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Sociodemographic Predictors of Veterans' Health-Related Quality of Life

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August 2023

Abstract

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by

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MPA, California State University, Long Beach, 2007

BS, California State University, San Bernardino, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Health-related quality of life (HRQoL) is a theoretical concept that intertwines physical, mental, emotional, and social functioning, with a focus on the impact that health status has on quality of life. Although sociodemographic factors are associated with lower HRQoL, how these factors influence HRQoL in military veterans is less understood. The study's purpose was to examine the relationships between sociodemographic characteristics (gender, military pay grade, military branch, and geographic location) and perceived HRQoL measured by the SF-8 survey among veterans living in a metropolitan community in the Mid-Atlantic region of the United States. A cross-sectional recruitment study design yielded 90 participants. Linear regression was used to assess the predictive relationship between veterans' sociodemographic characteristics and their self-reported HRQoL. An analysis of variance showed that the effect was not significantly different, R^2 = .061, $F(4, 81)$ =1.32, p = .270, 95% CI [-.263, .038]. Post hoc analyses indicated a trend toward significance for military pay grade (p =.094) and a significant predictive relationship for the Air Force military branch (p = .020) and HRQoL. Although this study identified relationships between the variables studied, there is much more to learn about how military service affects veterans' HRQoL. Positive social change may occur through the institution of (a) policy initiatives to capture HRQoL data during all veteran health encounters and (b) health initiatives to increase quality of life. By taking these actions, policy makers may be able to achieve the goals of greater health equity and improvements in veterans' health status ascribed in the Healthy People 2030 initiatives and the Veterans Health Administration Health Equity Action Plan.

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Dedication

To my parents (Dad—Navy veteran), who were my first teachers and who instilled in me a tenacious work ethic, perseverance, and my faith.

To my husband, Tshombe (Army veteran), thank you for your loving support, patience, and understanding during this process.

To my son, my inspiration: Oh, baby, the Places You'll Go!

Last, but not least, I dedicate this work to William Cooper (Air Force veteran), in loving memory.

Acknowledgments

Always give thanks to God the Father for everything in the name of our Lord

Jesus Christ.

—Epheshians 5:20

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To my siblings, friends, family, and colleagues, I appreciate your words of

encouragement and your continued support.

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Chapter 1: Introduction to the Study

Health-related quality of life (HRQoL) is an important concept that initially

gained attention in 2005 after the World Health Organization (WHO) recognized the

importance of evaluating and improving people's quality of life (Office of Disease

Prevention and Health Promotion, 2020a). The term *HRQoL* was introduced to indicate a

focus on the effects of health, illness, and treatment on quality of life, excluding aspects

of quality of life not related to health (Ferrans et al., 2005). Conversely, Guyatt (1993)

asserted that in chronic illness almost all areas of life are affected by health, which

consequently become health related. Moreover, chronic health conditions account for a

vast majority of health spending worldwide (Putera, 2017). Therefore, I concur with the

assessment of Guyatt that all areas of life are affected by health, particularly

sociodemographic factors. These impacts have significant public policy implications.

Background

During U.S. servicemembers' time on active duty, they not only serve in the most

dangerous of conditions, wartime, but they also inhabit occupations that increase their

risk for developing health conditions that have serious implications long after they depart

military service. One of the earliest studies conducted on the concept of HRQoL and

military service dates to the early 2000s. Barrett et al. (2003) conducted the first

population-based study comparing HRQoL among active duty, reserve, and veterans, in

which they evaluated the connection of military service and HRQoL. Barrett et al. found

that reserves reported better HRQoL than their active-duty counterparts; veterans had

little or no difference in HRQoL; and active-duty personnel had the highest levels of poor HRQoL with significantly more limitations related to activity, pain, and sleep days.

A more recent study also provides evidence of lower HRQoL in U.S. military veterans. Diaz-Santana et al. (2017) examined self-reported HRQoL among U.S. veterans of Operation Enduring Freedom and Operation Iraqi Freedom and their nondeployed counterparts. Diaz-Santana et al. found that deployed veterans had lower self-reported HRQoL compared to the U.S. general population. In this study, I examined the correlation, if any, between sociodemographic factors and veterans' HRQoL. Some research shows a connection between sociodemographic factors and HRQoL in the general population. Zimmerman et al. (2017), for instance, examined the effect of self-reported long-term health conditions and sociodemographic factors on perceived HRQoL. Zimmerman et al. found that health conditions such as depression, diabetes, and hypertension were associated with worse HRQoL, as were sociodemographic factors such as residential geographic location, economic status, and unemployment. Therefore, I explored the correlation between sociodemographic factors and veterans' HRQoL and the need for policy formulation to address this crisis.

Problem Statement

The United States spends more on health care than any other developed nation; however, it performs poorly in measures related to key health indicators (Papanicolas et al., 2018). In 2016, health care spending in the United States totaled 17.2% of gross domestic product, compared to the median of 8.9% for the Organization for Economic Cooperation and Development (OECD; Anderson et al., 2019). For some key

benchmarks (e.g., obesity, life expectancy, and infant mortality), the United States had the worst outcomes, when compared to other countries (Papanicolas et al., 2018). This creates a problem for policy makers, because in health care spending, health status is largely attributable to non-medical factors, labelled *social determinants of health* (SDOH), which include one's social, environmental, and behavioral exposures and adopted lifestyles (Bradley et al., 2016; Fitzpatrick et al., 2015, Taylor et al., 2016).

Thus, in the past decade, the health in all policies (HiAP) approach has become more prevalent in U.S. policy discussions. Hall and Jacobson (2018) described SDOH as the most important factors affecting health in general, thus providing a foundation for HiAP's inclusion in all levels of policy making. In 1979, the U.S. Department of Health and Human Services created the Healthy People initiative to increase the health of Americans by setting goals and objectives for health promotion and disease prevention (National Academies of Sciences, Engineering, and Medicine, 2020). For Healthy People 2020, a new topic area was added, HRQoL. As its name implies, HRQoL "focuses on the impact that health status has on quality of life" (Office of Disease Prevention and Health Promotion, 2020a, para. 1); physical, mental, emotional, and social functioning constitute its key domains.

The concept of quality of life is multifaceted, and when health care providers acknowledge the importance of the patient's perceived health status, the management of disease and disease outcomes expands (Yaziciog et al., 2006). Zimmerman et al. (2017) posited that HRQoL may aid in the development and assessment of health policies aimed at improving health and decreasing inequity. To date, there are few studies of the HRQoL

of veterans, and those studies that do have as their focus veterans' HRQoL are clinic-based rather than population-based and thus are limited in scope and generalizability. The intent of this study was to help bridge this gap and examine perceptions of HRQoL among a representative sample of veterans living in a metropolitan community in a Mid-Atlantic state. I sought to contribute scholarly information concerning how sociodemographic characteristics influence HRQoL in these veterans.

Purpose of the Study

The purpose of this quantitative study was to examine the relationship between veterans' sociodemographic characteristics and their perceived HRQoL among veterans living in a metropolitan community in a Mid-Atlantic state. Using the Quality Metric Short Form-8 (SF-8) health survey, I examined whether relationships existed among sociodemographic characteristics including race, gender, military service rank, and residential geographic location. I also explored whether these predictor variables influenced veterans' perception of their HRQoL, which was the outcome variable. By understanding relationships between sociodemographic characteristics, policy makers may be able to incorporate initiatives such as HiAP into policy making for veterans. Hopefully, the study may inform future health policy related to veterans' health disparities.

Research Question and Hypotheses

I sought to probe whether a predictive relationship exists between veterans' sociodemographic characteristics and HRQoL in veterans living in a metropolitan

community in a Mid-Atlantic state. To examine this relationship, I assessed the following research question (RQ) and hypotheses:

RQ1: Will race, gender, military service rank, and geographic residential location significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state?

$H_0$1: Race, gender, military service rank, and geographic residential location will not significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

$H_1$1: Race, gender, military service rank, and geographic residential location will significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

Theoretical Framework

Grounded in public policy, this study supports a component of the Healthy People 2030 framework, which is for the U.S. population to attain their full potential for health and well-being through policy making across all sectors (Office of Disease Prevention and Health Promotion, 2020b). Sabatier and Weible (2014) asserted that theories and models allow scholars to cautiously cultivate and empirically examine relations among variables in order to explain phenomena of interest. The theoretical framework that served as the foundation for this study was the HRQoL model.

The HRQoL model, developed by Wilson and Cleary (1995), categorizes measures of patient outcome, and proposed causal relationships between different health concepts. Wilson and Cleary assumed that measures of health occur on a continuum of collective biological, social, and psychological complexity. Their model was constructed and tested to explain an individual's HRQoL based on causally linked components. These components include biological and physiological variables, symptoms, functioning, general health perceptions, overall quality of life, the role of patient preferences, and the role of emotional or psychological factors.

Ferrans et al. (2005) revised the Wilson and Cleary causal model of HRQoL placing emphasis on the five types of patient outcome measurements: (a) biological function, (b) symptoms, (c) functional status, (d) general health perceptions, and (e) overall quality of life. The original model was revised in three fundamental ways. Using a logic model concept, Ferrans et al. added arrows to show that biological function is influenced by both individuals and environments. Ferrans et al. deleted nonmedical factors, and they omitted the labels on the arrows because they viewed the labels as limiting representation of the relationships. For my research, I used the Ferrans et al.'s version of the HRQoL conceptual model. I did so because this model illustrates the effects that individual and environmental characteristics have on biological function, symptoms, functional status, general health perceptions, and overall quality of life.

Nature of the Study

The nature of this study was a quantitative postpositivist worldview, wherein I tested a theory. I gathered self-reported information using the Quality Metric SF-8, which

I administered to veterans who live in a metropolitan community in a Mid-Atlantic state. By sampling the study population, administering the SF-8 to them, and quantitatively evaluating their survey responses, I was able to gain insight on the attitudes and beliefs of the population (Creswell, 2009, p. 12). The SF-8 is a survey instrument that was developed to replicate and simplify the Short-Form-36 Health Survey Version 2 (SF-36v2), ultimately yielding one highly predictive question for each identified health domain (Ware et al., 2001). The Short-Form-36 Health Survey (SF-36) was designed by the RAND Corporation as a generic indicator of health status for use in population surveys and evaluative studies of health policy (McDowell, 2006).

The key study variables included two descriptive variables (age and military branch of service), four independent variables (IVs; race, gender, military service rank, and residential location), and one dependent variable (DV; HRQoL). To illustrate the predictive relationship between veterans' sociodemographic characteristics (race, military service rank, gender, and geographic location) and their self-reported HRQoL, I conducted a cross-sectional study using linear regression. This was an appropriate study design based on the premise that the researcher measures the outcome and exposures in the study participants and possibly studies their association (see Setia, 2016).

Definitions

Gender: The "attitudes, feelings, and behaviors that a given culture associates with a person's biological sex" (American Psychological Association, 2012, as cited in American Psychological Association, 2022, Gender Versus Sex section).

Geographic residential location: The space and place in which an event occurs within a specific area, whether that is in a city, or neighborhood (Schmitz Weiss, 2018).

Health: A state of complete physical, mental, and social well-being and not merely an absence of disease and infirmity (Bircher & Kuruvilla, 2014).

Health disparities: Difference in the health status of different groups of people (United States National Library of Medicine, 2021).

Health equity: The "absence of disparities or avoidable differences among socioeconomic and demographic groups or geographic areas in health status and health outcomes such as disease, disability, or mortality" (Singh et al., 2017, p. 140).

Health-related quality of life (HRQoL): "An individual's or a group's perceived physical and mental health over time" (Centers for Disease Control and Prevention, 2021, HRQoL section).

Military service rank: A symbol of leadership. Rank reflects a servicemember's responsibility for personnel, equipment, and mission that increases with each advancement (United States Department of Defense, n.d.).

Race: Race is a human classification system that is socially constructed to distinguish between groups of people who share phenotypical characteristics (Ray & DeLoatch, 2016, para. 1). Race is further classified into categories that are used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The designations include ethnicity, such as Hispanic, Latino, Not Hispanic, or Latino, and race, such as American Indian or Alaska Native, Asian, Black or African

American, Native Hawaiian or Other Pacific Islander, and White (National Center of Education Statistics, n.d.).

Self-reported health: The person's overall rating of their own general health, such as excellent, very good, good, fair or poor (Organisation for Economic Cooperation and Development, n.d. Definition and Comparability section).

Sociodemographic variables: Variables "of, relating to, or involving a combination of social and demographic factors" (Merriam-Webster, n.d., para. 1). Sociodemographic variables include age, sex, education, background and ethnicity, religious affiliation, marital status, household, employment, and income (Leibnez Institute for the Social Sciences, n.d).

Veterans service organization: An organization that offers a range of services for veterans, servicemembers, dependents, and survivors (Congressional Research Service, 2021).

Veteran: A "person who served in the active military, naval, or air service, and who was discharged or released therefrom under conditions other than dishonorable" (38 U.S.C. § 101(2), n.d., as cited in United States Department of Veterans Affairs [VA], Office of Small and Disadvantaged Business Utilization, 2019, p. 1).

Assumptions

There were several assumptions in conducting this research. The primary assumption was that the participants were honest about being veterans. An additional assumption, related to the veteran truthfulness about residing in the study's geographic location of Baltimore City or Baltimore County. Another assumption was that it would be

relatively easy to obtain a partnership agreement from the veteran service organiztions in which I sought participants. The final assumption related to believing I would obtain the needed sample size based on having partnership agreements.

Limitations

The study had two early identified limitations**.** First, data collection was a potential issue. To address this limitation, I sought participants from both legacy and post-9/11 local veteran's service organizations such as the American Legion, Disabled American Veterans, Student Veterans of America, and Team Red, White, & Blue to ensure that my sample was representative of veterans only. To obtain membership in a veterans service organization, one must provide evidence to verify their veteran status. For example, to obtain membership in the American Legion, the veteran must have served at least one day of active military duty since December 7, 1941, and was honorably discharged or is still serving active military duty honorably (American Legion, n.d). Therefore, it was likely that the participants would meet the requirement for participation. The obtainment of actual participant responses to the Quality Metric SF-8 questionnaire required willing participants who met the residential and veteran status sample frame requirements, could read English and comprehend the survey questions, and had the manual dexterity to complete the response forms (or had a trusted surrogate to do so). Second, lack of prior research studies related to HRQoL in veterans was a limitation. The lack of previous research studies related to veterans' HRQoL inhibited my ability to build upon previous research as the framework for this study.

Sampling is an integral part of quantitative research. While collecting data for research, there are various ways by which researchers can unintentionally introduce bias in the study (Simundić, 2013). To circumvent issues of bias in sampling, I used the simple random sampling technique, wherein every case of the population had an equal chance of being selected.

Significance

The significance of this research lies in its implications for positive social change. To date, there are few studies of the HRQoL of veterans, and those studies that do focus on veterans' HRQoL are clinic-based rather than population-based and are thus limited in scope and generalizability. I sought to bridge this gap by examining perceptions of HRQoL among a representative sample of veterans living in a metropolitan community in a Mid-Atlantic state. The aim of this research was to contribute scholarly information concerning how sociodemographic characteristics influence HRQoL in these veterans.

