronic pain to improve the generalizability of the findings to the entire population. All the levels of measurement for the variables were correctly labeled before conducting data analysis.

Ordinal logistic regression is a parametric test that I used to investigate the research questions and hypotheses above. The dependent variable, “perceived effectiveness of managing chronic pain,” has ordered response categories, making it an ordinal variable. The independent variables relating to chronic pain management interventions were dichotomous (yes/no) variables. Ordinal logistic regression could be used to test the relationship between multiple dichotomous independent variables and an ordinal dependent variable, without violating statistical assumptions (Tutz, 2020). The analysis allowed the estimation of odds ratios to indicate how the different chronic pain management interventions influenced the odds of reporting certain effectiveness levels of managing pain at a .05 significance level. Using a medium 1.86 odds ratio effect size from G*Power analysis, the 2019 NHIS data provided meaningful associations using the ordinal logistic regression method to answer the specific research questions. If all assumptions for ordinal logistic regression analysis were not met in the analysis, I could consider analyzing the data with a non-parametric chi-square analysis. I gathered the demographic variables of the participants and presented the demographic data as aggregate data.

I tested the hypotheses at a .05 significance level, implying that if the p -value was equal to or greater than .05, then I would fail to reject the null hypothesis due to the lack of statistical significance. However, if the p -value was less than .05, then I would reject the null hypothesis and find a significant statistical relationship between the independent and dependent variables. For the significant relationships, I further evaluated the odds

ratio to understand the effect size and interpret the extent of the relationship between the independent and dependent variables for meaningfulness.

Threats to Validity

Threats to External Validity

Yu (2021) defined external validity as distinct factors that hinder the generalizability or applicability of quantitative research findings to broader settings, contexts, or populations. The present study utilized the 2019 NHIS secondary dataset, which could be vulnerable to external validity threats. One of the critical external validity threats facing the 2019 NHIS dataset is sampling bias. Sampling bias occurs when the selected sample is not sufficient to be representative of the US population. The threat is particularly serious for minority communities, such as African Americans used in this study because it may be difficult to capture a nationally representative sample for their population. According to the CDC (2019c), the 2019 NHIS minimized sampling bias by increasing the number of randomly selected participants from minority communities to ensure that it aligned with their proportional representation in the general US population.

Another important external validity threat facing the 2019 NHIS secondary data is the non-response bias. The threat occurs when a proportion of the selected participants decline to respond to the survey questions (Yu, 2021). Non-response bias affects the overall sample included in data analysis after data cleaning, which might affect the normal distribution of the data by skewing the data. The 2019 NHIS data were collected through face-to-face interviews. The NHIS reduced non-response bias by conducting follow-up telephone interviews for participants who failed to initially respond to the

questions (CDC, 2019c). The follow-up telephone interviews helped to minimize non-response bias in the data.

Cultural and linguistic factors also posed an external validity threat to the 2019 NHIS secondary data. The survey was administered to civilian, noninstitutionalized Americans, who have diverse cultural and linguistic backgrounds. The 2019 NHIS overcomes linguistic and cultural barriers by using neutral language when designing questions and translating the NHIS questionnaire into multiple languages to suit the diverse cultures and languages in the United States (CDC, 2019c).

Threats to Internal Validity

Internal validity threats entail factors that can undermine the ability to establish causal associations between variables (Yu, 2021). Some causes of internal validity threats include measurement errors, where the data collection instrument does not accurately measure the variables under investigation. The CDC rigorously assesses the survey items, designs the questions carefully, and trains over 700 specialists to help in data collection and quality control, promoting consistency and quality in the data (CDC, 2019c).

Another internal validity threat facing the 2019 NHIS is selection bias. Yu (2021) states that selection bias in research occurs when there are systematic differences between respondents who choose to participate in a survey study. The CDC minimizes selection bias in the NHIS data collection procedures by randomly selecting participants.

Randomization helped to even out participators and non-participators.

Response bias is an internal validity threat that impacts the 2019 NHIS. Response bias occurs when there are systemic differences between the individuals who choose to

respond to the survey questions and those who do not respond (Yu, 2021). The 2019 NHIS minimized response bias through randomization of the administration of the survey questionnaires (CDC, 2019c). Randomization ensured that among the selected individuals, each one had an equal chance of either completing the questionnaire or not completing the questionnaire.

Threats to Construct Validity

Construct validity entails unique factors that can affect the accuracy and appropriateness of measuring the variables or constructs of interest (Yu, 2021). Construct validity focuses on whether the data collection instruments, such as survey questionnaires, accurately measure the intended constructs (Yu, 2021). The construct validity threat that the 2019 NHIS faces is underrepresentation. The threat occurs when the research questionnaire fails to capture all constructs of interest associated with chronic pain. Due to the complex nature of pain, the 2019 NHIS focuses only on selected constructs about pain, including opioids as the only pharmacologic chronic pain management intervention. Whereas there may be many non-pharmacologic chronic pain management interventions, the 2019 NHIS focuses only on nine non-pharmacologic interventions, and only six were used in this study based on the theoretical framework as captured in Chapter 2 Figure 3 in the integrated biopsychosocial – COM-B model of behavior change framework.

Pain is a complex construct and can introduce construct complexity as a threat to construct validity in the 2019 NHIS. Construct complexity entails complex and multifaceted factors that can be difficult to accurately measure using figures (Yu, 2021).

