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Providers' Treatment for Overweight Navy Members and the Effect on Motivating Lifestyle Changes

Misty Scheel
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral dissertation by

Misty Scheel

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Review Committee
Dr. Diana Naser, Committee Chairperson, Public Health Faculty
Dr. Michael Brunet, Committee Member, Public Health Faculty
Dr. James Rohrer, University Reviewer, Public Health Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2018

Abstract

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by

Misty Dawn Scheel

MPH, University of South Florida, 2010

BSN, University of Phoenix, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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Abstract

In the military, excessive weight could put members at risk for training injuries, loss of potential career opportunities, and possible discharge from military service. This could increase cost to United States' national defense through increased injuries, decreased retention due to early discharge, cost of retraining, and lifelong chronic health conditions. The purpose of the study was to determine if there was a correlation or predictive value between active duty Navy members' perception of care provided for weight management and the active duty Navy member's motivation for weight management interventions. The social capital theory served as the theoretical framework for this cross-sectional survey design quantitative study. Data were collected from 241 active duty Navy members using a survey that included questions about clinical practice guidelines and motivation to change. Data were analyzed using Pearson chi-square and multiple linear regression to determine if individual demographics (body mass index [BMI], age, gender, ethnicity, military rank, and marital status) had a correlation or predictive value between reported care received and motivation to change. The results demonstrated a correlation between BMI, age, ethnicity, and care reported ($p < 0.01$); between BMI and motivation to change ($p < 0.01$) and between reported care and motivation to change ($p < 0.01$). The potential positive social change implications from the findings of this study could lead to knowledge of individual factors and social factors that support a fit Navy force, lower cost to the nation for national defense through increased retention of highly trained members, decreased chronic health conditions, and lower cost of military health care.

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Dedication

Dedicated to my husband, Garry, who has been by my side over 20 years supporting me through a bachelor degree, two masters degrees, two children, three deployments, eight moves, and finally, my PhD. He had a tough job keeping the family and I going through it all. I cannot image anyone who could have done a better job. Our family is strong and full of love because of his dedication to our girls and me. I dedicate this to my daughters, Ramie and Sydney; they have grown to be independent, dedicated young ladies with dreams and aspirations of their own. I pray the love and support from their Dad, and the long road I took to my goal, taught them that anything is possible with the love and support of family. Through it all, my greatest accomplishment will always be that I have them in my life, and the greatest title will always be “Mom”.

Acknowledgments

I personally want to thank Dr. Diana Naser, my chair, who was always available when I hit roadblocks or felt frustrated. She always helped me move forward and not give up. Thank you to Dr. Alejandro Ortiz for assisting me with inputting data into SPSS. Thank you to Dr. Mike Brunet for review of methods, and to Dr. James Rohrer for really helping me understand the outcomes of my study and pushing me through the last steps of the dissertation process.

I also want to personally thank CAPT James L. Hancock, whose dedication to the health of our Navy force was the inspiration of this research. His passion and concern for Navy members that struggle with weight and the loss of great individuals in our military family, due to weight issues, was always unacceptable to him. This research is only a part of the understanding needed to address the barriers and challenges our Navy members face to maintain a healthy weight. I hope this research and CAPT James L. Hancock will continue to inspire others to search for solutions to provide our struggling military members the best options and motivation for healthy lifestyles and weight management.

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Chapter 1: Introduction to the Study

Being overweight and obese continues to be a public health concern that has been studied in several populations of interest and among children, adolescence, and adults (Gagnon & Stephens, 2015; Long, Mareno, Shabo, & Wilson, 2012; Smith et al., 2012; Spieker et al., 2015; Sturm & Hattori, 2013). However, this trend of being overweight and obese and the concern for our future health as a nation has not been equally explored particularly in populations that are perceived to focus on fitness and health as a priority of job performance such as military personnel. This study evaluated how Navy service members reported treatment related to their weight and if the care provided by their primary care providers correlated to higher motivation to participate in weight management interventions and lifestyle changes. The questions on the reported treatment provided by a primary provider or healthcare team were based on the clinical practice guidelines (CPGs) for obesity (Department of Veterans Affairs, 2014). Chronic health conditions caused by being overweight and obese can lead to escalating healthcare cost to the federal health care system not only for active duty members, but also for those retired or discharged from the military increasing medical cost to the Veteran's Administration (Spieker et al., 2015). In the military, excessive weight has additional risk to the active duty population by impacting readiness through higher absenteeism, fewer eligible recruits, and decreased retention in the military that can threaten national security (Spieker et al., 2015).