This study could contribute to public policy at the national level by providing insights on how veterans perceive their HRQoL after service-related discharge. By understanding how veterans perceive their HRQoL, Veterans Health Administration (VHA) officials and staff may be better able to address the Healthy People 2030 goal of improving HRQoL and well-being within the veteran population. Policy recommendations could lead to implementation of initiatives to increase quality of life for this unique population, which could lead to achievement of greater health equity and improvements in veterans' health status. Health planners and policy makers may be able

to use the study data to create and implement policy and to examine resource allocations for possible changes to maximize benefits across a wider veteran population.

Summary

Public health policy is defined as laws, regulations, plans, and actions that are commenced to attain public health goals in a society (Pollack Porter et al., 2018). Scientists, community members, and policy makers have acknowledged that health is affected by a range of non-health factors that function on multiple levels and throughout a person's life span (National Research Council, 2011). Public officials continue to investigate and implement health policies to address the growing phenomenon of HRQoL. By investigating veterans' HRQoL in this Mid-Atlantic state, this study can contribute to positive social change by informing future health policy related to veterans' HRQoL.

In this chapter, I introduced this quantitative study and provided an overview of the background, purpose, and necessity for this research. In Chapter 2, I review pertinent research literature on the HRQoL theoretical framework and previous studies related to HRQoL, and I identify the gap in the scholarly literature. Chapter 3 includes details on the methodology for this study, including the rationale for the selection of the quantitative method.

Chapter 2: Literature Review

Introduction

The United States spends more on health care per capita than any other developed country; however, health outcomes are poor in comparison (Koh, 2016; Papanicolas et al., 2018). Health outcomes are largely attributable to SDOH (Braveman & Gottlieb, 2014). In this research, I examined relationships between sociodemographic characteristics and HRQoL in veterans, a unique population, living in a metropolitan mid-Atlantic coastal state. In this chapter, I review key literature related to the study topic. I begin by describing the literature search strategy. Then, I provide overviews of the theoretical framework, Wilson and Cleary's model of HRQoL, and the revised version of the model by Ferrans et al. (2005), and discuss previous studies featuring HRQoL. The literature review that follows begins with discussion of SDOH. I then provide an overview of HiAP. In the next section of the literature review, I examine the relationship between sociodemographic characteristics of race, gender, military service rank, and geographic location. The last section of the literature review includes discussion of the instrument that was used in this study, the SF-8 survey instrument. The chapter ends with a summary of key points and conclusions.

Literature Search Strategy

To thoroughly understand the multifaceted study topic, I structured the literature search into four segments: (a) scholarly studies published since 2015 on HRQoL, SDOH, and health equity; (b) sociodemographic characteristics and health outcomes; (c) U.S. health care spending; and (d) public policies related to overall health and well-being.

With regard to the first area, I decided to extend the search to the previous 10–15 years to examine the evolution of HRQoL. I initially searched Google Scholar and the following databases of the Walden University Library: Academic Search Complete, Health and Psychosocial Instruments, PubMed, National Academies Press, and National Center for Health Statistics. This initial search extended to the websites of the CDC, WHO, *Journal of American Medical Association*, U.S. Department of Health and Human Services, and Kaiser Family Foundation. I also searched the OECD Library. Keywords for all search methods included key variable terms and their permutations, such as *health equity*, *U.S. health care spending*, *social determinants of health*, *sociodemographic characteristics*, *veterans*, *health-related quality of life*, and *health in all policies.*

Theoretical Foundation

HRQoL is a concept that was initially examined by the WHO in 2005. In 2008, the Department of Health and Human Services, Office of Disease Prevention and Health Promotion added HRQoL to Healthy People 2020 as a high priority health issue. The conceptualization of health as related to quality of life is relatively new; therefore, I grounded this public policy study in the HRQoL model, which I used as the theoretical framework to examine HRQoL in veterans living in a metropolitan community in a Mid-Atlantic state. Examining the quality of life relative to one's health or disease status is a concern of policy makers, researchers, and health care practitioners (Bakas et al., 2012), and an important component in the assessment of disease outcomes and its management (Ojelabi et al., 2017).

Original Health Related Quality of Life Conceptual Model

In the late 1970's, Engel (1977) asserted that the biomedical model of disease grounded in molecular biology was no longer adequate for medicine or psychiatry disciplines. This model assumes that disease is fully accounted for by abnormal measurable biological variables, and it disregards the social, psychological, and behavioral dimensions of illness. Almost 2 decades later, Wilson and Cleary developed the HRQoL model combining two paradigms: biomedical and social science (Bakas et al., 2012). Wilson and Cleary (1995) noted that there was limited research that distinctly conceptualized the relationships of clinical variables to measures of HRQoL. Wilson and Cleary argued that a clear understanding of causal relationships would facilitate the design of effective clinical interventions. Consequently, they developed a model that integrated two models of health: measures of patient outcomes and specific causal relationships.

In the HRQoL model, measures of health are depicted in a sequence specific to biological, social, and psychological aspects of human existence (see Figure 1). At the beginning of the sequence are biological measures. Biological measures encompass medical diagnoses, lab values, and physical exam findings through conducted clinical assessments. In the center of the model, three overarching domains are collectively referred to as the *characteristics of individuals* and can be influenced uniquely by the impacts of *characteristics of the environment* upon an individual.

The three domains begin with symptom status. Symptom status refers to physical symptoms that comprise perception of physical, emotional, or cognitive state (Wilson &

Cleary, 1995). The next stage in the sequence is functional status, which refers to the

ability to perform specific defined tasks. In this stage, one's environment can affect the

ability to complete tasks. The third and final of the domains is general health perceptions,

which refers to more complex and integrated measures such as physical functioning

(Wilson & Cleary, 1995). General health perceptions integrate all health concepts

associated with each unique individual. Influences and outcomes from the general health

perceptions are then funneled into the final model element specific to measuring overall

quality of life. Wilson and Cleary (1995) described overall quality of life as the

subjective well-being associated with how happy or satisfied someone is with life.

Figure 1

Health-Related Quality of Life Conceptual Model
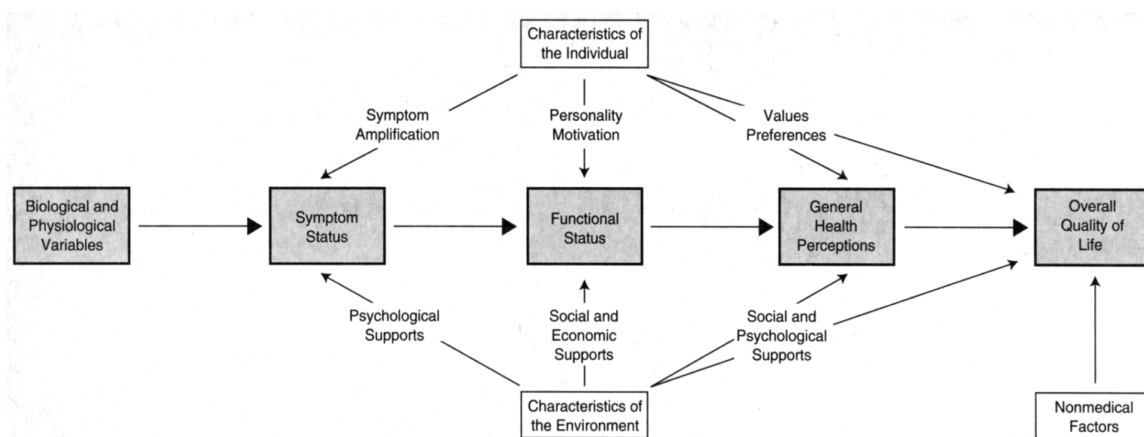
Note. This model illustrates the relationship among measures of patient outcomes. The

measures of health are in the five center boxes, and the dominant causal associations are

reflected outside of the boxes. From "Linking Clinical Variables With Health-Related

Quality of Life. A Conceptual Model of Patient Outcomes," by I. B. Wilson and P. D.

Cleary, 1995, *Journal of American Medical Association*, *273*(1), p. 60,

(https://doi.org/10.1001/jama.1995.03520250075037). Copyright 1995 by the American Medical Association.

Revised Health-Related Quality of Life Model

  In 2005 Ferrans, along with colleagues Zerwic, Wilbur, and Larson, revised the Wilson and Cleary HRQoL model in three fundamental ways to further the model's use in nursing and health care (see Figure 2). First, they added arrows to reflect that biological function is influenced by both individuals and their environment. Second, nonmedical factors were deleted as they are already incorporated into the model as characteristics of either the individual or their environment. Third, labels were omitted due to their restrictive characterization of the relationships.

  Further, Ferrans et al. (2005) provided a theoretical grounding of characteristics of the individual and their environment as it was not clearly defined in the original model. Characteristics of the individual are described as demographic, developmental, psychological, and biological factors that influence health outcomes. For example, genetic structure predisposes people to disease. Characteristics of the environment are described as social or physical. Social comprises interpersonal or social influences on health outcomes, and physical comprises settings such as home, neighborhood, and workplace. Social and physical factors can affect biologic function, their model asserts.

  I used Ferrans et al. (2005)'s conceptualization of HRQoL as the theoretical model for this study. Ferrans et al. expanded Wilson and Cleary's work in three fundamental ways. They (a) expounded on individual and environmental factors, (b) incorporated the

statistical measurement of an individual's HRQoL, and (c) made the instrument

applicable to any health discipline.

Figure 2

Ferran et al.'s Model of Health-Related Quality of Life
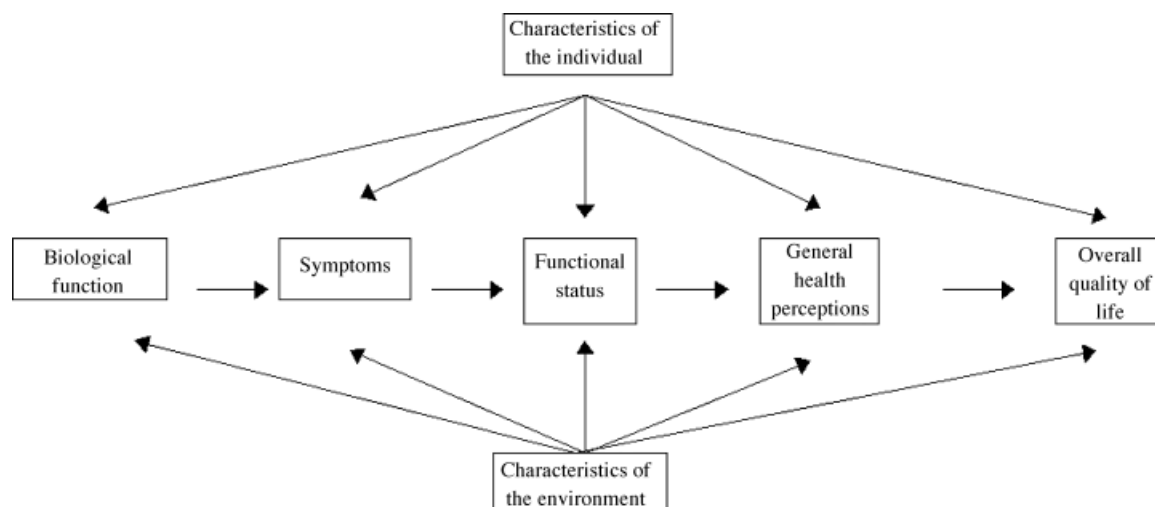
Note. This model illustrates a revised conceptualized version of the Wilson and Cleary

(2005) model, with the primary focus on patient outcomes located in the center. From

"Conceptual Model of Health-Related Quality of Life, " by C. E. Ferrans, J. J. Zerwic, J.

E. Wilbur, and J. L. Larson, 2005, *Journal of Nursing Scholarship*, *37*(4), p. 338

(https://doi.org/10.1111/j.1547-5069.2005.00058.x). Copyright 2005 by Sigma Theta Tau

International, Inc., Honor Society of Nursing. Reprinted with permission.

I examined the relationship between veterans' sociodemographic characteristics

and their perceived HRQoL using the SF-8 health survey to measure veterans' HRQoL.

Both Wilson and Cleary (1995) and Ferrans et al. (2005) encouraged the use of

standardized instruments to measure HRQoL to facilitate identification and evaluation of

quantitative changes in both individuals and wider communities.

Health Related Quality of Life Model Resources and Paradigms

To examine Wilson and Cleary HRQoL conceptual model and its applicability to patients living with HIV, Sousa and Kwok (2006) used structural equation modeling to analyze primary pathways using a sample of data ($n = 917$) from patient medical records and questionnaires from the AIDS Times-Oriented Health Outcomes study. First, they examined the relationship between the four constructs of symptom status, (a) symptom status, (b) functional health, (c) general health perceptions, and (d) overall quality of life. They then selected 395 patients from the initial sample group to examine the full model. Sousa and Kwok (2006, p. 731) found significant correlations for the composites of symptom status ($r = 0.27 - 0.56$); functional health ($r = 0.77 - 0.94$); general health perception ($r = 0.81$); and overall quality of life ($r = 0.70$). Sousa and Kwok concluded that this HRQoL model can be used to identify, measure, and improve quality patient care.

Rizzo and Kintner (2013) similarly examined the potential effects that race may have on the conceptualization of HRQoL and quality of life using Wilson and Cleary's model. Rizzo and Kintner applied multiple group analysis in structural equation modeling by comparing African Americans to Whites, and Hispanics to Whites to determine whether these racial groups perceive HRQoL similarly. The structural model was comprised of five constructs: (a) biological, (b) symptom distress, (c) HRQoL, (d) quality of life, and (e) environmental risk characteristics. Using a sample of data ($n = 6525$) from the Behavioral Risk Factor Surveillance System, Rizzo and Kintner (2013, p. 2108) found the full structural model indicated a good fit of the data at ($r = 0.967$). The findings

indicated a very good fit of the White sample; however, two key structural components

HRQoL on quality of life ($p = 0.579$) and biological factors on symptoms distress ($p =$

0.094) of the model failed to reach significance for the African American data.

Additionally, fit for the Hispanic data was minimal with biological factors on symptom

distress ($p = 0.118$), HRQol on quality of life ($p = 0.10$), and symptom distress on disease

load ($p = 0.159$) insignificant. Rizzo and Kintner concluded that the Wilson and Cleary

HRQoL model posed a challenge in predicting HRQoL and quality of life causal patterns

for minority groups.

Although both HRQoL models markedly focus on the five measures of health, the

Ferrans et al. model has greater "potential for guiding the design of interventions that

could be tested and applied in practice settings" (Bakas et al., 2012, p. 10). Alsayed et al.

(2017, p. 658) tested the Ferrans et al. revised model of HRQoL on women living with

HIV through path analysis in structural equation modeling. The goal of their study was to

examine the five main components of the revised model, (a) biological function, (b)

symptoms, (c) functional status, (d) general health status, and (e) overall quality of life in

addition to the relationships among the individual and environment.