One of the complex constructs in the present study was the perceived effectiveness of managing chronic pain. The CDC measures the construct using self-reported scores on an ordinal scale with four levels (CDC, 2019a). The scale can facilitate further analysis of the data to obtain important insights about the relationship between the independent and dependent variables.

My research focused on exploring the relationship between opioid treatment for chronic pain and the perceived effectiveness of managing chronic pain as well as the relationship between non-pharmacological chronic pain management interventions and the perceived effectiveness of managing chronic pain. The non-pharmacological chronic pain management intervention predictors comprised six variables, including (1) physical therapy for pain, (2) chiropractic care for pain, (3) talk therapy for pain, (4) self-management program for pain, (5) yoga for pain, and (6) massage for pain out of the nine variables in the dataset. Three variables were eliminated because there was no sufficient literature to ground meditation as a chronic pain intervention in African Americans, support groups overlap as both psychological and social chronic pain management interventions in the biopsychosocial model (Choi et al., 2022; Franqueiro et al., 2023), and other methods for treating chronic pain variables cannot be effectively classified as either biological, social, or psychological as captured in Chapter 2 Figure 3 in the integrated biopsychosocial – COM-B model of behavior change framework.

Ethical Procedures

I received IRB approval from the Walden IRB (06-17-24-1024769). The 2019 NHIS by the CDC observes ethical considerations to ensure compliance with ethical

standards and guidelines for research. All participants in the 2019 NHIS study provided voluntary informed consent before participating in the research process. All participants received the informed consent form, read it, and approved their voluntary participation before the survey was conducted. The research administrators explained to the participants what the survey concerns and assured them of their anonymity and confidentiality before they were allowed to take the survey.

The CDC protects all confidential and identifying information collected from participants. Researchers in need of such confidential data may require special permission and ethical approvals to access the data. However, the publicly available dataset has masked any identifying data, posing no threat to the respondents.

The 2019 NHIS dataset contains data about pregnant women as a vulnerable population. The main reason why pregnant women are deemed vulnerable is the inclusion of a third party—the fetus—who has a special and unbreakable bond with the mother and may be impacted by the research but is unable to offer consent (Biggio, 2020).

Therefore, I included only AA women who declared that they were not pregnant. Apart from pregnant women, the 2019 NHIS adult dataset does not contain any data about other vulnerable populations.

Summary

Chapter 3 included an examination of the research design and methodology. I used a quantitative cross-sectional research design. I analyzed open-access secondary data from the CDC's 2019 NHIS survey. I examined relationships between opioid treatment and nonpharmacological chronic pain management interventions and perceived

effectiveness of managing chronic pain in AA adults who were 18 and older. The minimum sample size for this study according to G*Power analysis (see Table 1) was 138 participants. I used SPSS (version 29) and analyzed data using ordinal logistic regression to determine relationships between the independent variables and the ordinal dependent variable. Results were interpreted to respond to research questions and hypotheses. In Chapter 4, I present results of data analysis.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to determine if there is (a) a relationship between opioid treatment pain management interventions and the perceived effectiveness of managing chronic pain in African American adults 18 years and older, and (b) a relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Research questions were:

RQ1: Is there a significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀1: There is no significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a1: There is a significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ2: Is there a significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀2: There is no significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a2: There is a significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ3: Is there a significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀3: There is no significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a3: There is a significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ4: Is there a significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AAA adults who are 18 and older?

H₀4: There is no significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a4}: There is a significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ5: Is there a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀₅: There is no significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a5}: There is a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

RQ6: Is there a significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀₆: There is no significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

H_{a6}: There is a significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ7: Is there a significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀7: There is no significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a7: There is a significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

In Chapter 4, I address the data collection process by describing the time frame for data collection, presenting any discrepancies in data collection from the plan that was presented in Chapter 3, reporting baseline descriptive and demographic characteristics of the sample, and describing how representative the sample was. I also present results of analyses by reporting descriptive statistics, evaluating statistical assumptions, reporting findings, and analyzing statistical tests. Finally, Chapter 4 includes a summary of answers to research questions and transition to Chapter 5.

Data Collection

Time Frame for Data Collection

I used the CDC NCHS 2019 NHIS secondary data. I collected data between Quarter 1 and Quarter 4 of 2019. Data were collected for the 2019 NHIS using a health questionnaire through personal household interviews. The CDC collects data collection throughout the year and releases data annually.

Discrepancies in Data Collection

The data collection process aligns with the plan presented in Chapter 3. After IRB approval, I accessed study data from the CDC website. The secondary 2019 NHIS data was free to access for public use. After accessing the secondary dataset, I conducted data cleaning in readiness for analysis. There was an overlap in the data as participants responded “Yes” or “No” to more than one question. Although many participants responded “Yes” or “No” to multiple questions, some did not respond either “Yes” or “No” to certain questions leading to missing values. I recoded the independent variables to 0= no, 1= yes, and system missing. I did not include the missing values in the analysis of the variables of interest for the research questions, therefore, the sample sizes vary for the analysis of each research question. I analyzed the relationship between each independent variable and the outcome variable separately to address the issue of overlapping responses for the independent variables. Although analyzing the relationship between each independent variable and the outcome variable separately did not directly resolve the issue of overlapping responses in the independent variables, it helped me understand the relationship between each independent variable and the dependent variable. I acknowledged the concern of overlapping variables as a limitation.