The potential positive social change implications from this study's findings could lead to a more fit Navy force, lower cost to the nation for national defense through

retention of highly trained members, decrease chronic health conditions, and lower cost of military health care. Primary care providers have the potential to address overweight and obesity issues within the Navy active duty population at an individual level and provide a pathway to nutrition and exercise knowledge, resources, and support to help Navy members maintain a healthy weight and be successful sailors. This study examined primary healthcare providers' use of the Veteran's Affairs (VA)/Department of Defense (DOD) CPG, which are described in the definitions, for screening and management of overweight and obese members (Department of Veterans Affairs, 2014). A survey design was used to evaluate Navy member's self-reported perceptions of treatment and recommendations that are discussed at primary care visits. This study examined relationships between providers use the CPG elements and the motivation of Navy members to use recommended weight management interventions and lifestyles to maintain Navy weight standards. This chapter provides the problem statement and describes the purpose of study, research questions, theoretical framework, nature of the study, definitions for the study, as well as the assumptions, limitations, and significance of the study.

Background

Lennon, Oberhofer, and McQuade (2015) found that among all 313,513 Navy service members the rate of obesity was 13.6 % with 2.2% failing to pass the Navy weight standards on their biannual body composition assessment (BCA) that is based on body mass index (BMI) and body fat. All active duty Navy members must have a current periodic health assessment (PHA) prior to taking their biannual BCA and physical fitness

test (NAVMED P 117; SECNAVINST 6120.3 CH-1 BUMED-M3/5). In accordance with Navy (2012) NAVMED P 117 and SECNAVINST 6120.3 CH-1 BUMED-M3/5, a PHA is to be done annually with Navy service members to assess health status, review and validate individual medical readiness, and correct any deficiencies. The purpose of this health assessment is to identify any unresolved health issues, find incomplete health care requirements for individual medical readiness (IMR) and complete deployment health requirements (NAVMED P 117; SECNAVINST 6120.3 CH-1 BUMED-M3/5). Service members complete several screenings at this annual visit to include height and weight to calculate their BMI, as well as obtaining annual laboratory studies such as lipid screening that may identify comorbidities (NAVMED P 117; SECNAVINST 6120.3 CH-1 BUMED-M3/5).

It is during this annual visit and other primary care visits that providers can enforce positive lifestyle changes and address weight issues prior to members taking their annual BCA and physical fitness test. This annual exam is seen as a way to complete all preventive health screening at one time to ensure a fit and ready force to defend our country at a moment's notice. This annual exam follows the most up to date CPG for preventive screens and treatment of chronic conditions (NAVMED P 117; SECNAVINST 6120.3 CH-1 BUMED-M3/5). Not only does this annual exam help the individual maintain health, the collection of information during the annual assessment through the electronic health records assist the military in identifying trends and health risks common in the population.

Leblanc et al. (2011) completed a systematic evidence review on the effectiveness of primary care treatments for obesity in adults, but found no studies that compared use of CPG on adult's obesity outcome. I found no research on how the PHA screening, or other visits with a provider, affect Navy members' ability to maintain Navy weight standards or their motivation to participate in weight management interventions. One study that looked at military medical professional's role in preventing and treating obesity reported that providers who exercise are significantly more likely to counsel and motivate their patients to exercise; however, they reported that only 34% of U.S. adults receive exercise counseling when visiting their physician (Lystrup et al., 2015).

Currently, I was unable to find a study that showed the following criteria:

- The percentage of Navy service members who receive exercise or nutrition counseling when visiting their physician.
- The amount of providers who use the recommended CPG to treat weight issues during the annual PHA or other primary care visits in an active duty Navy population.
- The effect CPG has on active duty Navy member's motivation to participate in recommended weight management interventions to stay within Navy weight standards.

This study was needed to assess the effect of preventive health screenings and treatment of overweight and obese individuals on the individual's motivation to participate in weight management interventions. The primary provider's role in weight management was evaluated based on the social capital theory. The intent of the study was

to better understand Navy members' motivation to make lifestyle changes in order to maintain Navy weight standards and to help maintain a fit and ready force for national security.