Alsayed et al. examined a sample of data ($n = 178$) from women who participated

in a randomized trial for HIV medication adherence. Baseline instruments (HIV viral

load, depressive symptoms, physical functioning, overall general health, overall quality

of life, HIV-related stigma, social support, and socio-demographic characteristics) were

established to assess the model's key variables. The findings suggested the path model

did not demonstrate a good fit for the five main components and the individual and

environmental factors (RMSEA = .222, CFI = .727, SRMR = .321). However, once

modified, the full observed variable path model was consistent with the model (RMSEA

= .142, CFI = .932, SRMR = .027).

Understanding the key measures of Ferrans et al. HRQoL model and its

application is key in testing and assessing HRQoL to promote public policy interventions

related to Veterans HRQoL. Daggett et al. (2009, p. 15) conducted a literature review of

17 studies to assess the concept of HRQoL in adult traumatic brain injury (TBI) survivors

to apply the findings toward future research in veterans with TBI. They found that the

Ferrans et al. model provides a comprehensive structure that can guide TBI researchers

and provide a holistic approach for future research. Bakas et al. (2012) offered that

Ferrans et al. conceptualization of Wilson and Cleary's model of HRQoL will provide

more opportunities for testing, and more importantly the model can evaluate which

HRQoL concepts are common to different populations.

Health Related Quality of Life Studies in Veterans

Kazis et al. (1998) posited that prior to 1998 there were no systematic studies

conducted in the VA to measure health status. Using the Short-Form 36 Survey (SF-36),

Kazis et al. (1998) conducted a cross-sectional study to examine a data sample of ($n =$

1,667) veterans in four Boston area VA medical centers. Analysis found that veterans

have poorer health, higher incidence of multiple chronic health conditions, and lower

HRQoL than their civilian counterparts. Weeks et al. (2004) examined if disparities occur

in rural veterans when compared to urban and suburban veterans HRQoL by conducting a

cross sectional study using data from the 1999 Large Health Survey of Veteran Enrollees.

Weeks et al. found that veterans living in rural communities are older, had increased physical and mental comorbidities, and lived a greater distance from private sector and VA medical facilities; moreover, rural veterans had lower HRQoL scores (Weeks et al., 2004).

Singh and Murdoch (2007) expanded on Kazis et al. initial study of HRQoL in the veteran population and combined the SF-36 survey with VA administrative data to conduct a cohort study of veterans receiving medical care from VA hospitals in the Upper Midwest. Singh and Murdoch compared women and men veterans' HRQoL along with their VA health care utilization and found that women veterans were younger, better educated, consistently employed, and more often single than their male counterparts. Furthermore, women appeared healthier and reported better HRQoL. However, both men and women veterans had comparable VA inpatient and outpatient utilization (Singh & Murdoch, 2007).

Der-Martirosian et al. (2013) hypothesized that women veterans have factors that are unique to their military experiences that influence their HRQoL, specifically, exposure to military sexual trauma. Using data from the National Survey of Women Veterans combined with the Short-Form 12 Survey (SF-12) Der=Martirosian measured women veterans' current health status and found that older women veterans HRQoL is associated with general sociodemographic characteristics in addition to influences such as military sexual trauma and combat exposure. For example, older women veterans who experienced military sexual trauma had lower physical component summary scores (PCS) and mental component summary scores (MCS), whereas sociodemographic

characteristics for women veterans in general indicated better PCS associated with those who are married, employed, have higher incomes, and higher MCS for those with higher education (Der-Martirosian et al., 2013, p. 2754).

Epidemiologic studies have illustrated an extensive range of health issues experienced by veterans with combat exposure, which has serious implications (Díaz Santana et al., 2017). Helmer et al. (2007) found that veterans serving in the Afghanistan and Iraq wars (Operation Enduring Freedom [OEF] and Operation Iraqi Freedom [OIF]) reported deployment-related health and exposure concerns, including mental health. Diaz Santana et al. (2017) examined mental and physical health of deployed and nondeployed OEF/OIF veterans by using self-reported HRQoL data through the SF-12 survey. Findings suggested that overall, OEF/OIF veterans have lower mean MCS, and PCS compared to the U.S. general population mean of 50 (p. e1888).

The above-mentioned conceptual studies that have sought to examine veterans, a unique population and their HRQoL provide a baseline for understanding the determinants that influence veterans HRQoL; however, there is a gap in the research related to specific variables such as sociodemographic characteristics, military service rank, and geographic location. Focusing research on these variables can have significant policy implications for community resource and health care services planning for veterans.

Literature Review Related to Key Variables and/or Concepts

Social Determinants of Health

Social conditions have a tremendous impact on health. SDOH are "the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life" (WHO, n.d.-a, para. 1). All SDOH are interconnected to social, environmental, and behavioral factors. Artiga and Hinton (2018) posited that these factors include socioeconomic status, education, and living environment and have a huge impact on health and quality of life. Taylor et al. (2016) suggested that SDOH are largely attributed to a person's health status more so than medical factors. Conversely, negative social conditions can harm health and increase costs (Bradley et al., 2017). Additionally, researchers have found that improved health outcomes are related to social service interventions (Bradley et al., 2016; Taylor et al., 2016).

Social

The social aspect of SDOH encompasses sociodemographic and socioeconomic characteristics. Prus (2011) proposed in a SDOH conceptual framework that sociodemographic factors like sex, age, race, and ethnicity interact with socioeconomic condition to influence exposure to social stressors, health behavior, access to medical care, and ultimately health (p. 50). However, the social aspects of SDOH extend beyond sociodemographic and socioeconomic characteristics to a larger social and community context. For example, social determinants comprise:

- safe housing

- access to education and job opportunities

- quality education and job training

- social support

- access to transportation

- public safety

- availability of community-based resources (Office of Disease Prevention

  and Health Promotion, 2020c).

When specific populations of individuals and communities in the United States

experience measurable adverse effects related to SDOH in their attainment of full health,

health disparities occur (National Academies of Sciences, Engineering, and Medicine,

2017a). Health disparities are a direct result of a health difference closely associated with

social, economic, and/or environmental disadvantage (Office of Disease Prevention and

Health Promotion, 2020d). Delpierre et al. (2012) asserted that self-rated health and

HRQoL have been used to measure health disparities and the way in which individual's

rate their health is contingent on what they perceive their health should be. Moreover,

Prus (2011) suggested that self-rated health is a valuable indicator of the overall health

and well-being of both individuals and populations. Conversely, Talmage et al. (2017)

noted that HRQoL is only one facet that contributes to a high-quality life.

Behavioral

Levitis et al. (2009) proposed the following definition for behavior: "Behavior is

the internally coordinated responses (actions or inactions) of whole living organisms

(individuals or groups) to internal and/or external stimuli, excluding responses more

easily understood as developmental changes" (p. 108). Health behavior encompasses actions a person takes related to their health. For example, alcohol and tobacco consumption, eating habits, and exercise are considered health behaviors. Artiga and Hinton (2018) found that health behaviors, and social and economic factors are the main drivers of health outcomes. Subsequently, Cohrdes et al. (2018) found mounting research-based evidence that relates positive effects from health behaviors to physical and mental health-related outcomes, and Krist et al. (2017) argued that health can be improved when engaging people in health behavior change.

Environmental

Environmental determinants include the physical, chemical, and biological factors outside of the individual, and all other-factors that impact behaviors for disease prevention and to create healthy environments. As such, the intricate and dynamic interaction among environmental determinants and health outcomes are known to affect the progress of a wholesome life (Salgado et al., 2020). The Zone Improvement Plan (ZIP code) was created in 1963 by the U.S. Postal Service for purposes of organizing mail operations and delivery. The ZIP code is connected to mail volume, delivery-area size, and geographic location (United States Postal Service, 2015). Terry (2019) proposed that a persons' ZIP code serves as a representation of their SDOH such as, "income, race, education, and access to healthy foods or health-care resources" (p. 646). Graham et al. (2015) asserted that a person's ZIP code is a stronger predictor of their overall health than other factors, including race and genetics. Access to care, health information, and quality

of life are all affected by a person's environment, and environmental factors could have multi-generational impacts (Artiga & Hinton, 2018).

Health Disparities Among Veterans

The Office of Health Equity was created in 2012 in response to the VHA recognizing that some minority veterans experience health disparities due to their social circumstances, which leads to health inequities (Jesse, 2014). The focus of the Office of Health Equity is "to ensure that VHA provides appropriate individualized health care to each veteran in a way that eliminates disparate health outcomes and assures health equity" (Uchendu, 2014, p. S511) regardless of geography, gender, race, age, or sexual orientation (Marmot & Allen, 2014). Veterans' consistently report poorer physical and mental health than non-veterans (Schure et al., 2016), and veterans who access care at the VHA are generally from socially disadvantaged groups compared to their non-veteran counterparts (Nelson et al., 2016).

The VHA Blueprint for Excellence has made addressing health disparities and its commitment to health equity for veterans a priority. Given its unique position, VHA can address medical and non-medical determinants of veterans' health through its extensive programs and network access. O'Toole et al. (2016) posited that incorporating SDOH into medical care is one method to effectively manage the needs of vulnerable and marginalized patients. In a review examining the prevalence of health disparities in veterans, Kondo et al. (2017) found that many of the previous studies examining racial and ethnic minorities found no clear evidence of disparities. Wong et al. (2019) also examined racial/ethnic mortality disparities within VHA and after comparing disparities

to the U.S. general population, they found that within VHA, there were few racial/ethnic disparities in all-cause, cancer, and cardiovascular-related mortality. Perhaps VHA's commitment to addressing health disparities in veterans who seek care at the VHA is effective.

Health in All Policies

Policies are devised to address problems and guide decisions to achieve a specific goal. Health policy has been defined explicitly as policy that aims to positively influence population health (De Leeuw et al., 2014). HiAP, once referred to as healthy public policies, is an approach that includes health considerations into decision making across sectors and policy areas to improve the health of all people (Artiga & Hinton, 2018). The WHO and the Ministry of Social Affairs and Health, Finland (2014) defined HiAP as

> An approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts in order to improve population health and health equity. It improves accountability of policymakers for health impacts at all levels of policymaking. It includes an emphasis on the consequences of public policies on health systems, determinants of health and well-being.
> (p. 2)

De Leew (2017) contended that individual and population health is fundamentally affected by public policy and civil society (p. 334). Furthermore, countries who spend more on social services compared to health care had considerably better health outcomes (Bradley et al., 2016), and if the OECD countries spending on both health care and social

services are compared to the United States, the United States spending on social services compared to health care is the lowest of all countries (Bradley et al., 2017). Conversely, Papanicolas (2018) argued that the United States social services spending appears to be comparable to other OECD countries.

The objective of HiAP encompasses addressing the SDOH such as public transportation, education access, access to healthy food, and economic opportunities, to promote healthy communities, specifically the achievement of health equity across different population groups (WHO, n.d.-b), and to enhance the potential for state, national, and local health departments to increase health outcomes (CDC, 2016, para. 1). Objective action from various entities is crucial. Hall and Jacobson (2017) identified best practices that leaders and practitioners of non-health sectors should heed when implementing HiAP. These include (a) anticipating the political environment, (b) not waiting for the adoption of broad mandates, and (c) obtaining adequate resources to promote equity (p. 369).

Maryland State Health in All Policies

In 2017, Governor Lawrence Hogan signed Maryland's Senate Bill 340 and House Bill 1225 into law. This bill requires the University of Maryland School of Public Health, in collaboration with the Department of Health and Mental Hygiene to assemble a workgroup to analyze and make proposals to state and local government on policies that will positively impact the health of residents in the state (Maryland General Assembly, 2017). On January 31, 2019, the HiAP workgroup report recommended the following:

- Establish a HiAP council with a multi-disciplinary group of stakeholders applying the CDC'S policy process to guide development of a framework.

- Development of a toolkit with a reference guide to help state agencies, legislators, and policy makers understand what HiAP is and how to implement it.

- The HiAP council further develop an addendum for the procurement process so that efforts made by applicants responding to requests for proposals or other state procurement opportunities consider extensive health implications when making business decisions.

- The process to facilitate data sharing be made available for use by state agencies and the creation of a task force to implement and evaluate the data sharing process within a HiAP framework in Maryland state agencies. (Maryland Manual On-Line, 2020)

Baltimore City Health in All Policies

The 2013 National Association of County and City Health Officials Profile along with interviews from the Big Cities Health Coalition (BCHC) found that big city officials identified HiAP as a top priority (Hearne et al., 2015). Wernham and Teutsch (2015) contended that creating healthy communities necessitates building a culture of health, where health is incorporated into planning in all segments of society. The city of Baltimore is one of the local health departments involved in the BCHC and illustrates the concept of incorporating health into planning through its Cross-Agency Health Taskforce. This taskforce is a group comprised of representatives from all Baltimore

agencies that work together to foster cross sector collaboration to support Healthy

Baltimore. This is one example of how the various large cities implement HiAP

(Baltimore City Health Department [BCHD], n.d.).

In August 2016, BCHD launched Healthy Baltimore 2020, a strategic blueprint

for health in the city. The plan was to reduce health disparities over the next 10 years by

concentrating on three core values: (a) race, equity, and inclusion; (b) well-being; and (c)

HiAP. Additionally, the proposal emphasized four priority health topics: (a) behavioral

health, (b) violence prevention, (c) chronic disease prevention, and (d) public health

infrastructure (BCHD, 2017). The Healthy Baltimore 2020 most recent report showed

significant progress of the various initiatives that were implemented to address the

priority health topics. For example, for the first priority, behavioral health, the initiatives

include addressing the opioid epidemic, and addressing trauma and access to mental

health services. For the second priority, violence prevention, BCHD incorporated

violence interruption, addressing addiction and mental health needs, and upstream

investment. For the third priority, chronic disease prevention, the initiatives encompass

direct services, education, and policy actions; finally, the fourth priority, public health

infrastructure, BCHD focuses on enhancing the quality of life of older adults through

various programs to include advocacy, guardianship, in-home care, and transportation to

name a few (BCHD, 2018).

In viewing health as foundational to every issue, BCHD is leading initiatives that

address these social determinants, all which impact health. These HiAP initiatives

incorporate the establishment of a new clinic to increase access, which includes

medication-assisted treatment and care management services; the establishment of an

accountable health community to increase access for screening, referral, and navigation

to essential community resources to address social needs; the creation of a local health

improvement council consisting of a multi-disciplinary coalition, whom members serve

as key advisors and implementation partners for Healthy Baltimore 2020; the

implementation of a high utilizer task force comprised of health care leaders who discuss

behavioral health priorities and case management for high utilizers; emergency

department convenings to address opioid use disorder; and lastly the formation of a

business advisory group to solicit advice from the business community for support of the

various initiatives to improve health (BCHD, 2018).

Veterans' Health Administration and Health in All Policies

Compared to most medical providers, the VHA has a legislative obligation to

address both the medical and non-medical needs of veterans. Given this fact, the VHA is

progressively focused on the development of tools and health indicators, such as health

registries that consider the SDOH influences of veterans and those linked with their

communities (Hatef et al., 2019). The VA has done significant work on SDOH,

specifically in veteran housing and homelessness. One of the advantages the

VA has is that its patient population obtains consistent care at the VA, allowing it to

recapture the investments it makes in social determinants (National Academies of

Sciences, Engineering, and Medicine, 2019b). Given VHA's obligation to treat the whole

veteran, and those non-health factors that affect health, VHA demonstrates the concept of

HiAP in its various policies and programs implemented within the organization.