I used the reverse coding technique as a strategy for changing the direction of scoring for the dependent variable, the perceived effectiveness of managing chronic pain. The process involved reversing the original coding scheme of the variable by assigning different values to the response categories. I reverse coded the ordinal levels for the dependent variable, perceived effectiveness of managing chronic pain from 1 – “very

effective”, 2 – “somewhat effective”, 3 – “only a little effective”, and 4 – “not at all effective” to 1 – “not at all effective,” 2 – “only a little effective,” 3 – “somewhat effective,” and 4 – “very effective.” Reverse coding was important because it helped me to change the direction of the scale, implying that higher values on the dependent variable, perceived effectiveness of managing chronic pain, now represented higher levels of perceived effectiveness of managing chronic pain. The reverse coding process helped me align the scoring direction of the dependent variable with the desired interpretation to facilitate a clearer understanding of the results.

Baseline Descriptive and Demographic Characteristics of the Sample

My study focused on the NHIS adult survey. The 2019 NHIS adult survey recruited 31,997 (100%) adults. 30,942 individuals participated in the survey, indicating a 96.70% response rate (CDC, 2019a). In my study, I focused on African American adults experiencing chronic pain.

There were 3,592 African American adult participants in the 2019 NHIS survey, representing 11.23% of the total survey participants (CDC, 2019a). My study considered all African Americans who participated in the 2019 NHIS survey. Of the 3592 AAs in the original 2019 NHIS dataset, the final sample for my study included only males (n = 1490) and females who responded “no” to being pregnant now (n = 1035) yielding a total of 2525 participants. The sample size for each research question varied from the sample of 2,525. Overlapping variables or missing data may contribute to variations in sample size.

Results

Descriptive Statistics

I conducted a descriptive analysis to help understand the characteristics of the participants. Demographic variables included in the analysis were age, gender, general health status, and insurance coverage of the participants. The descriptive analysis results are presented below.

Table 2 summarizes the demographic variables among African Americans with chronic pain. The majority of African Americans in the selected sample were adults aged between 18 and 40 years old, consisting of 48.3%. 33% of the participants were aged between 41 and 60 years old, while the remaining elderly adults above 60 years formed 18.7% of the participants. The gender distribution of the participants considered in this study comprised 59.0% males and 41.0% non-pregnant females (Table 2). 80.9% of the participants reported their general health as good, very good, or excellent, and even more (87%) were insured (see Table 2).

Table 2 Descriptive Analysis

Variable	N(Valid)	%
Age		
18-40 years	1220	48.3%
41 – 60 years	834	33%
61 – 80 years	404	16%
81 – 99 years	67	2.7%

Gender

Male	1490	59.0%
Female	1035	41.0%

Insurance Coverage Status

Covered	2206	87.4%
Not covered	307	12.2%
Don't know	12	0.5%

General Health

Excellent	542	21.5%
Very Good	751	29.7%
Good	751	29.7%
Fair	386	15.3%
Poor	94	3.7%
Refused	1	0.0%

Statistical Assumptions

I checked my data to make sure that it could be analyzed using ordinal regression based on specific fundamental assumptions. The first assumption was that the dependent variable was measured at the ordinal level. Ordinal variables can take different forms of ranking categories, such as Likert items on a 4-point scale showing the participants' perceived effectiveness towards a given concern (Walden University Academic Skills Center, 2020). My dependent variable was the perceived effectiveness of managing chronic pain. The dependent variable has four ordinal levels, including 1 – “not at all

effective,” 2 – “only a little effective,” 3 – “somewhat effective,” and 4 – “very effective”. Therefore, the dependent variable fulfills the first assumption that it was measured at the ordinal level.

The second assumption was that the independent variables were either continuous, categorical, or ordinal (Walden University Academic Skills Center, 2020). There were seven independent variables in my study. The independent variables include (1) opioid use for chronic pain, (2) physical therapy for pain, (3) chiropractic care for pain, (4) talk therapy for pain, (5) self-management program for pain, (6) yoga for pain, and (7) massage for pain (CDC, 2019a). All the independent variables are dichotomous (Yes/No), implying that they were categorical variables with two levels. Therefore, all the independent variables fulfilled the second assumption that they were either continuous, categorical, or ordinal.

The third assumption was no multicollinearity. The assumption holds that no two or more independent variables are highly correlated with each other. The assumption is violated when two or more variables are highly correlated to each other, undermining the ability to provide independent information in the regression model (Walden University Academic Skills Center, 2020). According to IBM (2024), regression procedures for categorical dependent variables do not have collinearity diagnostics. Therefore, a linear regression procedure can be used to test for multicollinearity in SPSS by running linear regression with the same list of predictors and dependent variables that would be used in logistic regression and request for collinearity diagnostics (IBM, 2024). I ran a linear regression analysis with the independent and dependent variables to obtain

multicollinearity, given that my categorical independent variables were dichotomous, and I did not have to create dummy variables. The multicollinearity diagnostics were evaluated using the Variance Inflation Factor (VIF). A VIF of 1 indicates no multicollinearity, whereas higher values indicate more collinearity is present. According to Kim (2019), VIF measures between 10 and 30 show that multicollinearity is present, and values greater than 30 indicate strong multicollinearity. Multicollinearity diagnostic for this study indicated that the VIF measures for the independent variables were all less than 2 (Table 3). Therefore, the assumption of no multicollinearity was satisfied.