Problem Statement

Military members have free access to fitness centers, personal trainers, nutritionists, weight management classes, and free access to healthcare providers to discuss weight management options. Despite the many resources available to this population to stay within weight standards, many continue to struggle. Being overweight and obese within the active duty military is approaching civilian estimates with 68.8% classified as overweight and 35.5% are classified as obese (Tanofsky-Kraff et al., 2013). The described growing rate is alarming with obesity in the military increasing 210% between 1999 and 2005, and 120% between 2005 and 2012 (Lennon, Oberhofer, & McQuade, 2015). In 2012, it was reported that military services spend $1.4 billion a year on health care costs related to obesity (Fairchild, 2012). Being overweight is now the leading medical reason for disqualifying to serve in the military, and failure to maintain Navy weight standards once on active duty often leads to administrative action or discharge from the military (Tanofsky-Kraff et al., 2013). The number of sailors discharged from the Navy annually because they did not meet physical standards has more than doubled from 694 in 2011 to 1,536 in 2014 (Watson, 2016). Excess weight is costly to the DoD not only in fiscal expenses related to health and comorbidities, but also decreased retention in the service, decreased readiness, and threatens our national defense (Spieker et al., 2015).

Purpose of the Study

The purpose of this cross-sectional survey design quantitative study was to determine the correlations between providers treatment of overweight Navy members, based on CPG to diagnoses and treat overweight and obesity, and the effect on motivation to participate in weight management interventions and lifestyle changes to maintain Navy weight standards. With this study, I tested if BMI, age, gender, ethnicity, military rank, and marital status, affected the participant's perception of care received and their motivation to participate in weight management and lifestyle interventions to maintain Navy weight standards. The independent variable (IV) for this study is Navy member's reports of care received based on CPG elements to diagnose and treat obesity. Other IVs were BMI, age, gender, ethnicity, military rank, and marital status. The dependent variable (DV) is Navy active duty member's motivation toward weight control interventions recommended by providers.

Research Questions and Hypothesis

For this study, I focused on the following research questions and hypotheses:

RQ1: Is there a correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$1: There is no correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a1: There is a correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, and military rank.

RQ2: Is there a correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$2: There is no correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a2: There is a correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

RQ3: Is there a correlation between reported obesity care and education provided during primary care appointment and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$3: There is no correlation between reported obesity care and education provided during primary care appointments and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a3: There is a correlation with reported obesity care and treatment provided during primary care appointments and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

RQ4: Is there a predictive value between Navy member's BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control?

$H_0$4: There is no predictive value between Navy member's BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control.

H_a4: There is a predictive value between Navy member's BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control.

Theoretical Framework for the Study

Social capital theory comes from sociology and has been used to study chronic illnesses by examining social relations, networks, families, communities, neighborhoods and the shared norms, mutual trust, and resources utilized by both individuals and groups (Waverijn et al., 2014). Since being overweight and obese are seen as chronic conditions for many individuals and lead to other chronic health issues (Bray, Kim, & Wilding, 2017), using the social capital theory to understand both the individual and community support for being overweight or obese in this population of interest could lead to a better understanding of the problem and the solution. Social capital theory has been used to look at adherence of breast and cervical cancer screenings using both cognitive and structural social capital dimensions (Moudatsou, Kritsotakis, Alegakis, Koutis, & Philalithis, 2014). In Moudatsou et al.'s (2014) study, cognitive social capital referred to what people feel (trust, safety, etc.) and structural social capital referred to what people do in their communities (participation, volunteerism, etc.).

Social capital theory focuses on relationships to determine outcomes on individuals and society as a whole (Ayios, Jeurissen, Manning, & Spence, 2014). The use

of the social capital theory was used to describe the outcome between the use of CPG, and motivation for weight management. I therefore looked for a relationship between provider's use of the CPG to evaluate and recommend members to use community weight management resources to study the effect on motivation of active duty Navy individuals to participate in weight control interventions to maintain Navy weight standards. Knowledge gained in this study may improve use of CPG and improve interactions between providers and Navy members during primary care visits. Therefore, this study and its outcomes had the potential to improve not only individual goals of weight management but also organizational goals of a fit and ready force.

Nature of the Study

This cross sectional quantitative survey study was conducted to determine the effects of CPG used on overweight and obese service members to help maintain Navy weight standards. This quantitative design provided numeric data on overweight and obese military members, demographic data, reported care received, and how care effected member's motivation to participate in weight management interventions or lifestyle changes to maintain Navy weight standards. Demographic data included member BMI based on self-reported height and weight, age, gender, ethnicity, military rank, and marital status. I started this study by retrieving data from the Military Health System Population Health Portal (MHSPHP) tool, known as Care Point (2017). By using this tool and database I was able to pull information out of a large amount of outpatient records and filter data to the needs of the researcher. For this retrospective study, the tool was used to filter down to only active duty Navy members with BMI entered into the system