Sociodemographic Characteristics

Demographic variables are distinct qualities in people and groups. Social qualities and demographic variables are cojoined to form sociodemographic variables. Common demographic variables include age, race, education, and sex. Other common demographic variables include marital status, income, religion, and political affiliation (Frey, 2018). Numerous studies have been conducted to evaluate relationships between sociodemographic factors and quality of life. For example, Gobbens and Remmen (2019) conducted a study to compare the effects of sociodemographic factors (sex, age, marital status, education, and income) on quality of life and to determine the links between these factors and quality of life. They found that all sociodemographic factors used in their study explain a significant part of all quality-of-life domains. The implications for identifying sociodemographic factors and understanding their relationships with HRQoL can assist policy makers with implementing interventions aimed at improving the HRQoL for veterans.

Race

In the United States disparities based on race and ethnicity persist throughout most major chronic conditions (Johnson-Lawrence et al., 2017). White et al. (2020) contended that self-identified race/ethnicity remains a significant predictor of overall well-being and health even after accounting for sociodemographic characteristics known to influence disease risk such as socioeconomic status, health behaviors and health care. Moreover, Hill et al. (2015) asserted that communities of color and socially

disadvantaged individuals experience chronic disease at an inexplicable rate due to additional stressors that effect health, fast-track aging, and decrease quality of life.

Race and Veterans

In health care it is imperative to have comprehensive, trustworthy, and consistent data related to racial and ethnic backgrounds for valid health equity and disparity analyses (Gebregziabher et al., 2016). According to the National Center for Veterans Analysis and Statistics (2020b), the United States veteran population is 19,541,951. By race, 80.5% are white; 12.7% are Black; 8.2% are Hispanic; 3.9% are other; 2.1% are Asian/Pacific Islander; and 0.8% are American Indian/Alaska Natives. In 2020, there were 362,000 projected number of veterans in Maryland. Of the 362,000 veterans in Maryland, approximately 70,000 lived in the Baltimore City and Baltimore County region (VA, n.d.). Furthermore, it is projected that from 2019 to 2045, the racial and ethnic composition of veterans will change. The projected percentage of veterans who are Non-Hispanic White will decrease, and all other groups will have increases (VA, 2020a).

Gender

In 2005, WHO's Commission on Social Determinants of Health emphasized the significant role that SDOH, specifically gender, plays in influencing health outcomes. The Commission also emphasized intersectionality in recognizing the interaction of gender with other factors (e.g., race, age, and income) "to create clustered relative advantage or disadvantage that gives rise to power dynamics and hierarchies among boys and men and girls and women, not just between them" (Gupta et al., 2019, p. 2550). Heise et al. (2019) asserted that health care systems encompass unconscious gender

biases; decision making based on gender stereotypes; and obvious sexism; which all affect patient care, causing gender-based disparities. While there are limited studies that have been conducted related to the relationship of HRQoL and gender, one such study found a correlation of perceived bias on HRQoL outcomes resulting in gender differences among African Americans, particularly women's mental health (Coley et al., 2017). Based on this aspect there is a need for future research to understand the relationship between HRQoL and gender, since gender equality is a key indicator of life satisfaction (Audette et al., 2019). Conversely, gender inequalities that disadvantage women, but benefit men, remain prevalent worldwide (Flood, 2019).

Gender and Veterans

According to the VA, National Center for Veterans Analysis and Statistics (2020a), the United States veteran population is comprised of 19,541,961veterans, of which 2,030,586 are female. Between 2005 and 2015, the number of women veterans accessing VHA care resulted in approximately a two-fold increase (92%) far outpacing the increase of men veterans (Harrington et al., 2019). Ziobrowski et al. (2017) discovered gender differentiations in various health conditions in U.S. veterans. For example, women veterans who suffered physical assault were at greater risk for post-traumatic stress disorder; whereas male veterans who suffered physical assault had increased risk of suicidal ideation, heart attack, and high blood pressure. The implications for identifying and understanding how gender differences effect health outcomes for veterans will help guide policy decisions that can have a profound effect on veterans HRQoL.

U.S. Military Rank

Military rank reflects one's leadership abilities. Thus, each level reveals responsibility for personnel, equipment, and most importantly the mission. There are six military branches: (a) Army, (b) Marine Corps, (c) Navy, (d) Air Force, (e) Coast Guard, and (f) Space Force. Each military branch is divided into enlisted personnel with the ranks of E-1 to E-9; warrant officers W1- to W-5 (unused in the Air Force and Space Force); and officers ranking from O-1 to O-10. The level of responsibility rises with each increase in rank (United States Department of Defense, n.d.).

According to the United States Bureau of Labor Statistics (2020), enlisted members make up 82% of the armed forces. Furthermore, enlisted members rank below all officers. There are three groups of enlisted personnel: (a) junior enlisted (pay grades E-1 to E4); (b) mid-level non-commissioned officers (pay grades E-5 to E-7), and (c) senior non-commissioned officers (pay grades E-8 to E-9). The job duties and level of responsibility increases significantly based on each pay grade. The Congressional Research Service (2020) reported that junior enlisted personnel are the largest enlisted group making up approximately 52% of the enlisted staff. These members typically serve in small units and are supervised by senior enlisted personnel. The mid-level non-commissioned officers make up approximately 44% of enlisted staff, and they typically lead the smaller units supervising the junior enlisted.

In this capacity, non-commissioned officers are considered technical experts in their military occupations, and they carry out the orders from their superior officers. Senior non-commissioned officers are the highest-ranking enlisted personnel, making up

4% of the enlisted workforce. In this capacity, senior non-commissioned officers are not only considered experts in their military occupation serving as advisors to commanders, but more importantly they aid as a conduit of support for the enlisted members (Congressional Research Service, 2020).

While 82% of military operations are carried out by enlisted personnel, 18% are officers—military leaders who manage operations and enlisted personnel (U.S. Bureau of Labor Statistics, 2020). There are four groups within the officer ranks: (a) warrant officers (pay grades W-1 to W-5), (b) junior-grade officers (pay grades O-1 to O-3), (c) midgrade officers (pay grades O-4 to O-6), and (d) general or flag officers (pay grades O-7 to O-10). According to the Congressional Research Service (2020), warrant officers performing highly technical and specialized work within their career field represent approximately 8% of officers. Junior-grade officers make up approximately 56% of the officer rank and typically lead units with several dozen to several hundred personnel. In 2020, midgrade officers made up 36% of the officer rank and led larger units ranging from several hundred to several thousand personnel. Lastly, general officers, the highest-ranking leaders in the military, make up under 0.4% of the officer ranks due to statutory limits on the number of officers that can serve in these grades. These officers lead units or organizations with several thousand to hundreds of thousands of personnel (Congressional Research Service, 2020).

Veteran Status, Rank, and Health-Related Quality of Life. Every year, more than 200,000 U.S. service members transition out of military service. During this transition period these veterans reacclimate to civilian life, relocating geographically,

seeking employment, pursuing education, and even obtaining health care (Vogt et al., 2020). This transition period can be a vulnerable time for veterans and has implications on their future HRQoL. Ahern et al. (2015) asserted that veterans from wars preceding the Afghanistan and Iraq war had complications transitioning to civilian life, and they faced increased risk of long-term problems. Likewise, veterans who served in the Afghanistan and Iraq wars have significant health problems, likely probable to create long-term effects on their HRQoL. Vogt et al. (2020) found that health concerns was the most prominent readjustment issue facing veterans, with many reporting chronic physical or mental health conditions.

Magerøy et al. (2007) asserted that there is a correlation between military rank and both physical and mental health; higher rank being associated with better overall HRQoL. Moreover, one's military rank is often associated with differences in environmental job exposures and may be associated with the incidence of job stress and psychological distress (Magerøy, 2007; Martins & Lopes, 2013). These findings illustrate that lower ranking personnel who carry out the military mission would typically have lower HRQoL due to the unique military exposures that they experienced while fulfilling their military-related job. Vogt et al. (2020) offered that "enlisted personnel were more likely to report sleep problems, anxiety, depression, and post-traumatic stress disorder" (p. 358) while contrarily, officers reported better health and well-being.

Geographic Location

Baltimore City was incorporated in 1796 as a municipality of Baltimore County in Maryland. The name originated from the Proprietary's Irish Barony, a historical

subdivision of a county. In 1851, Baltimore City separated from Baltimore County as its own governmental unit (Maryland Manual On-line, 2021a). According to the United States Census Bureau (n.d.), Baltimore City had 593,490 residents, with 28,002 reported as veterans. The highest racial/ethnic group within Baltimore City were Black/African Americans representing 62.4% of the population. The next highest racial/ethnic group were Whites, which represented approximately 30.5%. 53% were female, while 47% were male. 85.2% of residents were high school graduates with 31.9% having college degrees. 11.9% of residents had a disability, and 7.5% were without health insurance. Of all Baltimore City residents, 72.9% were 18 years of age or older (U.S. Census Bureau, n.d.).

The legal origin of Baltimore County, Maryland is unknown; however, it was in existence by January 12, 1659/1660, when a formal legal document was issued. The name originated from the Proprietary's Irish Barony, a historical subdivision of a county (Maryland Manual On-Line, 2021b). The U.S. Census Bureau (n.d.) reported Baltimore County had 827,370 residents, with 42,429 reported as veterans. The highest racial/ethnic group within Baltimore County was White representing 60.2% of the population. The next highest racial/ethnic group was Black/African American, which represent approximately 30.3%. 52.7% were female, while 47.3% were male. 91.5% of residents were high school graduates and 39.4% had college degrees. 7.7% of residents had a disability, and 6.2% were without health insurance. Of all Baltimore County residents, 72.5% were 18 years of age or older (U.S. Census Bureau, n.d.; Table 1).

Table 1

Baltimore City and Baltimore County, Maryland Demographics

	Baltimore City	Baltimore County
Total Residents	593,490	827,370
Race/Ethnicity		
Black or African American	62.4%	30.3%
White alone	30.5%	60.2%
American Indian/Alaska Native	0.3%	0.4%
Asian	2.6%	6.3%
Two or more Races	2.5%	2.6%
Hispanic or Latino	5.3%	5.8%
White not Hispanic or Latino	27.5%	55.8%
Veterans	28,002	42,429
Education		
High school graduate or higher	85.2%	91.5%
Bachelor's degree or higher	31.9%	39.4%
Health		
With a disability, under 65	11.9%	7.7%
Persons without health insurance under 65	7.5%	6.2%
Age and Sex		
Persons under 5	6.4%	5.9%
Persons under 18	20.7%	21.6%
Persons age 65 and over	13.6%	17.6%
Female persons	53%	52.7%
Male persons	47%	47.3%

Note. This table illustrates Census Data (July 1, 2019) for Baltimore City and Baltimore County, Maryland. Some of the estimates presented come from sample data, thus having sampling errors that may render some differences between geographies statistically vague.

Short Form-8 Survey Instrument

General health status and HRQoL measurements typically encompass physical, emotional, and social dimensions of health. Social scientists have consistently examined

the concept of quality of life compared to health researchers. In the social sciences, quality of life is considered through life satisfaction, morale, happiness, and anomie based on one's personal feelings (McDowell, 2006). Barile et al. (2013) declared quality of life to be the state of physical, mental, and social well-being, with HRQoL being measured by the traits of overall quality of life that have been indicated to affect physical and mental health. The SF-36 created by the RAND Corporation during the 1970's was designed to measure health status for use in population surveys and evaluative studies of health policy (McDowell, 2006). The SF-8 is derived from the SF-36; however, it is not a direct subset of the SF-36. The SF-8 is a brief, generic, versatile survey, which measures health status by using a single item question for all eight health domains (Quality Metric, 2011), while generating scores comparable to the eight scores created by the standard SF-36 (Lefante et al., 2005).

Lefante et al. (2005) confirmed that the SF-8 creates a health profile of eight distinct scores defining HRQoL. These scores are then summarized into PCS and MCS scores. In order to analyze these scores, the SF-8 survey first measures the following eight ordinal items: (a) *general health*, the overall rating of health; (b) *physical functioning,* the presence and extent of physical limitations; (c) *role physical*, limitations related to physical health issues; (d) *bodily pain,* severity of bodily pain experienced; (e) *vitality,* subjective well-being based on energy level; (f) *social functioning*, the impact of physical health and emotional problems related to social activities; (g) *mental health,* emotional problems such as anxiety, depression, or irritability; and (h) *emotional roles,*

role limitation related to personal or emotional problems on performing work or other activities (Lefante et al., 2005; Quality Metric, 2011).

Validity and Reliability of the Short-Form-8 Instrument

According to Quality Metric (2011) there are various studies demonstrating the validity and reliability of the SF-8 health domain scales and component summary measures. Specifically, construct validity is illustrated through factor analyses, tests of convergent and discriminant validity. For example, Turner-Bowker et al. (2003) evaluated convergent-discriminant validity by comparing the SF-8 and SF-36v2 in their study on the impact of migraine and other conditions. Turner-Bowker found high correlations in the diagonal of the matrix. Convergent correlations ranged from 0.67 to 0.84. Out of the eight scales, seven showed correlations above 0.70. The summary measures between the SF-8 and SF-36v2 were 0.87 (PCS) and 0.86 (MCS; p. 1007). Reliabilities for the 4-week recall form in relation to the 2000 normative data were found to be .88 for the PCS measure and .82 for the MCS measure, while alternate form reliabilities for the eight health domain scales ranged from .70, role emotional to .88, bodily pain in a large U.S. sample. Criterion validity is demonstrated in correlations with similar measures; and lastly content validity is maintained by the inclusion of content representative of the health domains commonly measured in broadly used health surveys (Quality Metric, 2011).

Summary and Conclusions

Veterans consistently report poorer physical and mental health when compared to their civilian counterparts, which is partly due to the nature of veterans' job exposures.

Although health is a significant domain of overall quality of life, jobs, housing, schools, and geographic location are also important. Health is foundational to every issue; social, environmental, and economic. These social determinants impact health and in essence have a profound effect on health equity. In addition, health policy has an impact on health and well-being.

Health policy can determine if, and when, an uninsured or underinsured person gets treatment, or more importantly lifesaving treatments when facing a serious medical ailment. However, non-health circumstances are rarely considered. Rudolph et al. (2013) asserted that "economic status, educational attainment, structural racism, and neighborhood characteristics are critical determinants of health and health inequities. Improvements in a community's economic, physical, social, and service environments can help ensure opportunities for health and support healthy behaviors" (p. 2). Therefore, this study explored the relationships between sociodemographic characteristics and HRQoL so that public policy initiatives such as HiAP can be incorporated into policy making for U.S. Veterans.

This chapter focused on pertinent research literature related to the HRQoL theoretical framework, previous studies related to HRQoL, and identified the gap in scholarly literature. Chapter 3 details the study's methodology describing the significance of the quantitative analysis method of linear regression.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to examine the relationship between sociodemographic characteristics and perceived HRQoL among veterans living in a metropolitan community in a Mid-Atlantic state. I obtained permission from Quality Metric to use the SF-8 survey (see Appendix A). I also included questions to examine the relationships between the study variables. I examined sociodemographic characteristics including race, gender, military service rank, and residential geographic location as predictor variables and their influence on a veteran's perception of their HRQoL as the outcome variable. By understanding relationships between sociodemographic characteristics, policy makers may be able to incorporate initiatives such as HiAP in future health policy initiatives related to veterans' health disparities.