Table 3 Multicollinearity Tests

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance VIF
1	(Constant)	1.992	.443		4.500	<.001	
	Physical Therapy for Pain	.030	.079	.016	.382	.703	.892 1.122
	Chiropractic Care for Pain	.192	.100	.078	1.909	.057	.905 1.105
	Talk Therapy for Pain	.135	.171	.033	.788	.431	.888 1.126
	Self-Management for Chronic Pain	.123	.150	.034	.820	.412	.886 1.128
	Yoga for Pain	-.042	.111	-.015	-.381	.704	.922 1.084
	Massage for Pain	.018	.076	.009	.231	.817	.940 1.064
	Opioid Use - Past 12 Months	.226	.067	.136	3.377	<.001	.948 1.055

a. Dependent Variable: Managing Pain

The fourth assumption was the assumption of proportional odds. According to Walden University Academic Skills Center (2020), the test of parallel lines helps determine whether the slopes of the regression lines are equal across the different outcome categories. The proportional odds assumption was tested using the test of Parallel Lines in SPSS. The null hypothesis for testing the assumption was that the slope coefficients in the model were similar across response categories. The assumption of proportional odds was met, as assessed by a full likelihood ratio test comparing the fit of the proportional odds model to a model with varying location parameters, $X^2(14) = 19.082, p=0.162$ (see Table 4).

Table 4 Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	292.458			
General	273.377	19.082	14	.162

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

Statistical Analysis Findings

My data satisfied the fundamental assumptions for ordinal logistic regression analysis. I proceeded to conduct data analysis using the Polytomous Universal Model (PLUM) ordinal regression procedure. IBM (2023b) defines PLUM ordinal regression in SPSS as a type of ordinal regression analysis that allows the researcher to model the

dependence of a polytomous ordinal response on a set of predictors. In my case, the polytomous ordinal response was the perceived effectiveness of managing chronic pain, which has four categories. The following section provides the findings for every research question and respective hypotheses investigated in this study.

RQ1: What is the relationship between opioid pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted an ordinal logistic regression to explore the relationship between opioid pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. A preliminary analysis suggested that the model was a good fit for the observed data using the Pearson goodness-of-fit test, $X^2_{(2, 641)} = 1.043, p = .594$. Furthermore, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model statistically significantly predicted the dependent variable over and above the intercept-only model, $X^2_{(1, 642)} = 11.445, p < 0.001$. The log odds of perceiving the highest level of effectiveness for pain management were .518 (95% CI, -.818 to -.218) times lower for those who reported using opioids compared to those who did not report using opioids ($W_{(1,642)} = 11.452, p < 0.001$) (Table 5).

Table 5 RQ1 Parameter Estimates

Parameter Estimates						
Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	

							Lower Bound	Upper Bound
Thresh	[Pain_Managemen	-3.477	.220	249.67	1	<.001	-3.908	-3.045
old	t_Effectiveness =			5				
	1]							
	[Pain_Managemen	-1.827	.126	210.62	1	<.001	-2.073	-1.580
	t_Effectiveness =			3				
	2]							
	[Pain_Managemen	.096	.098	.967	1	.325	-.096	.288
	t_Effectiveness =							
	3]							
Locati	Opioid_Treatment	-.518	.153	11.452	1	<.001	-.818	-.218
on	_12M							

Link function: Logit.

I evaluated the meaningfulness of the model using Nagelkerke Pseudo R-Square. Nagelkerke R-Square value was 0.020, suggesting that opioid pain management intervention was responsible for explaining 2.0% of the variation in the perceived effectiveness of managing chronic pain in African American adults, which is a weak effect size. The pseudo-Nagelkerke R-squared value should be interpreted with caution due to the lack of a universally agreed-upon interpretation like R-squared in linear regression (IBM, 2023a).

RQ2: What is the relationship between physical therapy for pain intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted an ordinal logistic regression to explore the relationship between physical therapy pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. A preliminary

analysis suggested that the model was not a good fit for the observed data using the Pearson goodness-of-fit test, $X^2_{(2, 824)} = 10.399, p = .006$. However, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model statistically significantly predicted the dependent variable over and above the intercept-only model, $X^2_{(1, 825)} = 42.317, p = .031$. The log odds of perceiving the highest level of effectiveness for pain management were .343 (95% CI, -.658 to -.028) times lower for those who reported using physical therapy compared to those who did not report using physical therapy ($W_{(1,825)} = 4.553, p = .033$) (Table 6).

Table 6 RQ2 Parameter Estimates

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Threshold [Pain_Management_Effectiveness = 1]	-3.506	.203	297.7201		<.001	-3.904	-3.108	
	[Pain_Management_Effectiveness = 2]	-1.804	.105	297.7481		<.001	-2.009	-1.599
	[Pain_Management_Effectiveness = 3]	.072	.077	.871	1	.351	-.079	.224
Location Physical_Therapy	-.343	.161	4.553	1	.033	-.658	-.028	

Link function: Logit.

I examined the meaningfulness of the model using Nagelkerke Pseudo R-Square due to the statistically significant relationship. Nagelkerke R-Square value was 0.006,

suggesting that physical therapy pain management intervention was responsible for explaining 0.60% of the variation in the perceived effectiveness of managing chronic pain in African American adults, which is a very weak effect size. The pseudo-Nagelkerke R-squared value should be interpreted with caution due to the lack of a universally agreed-upon interpretation like R-squared in linear regression (IBM, 2023a).