before June 1, 2017, at the request of the Navy institutional review board (IRB) (#NHCL.2017.0006). While a higher BMI within this population may be noted due to muscle mass, for this study the Department of Veterans Affairs' definitions of being overweight or obese, as seen in the definition section was used for consistency. The database was used to determine prevalence rates for underweight, normal weight, overweight, and obesity in the population. Due to the sensitive nature of individual's weight, an email was sent to all active duty members in the population to participate in anonymous one-time survey from July 2017 to August 2017. This survey design gathered information on members reported care received over the last year prior to completion of survey and assessed motivation to participate in weight management interventions. All surveys returned were evaluated for the reported care received, descriptive statistics on the participant's characteristics, and their motivation to change.

The IV for this study was Navy members reported treatments during primary care visits for overweight and obesity that are based on the CPG. The survey care and treatment questions for active duty members determined if provider discussed overweight or obese status, counseled on weight, diet, and exercise during the PHA or primary care visit, referred for weight management if needed or desired, and did assessment using laboratory testing for comorbidities related to and associated with overweight and obesity, such as cholesterol, hypertension, and diabetes. The IV also included the active duty members BMI, age, gender, ethnicity, military rank, and marital status. These IV were used as part of the studies descriptive statistics, and statistical analysis to determine correlation to the dependent variable. The DV was the Navy member's motivation to

participate in weight management lifestyle interventions based on the Weight Loss Readiness Test II used to determine members motivation score prior to starting the current Navy weight loss program, Ship Shape, (Brownell, Hager, & Leermakers, 2004).

For this study, one data set, known as Population Health Portal, was used to determine prevalence of Navy members in this population with a BMI greater than 25 kg/m2 and their demographics. I sent emails requesting participation in a survey to evaluate weight management treatment and education received during primary care visits to command leaders to disseminate to all active duty members within the population. The Pearson Chi-square test was used to test statistically significant correlations between the independent variable of Navy member's demographics of BMI, age, gender, ethnicity, military rank, marital status, reported care received, and the dependent variable of motivation to participate in weight management interventions. Multiple linear regression was used to examine independent variables for predictive value on the dependent variable of motivation to change.

Definitions

Individual Medical Readiness (IMR): IMR is defined as fully medically ready if all six components of IMR are complete to include: periodic health assessment, no deployment-limiting conditions, dental readiness, immunization status current, medical readiness laboratory tests completed, and individual medical equipment provided (Leiendecker, 2007).

Navy 2016 weight standards: Beginning January 1, (1) Males: 18-21 = 22 %, 22-29 = 23 %, 30-39 = 24 %, 40+ = 26 %. (2) Females: 18-21 = 33 %, 22-29 = 34 %, 30-39 = 35 %, 40+ = 36 % (NAVADMIN 178/15, 2015).

Periodic Health Assessment (PHA): PHA is the annual face-to-face assessment of a service member's health status that provides an opportunity to review and validate individual medical readiness and correct any deficiencies (SECNAVINST 6120.3, 2007).

Providers: For purposes of the PHA and primary care visits, approved providers include Independent Duty Corpsmen (IDC), physicians, nurse practitioners, and physician assistants (SECNAVINST 6120.3, 2007).

Overweight: Overweight, or being overweight, is defined by a BMI between 25.0 and 29.9 kg/m2 (Department of Veterans Affairs, 2014).

Obesity: Obesity, or being obese, is defined by a BMI ≥ 30.0 kg/m2 (Department of Veterans Affairs, 2014).

U.S. Navy Physical Fitness Assessment (PFA): The PFA includes the body composition assessment (BCA), height, weight and BMI, and the physical readiness test (PRT) which is designed to assess the minimum level of fitness required for Navy service (Whitehead et al., 2012).

VA/DoD Clinical Practice Guideline (CPG) for Screening and Management of Overweight and Obesity: This CPG is intended to provide primary care clinicians with a framework by which to evaluate the individual needs and preferences of overweight and obese patients, leading to improved clinical outcomes (Department of Veterans Affairs, 2014).

Assumptions

One assumption of the use of clinical practice guidelines is that they will assist providers in using the most current evidence-based practice guidelines for a given condition and improve the health outcomes of the individuals (Department of Veterans Affairs, 2014). It is an assumption that providers that use CPG to recognize, diagnose, and treat the overweight and obese will be instrumental in members reaching weight control goals. At this time, no study can be found that test the effectiveness of CPG for overweight and obese individuals in a military population. The Navy active duty population is ideal to test this assumption that CPG for overweight and obesity are beneficial to patients since members must not only maintain Navy weight standards but are also able to be screened by a provider for health issues that include a BMI check at least annually, and screened for ability to meet weight standards bi-annually. It is assumed that an actual height and weight were done during the annual visit and not taken verbally and that the BMI information was entered correctly per Navy instructions (NAVMED P 117; SECNAVINST 6120.3 CH-1 BUMED-M3/5).