In this chapter, I will summarize the study's methodology highlighting the research design, the study variables, the population and sampling methods, and participant recruitment and data collection methods. Additionally, I discuss the SF-8 survey instrument and its validity and reliability. I also describe the data analyses I performed using SPSS Version 27 software. Last, I address the ethical procedures I employed to ensure compliance with ethical research and scholarly standards.

Research Design and Rationale

Researchers use cross-sectional study designs for population-based surveys. Additonally, this study design is used to evaluate the prevalence of diseases in a community (Setia, 2016) and of health behaviors, health states, and health outcomes

(CDC, 2021). Therefore, to illustrate the relationship between veterans'

sociodemographic characteristics (race, military service rank, gender, and geographic

location) and HRQoL, I conducted a cross-sectional study featuring quantitative analysis,

specifically linear regression, to accomplish my research aim. This was an appropriate

design for my study based on the premise that in a cross-sectional study the researcher

measures the outcome and exposures in the study participants and possibly studies their

association (Setia, 2016). The study participants included veterans of the United States

Armed Forces, separated into descriptive categories by branch of service, age, race, and

geographic location.

Survey research is valuable in that it permits a variety of methods in the

recruitment of participants, data collection, and instrumentation (Ponto, 2015). In this

project, I used the SF-8 survey to collect self-reported HRQoL data from veterans who

resided in a metropolitan Mid-Atlantic state. I sought to generate knowledge to inform

future health policy related to veterans' health disparities. Participants completed an

eight-question Likert scale questionnaire, which met the criteria of brevity with a 1-to-2-

min administration time (see Roberts et al., 2008). This research design was chosen

because it best illustrates parsimony. Crosby et al. (2006) noted that "parsimony implies

that the need (that is, investigating the research question) is met by a tool (that is,

research design) that does the job well, without going beyond that which is necessary" (p.

9).

Methodology

Population

There is a distinct difference in the health care needs of military veterans when compared to the general U.S. population (Flynn et al., 2019). For example, many veterans have been exposed to various hazards to include burn pits, chemical agents, and improvised explosive devices that the general U.S. population does not typically encounter in everyday life (Krause-Parello & Morales, 2018). Because of this, the selected sample frame consisted of U.S. military veterans who resided in a metropolitan Mid-Atlantic state and self-identified as belonging to a veterans service organization located within the study's geographical boundaries. An estimated 362,000 veterans resided within the Mid-Atlantic state with approximately 28,000 residing within the state's largest metropolitan area, the study's geographical focus location (VA, n.d.).

Sampling and Sampling Procedures

The main purpose of sampling strategies in survey research is to achieve an adequate sample that represents the population of interest (Ponto, 2015). For this research, I used simple random sampling, wherein every case had an equal chance of being in the sample. I chose this sampling method because the use of a large random sample increases the probability that the responses are representative of the entire population being studied (Ponto, 2015) and it has the greatest freedom from bias due to the representativeness of the sample (Taherdoost, 2016). Regarding the specific procedures for how the sample was drawn, I randomly selected participants using the *by-the-lot* method. According to Johnson et al. (2008) the by-the-lot method involves putting

the names of all the participants in a hat and then randomly drawing names until the required sample size is reached.

The by-the-lot method of initial randomization for this study included separate draws for days of the week and the names of veterans service organizations in the Greater Baltimore area. This was a two-step process. First, I created individual slips of paper for each day from Monday through Saturday and placed them into a hat. I then drew three slips, without replacement, from the hat. Week 1 participant recruitment was those days as represented by the slips drawn. Next, I listed veterans service organizations within the Greater Baltimore area to which I had access through invitation or membership. After placing these names in the hat, I drew the first slip and assigned it to a selected weekday on the first slip from Step 1. The hat was agitated prior to each draw to ensure a mixing of the remaining elements to support an equal, random chance of being drawn (Johnson, 2008).

After I had selected a veterans service organization location using the by-the-lot method, and matched it with a day of the week, I collected data using two response options: (a) a paper survey option and (b) an online survey hosted by Momentum (formerly SurveyMonkey). Later in this chapter, I discuss the survey response options in greater detail. Once at the selected location, I set up a table with my survey and a poster that illustrated my study's purpose. I then approached participants, introduced myself, and explained my study and the participation benefits. Last, I invited any veteran at the venue to participate and avoided multiple survey responses from the same veteran by

asking them if they had participated in the survey in a different veteran venue or on a previous night in the present venue.

There were multiple methods for the participants to take the survey. I had printed surveys with a sharpened pencil for the participant to complete on the spot. Prior to leaving the venue, the participant returned the survey to me in a sealed envelope that I had provided. Additionally, I had an iPad with the SF-8 survey preloaded onto it; interested participants were able to use the iPad to complete and submit the survey on the spot. Last, for participants who preferred to complete the survey later, I had flyers with a link to the survey and a paper survey along with a pencil and return-addressed, stamped envelope to be sent via U.S. First Class mail. Participants reviewed the informed consent prior to taking the flyer with the survey link for completion later.

Power Analysis and Sample Size

Israel (1992) asserted there are several factors that dictate a study's sample size. Those factors include the study's purpose, population size, risk of selecting a bad sample, and the allowable sampling error. In addition to these factors, level of precision, level of confidence or risk, and degree of variability need to be specified. Using Cohen's (1992) methodology to derive sufficient sample sizes for multiple and multiple partial correlation analysis (multiple regression, multiple logistic regression), I calculated a sample size of at least 85 as necessary to meet an alpha of .05, effect size of $f^2 = .15$, and power of .80 with four IVs (k) in my statistical analysis. I conducted a second sample size determination using G*Power 3.1 (Faul et al., 2009) for linear regression, fixed model, R^2 deviation from 0. Using the same determinates provided by Cohen (1992), an output

parameter for the total sample size using four predictor variables was at least 85, thus

consistent with Cohen's method.

Procedures for Recruitment, Participation, and Data Collection

Crosby et al. (2006) proposed two key principles necessary for successful

recruitment in health promotion research: (a) developing strategies to promote high

participation and (b) implementing systematic recruiting efforts. The inclusion criteria for

this study specified that participants be veterans of the U.S. military who resided in the

Greater Baltimore area. To garner participants, I distributed a recruitment flyer to local

veterans service organizations. This recruitment strategy ensured that the study would be

conducted with current veterans who met the inclusion criteria. I also arranged for

electronic email recruitment invitations to be distributed on my behalf via local veterans

service organizations using their listserv email distribution lists (see Appendix C). As the

researcher, I was the sole person to work with the participants, and I managed their data

exclusively ensuring their confidentiality and securing the data. To collect data, I

administered a paper survey and an online survey hosted by Momentum (formerly

SurveyMonkey). Each participant completed an informed consent form prior to

completing the survey.

On behalf of the participants that completed the manual SF-8 method or the iPad,

they acknowledged the informed consent prior to answering the survey questions and

were offered a copy of the informed consent to retain for their files. Once the participant

completed the survey, they were thanked for their participation. There was no additional

follow-up with participants after the completion of the survey, further supporting

participant confidentially.

Instrumentation and Operationalization of Constructs

General health status measures, or measures of HRQoL, encompass the physical,

emotional, and social dimensions of health. The SF-8 was developed in 2001 by Quality

Metric as a brief, generic, multipurpose survey to measure health status from eight health

domains—(a) physical functioning, (b) role-physical, (c) bodily pain, (d) general health,

(e) vitality, (f) social functioning, (g) role-emotional, and (h) mental health scores—and

the component summary measures. There are two component summary measures: (a)

PCS and (b) MCS. The PCS measure contains the scores for all eight health domain

scales, which produces a single composite average score as an overall measure of

physical health. The MCS measure also produces one single composite average score

from the eight health domain scales to assess mental health (Quality Metric, 2011).

Although the SF-8 is available in three forms with varying recall periods, this

study used the 4-week recall, which asked the respondent to answer the questions as they

related to the way they felt or acted during the past 4 weeks. An additional benefit of the

SF-8 is its 1-to-2-min average time for completion (Optum, n.d.). A slight variation in the

original SF-8 instruction was applied. The Optum SF-8 instructs respondents to place a

mark [x] in the box next to their response. This was modified to remove the 'mark [x]'

with new instructions to *circle the word that best describes your answer*. Since this

research proposed to measure HRQoL in veterans, I found this survey was the best fit for

the target population. I received permission to use the SF-8 survey via user agreement

from Quality Metric (see Appendix A).

> According to Quality Metric (2011), there are numerous studies demonstrating the
> validity of the SF-8 health domain scales and component summary measures. For
> example: Evidence of construct validity is validated in findings from factor
> analyses, tests of convergent and discriminant validity, and known-groups
> comparisons; criterion validity, as revealed in correlations with other similar
> measures; and content validity, as supported by the inclusion of content
> representing the health domains most frequently measured in widely used health
> surveys and those domains believed to be most affected by disease and health
> conditions. (p. 2)

Furthermore, the component summary measures provide valid and reliable summaries of

both individual respondent and group-level physical and mental health status. For the 4-

week recall form, normative data were found to be $r = .88$ for the PCS measure and $r =$

.82 for the MCS measure. When analyzing the PCS and MCS scores, T-value of 45 ($\alpha =$

.05; 1.6794) or greater for individual respondents and T-value of 47 ($\alpha = .05$; 1.6779) or

greater for group-level data should be considered average or better (Quality Metric,

2011).

The Short-Form surveys were employed in several studies to measure HRQoL in

various populations. Kazis et al. (1998) used the SF-36 survey to conduct a cross-

sectional study of veterans in four Boston VA medical centers. Singh and Murdoch

(2007) expanded on Kazis et al. study with veterans in the Upper Midwest. Der-

Martirosian (2013) combined the SF-12 survey with data from the National Survey of Women Veterans to measure women veterans' health status. Diaz-Santana et al. (2017) used the SF-12 survey to examine deployed and non-deployed veterans mental and physical health. Each of these independent studies concluded that the SF instruments are valid and reliable tools across both analogous and diverse populations.

Turner-Bowker et al. (2003) conducted the first study using the SF-8 to evaluate its validity in migraineurs. Turner-Bowker et al.'s study documented the burden of migraine on HRQoL and compared the relative HRQoL burden of migraine and other chronic conditions. Tuner-Bowker et al. used a subset of data ($n = 465$) with participants who completed both the SF-8 and SF-36v2 to evaluate construct validity of the SF-8 in relation to the SF-36v2. To evaluate convergent-discriminant validity, bivariate correlations were conducted. Correlations were considered significant at $p < 0.05$, providing evidence for convergent validity (p. 1006). Convergent correlations for the SF-8 and SF-36v2 scales ranged from $r = 0.67$ to 0.84. Seven of the eight scales measuring the same concepts showed correlations above 0.70. Correlations between the summary measures for both the SF-8 and SF-36v2 were $r = 0.87$ (PCS) and $r = 0.86$ (MCS) (Turner-Bowker, 2003, p. 1007). Through this study, Turner-Bowker et al. confirmed that the SF-8 provides a practical and efficient alternative for HRQoL studies related to migraine and other chronic conditions.

Lefante et al. (2005) used the SF-8 to measure PCS and MCS among participants in the Central Louisiana Medication Access Program (CMAP) in which individuals are provided prescription medications for low-income individuals with chronic illnesses.

Using multiple linear regression with a data sample ($n = 1,687$), they found that the overall PCS-8 and MCS-8 CMAP scores were 10-12 points lower than the national averages (p. 668). Lefante et al. concluded the SF-8 to be a useful comparison tool when analyzing differences between a population with chronic illness and comparing it to a standard, and when looking for a shift in overall health due to an intervention. Lastly, Roberts et al. (2008) tested the validity and reliability of the SF-8 with a conflict-affected population in northern Uganda. Using a cross-sectional design with a data sample ($n = 82$), they conducted various statistical analyses (principal component analysis, Pearson Correlation Test, t-test, and intraclass correlation test (ICC)) and concluded the SF-8 could be used for population studies in conflict-affected areas.

The test-retest reliability of the ICC results, $r = 0.61$ (PCS) and $r = 0.68$ (MCS), showed good reliability for PCS; however, Roberts et al.recommend a shorter retest period for conflict-affected populations due to the volatile situations that occur in that population. The principal component analysis aligns with the developer's assessment of the SF-8 validity, and the item-summary score correlation coefficients revealed strong convergent and discriminant validity (Roberts et al., 2008, p. 8). Convergent validity results were $r = \geq 0.50$ of PCS-related items with the PCS summary score and MCS related items and MCS summary score. Although Roberts et al. noted several limitations, they cite the brevity of the SF-8, ease of use, and translation of the survey into Uganda's language as positive factors in determining the survey tool's utility in the Ugandan population. Overall, Robers et al. concluded the SF-8 could be used for population studies in conflict-affected areas. These studies significantly support both the validity and

reliability of the SF-8 to assess HRQoL across heterogenous populations. The study

variables, descriptions, and RQ references are provided in Table 2.

Table 2

Operationalization of Constructs

Descriptive	IV	DV	Test statistic
Age (ratio)	Race (nominal)	HRQoL Mean Scores (interval)	Linear Regression
Military Branch of Service (nominal)	Gender (nominal)		
	Military Service Rank (ordinal)		
	Residential Geographic Location (nominal)		

Table 2 summarizes the study variables, their associated data level descriptions,

and their use as predictors in the multiple linear regression analyses. Briefly, two

descriptive questions were asked of the participants. Age was defined as the participant's

self-reported age on their last birthday. Military branch of service was defined as (a) Air

Force, (b) Army, (c) Coast Guard, (d) Marine Corps, and (e) Navy. Due to Space Force's

recent establishment in 2019, and its mission to design, acquire, field test, operate, and

defend the critical space systems in the nation and the world (United States Space Force,

n.d.), it was not included in my research.

If the veteran served in more than one branch, the veteran was asked to select the

branch of their most recent period of service. Race and gender were self-reported

descriptive variables from the defined attribute list. Military service was grouped using

standardized enlisted and officer ranks as defined by the U.S. Department of Defense.

Residential geographic location offers two options: Baltimore City or Baltimore County. Lastly, HRQoL, the DV of interest, was measured using mean scores from the SF-8 survey instrument.

Data Analysis Plan

To analyze the study data, I used SPSS Version 27. Univariate and multivariate analyses was conducted utitilizing multiple linear regression as the primary test statistic. The purpose of these analyses was to determine the one-unit predictive change in the IVs, individually and collectively, and how those changes affect the DV when all other variables in the model have been held constant or controlled (Johnson, 2008).

Data cleaning is a vital activity when preparing data for analysis. For example, missing and erroneous data can pose significant problems to the validity and reliability of study results (Salkind, 2010). After uploading all response data into the SPSS data table, I ran frequency distributions on all responses, evaluating for out-of-range data indicating a mis-keyed data entry point and missing data through evaluation of those data outputs. I evaluated for erroneous data and data ranges that would illustrate values that were out of range for the response variable. Upon identification of any of these discrepancies they were addressed as follows. For missing data, I evaluated if it was a missing descriptive value. Missing descriptive data did not inviolate further data analyses. If missing data was illustrated in response to the IVs or DV, I further evaluated whether those data could remain for regression analyses or be removed from the regression computations.