RQ3: What is the relationship between chiropractic care pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted PLUM ordinal logistic regression analysis to evaluate the relationship between chiropractic care pain management intervention and the perceived effectiveness of managing chronic pain in African American adults, 18 years and older. A preliminary analysis suggested that the model was a good fit for the observed data using the Pearson goodness-of-fit test, $X^2(2, 824) = 5.345, p = .069$. Furthermore, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model was significant in predicting the dependent variable over and above the intercept-only model, $X^2(1, 825) = 4.975, p = .026$. The log odds of perceiving the highest level of effectiveness for pain management were .473 (95% CI, -.875 to -.071) times lower for those who reported using chiropractic care compared to those who did not report using chiropractic care ($W_{(1,825)} = 5.308, p = .021$) (Table 7).

Table 7 RQ3 Parameter Estimates

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold [Pain_Management _Effectiveness = 1]	-3.489	.201	299.8771		<.001	-3.884	-3.094
[Pain_Management _Effectiveness = 2]	-1.780	.101	309.7791		<.001	-1.979	-1.582
[Pain_Management _Effectiveness = 3]	.097	.073	1.735	1	.188	-.047	.241
Location Chiropractic_Care	-.473	.205	5.308	1	.021	-.875	-.071

Link function: Logit.

I checked the meaningfulness of the model using Nagelkerke Pseudo R-Square due to the statistically significant relationship. Nagelkerke R-Square value was 0.007, implying that chiropractic care pain management intervention was responsible for explaining 0.70% of the variation in the perceived effectiveness of managing chronic pain in African American adults, which is a weak effect size. The pseudo-Nagelkerke R-squared value should be interpreted with caution due to the lack of a universally agreed-upon interpretation like R-squared in linear regression (IBM, 2023a).

RQ4: What is the relationship between talk therapy pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted an ordinal logistic regression to explore the relationship between talk therapy pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. A preliminary analysis suggested that the model was a good fit for the observed data using the Pearson goodness-of-fit test, $X^2_{(2, 824)} = 1.581, p = .454$. However, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model did not statistically significantly predict the dependent variable over and above the intercept-only model, $X^2_{(1, 825)} = 1.622, p = .203$. The log odds of perceiving the highest level of effectiveness for pain management were .435 (95% CI, -1.112 to .243) times lower for those who reported using talk therapy compared to those who did not report using talk therapy ($W_{(1,825)} = 1.581, p = .209$) (Table 8). The relationship was not statistically significant ($p = .209$) (Table 8).

Table 8 RQ4 Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
Threshold	[Pain_Management Effectiveness = 1]	-3.445	.200	296.864	1	<.001	-3.837	-3.053
	[Pain_Management Effectiveness = 2]	-1.743	.098	313.834	1	<.001	-1.936	-1.550
	[Pain_Management Effectiveness = 3]	.129	.071	3.339	1	.068	-.009	.268
Location	Talk_Therapy	-.435	.346	1.581	1	.209	-1.112	.243

Link function: Logit.

RQ5: What is the relationship between self-management program pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted an ordinal logistic regression to explore the relationship between self-management program pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. A preliminary analysis suggested that the model was a good fit for the observed data using the Pearson goodness-of-fit test, $X^2_{(2, 824)} = 1.343, p = .511$. However, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model did not predict the dependent variable over and above the intercept-only model, $X^2_{(1, 825)} = 1.106, p = .293$. The log odds of perceiving the highest level of effectiveness for pain management were .323 (95% CI, -.915 to .269) times lower for those who reported using a self-management program compared to those who did not report using a self-management program ($W_{(1,825)} = 1.143, p = .285$) (Table 9). The relationship was not statistically significant ($p = .285$) (Table 9).

Table 9 RQ5 Parameter Estimates

Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold [Pain_Management_Effectiveness = 1]	-3.444	.200	296.371	1	<.001	-3.836	-3.052

	[Pain_Management _Effectiveness = 2]	-1.741	.099	311.771	1	<.001	-1.934	-1.548
	[Pain_Management _Effectiveness = 3]	.130	.071	3.351	1	.067	-.009	.270
Locatio n	Self_Management	-.323	.302	1.143	1	.285	-.915	.269

Link function: Logit.

RQ6: What is the relationship between Yoga pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted an ordinal logistic regression to explore the relationship between Yoga pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. A preliminary analysis suggested that the model was a good fit for the observed data using the Pearson goodness-of-fit test, $X^2(2, 824) = 2.072, p = .355$. However, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model did not predict the dependent variable over and above the intercept-only model, $X^2(1, 825) = .628, p = .428$. The log odds of perceiving the highest level of effectiveness for pain management were .157 (95% CI, -.238 to .551) times higher for those who reported using Yoga compared to those who did not report using Yoga ($W(1, 825) = .606, p = .436$) (Table 10). The relationship was not statistically significant ($p = .436$) (Table 10).

Table 10 RQ6 Parameter Estimates

	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Threshold [Pain_Management _Effectiveness = 1]	-3.408	.201	288.819	1	<.001	-3.801	-3.015
[Pain_Management _Effectiveness = 2]	-1.705	.100	291.903	1	<.001	-1.901	-1.509
[Pain_Management _Effectiveness = 3]	.166	.074	4.998	1	.025	.020	.311
Location Yoga	.157	.201	.606	1	.436	-.238	.551

Link function: Logit.

RQ7: What is the relationship between massage pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older?