Another assumption is that providers that use the CPG will diagnose based on BMI, document any discussion of weight concerns and education in the electronic health record (EHR), make referrals as needed, and complete labs to assess for obesity-associated health condition as recommended by the CPG (Department of Veterans Affairs, 2014). Therefore, the assumption is that the annual screening is done properly, and all health issues and health risk assessment are completed and addressed, per the

Navy instructions, actual height and weight to calculate BMI must be measured, not self-reported, as part of the annual PHA (SECNAVINST 6120.3, 2007).

Scope and Delimitations

The study used secondary data sets from the Navy's population health portal that contains members BMI at their last primary care visit along with their age and gender. This information was used to determine prevalence of overweight and obesity with in the population at the time of the study and their demographics. A delimitation for this study is to only look at active duty members assigned to a military treatment facility on the east coast. This location had a mix of young sailors new to Navy weight standards and older sailors that may be struggling to make weight standards as they age. This location was selected for the variation of ages that will be represented. Other command or locations may be more skewed toward a younger or older population. For example, an operational command such as a large aircraft carrier or other fleet commands may have a younger population and mostly enlisted members. This may have provided less variation in age range, limited number of females in the study, and decreased variability in income and educational levels of participants. Data is only representative of similar size military treatment facilities and commands that have similar demographics.

For this study the health belief model was considered as it has been used to address weight issues in prior studies (Das & Evans, 2014; Ozden, & Cicek, 2011). The social capital theory was selected to look at the problem of overweight and obesity in the military population not only from an individual focus, but also from a community issue. This study focused on the relationship factor of the social capital theory, between the

primary provider and the patient. It studied the provider's use of CPG to guide treatment using the Navy active duty member's perception of treatment used. The study looked at the provider's ability to educate and link active duty Navy members to resources in the community, and its effect on member's motivation to participate in weight management interventions to maintain Navy weight standards.

Limitations

There are many advantages to using a survey design, such as low cost, reduction of researcher bias in collected data, greater privacy for participants, and accessibility to the population of interest (Frankfort-Nachmias & Nachmias, 2008). However, there are disadvantages or limitations; one concern for this study is the possibility of a low response rate. A low response rate makes it difficult for a study to have generalization and the non-responders may have different characteristics or have answered differently than those that complete the survey (Frankfort-Nachmias& Nachmias, 2008). In the case of this survey, it was sent to all active duty members, regardless of weight status. A limitation of concern was that fewer overweight and obese members would respond when compared to the population's prevalence rates of overweight and obesity. In addition, the survey asked sensitive questions about individual's weight and their past experiences with providers and treatment. Due to the sensitivity of the survey, members within the population may have been non-responders by not completing one or more questions from the questionnaire or the entire questionnaire itself (Stec, 2008). This would leave a gap in the data and partially completed surveys may not be included in the study. All partially

completed surveys and the data that was missing were included in the descriptive statistics.

Another limitation may have been the self-reported weight that is less than or more than the participants actually weigh. This may have skewed the data and the analysis may have found the population as more fit than the data that is pulled from actual medical records where manual height and weight is done. A computer-based survey design may have provided the anonymity participants need to answer questions honestly and to the best of their ability. Their ability to answer the questions and to remember care provided over the last year may have been a limitation. Measurement bias is potential limitation of a survey design that can be difficult to detect that can stem from several sources, but for this study it is the respondents recall ability that is a concern (Stec, 2008). One might be able to detect a measurement or recall bias if the same questions have missing answers. It could mean the question was not clear, or participants were unable to recall and did not know how to answer the question.

Significance

There are several potential contributions to weight management knowledge in the Navy active duty population this study may impact. First, it is unknown what percentage of Navy providers follows the CPG for overweight and obesity when seeing a patient for their annual health assessment or other primary care visits. Knowing if there is a low or high percentage of the CPG usage may help determine if provider training on the overweight and obesity guidelines is needed, or if there is a need to training on communication with patients. Second, there has been no research currently found that

determines the effectiveness of the current CPG for weight management in this population. This study may show a link between the provider's knowledge and use of CPG as a resource for weight management in this unique population.