The RQ probed the predictive relationship between veterans' sociodemographic characteristics and HRQoL in veterans living in a metropolitan community in a Mid-

Atlantic state. To examine this relationship the following RQ and testable hypotheses were assessed:

RQ1: Will race, gender, military service rank, and geographic residential location significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state?

$H_0 1$: Race, gender, military service rank, and geographic residential location will not significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

$H_1 1$: Race, gender, military service rank, and geographic residential location will significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

Assumptions

Regression analysis is a statistical procedure for studying the relationship between two or more quantitative variables. Regression techniques can be used to analyze a variety of variables to identify various relationships (Johnson et al., 2008). Linear regression is the statistical test that was applied in this research, in addition to a correlation coefficient matrix, and data was evaluated for the assumptions of linear regression prior to regression model generation. Using a clean and valid data set, I evaluated the following test assumptions prior to regression model generation. The

predictor variables must be continuous or categorical and the outcome variable must be a continuous and unbounded value. Additionally, the predictors must display some variation in value and there must be no perfect linear relationship between two or more of the predictors. Further, multicollinearity was assessed using a correlation coefficient matrix.

The correlation coefficient measures the strength and direction of the linear correlation between two quantitative variables (Johnson et al., 2008). Significant correlations required further evaluation as to their individual predictive effects in the regression models. Also, the outcome variable must be independent of the predictors, and the predictor variables should have homoscedasticity, the same variance as the residuals, with the residual terms being uncorrelated. Likewise, differences between the model and the observed data are most often 0, or very close, as it is rare to be over 0. Finally, values from the outcome variable must be independent, and both the outcome and predictor variables must have a linear relationship (Field, 2018).

<div align="center">**Threats to Validity**</div>

External Validity

The validity of a measurement is its ability to capture what it intends to measure. A valid measure provides a clear, unobstructed link between the variables tested. The essential feature of a valid measure is that it encompasses no systematic error or bias that pulls the measurement off the true value (Pollock, 2005). External validity refers to the ability to generalize study findings across populations that comprise similar characteristics (Crosby, 2006). Veterans are a unique population, and therefore it would

be difficult to generalize the study findings to a non-veteran group; however, the study

findings can be generalized to other veterans, specifically those who have similar

attributes to the veterans in this study. This external validity occurs through meeting

sufficient statistical sample size for regression analyses based on the selected alpha,

power, effect size and the number of predictive variables. Additionally, randomizing of

participant recruitment further supports external validity confidence.

Internal Validity

The study's internal validity is the aptitude in which the design tests the

hypothesis it was intended to test (Crosby, 2006). A threat to internal validity that I

accounted for was selection bias. This threat occurs when a difference exists between

participant groups. To guard against selection bias, I used a random selection method to

obtain study participants. Another method to guard against threats to internal validity was

to increase the sample size. It was imperative to address threats to internal validity prior

to conducting the study.

Construct Validity

Construct validity refers to the relationship a measure might have with other

theoretical concepts (Crosby, 2006). Westen and Rosenthal (2003) contended there are

two themes surrounding construct validity. Construct validity is an estimate of the extent

to which change in the instrument indicates change in the theory. Secondly, construct

validation is always supported by theory. Construct validity can be accomplished through

confirming the survey instrument is correlated to the concepts of the research theory.

Threats to construct validity occur when the researchers fail to use adequate definitions

and measures of variables (Creswell, 2009). Construct validity can be obtained by ensuring the instrument and theory are synchronized and by using adequate variable definitions and measures which have been tested using factor analyses to determine convergent and discriminant validity with known group comparisons (Quality Metric, 2011).

Ethical Protections

I followed the guiding principles for ethical research set forth by the National Institutes of Health. The social value for this research contributes to scientific understanding of health and the methodological approach supports research validity. Participants were recruited to meet the study goal and procedures were in place to minimize risk to participants. Prior to study commencement, the methodology and human subject protections underwent Walden University's Institutional Review Board (IRB) approval process to ensure that the study was ethically acceptable. Through the informed consent procedure, participants were notified of any risks, their rights, study benefits, and any dangers. Participants were required to provide informed consent by signing the paper document prior to completion of the survey. For participants who chose to complete the Momentum survey later, either by paper format or the supplied access link on the provided flyer, reviewed the informed consent process prior to being handed either option (paper survey or flyer with link). In addition, procedures were implemented to protect participants' confidentiality. Lastly, all potential and enrolled participants were treated with respect throughout their study involvement.

While there are various concerns when conducting survey research, the protection of participants privacy is of utmost concern (Eysenbach & Wyatt, 2002). The main function of participants in research is to serve as a data source. Researchers have a duty to "protect the life, health, dignity, integrity, right to self-determination, privacy and confidentiality of personal information of research subjects" (World Medical Association Declaration of Helsinki, 2013, p. 2191). Yip et al. (2016) suggested that researchers safeguard nonessential information that can identify participants by excluding that information during data collection and storage when possible. During this project the following procedures were implemented to ensure protection of the confidential data sources. Personal identifying information was deidentified and information was stored on a secure computer with password protection in which I solely have access. All data formats are retained securely for 5 years on a password protected flash drive, after which the flash drive will be encrypted and then content deleted. Momentive (on-line survey host) data was downloaded to a secure flash drive and the on-line survey instrument was deleted along with any associated data archive at the study's conclusion.

Summary

This study sought to examine the relationship between veterans' sociodemographic characteristics and their perceived HRQoL using a cross-sectional survey design. By employing multiple regression analysis, I was able to assess the predictive relationship between variables of race, gender, military service rank, and residential location to the outcome variable, HRQoL through variance change produced

by statistical analyses. Chapter 4 will describe data collection procedures and descriptive

statistical results.

Chapter 4: Results

Introduction

The purpose of this quantitative, cross-sectional study was to examine the

relationship between sociodemographic characteristics and perceived HRQoL among

veterans living in a metropolitan community in a Mid-Atlantic state. I examined

relationships of sociodemographic characteristics including race, gender, military service

rank, and residential geographic location. I assessed the impacts of these predictor

variables on HRQoL, measured using the SF-8, as the outcome variable. I structured the

RQ to investigate the presence of any predictive relationships between the IVs and the

DV.The RQ and corresponding hypotheses were as follows:

RQ1: Will race, gender, military service rank, and geographic residential location

significantly contribute to the percent change of R^2 variance accounted for in the

predictive effect of self-reported health in the past 4 weeks among veterans living in a

metropolitan community in a Mid-Atlantic state?

$H_0 1$: Race, gender, military service rank, and geographic residential location will

not significantly contribute to the percent change of R^2 variance accounted for in

the predictive effect of self-reported health in the past 4 weeks among veterans

living in a metropolitan community in a Mid-Atlantic state.

$H_1 1$: Race, gender, military service rank, and geographic residential location will

significantly contribute to the percent change of R^2 variance accounted for in the

predictive effect of self-reported health in the past 4 weeks among veterans living

in a metropolitan community in a Mid-Atlantic state.

I begin this chapter by providing information on procedural modifications that I made due to challenges in recruiting participants. I also describe the data collection process and provide descriptive statistics for the sample. Then, I present results from the multiple linear regression analysis I conducted to examine the influence of a veteran's self-reported gender, military service rank and geographic location (IVs) on the grand mean of the SF-8 survey responses (DV). The statistical assumptions undergirding the regression analysis are also discussed.

Data Collection

I obtained preliminary IRB approval (no. 07-01-22-0524385) to conduct research on July 1, 2022. The approval required the obtainment of one or more partnership agreements with any veterans service organization where recruitment was to take place. On July 6, 2022, I sent requests to several organizations with follow-up emails sent on July 16, 2022. I sent follow-up emails to five local veterans service organizations with a final follow-up email on August 1, 2022. On August 10, 2022, I received a response from a local veterans service organization inviting me to attend a member meeting in September. During my initial visit, I was provided a forum to introduce myself, explain my study, and describe participation benefits. I remained in the lobby after the meeting to answer any follow-up questions.

Due to the lack of responses, on September 11, 2022, I also submitted an IRB change of methodology request that expanded my recruitment to include an ad placed in a local community paper. For both recruitment methods, I requested to add a $5 donation per completed survey to a local nonprofit that supports veterans as a recruitment

incentive. On September 14, 2022, I received a signed partnership agreement from the local veteran service organization and on September 16, 2022, I obtained approval from the IRB for the change of procedures along with my partnership agreement. The IRB converted my preliminary approval to full approval to conduct research. Upon reaching the participant sample needed, I tallied the number of participants to compute the pledged donation amount. In January 2023, I donated $430 ($n$ = 86 x $5.00 = $430.00) to a Baltimore City nonprofit that offers services to veterans who experience mental health, addiction, and homeless issues.

Methodological Changes

I made modifications to the methods described in Chapter 3 involving one IV and the sampling procedures. My initial RQ included the IV of race in addition to gender, military service rank, and geographic location. However, when loading the preliminary data into SPSS I discovered that race was inadvertently excluded from the response questions. Given the data collection momentum underway and bearing in mind the recruitment challenges encountered to date, I made the methodological decision to continue data collection without race as an IV. Regarding my initial sampling procedure, it was unnecessary to use the by-the-lot method because I obtained only one partnership agreement, which meant that there was one recruitment setting. Finally, military service rank was amended to military pay grade to more accurately reflect the IV descriptor. Military service ranks vary across the military branches. For example, an E1 in the Air Force is an airman basic, whereas an E1 in the Army is a private (U.S. Department of

Defense, n.d.).. The EI pay grade provides a uniform compensation system across the branches The RQ and testable hypotheses were amended accordingly, as follows:

RQ: Will gender, military pay grade, and geographic residential location significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state?

$H_0 1$: Gender, military pay grade, and geographic residential location will not significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

$H_1 1$: Gender, military pay grade, and geographic residential location will significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

Descriptive Statistics

I collected data between September 17, 2022, and December 9, 2022. During this time frame, I approached participants at the local veteran service organization and received completed surveys through SurveyMonkey from my ad solicitation in the local community paper. G*Power was used to compute my required sample size as at least 85. With the exclusion of race as an IV, the amended minimal sample size lowered slightly to 77. The total usable participant sample obtained was 90, a value sufficiently meeting the minimum sample size requirements for linear regression. In post hoc analysis using

G*Power, the achieved power for a sample size of 90 was 0.87. Two surveys had incomplete responses related to military branch, three surveys had incomplete responses related to pay grade, and one survey had an incomplete response related to SF-8 (Question 4). They were retained in the study data for analyses.

When examining descriptive responses, most participants lived in Baltimore County (71.1%) and were male. Data from the 2020 U.S. census reported Baltimore City's population as 47% male and 53% female and Baltimore County's population as 47.3% male and 52.7% female (U.S. Census Bureau, n.d.; see Table 1). The percentage of male and female participants in this study was 65.6% and 25.6%, respectively, which demonstrates a gender ratio divergence from that of the study city's population. One potential reason for the lower percentage of female participants is that fewer women typically serve in the military; therefore, few women attending a veterans service organization would be a plausible explanation for a disproportionate response rate. Moreover, the U.S. Department of Defense's (2022) annual demographics report identified that in 2021 women made up 17.3% of its active-duty force, totaling 231,741 members. The study's female veteran participants exceeded this active-duty ratio by a modest factor. In a report to the U.S. Congress, the United States Government Accountability Office (2020) noted that nominal gender diversity exists in the military particularly in the highest echelons of departmental leadership.

Participants served in four of the U.S. military's five branches, with the Army having the highest representation (36.7%). The following ranks (pay grades) were recoded into the following groupings: (a) enlisted personnel E1–E4 (16.6%), (b) E5–E7

(38.9%), (c) E8–E9 (22.2%), (d) warrant officersW1–W4 (7.7%), (e) officers O1–O3

(8.8%), and (f) O4–O5 (2.2%). Enlisted members (E1–E9) made up 82% of the armed

forces, while officers made up 18% (United States Bureau of Labor Statistics, 2020). In

my study, the enlisted population was at 77.7% with officer participants at 18.7%. For

regression purposes, I treated the recoded IV of military rank (pay grades) as scale-level

data. Pasta (2009) asserted that it is nearly always worthwhile to examine the linear

component associated with any ordinal variable by treating it as continuous variable, as it

lends the opportunity to evaluate the extent to which the relationship is linear. Without

doing so, one may be overlooking many useful relationships. Table 3 provides a detailed

illustration of descriptive variables in terms of frequency and percentage.

The SF-8 measured the participant's HRQoL based on their perceived health. Of

the 90 participants, 36 (40%) rated their health as good (SF8-1); 33 (36.7%) reported no

physical health problems limited physical activities (SF8-2); 32 (35.6%) reported their

health has no effect on conducting daily activities (SF8-3); 27 (30%) reported moderate

bodily pain (SF8-4); 32 (35.6%) reported having quite a lot of energy (SF8-5); 37

(41.1%) reported physical health nor emotional problems limited their usual social

activities (SF8-6); 40 (44.4%) reported not being bothered by emotional problems (SF8-

7); and 42 (46.7%) reported not having personal or emotional problems keeping them

from doing their usual work, school, or daily activities (SF8-8).

Table 3

Descriptive Frequencies for Participants

Descriptive variable	*f*	%
Location		
Baltimore City	26	28.9
Baltimore County	64	71.1
Total	90	100
Gender		
Male	59	65.5
Female	23	25.6
Prefer not to say	8	8.9
Total	90	100
Military branch		
Air Force	13	14.4
Army	33	36.7
Coast Guard	0	0
Marine Corps	18	20.0
Navy	24	26.7
Missing	2	2.2
Total	90	100
Military pay grade		
E1-E4	15	16.6
E5-E7	35	38.9
E8-E9	20	22.5
W1-W4	7	7.7
O1-O3	8	8.8
O4-O5	2	2.2
Missing	3	3.3
Total	90	100

Table 4 illustrates participant SF-8 response distribution and the computed SF-8 grand mean value serving as the regression model DV.

Table 4

Descriptive Statistics for SF-8 Health Survey

Item responses	Frequency	Percentage
SF8-1		
Excellent	9	10.0%
Very Good	24	26.7%
Good	36	40.0%
Fair	20	22.2%
Very Poor	1	1.1%

Total	90	100%
SF8-2		
Not at all	33	36.7%
Very little	22	24.4%
Somewhat	26	28.9%
Quite a lot	8	8.9%
Could not do physical activities	1	1.1%
Total	90	100%
SF8-3		
Not at all	32	35.6%
Very little	28	31.1%
Somewhat	24	26.6%
Quite a lot	5	5.6%
Could not do daily work	1	1.1%
Total	90	100%
SF8-4		
None	12	13.3%
Very mild	17	18.9%
Mild	20	22.2%
Moderate	27	30.0%
Severe	11	12.2%
Very Severe	2	2.3%
Missing	1	1.1%
Total	90	100%
SF8-5		
Very much	19	21.1%
Quite a lot	32	35.6%
Some	30	33.3%
A little	8	8.9%
None	1	1.1%
Total	90	100%
SF8-6		
Not at all	37	41.1%
Very little	18	20.0%
Somewhat	26	28.9%
Quite a lot	8	8.9%
Could not do social activities	1	1.1%
Total	90	100%
SF8-7		
Not at all	40	44.4%
Slightly	17	18.9%
Moderately	21	23.3%
Quite a lot	11	12.3%
Extremely	1	1.1%
Total	90	100%
SF8-8		
Not at all	42	46.7%
Very little	14	15.6%
Somewhat	22	24.4%
Quite a lot	11	12.2%
Could not do daily activities	1	1.1%
Total	90	100%

SF-8 Grand Mean			2.32	

Table 5 illustrates the study variables demonstrated normality with skewness and kurtosis values within +/-2.0, which meets normal data distribution.