I conducted an ordinal logistic regression to explore the relationship between massage program pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. A preliminary analysis suggested that the model was a good fit for the observed data using the Pearson goodness-of-fit test, $X^2_{(2, 824)} = .094, p = .954$. However, the likelihood-ratio test, exemplified by the model fitting information, showed that the final model did not predict the dependent variable over and above the intercept-only model, $X^2_{(1, 825)} = .367, p = .545$. The log odds of perceiving the highest level of effectiveness for pain management were

.090 (95% CI, -.201 to .381) times higher for those who reported using massage for pain compared to those who did not report using massage for pain ($W_{(1,825)} = .366, p = .545$) (Table 11). The relationship was not statistically significant ($p = .545$; see Table 11).

Table 11 RQ7 Parameter Estimates

		Parameter Estimates				95% Confidence Interval		
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Thresh old	[Pain_Management _Effectiveness = 1]	-3.403	.203	281.21	1	<.001	-3.801	-3.005
	[Pain_Management _Effectiveness = 2]	-1.700	.105	264.65	1	<.001	-1.905	-1.496
	[Pain_Management _Effectiveness = 3]	.170	.080	4.454	1	.035	.012	.328
Locatio n	Massage_for_Pain	.090	.148	.366	1	.545	-.201	.381

Link function: Logit.

Conclusion

The purpose of this study was to explore the relationship between pain management interventions and the perceived effectiveness of managing chronic pain in African American adults, 18 years and older. The research findings showed that there was statistical significance ($p < .001$) in those who used opioids [(log odds of perceiving the highest level of effectiveness for pain management were .518 (95% CI, -.818 to -.218)]

times lower for those who did report using opioids compared to those who did not report using opioids ($W_{(1,642)} = 11.452, p < 0.001$).

For those individuals using physical therapy, there was statistical significance ($p < 0.031$), [the log odds of perceiving the highest level of effectiveness for pain management were .343 (95% CI, -.658 to -.028) times lower for those who reported using physical therapy compared to those who did not reported using physical therapy ($W_{(1,825)} = 4.553, p = .033$)].

For individuals using chiropractic care for pain management, there was statistical significance ($p = .021$), [the log odds of perceiving the highest level of effectiveness for pain management were .473 (95% CI, -.875 to -.071) times lower for those who did report using chiropractic care compared to those who did not report using chiropractic care ($W_{(1,825)} = 5.308, p = .021$)].

There was no statistically significant relationship between talk therapy, self-management, Yoga, and massage pain management interventions, respectively, and the perceived effectiveness of managing chronic pain in African American adults, 18 years and older. In Chapter 5, I provide an interpretation of the findings, limitations, recommendations, and implications of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

.The purpose of this quantitative study was to evaluate if there is (a) a relationship between opioid treatment pain management intervention and the perceived effectiveness of managing chronic pain in African American adults 18 years and older, and (b) a relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Specific research questions in the study were:

RQ1: Is there a significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀1: There is no significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a1: There is a significant relationship between opioid pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ2: Is there a significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀2: There is no significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a2: There is a significant relationship between physical therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ3: Is there a significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀3: There is no significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a3: There is a significant relationship between chiropractic care pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ4: Is there a significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AAA adults who are 18 and older?

H₀4: There is no significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a4}: There is a significant relationship between talk therapy pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ5: Is there a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀₅: There is no significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_{a5}: There is a significant relationship between self-management program pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

RQ6: Is there a significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀₆: There is no significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in African American adults 18 years and older.

H_{a6}: There is a significant relationship between yoga pain management interventions and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

RQ7: Is there a significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older?

H₀7: There is no significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

H_a7: There is a significant relationship between massage pain management intervention and perceived effectiveness of managing chronic pain in AA adults who are 18 and older.

I used a cross-sectional design to investigate research questions. Findings suggested that individuals who used opioid treatment, physical therapy, or chiropractic care perceived their chronic pain management as less effective than those who did not use chronic pain management interventions. There was no statistically significant relationship between talk therapy, self-management, yoga, or massage pain management interventions and perceived effectiveness of managing chronic pain in AA adults who were 18 and older. In Chapter 5, I present interpretations of findings, study limitations, recommendations, implications for social change, and a conclusion.

Interpretation of the Findings

RQ1

My study findings indicated participants who reported using opioid treatment felt their pain management was less likely to be effective compared to those who reported not using opioids. This may be due to insufficient narcotics being administered, being

administered too late, inadequate dosage, or suboptimal chosen method of treatment. Additionally, AAs also are more likely to have diabetes, and many diabetics suffer from peripheral neuropathy (Kang et al., 2022). However, narcotics are not the most effective choice for treating neuropathic pain. The most prescribed opioids are Hydrocodone (65%) and acetaminophen/Hydrocodone (15%; Yazdanshenas et al., 2016). Opioid prescriptions are regulated due to the potential negative effects of these medications, which may explain the low effect size of my study. According to Oloruntoba et al. (2024), administration of opioid drugs is regulated to prevent misuse or abuse which might cause addiction.

RQ2

My results showed that the relationship between physical therapy and chronic pain management was statistically significant but physical therapy accounted for .60% of the variation in how African American adults perceived the effectiveness of managing chronic pain. Park et al. (2014) established that physicians frequently recommended physical therapy and nonaquatic exercises for African Americans experiencing chronic pain. However, the low effect size can be explained by previous literature that many African Americans may consider other chronic pain management interventions, such as nonaquatic exercise and prayer, instead of engaging in physical therapy for chronic pain (Drazich et al., 2022).

RQ3

Hays et al. (2019) showed individuals (including African Americans), who use chiropractic care for chronic low back pain and neck pain, reported positive experiences.