The knowledge gained from this study may lead to improved education and training for providers caring for overweight and obese service members or may show the need for changes in communication to build trust and increase social capital for members to participate in recommended programs and resources to help members reach their weight goals. A positive correlation between providers use of CPG to treat overweight and obese service members and a positive outcome on members motivation to maintain Navy weight standards may lead to a positive social change as knowledge is gained on the importance of the provider's role in addressing weight management issues. Positive social change may come in the form of lower cost to the nation for national defense through increased retention of highly trained members, decreased chronic health conditions, lower cost of military health care, and more fit Navy force. Changes in provider's treatment for overweight and obese members may lead not only to a healthier active duty Navy population, but in the long run may also affect the care for their families and their communities.

Summary

Being overweight or obese remain health conditions that continue to perplex public health professionals for the best approach to help people reach their weight goals. In the military, maintaining weight is not only about living a healthy lifestyle; it is required to maintain top physical condition to perform military operations that take

strength and endurance without injuries that extra weight can cause. For this reason, a healthy weight is also important to military members for career progression and family economic stability. However, members still struggle with weight management in this population and very limited research can be found on what helps members toward their weight goals. This study looked at the aspect of providers uses of CPG to screen, diagnose, and educate members about weight management during the PHA visit and primary care visits from the Navy member's report of care received. It determined if there was a correlation between the use of reported CPG treatment and education provided and the motivation of members to participate in weight management intervention to maintaining weight standards in the active duty Navy population. Chapter 2 will examine overweight and obesity trends in the general population and compare them to a military community. It will look at known factors studied among a variety of populations and focus on obesity factors that have been studied in military populations.

Chapter 2: Literature Review

Introduction

As a healthcare professional observing overweight and obese Navy members struggle to make weight standards despite the resources available, there was a concern that members may not be provided with the knowledge of the available resources for weight management. In addition, active duty military members are required to be seen by their primary providers at least annually. Members that are considered overweight or obese based on BMI may not be receiving proper education about weight management and lifestyle interventions as recommended by CPG. Therefore, this population may not be getting linked to the resources that can help them maintain Navy weight standards and may not be aware of how to start living a healthy lifestyle. The purpose of this study was to determine the use of CPG by healthcare providers for overweight and obese Navy active duty personnel. Additionally, the effect that CPG had on Navy active duty personnel motivation to participate in weight management interventions to stay within Navy weight standards was also examined. This chapter will describe the current trends of overweight and obesity within the active duty Navy population, the current use of CPG for overweight and obese members, and the important variables and methodology for weight management found in prior studies. This chapter will also describe the community level theory of social capital and the role it plays in understanding weight management within a population.

Literature Search Strategy

To study the relationship between providers' treatment of overweight and obesity and the effect it had on Navy members motivation to participate in weight management intervention, the literature review for this research focused on the key concepts pertinent to understand not only weight requirements in the Navy, but also current practice to assist members in maintaining those weight standards. The literature search strategy included the use of several databases: military and government, CINAHL, PsycINFO, Academic Search Complete, ProQuest Nursing & Allied Health. The keywords *obesity, weight management, clinical practice guidelines, health, social capital theory,* and *Navy* were used. To better understand the military demographics the keywords *military demographics* was used with the collection from CINAHL that produced 13 articles from 2011-2015, with one article of interest.

To locate information about the theoretical framework CINAHL was used. The keywords *social capital theory* for the years 1998-2015 resulted in 93 articles, of which there were six articles of interest. Between the years 1992-2015, PsycINFO yielded 202 articles with eight articles of interest, and Academic Search Complete, between the years 1990-2015, yielded 369 articles when using the keyword *social capital theory* which narrowed to 59 articles when the keyword *health* was added.

To understand the current clinical practice for overweight and obesity guidelines a literature search started with a collection of military and government articles and keyword *obesity* that resulted in 1,704 articles between the years 1980-2015. When the keyword *navy* was added it narrowed possible research studies to 11 articles, of which six

articles were of relevance. Using the collection of research on CINAHL and with keywords *clinical practice guidelines* for the years 2011-2015, 4,879 were available and then narrowed by using keyword *obesity* for 118 articles of which there were 11 articles of interest. When the search was narrowed to the United States, only 21 articles were found. When the keywords *clinical practice guidelines, obesity and adults* was searched only 32 articles were found. Trying to expand and find more articles on the subject, the collection of ProQuest Nursing & Allied Health Source was used for to search between the years 2011-2015 with the same keywords *clinical practice guidelines*. This expanded the search to 68,971 articles, but when *obesity and adult* was added it narrowed the search to 7,583 articles. Going back and using the collection of military and government research, with keywords *clinical practice guidelines* only 16 articles between the years 2002-2015 were found, with only one article of interest.