Table 5

Descriptive Statistics for Regression Variables

	IV				DV
	Location	Gender	Military branch	Military pay grade	SF-8 grand mean
N	90	90	88	87	89
Missing			2	3	1
Mean				2.63	2.32
Mode	2.00	1.00	3.00		
Std. Deviation				1.37	.94
Skewness				1.1	.52
Kurtosis				.76	-.43

Results

Assumptions Testing

Prior to analyzing data with linear or multiple regression as a test statistic, seven data assumptions must be evaluated and met, or data transformations are required before running data and interpretation. Assumption 1 requires a DV that is measured at a continuous data level. This assumption was met as the SF-8 grand mean is continuous level data. Assumption 2 requires that one IV is measured at the continuous level for simple linear regression and at least one IV is at the continuous level for multiple

regression. Military pay grade, had a response option at the ordinal level, but was treated as a continuous level data since there are distinct and measurable distances between the pay grades; therefore, this assumption was met. Assumption 3 requires there to be a linear relationship between at least one IV and the DV. An output scatterplot visualization illustrated a linear relationship with datapoints closely fitted to the regression line. Assumption 4 requires there should be independence of observations, which can be evaluated using the Durbin-Watson statistic. The Durbin-Watson output value was 2.34, which falls within the parameters of no evidence of autocorrelation; therefore, independence of observations can be accepted.

Assumption 5 requires that there should be no significant outliers within the IV or DV data sets. A descriptive evaluation of all variables found each within the accepted data limits and a visualization of the regression output scatterplot did not display outliers of significance. Therefore, this assumption was met. Assumption 6 requires that data outputs demonstrate a homoscedastic plot pattern. A residual scatterplot was evaluated, and data were observed to evenly distribute across the standardized predicted values and displayed no heteroscedastic "fan" display. Finally, assumption 7 requires that a regression line can be generated, and output data points are normally distributed along the regression line. Visual inspection of the residuals confirmed this output distribution pattern. Based on the evaluation of these seven regression assumptions being compliant, I proceeded with the proposed multiple linear regression modeling.

Hypothesis Testing – RQ 1

A multiple linear regression analysis was performed to examine the influence of a

veteran's self-reported gender, pay grade, and geographic location (IVs) on the grand

mean of the SF-8 survey responses (DV). There was no indication in the reviewed

literature, nor a research plan to evaluate a hierarchical modeling structure of the IVs;

therefore, all IVs were simultaneously placed in Model 1. The regression model output

(Table 6) showed that the IVs explained 6.12% of the variance from the DV.

Table 6

Multiple Linear Regression Output – Model 1

					Model Summary[b]					
				Std. Error		Change Statistics				
		R	Adjusted	of the	R Square	F			Sig. F	Durbin-
Model	R	Square	R Square	Estimate	Change	Change	df1	df2	Change	Watson
1	.247[a]	.061	.015	.941	.061	1.318	4	81	.270	2.345

a. Predictors: (Constant), gender=female, Recode Pay grade, location=Baltimore County, gender=male
b. Dependent Variable: SF-8 Grand Mean

I performed an analysis of variance (ANOVA; see Tables 7 and 8) to test whether

this value was significantly different from 0 and found that the effect

was not significantly different, $R^2 = .061$, $F(4, 81) = 1.32$, $p = .270$, 95% CI [-.263, .038].

Therefore, it can be assumed that the unstandardized population coefficients are not

different from 0; null hypothesis retained.

Table 7

ANOVA Output

	ANOVA[a]				
	Sum of		Mean		
Model	Squares	Df	Square	*F*	Sig.
1 Regression	4.671	4	1.168	1.318	.270[b]
Residual	71.750	81	.886		
Total	76.421	85			

a. Dependent Variable: SF-8 Grand Mean

b. Predictors: (Constant), gender=female, Recode Pay grade, location=Baltimore County, gender=male

Table 8

ANOVA Coefficients

	Coefficients[a]							
	Unstandardized Coefficients		Standardized Coefficients				95% Confidence Interval	
							Lower	Upper
Model	B	Std. Error	Beta	*T*	Sig.		Bound	Bound
1 (Constant)	3.209	.420		7.645	<.001		2.374	4.044
Recode Pay grade	-.113	.076	-.163	-1.491	.140		-.263	.038
location=Baltimore County	-.185	.234	-.087	-.790	.432		-.650	.281
gender=male	-.501	.357	-.251	-1.402	.165		-1.212	.210
gender=female	-.493	.394	-.224	-1.249	.215		-1.277	.292

a. Dependent Variable: SF-8 Grand Mean

Gender, military pay grade, and geographic residential location do not significantly contribute to the percent change of R^2 variance accounted for in the predictive effect of self-reported health in the past 4 weeks among veterans living in a metropolitan community in a Mid-Atlantic state.

Post Hoc Analyses

Initially, I performed a multiple linear regression analysis to examine the

influence of the IVs on the grand mean of the SF-8 survey responses (DV) with all IVs

simultaneously placed in the model. To further investigate the individual predictability of

each IV alone, I performed additional linear regression analyses starting with veterans'

pay grade (IV) regressed on the SF-8 grand mean score (DV). While not significant in the

model, there was a noted trend toward significance (Table 9; p = .094) that warrants

future investigation using a more distributed participant pool and by increasing the

sample size to more thoroughly examine this variable's relationship with HRQoL.

Table 9

Post hoc Analysis - Model 1 Recoded Pay grade

				Std. Error		Change Statistics					
		R	Adjusted	of the	R Square	F				Sig. F	Durbin-
Model	R	Square	R Square	Estimate	Change	Change	df1	df2	Change	Watson
1	.182[a]	.033	.022	.937	.033	2.870	1	84	.094	2.302

a. Predictors: Recode Pay grade b. Dependent Variable: SF-8 Grand Mean

An ANOVA (Tables 10 & 11) was used to interpret whether this value was significantly different from 0 or not and it was found that the effect was not significantly different, but trended toward significance, $R^2 = .033$, $F(1, 84) = 2.87$, $p = .094$, 95% CI [-.273, .022].

Each of the other IVs were not significant using individual regression modeling.

Table 10

Post hoc Analysis - ANOVA Output Model 1 Recoded Pay grade

ANOVAa						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.525	1	2.525	2.870	.094
	Residual	73.896	84	.880		
	Total	76.421	85			

a. Dependent Variable: SF-8 Grand Mean b. Predictors: Recode Pay grade

Table 11

Post hoc Analysis - ANOVA Coefficients Model 1 Recoded Pay grade

		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval	
							Lower	Upper
Model		B	Std. Error	Beta	t	Sig.	Bound	Bound
1	(Constant)	2.656	.221		12.001	.000	2.216	3.096
	Recode Pay grade	-.126	.074	-.182	-1.694	.094	-.273	.022

a. Dependent Variable: SF-8 Grand Mean

Although military branch of service was considered a descriptive variable, curiousity guided me to conduct a second post hoc analysis to investigate whether a predictive relationship exists between military branch (IV) and the SF-8 grand mean

score (DV). The regression model output resulted in a significant finding for the Air Force (Table 12; $p = .020$). Given this output, additional research is warranted using a more distributed participant pool and by increasing the sample size to more thoroughly examine this variable's relationship with HRQoL.

Table 12

Post hoc Analysis - Model 1 Military Branch

					Model Summary[b]					
				Std. Error		Change Statistics				
		R	Adjusted	of the	R Square	F			Sig. F	Durbin-
Model	R	Square	R Square	Estimate	Change	Change	df1	df2	Change	Watson
1	.249[a]	.062	.051	.923	.062	5.623	1	85	.020	2.164

a. Predictors: military branch (Air Force) b. Dependent Variable: SF-8 Grand Mean

An ANOVA (Tables 13 & 14) was used to interpret whether this value was significantly different from 0 and it was found that the effect was significantly different, $R^2 = .062$, $F(1, 85) = 5.62$, $p = .020$, 95% CI [-1.21, -.106].

Table 13

Post hoc Analysis - ANOVA Output Model 1 Military Branch

	ANOVA[a]				
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.789	1	4.789	5.563	.020
	Residual	72.402	85	.852		
	Total	77.191	86			

a. Dependent Variable: SF-8 Grand Mean b. Predictors: military branch (Air Force)

Table 14

Post hoc Analysis - ANOVA Coefficients Model 1 Military Branch

		Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval	
							Lower	Upper
Model		B	Std. Error	Beta	t	Sig.	Bound	Bound
1	(Constant)	2.427	.107		22,625	.000	2.214	2.641
	Military Branch	-.658	.278	-.249	-2.371	.020	-1.210	-.106

a. Dependent Variable: SF-8 Grand Mean

Summary

In this study, I examined relationships between sociodemographic characteristics of gender, military pay grade, geographic location, and military branch of service and their effect on HRQoL in veterans living in a metropolitan community within a Mid-Atlantic state. Output evaluation of the multiple regression modeling did not find significance in sociodemographic IVs predicting the grand mean scores (DV) assessing HRQoL using the SF-8 survey instrument. Post hoc analyses found a trend toward significance for military pay grade and a significant predictive relationship for the Air Force military branch and HRQoL. In Chapter 5, I will interpret the findings in relation to the reviewed literature, discuss the study limitations, offer recommendations for future research, and consider the study's implications for positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative, cross-sectional study was to examine the

relationship between sociodemographic characteristics and perceived HRQoL among

veterans living in a metropolitan community in a Mid-Atlantic state. I examined

relationships of sociodemographic characteristics including race, gender, military pay

grade, and residential geographic location. I assessed the impacts of these predictor

variables on HRQoL, measured using the SF-8, as the outcome variable. I structured the

RQ to investigate the presence of any predictive relationships between the IVs and the

DV. I collected data over a 3-month period from 90 veterans who resided in a

metropolitan community in a Mid-Atlantic state. A multiple linear regression analysis

was performed, and the regression model showed that the IVs explained 6.12% of the

variance from the DV. Output evaluation of the multiple regression modeling did not

show statistical significance in the percentage change of R^2 variance using the

sociodemographic IVs regressed on the SF-8 grand mean scores (DV). In this chapter, I

will interpret the findings in relation to the reviewed literature, discuss the study's

limitations, offer recommendations for future research, and consider the study's

implications for positive social change. I also provide a conclusion to the study.

Interpretation of the Findings

Several researchers have examined veterans' HRQoL; however, few of those

studies focused on understanding the correlations and predictive relationships between

sociodemographic factors and veterans HRQoL. I examined self-reported HRQoL among

a representative sample of veterans living in a metropolitan community in a Mid-Atlantic state. The regression modeling did identify a small relationship between gender, military pay grade, and residential location and veterans' HRQoL with 6.12% of variance explained; however, these IVs were not significantly predictive in the full regression model. With the exceedingly small variance explained (6.12%); therefore, there is a 93% chance that some other variable attribute to]the veteran's HRQoL. In the absence of significant findings, the study results remain meaningful as they offer new insight regarding the scant interplay between the IVs and the participating veterans' self-evaluation of their HRQoL. Visentin et al. (2020, p. 917) contended that it is important to report significant and nonsignificant findings in well-designed studies, as underreporting of negative results indicates bias of meta-analyses and wastes resources when other researchers replicate those studies.

Previous Health-Related Quality of Life Studies for Comparative Analysis

Barrett et al. (2003) found that military reserves reported better HRQoL than their active-duty counterparts; veterans had little or no difference, and active duty had the highest level of poor HRQoL with more limitations related to activity, pain, and sleep days. I did not compare veterans' HRQoL to other servicemember groups. The lack of support for the alternative hypotheses might be an indication that other factors warrant investigation; gender, military pay grade, and where participants lived did not significantly influence their health quality perceptions.

Zimmerman et al. (2017) found that health conditions such as depression, diabetes, and hypertension were associated with worse HRQoL. Sociodemographic

factors such as residential geographic location, economic status, and unemployment were also associated with lower HRQoL. Unlike Zimmerman et al., I found that geographic location had a positive, moderate correlation with HRQoL scores ($r = .432$; $p = .05$; see Table 8) illustrating that the participants' residential location had some correlative effect on their HRQoL, but that effect was found to not be a significant predictor in the regression model. Assessing veterans who live in diverse geographic locations would be an important extension of my research to further determine if there is a residential location that is more influential over others.

Kazis et al. (1998) found that veterans receiving care at the Boston VA had poorer health, higher incidence of multiple chronic health conditions, and lower HRQoL than their civilian counterparts. Singh and Murdoch (2007) expanded on Kazis et al. by conducting a cohort study of veterans who received medical care from VA hospitals in the Upper Midwest; they found that women veterans were younger, better educated, more consistently employed, and more often single than their male counterparts. Women also appeared healthier and reported better HRQoL. When comparing my study to Kazis et al. ($N = 5,667$ surveyed; $n = 1,667$ completed baseline assessments) and Singh and Murdoch ($n = 1,500$ women; $n = 35,000$ men) the difference in enrolled participants is an area of focus for future research. I did not reject the null hypothesis, even with a sufficient sample size. Increasing the sample size to be more representative may be a better comparative benchmark.

Table 15 illustrates the response rates for SF-8 Question 1, "How would you rate your overall health in the past 4 weeks?," by location and gender. Although most

participants reported their HRQoL as excellent, very good, and good (76.7%), 21

reported their HRQoL as fair and very poor (23.3%). Of those 21, 12 were male, five

were female, and four did not disclose their gender. These observations provide insight

into areas that future researchers can investigate to determine preventive measures that

can increase veterans HRQoL in this mid-Atlantic state.

Table 15

Veterans' responses to SF8-1 responses (How would you rate your overall health in the

past 4 weeks) by location and gender

SF8-1	Excellent	Very good	Good	Fair	Very Poor	Total
Baltimore City	1	8	10	7	0	26
Baltimore County	8	16	26	13	1	64
Location						90
Male	6	16	25	11	1	59
Female	3	8	7	5	0	23
Prefer not to say	0	0	4	4	0	8
Gender						90

Application of the Health-Related Quality of Life Model to Practice

Using the Ferrans et al. (2005) conceptualization of Wilson and Cleary's model of

HRQoL, I examined the demographic, psychological, biological, and environmental

characteristics of veterans using the SF-8 instrument, a valid and reliable instrument

designed to measure an individual's self-perceptions and subjective appraisal of their

health care quality at a given time frame. In addition, a prominent reason I selected the

Ferrans et al. model was that it is applicable to any health discipline. While

characteristics of the individual are of utmost importance, Ferrans et al. argued that

environmental factors are equally important and both characteristics of the individual and

the environment effect one's quality of life. The regression model illustrated that 6.12% of the variances were attributed to gender, military pay grade, and residential location, but the remaining 93.9% infers that additional variables, which may include demographic, psychological, biological, environmental, or other characteristics, could influence HRQoL; thus beneficial for future research. After implementing the theoretical framework application to practice, I have gained additional knowledge to facilitate my discussion for recommendations to formulate policy initiatives to increase veterans HRQoL, which is presented in the recommendations and implications for social change sections.