However, Bhondoekhan et al. (2023) revealed that the use of chiropractic care was low among African Americans and Hispanic persons compared to non-Hispanic White persons. The lower utilization of chiropractic care among African Americans may account for the small effect size in my study of chiropractic care in managing chronic pain.

RQ4

I found that talk therapy is not significantly associated with the perceived effectiveness of managing chronic pain in African American adults. Previous research showed that African Americans may find it difficult to talk about their pain with family members, friends, or healthcare professionals because talking about pain would make the listeners uncomfortable (Park et al., 2014). Similarly, Allen et al. (2019) established that African Americans do not like talking about pain as a cultural issue because talking about pain feels like accepting pain.

RQ5

My results that self-management is not significantly associated with the perceived effectiveness of managing chronic pain in African American adults, is consistent with previous literature. Morales and Yong, (2021) found that even though self-management programs were common among African Americans experiencing chronic pain, there were disparities in self-management programs used by individuals, not well understood in mainstream medicine. The lack of understanding of the self-management strategies used by African Americans to manage chronic pain may explain the lack of association

between self-management chronic pain intervention and the perceived effectiveness of managing chronic pain (Morles & Yong, 2021).

RQ6

My results that there was no statistical association between Yoga pain intervention and the perceived effectiveness of managing chronic pain in African Americans align with previous research. Although African Americans use different non-pharmacological chronic pain management interventions, such as Yoga, there is a lack of statistical evidence about the perceived effectiveness of those interventions (Rikard et al., 2023).

RQ7

My results suggest that there is no statistical relationship between massage chronic pain management intervention and the perceived effectiveness of managing chronic pain in African American adults which aligns with previous literature. Even though African Americans employ different chronic pain management interventions, such as massage, there is a lack of sufficient statistical evidence supporting the effectiveness of massage pain management intervention in managing chronic pain (Rikard et al., 2023).

Interpretation of the Findings in the Context of Theoretical Framework

The theories that grounded this study were the Biopsychosocial Theory and the COM-B Model of Behavior Change. The Biopsychosocial Theory focuses on how biological, social, and psychological factors interact to influence the outcomes of chronic pain management interventions (Engel, 1977). On the other hand, the COM-B Model of Behavior Change focuses on the connections and interrelationships between capability

(C), opportunity (O), and motivation (M) and their influence on behavior (B) change (Mitchie et al., 2011). I combined the Biopsychosocial Theory and COM-B Model of Behavior Change to produce an integrated model to guide this study. The integrated model illustrated how factors within the biopsychosocial domains of an individual (biological, psychological, and social) affected their capabilities, opportunities, and motivations to engage in behavior change activities concerning pain management interventions.

The results of this study were aligned with the integrated Biopsychosocial Theory and COM-B Model of Behavior Change as the model helped connect how the multidimensional interplay between the biological, psychological, and social factors of the biopsychosocial theory, and their influence on capability, opportunity, and motivation of the COM-B model impacted the desired behavior of effective chronic pain management in African American adults, 18 years and older. The integrated biopsychosocial theory and COM-B model of Behavior Change illustrate how factors at one level influence factors at another level, and act across the multiple levels of the integrated model to better understand the perceived effectiveness of managing chronic pain. At the individual level, the findings demonstrated the need for chronic pain management intervention on biological, social, and psychological levels to utilize capability, opportunity, and motivation, to be able to achieve the desired effective chronic pain management outcomes. On the community level, healthcare providers, health coaches, social workers, and counselors can work hand in hand to understand other approaches not in mainstream medicine used by African Americans to manage chronic

pain to help in the ongoing research about what works better for the population. On a societal level, there is a need for relevant and more effective interventions to reduce the burden of chronic pain and the risk factors in African American adults, 18 years and older.

Limitations of the Study

My study used the NHIS 2019 cross-sectional data. Although the data are widely used and considered to have strong validity, the trade-off for nationally representative data on a large scale is the lack of granularity to describe pain treatment strategies used by African Americans, which requires increased research in the future. The 2019 NHIS dataset has limited variables covering pharmacological chronic pain management interventions. The dataset does not contain non-steroidal anti-inflammatory drugs (NSAIDs) despite the drugs being widely used in the treatment and management of chronic pain. Furthermore, the 2019 NHIS dataset is cross-sectional; hence it did not allow me to investigate the cause-and-effect relationship between the independent and dependent variables. Another limitation is that women over the age of 49 were not included in the sample.

Recommendations

The recommendations for how the study findings can be applied to practice are in response to the statistically significant association between the predictors and the outcome variable, the perceived effectiveness of managing chronic pain in African American adults, 18 years and older. There is a need for further research to explore the other factors not included in this research that account for higher variation in the

perceived effectiveness of managing chronic pain in African American adults, 18 years and older. According to Robinson-Lane and Booker (2018), evidence suggests the need for culturally responsive chronic pain management interventions in African Americans. Other factors not included in this study that African Americans may use to manage chronic pain may include mind-body practices, such as prayer, faith, and spiritual practices, which serve as a cornerstone of pain management in many African communities. In addition, African Americans may consider over-the-counter medications not included in this study, and complementary and alternative medicine, such as herbal remedies, which were not covered by this study. Therefore, further research is needed to determine the perceived effectiveness of other predictors, such as mind-body practices like prayer, faith, and spiritual practices, over-the-counter medications, and complementary and alternative medicines like herbal remedies that may account for higher variation in the perceived effectiveness of managing chronic pain in African American adults, 18 years and older.