Theoretical Framework

The social capital theory served as the theoretical framework for this research which has been used to study various chronic disease processes such as cardiovascular diseases, cancers, chronic respiratory diseases, diabetes, and the impact diseases have on health, financial burden, loss of productivity, and the overall effect on the social and economic well-being of a community (Hu et al., 2014). Based in sociology, the theory has been used to study illness from by both individuals and groups perspective (Waverijn et al., 2014). Growing recognition of social determinants of health has lead social capital to become an increasingly popular theory to explore an interdisciplinary approach from sociology and economics to define social capital as features of social organization, such

as trust, norms, and networks, to improve and facilitate actions (Hu et al., 2014). Some early definitions of social capital refer to the resources that flow through relationship ties (Coleman, 1988). From Coleman (1988), social capital is the structure of social relations between and among individuals that benefits the community and individuals through different relationships within and between social networks. Social capital comes through changes in relations among persons that facilitate the action (Coleman, 1988). It is the provider relationship with patients that this study looked at to determine action of health weight management and motivation.

Another important concept in Coleman's (1988) social capital theory was the importance of information sharing to build social capital and the trustworthiness of that information in social relations that can lead to action. It is this concept of trustworthiness of information shared among providers and patients and possible connection of motivation of patients to implement lifestyle changes that is of interest for this study. This study looked at information shared at time of primary care visits, to see if providers were informing participants of weight management options and linking them to resources through referrals. Social capital encompasses a wide range of concepts that are in three dimensions of structural, cognitive, and relational (Lin & Lu, 2011). Mahmood (2015) described the terms and concepts of social capital from decades of work as networks, social norms and trust, and the way these allow individuals and organizations to achieve their goals. The three dimensions in social capital relationships are; rational the degree of trust and respect because of social values and norms arising, structural the general arrangement of the existing network and access to resources for cultivation of social

capital, and cognitive the culture, routines, codes and languages (Mahmood, 2015). This research looked at the concept of relationships as it relates to the concept of trust. The study did this by looking at provider's use of CPG to educate and provide resources to overweight and obese members and if it led to action of maintaining weight standards among Navy members.

As the theory continued to develop, literature started to formulate around the idea of social capital as the ability of individuals or groups to secure resources or benefits from membership within a social networks or social structure (Portes, 1998). Wouter (2012) discussed both positive and negative aspects of the social capital theory. The social capital theory has been used to show the connection between social relationships and positive health outcomes at the individual level while building community health (Wouter, 2012). The social capital theory has been criticized for being too vague and broad as it can cover almost every aspect of social environment (Portes, 1998). Wouter (2012) broke down the theory and provided a simplified definition and the differences between bonding, bridging, and linkage all of which are important for people's health and wellbeing. To summarize, bonding is a social network that occurs between people who share social identities where bridging is social networks across different social and ethnic groups or between people who are not alike (Wouter, 2012). Linking is relationships that across power or authority gradients or how communities network with institutions and political structures (Wouter, 2012). Mahmood (2015) defined bonds between individuals based on common identity such as family, friends, and group of individuals with same traditions, customs, culture, language or background, bridges as relationship that take a

step forward in a shared sense of identity, and linkages relates to individuals or groups which are not socially in the same set up, rather up or lower down the social ladder.

At the time of Wouter's (2012) study, limited research had gone into examining the role of bridging and linking social capital in building and maintaining community health. The interest of this research looked at the structural dimension and linkage form of social capital that may exist for Navy military members. This research could expand the understanding of bridging and linking as Navy members learn to interact with members outside of their cultural norms. Navy members frequently live and work with others from different cultural backgrounds and must link on a frequent basis to new resources and support systems with each move. In this study, I used the social capital theory to understand relationships and communications between providers and active duty members that may benefit both the individual and the community by using a multidisciplinary approach and help members make new links to resources needed for healthy lifestyle changes. The potential benefit of this research is to provide information on the relationship between provider and military members with the goal of improving outcome on weight both for the individual and for the Navy to ensure readiness of the organization to meet its mission.