Limitations of the Study

This study has several limitations. Riecke et al. (2019) asserted that "estimating correlations among demographic parameters is critical to understanding population dynamics" (p. 13521). As such, a major limitation of this study was failing to capture demographic information pertaining to the participating veterans' race and age. The American Medical Association contended there are a myriad of reasons that capturing race and ethnic data can improve quality of care for all patients because it identifies discrepancies in care for certain populations and identifies the populations that do not achieve optimal interventions (Berg, 2018). It is possible that the demographic characteristics of the veteran that I did not capture may have positively influenced their HRQoL.

Data collection methods were identified early as a possible limitation and consequently confirmed. Veterans are a vulnerable population since they are at higher

risk of developing health problems due to military-related exposure. As such, when seeking veterans as study participants, it is important to employ measures to safeguard their privacy, emotional, and physical health. Given this fact, I initially planned to obtain study participants from local veteran social clubs and veteran student organizations; however, it proved difficult to obtain partnership agreements. One veteran organization initially agreed to share my study and survey information on their social media platforms, but when the time came to enter a partnership agreement, the organization did not respond to my inquiries. This delay in the rate of recruitment extended the data collection procedures.

An additional limitation associated with seeking participants at social clubs is that not all veterans are members or associate with social clubs, and some veterans may avoid these clubs because of the social aspect (i.e., alcohol consumption). Additionally, some veterans may only attend events during holidays such as Memorial and Veterans Day. Each of these identified limitations present opportunities for future research by including expanded venues for participant recruitment.

Recommendations

This cross-sectional study was influenced by the VHA Health Equity Action Plan. The VA strategic guide for health equity is organized around five aims (awareness; leadership; healthy system and life experience; cultural competency and diversity; data, research, and evaluation) to align with the National Partnership for Action (Office of Health Equity, 2019). It was important to gain an understanding of veterans' HRQoL and its association with health equity. For example, there are certain medical conditions that

disproportionately affect minority and older veterans and therefore negatively affect their health outcomes and perceptions of their HRQoL leading to health equity issues. This topic is of great importance because veterans are a unique population of men and women who put service before self to protect the nation. Thus, the following recommendations are formulated to enhance knowledge related to veterans HRQoL and health equity.

Andrade (2020) asserted that a sample larger than required will be a better representation of the population being studied and will consequently provide more accurate results. Although the participant size was sufficient to meet the inferential statistical parameters, generalizability to a larger population was limited; therefore, I recommend increasing the participant pool by increasing the sample size and matching the participant by branch of service (86 Air Force, 86 Army, 86 Coast Guard, 86 Marine Corps, 86 Navy). Additionally, I recommend actively seeking Coast Guard veterans from alternative settings as they lacked representation in my participant group. Lastly, I recommend adding Space Force veterans to future studies. Space Force was not initially included at the study's inception due to its recent establishment as a U.S. military branch (December 20, 2019). Seeking veterans from all military branches and by comparing those results will provide a more holistic view of perceived HRQoL and may yield different results.

To increase this research value to the veterans integrated service networks (VISNs), VA hospital administrators, and local and state public practitioners, a longitudinal study should be continued throughout the state of Maryland and expanded throughout VISNs nationwide. To capture veterans' HRQoL, VISNs could require a self-

administered HRQoL assessment upon initial health-related program intake assessment evaluations at first point of contact and then including the HRQoL assessment into yearly health clinic visits during follow-up clinical encounters. Capturing these assessment trigger points could be programed into the integrated veteran's health records and individual and aggregate data could be obtained for longitudinal analyses. Based on the results of these expanded data, additional studies that examine veterans' HRQoL could provide valuable longitudinal information about their HRQoL. These data could then be linked to HRQoL program and policy development specific to sociodemographic variables that positively and negatively impact HRQoL.

Lastly, the regression model illustrated that 6.12% of the variances were attributed to gender, military pay grade, and residential location and veterans' HRQoL but the remaining 93.9% infers that additional variables could influence HRQoL and were not measured. Post hoc analyses also identified a trend toward significance for military pay grade and a significant predictive relationship for the Air Force military branch and HRQoL. Smith (2022) declared that "negative social determinants of health can adversely impact a person's quality of life, work productivity, cardiovascular health, immune system, pain experience, and a multitude of other conditions" (p. 252). Given these results, it is imperative to research additional sociodemographic variables of age, race, employment status, and marital status. Additional variables specific to military service that would provide greater insights include military occupation specialty, period of service (4 years, 6 years, and so on), and whether the veteran served during wartime or

in other declared conflict zones as direct military personnel or support in joint military activities.

Additional insight into the concept of HRQoL for veterans requires additional research. Although this study identified some relationship between the variables studied, there is much more to learn about how military service affects veterans HRQoL to propose sound program initiatives and policy interventions. While limited in private and state-operated healthcare organizations, the VHA has the unique opportunity through their policies and practices to deeply influence HRQoL for all veterans in their care. To manifest and meet the Healthy People 2030 goals of eliminating health disparities, achieving health equity, and attaining health literacy to improve the health and well-being of all (Office of Disease Prevention and Health Promotion, 2020b), it is of paramount importance to identify SDOHs affecting veterans. Employing additional research to increase this information demonstrates a commitment to improve population health and create social change by providing actionable information for veteran policy developers, legislators, and constituents.

Implications

The U.S. veteran population was 19,541,951 (National Center for Veterans Analysis and Statistics, 2020b), which means that a vast majority of people in the United States encounter a veteran daily. Putting this into context, a veteran may be your parent, sibling, extended family member, neighbor, or coworker. When a person raises their right hand and takes the oath of enlistment, they are making a commitment to their country. They are also agreeing to abide by military policies and practices, which can profoundly

affect their lives both while they serve and after they separate from service. Servicemembers in uniform pledge to defend the Constitution and can expect to be placed in dangerous situations that can threaten their livelihood and bear serious consequences for their long-term health and well-being (Smith, 2022). Therefore, it is crucial to bridge this gap in understanding how SDOH affect veterans HRQoL and constructing interventions to enable veterans to attain the highest level of health and well-being, which may improve not only their lives, but the lives of the people around them.

Recommendations for Policy Making

The Healthy People goal of guiding national health promotion and disease prevention efforts to improve the health of the nation is a significant undertaking and requires a commitment and various resources across a diverse group of stakeholders, including the public. The VA not only has the obligation to treat the whole veteran but can design interventions for the veterans that utilize their services. One such intervention implemented by VA to achieve health equity is by placing unhoused veterans into stable housing (VHA Health Equity Action Plan, 2019). This is one example of how a non-health practice has promoted health and health equity. These practices also demonstrate VA's keen ability to accomplish challenging policy initiatives.

The veterans who participated in this study stated that they were delighted to contribute to research that could create social change, especially for future generations. As I disseminate the study's information, I hope to bring additional awareness for the need to capture data related to veterans HRQoL to improve health and increase health equity. Attention should be placed on increasing programs to engage veterans to optimize

their whole health, identifying and addressing environmental characteristics that cause

health disparities, and lastly instituting policy initiatives to capture HRQoL data.

Implementing these programs and policy initiatives could improve veterans' lives,

consequently generating social change.

Recommendations for Research

The study's findings indicate the need to capture HRQoL data through a

longitudinal study using the SF-8 or a similar survey. These data can be captured by

using clinical reminders programed into the integrated veteran's health records. An

additional recommendation is to enhance VA leaders' knowledge with respect to health

disparities and health equity goals and establish strategic partnerships to support training

and development to expand synergy in accomplishing the VHA Health Equity Action

Plan milestones. Every stakeholder committed to meeting Healthy People 2030 vision of

creating "a society in which all people can achieve their full potential for health and well-

being across the lifespan" (Office of Disease Prevention and Health Promotion, 2020b) is

attainable and has been prioritized as a major VA initiative.

Conclusion

The study's aim was to advance the scholarly information concerning how

sociodemographic characteristics influence HRQoL in veterans. The study has

contributed information that researchers can use to further examine relationships between

SDOH and how they affect veterans HRQoL. Additionally, I offered policy strategies that

could, if implemented, positively affect the VHA at the national level; with greater

understanding of factors that affect HRQoL, VHA stakeholders may be better able to

implement programs to support well-being within the veteran population in their care. As a mechanism for positive social change, these policy recommendations could lead to implementation of initiatives to include engaging veterans to improve their whole health by practicing self-care (mindfulness, yoga, making healthy food choices, decreasing alcohol consumption, and seeking therapy or engaging in other modalities for behavioral interventions); addressing environmental characteristics that cause health disparities by increasing access to care for rural veterans and increasing environmental public health research; and lastly, by instituting policy initiatives to capture HRQoL data by performing a longitudinal study to gain insight into how veterans HRQoL may change over time. Implementing these initiatives can increase quality of life for this unique population, which could lead to achievement of greater health equity and improvements in veterans' health status.

The acknowledgement that health is created by individuals in their social and physical environments is essential to understanding the significance that one's environment has on their quality of life. The VA has an obligation to treat the veteran's whole health and can do so by employing comprehensive approaches to eliminate health disparities. By considering this study's results, hospital administrators and policy makers can devote resources to conducting research and measuring HRQoL, which may help them to move closer to achieving the goals ascribed in the Healthy People 2030 initiatives and the VHA Health Equity Action Plan.

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Appendix A: Permission to Use the Short Form-8

QualityMetric
We measure health.

NON-COMMERCIAL AMENDMENT TO LICENSE AGREEMENT

Amendment Effective Date: November 8, 2021

Amendment Number: QM057067

License Agreement Amended: QM051364, as amended

Licensee Name: Walden University
Licensee Address:

Approved Purpose:
Purpose: Sociodemographic effects on Veterans heath related-Quality of life in Baltimore, MD
Study Name:
Study Type: Non-commercial academic research and/or thesis: Unfunded student

Therapeutic Area: Wellness & Lifestyle

Study Term: Beginning on 12/01/19 and ending on 12/31/22

QualityMetric Incorporated, LLC, a Delaware limited liability company, with offices at 1301 Atwood Avenue, Suite 216E, Johnston, RI 02919 dba QualityMetric ("QualityMetric") and Licensee entered into the Non-Commercial License Agreement referenced above (the "License Agreement"). The parties have mutually agreed to enter into this Amendment to the License Agreement ("Amendment") as of the Amendment Effective Date. All capitalized terms used herein and not otherwise defined shall have the meanings ascribed to them in the License Agreement.

The term(s) of the License Agreement are modified as indicated on Appendix B.

Except as expressly modified by this Amendment and Appendix B, all terms and conditions of the License Agreement shall continue in full force and effect without change.

Electronic Signature: The parties agree that execution of this Agreement by e-Signatures (as defined below) shall have the same legal force and effect as the exchange of original signatures.
Pursuant to this Agreement, e-Signatures shall mean a signature that consists of one or more letters, characters, numbers or other symbols in digital form incorporated in, attached to or associated with the electronic document, that (a)is unique to the person making the signature; (b) the technology or process used to make the signature is under the sole control of the person making the signature; (c) the technology or process can be used to identify the person using the technology or process; and (d) the electronic signature can be linked with an electronic document in such a way that it can be used to determine whether the electronic document has been changed since the electronic signature was incorporated in, attached to or associated with the electronic document.

QualityMetric
*We measure health.*

EXECUTED, as of the Amendment Effective Date, by the duly authorized representatives as set forth below.

QualityMetric Incorporated, LLC	Walden University
Signature: _____	Signature: *Tamala S. Jones*
Name: _____	Name: Tamala Shn Jones
Title: _____	Title: Student Ph.D
Date: _____	Date: 11/8/2021

QualityMetric

We measure health.

APPENDIX B

QualityMetric

We measure health.
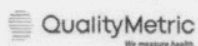
LICENSE AGREEMENT DETAILS

Licensee: Walden University	License Number: QM057067
Tamala Jones	Amendment to: QM051364
▬▬▬▬▬▬▬	Study Term: 12/01/19 to 12/31/22
United States	

Approved Purpose
Sociodemographic effects on Veterans heath
related-Quality of life in Baltimore, MD

Therapeutic Area:
Wellness & Lifestyle :

Licensed Surveys (Modes) and Services:

Item	Description	Mode of Admin	Quantity
MISC02	Contract Amendment		1
	To QM051364 Extending Study End Date to 12/31/22		
SS515	PRO CoRE: SF-8		100
SS800	SF-8 PRO CoRE: MSE		100
SS801	SF-8 PRO CoRE: DQE		100

TOTAL FEES: 0.00 USD

Appendix B: Permission to Use the Conceptual Model of Health Related Quality of Life

CCC | Marketplace™

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Order Date: 13 Oct 2021

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Date	01/01/2000	URL	http://onlinelibrary.wiley.com/journal/10 .1111/(ISSN)1547-5069
Language	English		

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Rights Requested	Main product		

NEW WORK DETAILS

Title	Sociodemographic Predictors of Veterans' Health Related Quality of Life	Institution name	Walden University
		Expected presentation date	2021-11-29
Instructor name	Dr. Steve Matarelli (Chair) TAMALA JONES (dissertation)		

ADDITIONAL DETAILS

The requesting person / organization to appear on the license	Tamala Jones

REUSE CONTENT DETAILS

Title, description or numeric reference of the portion(s)	Revised Wilson and Cleary Model for Health Related Quality of Life (2005)	Title of the article/chapter the portion is from	Chapter 2
Editor of portion(s)	N/A	Author of portion(s)	Sigma Theta Tau International.
Volume of serial or monograph	N/A	Publication date of portion	2000-01-01
Page or page range of portion	18		

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Number of charts / graphs / tables / figures requested	1	Translation	Original language of publication
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		Expected presentation date	2021-11-29
Instructor name	Dr. Steve Matarelli (Chair) TAMALA JONES (dissertation)		

ADDITIONAL DETAILS

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Volume of serial or monograph	N/A	Publication date of portion	2000-01-01
Page or page range of portion	18		

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Appendix C: Recruitment Flyer

RESEARCH ON SOCIODEMOGRAPHIC PREDICTORS OF VETERANS' HEALTH
RELATED QUALITY OF LIFE

You're Invited!

Are you a Veteran living in Baltimore City or Baltimore County, Maryland? If so, you are invited to participate in a study that will examine veterans pereived health related quality of life. The study involves a short 8-question survey.

To be eligible you must:

- Be 18 years of age or older
- Be able to read and understand English
- Be a veteran of the United States Armed Forces (Air Force, Army, Coast Guard, Navy, or Marine Corps)

If interested, please contact Tamala Choice at [email address redacted] or complete survey here.