I recommend using longitudinal data to help examine the relationships over time to help researchers understand patterns over time. The current study did not include all medical chronic pain treatment interventions, such as NSAIDs because they were not present in the secondary data set. Future research is needed to examine the relationship between NSAIDs and their perceived effectiveness in managing chronic pain in African American adults, 18 years and older. In addition, future research should be conducted using non-overlapping independent variables to improve the measurement of the impact

of the predictors on the outcome variable, the perceived effectiveness of managing chronic pain in African American adults, 18 years and older.

Implications

My study has implications for social change at the individual, family, organizational, and societal levels. In addition, the study has methodological implications. At the individual level, my study has revealed that while the burden of pain is critical among African Americans, the main methods used to address chronic pain among the population, such as opioid treatment, physical therapy, and chiropractic care are not meaningful. Therefore, there is a need to consider other pain management strategies not included in this study to find out what works for African Americans to recommend the most effective chronic pain management interventions for the population. Nurse professionals can consider integrating culturally responsive treatment interventions, such as mind-body practices like faith, prayer, and spiritual practices, and complementary and alternative medicine such as herbal remedies for African Americans to improve pain treatment outcomes (Robinson-Lane & Booker, 2018).

At the family level, family members and caregivers should consider collaborating with healthcare professionals and social workers to help improve the patient experience for African Americans experiencing chronic pain. According to Cordero (2024), a lack of family support for chronic pain patients is associated with worse pain outcomes. Therefore, the availability of reliable family and caregiver support for chronic pain patients can help improve pain outcomes.

At the organizational level, healthcare providers can utilize the findings of this study to understand what chronic pain management strategies may not work for African American adults with chronic pain, helping them to focus narrowly on other interventions not covered in this study. In addition, healthcare organizations can help address barriers to healthcare access and systemic racism to ensure equitable access to chronic pain treatment for African Americans (Knoebel et al., 2021).

At the societal level, the findings from this study can serve as a basis for creating awareness and advocacy about what chronic pain management interventions may not effectively address chronic pain in African American adults, 18 years and older. The evidence from this study may help policymakers concentrate scarce resources on research about other chronic pain management interventions not included in this study that may account for greater variation in the perceived effectiveness of managing chronic pain in African American adults, 18 years and older.

Methodologically, future research should consider ways to use longitudinal data to investigate the relationship between different chronic pain management interventions and the perceived effectiveness of managing chronic pain in African American adults, 18 years and older, over an extended period. Longitudinal data can help establish cause-and-effect relationships, which can be used to make predictions about the perceived effectiveness of managing chronic pain (Mueller-Peltzer et al., 2020). Using a cause-and-effect model provides a stronger model for decision-making based on predictions.

Healthcare practitioners can utilize the study findings to improve chronic pain management outcomes in African American adults, 18 years and older. African

Americans disproportionately face the burden of chronic pain in the United States (Knoebel et al., (2021). My study provides an understanding of what does not work for African Americans regarding chronic pain management. Therefore, healthcare practitioners can utilize the findings to narrow their focus on the different strategies that African Americans use to manage chronic pain. Identifying and implementing the most effective chronic pain management interventions in African Americans will help reduce the economic burden of pain on African Americans, improve their quality of life, and improve their overall well-being.

Conclusion

The purpose of this quantitative study was to determine if there is (a) a relationship between opioid treatment pain management interventions and the perceived effectiveness of managing chronic pain in African American adults 18 years and older, and (b) a relationship between non-pharmacological interventions (physical therapy for pain, chiropractic care for pain, talk therapy for pain, self-management program for pain, yoga for pain, massage for pain) and the perceived effectiveness of managing chronic pain in African American adults 18 years and older. Each non-pharmacological intervention was analyzed separately in relationship to the perceived effectiveness of managing chronic pain in African American adults 18 years and older.

I used secondary data with a cross-sectional design to investigate the research questions. The findings suggested that individuals who used opioid treatment, physical therapy, or chiropractic care perceived their chronic pain management as less effective than those who did not use chronic pain management interventions. There was no

statistically significant relationship between talk therapy, self-management, Yoga, and massage pain management interventions and the perceived effectiveness of managing chronic pain in African American adults, 18 years and older.

Further research is needed to determine the other factors, such as mind-body practices like prayer, faith, and spiritual practices, over-the-counter medications, and complementary and alternative medicines like herbal remedies that may account for higher variation in the perceived effectiveness of managing chronic pain in African American adults, 18 years and older. I suggest the need to address chronic pain in African American adults across the four levels (individual, community, organizational, and societal) of the integrated biopsychosocial and COM-B models. The findings of this study support the need for chronic pain management interventions that can meaningfully improve the perceived effectiveness of managing chronic pain in African Americans, reducing the economic burden of pain, and improving the quality of life in the population.

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Appendix A: Demographic Variable Valid Cases

		Statistics					
		SEX_A	AGEP_A	EDUC_A	FAMINCTC_A	HICOV_A	PCNTADLT_A
N	Valid	3592	3592	3592	3592	3592	3592
	Missing	0	0	0	0	0	0

Appendix B: Number of AA Participants

		RACEALLP_A			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3592	100.0	100.0	100.0

Appendix C: Variables Included in the Regression Model

Biological	Psychological	Social
1. Opioid treatment	1. Yoga 2. Talk therapy. 3. Self-management.	1. Physical therapy. 2. Massage for pain. 3. Chiropractic care.