Waverijn et al. (2014) used the concepts of the social capital theory to look at the physical and social features of an environment to understand health. They proposed that with the increase of chronic diseases, more research was needed to understand the influences on health and used social capital as a potential supportive resource to help people cope with their chronic illness and encourage them to engage in a lifestyle that

prevents deterioration of health (Waveijn et al., 2014). They found that individuals as well as neighborhoods with greater social capital had a significant positive effect on health for people with chronic illness (Waveijn et al., 2014). It is the encouragement to engage in healthy lifestyles that Waveijn et al. (2014) talked about that is also part of the recommendations in the CPG. Therefore, I looked at the provider's use of the CPG and if this education and encouragement for weight management effects individuals' motivation to participate in weight management interventions.

Ling and Thomas (2013) looked at several factors in childhood obesity using social capital theory and found in their review that past studies had mixed results of social capital as an environmental factor for health, especially in obesity-related interventions. They used a social capital measure based on Putnam's (2000) concept of social capital as five components: (a) participation in public activities, (b) participation in community organizations, (c) community volunteerism, (d) informal sociability, and (e) social trust (Ling and Thomas, 2013). They found both policies and social capital may be a source of support for weight control programs (Ling and Thomas, 2013). The lack of social capital that supports school-based policies may impede effective policy interventions; highlighting to policymakers that promoting healthy dietary behaviors and active lifestyles should balance the design of policy interventions and community conditions where the policies are implemented (Ling & Thomas, 2013). While not all five components of Putnam's (2000) concept of social capital could be tested in my study, the social trust discussed by Ling and Thomas (2013) was tested through studying the relationship between provider and patient. The survey method was done to determine if

the conversations on weight management are present between provider and patient, and if this relationship leads to member's motivation in lifestyle changes. Putland et al. (2013) looked at policy and social capital theory to focus on what could be done at both an individual and an organizational level to improve the health of a population. While the social capital theory has been known to be complex in terms of different kinds of resources operating on different levels, it has not prevented the theory from being considered within public health to develop strategies to address health inequities at the community level (Putland et al., 2013).

The social capital theory and its focus on culture, value, social norms, and resources are an important concept for this study as the military has a very different culture from the general population. The military culture and values extend well beyond the warrior ethos and service members are somewhat isolated from the larger U.S. society because of their culture (Redmond et al., 2015). The military emphasizes core values that become an integral part of military culture and experience, and service members possess shared experiences, values, languages, and symbols (Redmond et al., 2015). The military environment is extremely structured. Self-improvement by engagement civically in the community, health, personal responsibility, obedience, discipline, self-sacrifice, trust, and courage are identified as key military values stressed by the military (Redmond et al., 2015). The team's wellbeing is often above that of the individual and thinking and acting according to military culture becomes ingrained for active duty members who work and reside on post with others that are part of the military (Redmond et al., 2015). As the community is the focus of the social capital theory, it works well to evaluate a

community with the mind set described above. This community also faces many of life's stressors together as a unit, not as individuals. Due to the military's mission, service members are subject to different workplace regulations than their civilian counterparts; for example, 24-hour a day and 7-day a week call, vacation time can be issued and/or canceled by their commander based on mission needs, and they can be asked to deploy abroad with short notice (Redmond et al., 2015).

The military also shows sign of using a theoretical model that mirrors several concepts found in the social capital theory to understand and strengthen healthy lifestyles among military members and families. The model, known as the Military Family Fitness Model (MFFM), is multifaceted and based on conceptual theory and empirical literature that highlights potential areas of individual, family, and external strength-building resources that can foster positive outcomes for military families (Bowles et al., 2015). The MFFM is an expansion of an earlier military health model called Total Force Fitness (TFF) model that concepts focuses on family, organization, and environment and reflect common themes found in the social capital theory. It was concluded that the model might lead providers, family resources, and leaders to foster strength for the military families to act and increase readiness and force health protection (Bowles et al., 2015).

For this study, CPGs have been in place and are readily available for providers to use a resource to treat active duty Navy members when they are documenting care in the electronic medical record. It is the expectation and the norm that all active duty Navy members will have a health risk assessment and physical annually in addition to primary care visits as needed, but currently no policy or quality measure has been found that looks

at the relationship between CPG use by provider and the outcome. Evidence that showed the effectiveness of the CPG use for an overweight or obese Navy member may lead to a review of policies and practice change.

Overweight and Obesity Trends in the United States

Obesity is considered the third global social burden generated by human beings right behind smoking and armed violence and terrorism (Gaines, 2015). The United States now has the highest mean BMI among high-income countries (Sturm & Hattori, 2013). In the United States after three decades of increasing obesity trends, obesity rates have stabilized remained around 34% for adults and 17% for children since 2007 (Gagnon & Stephens, 2015). In addition to the concern of obesity, two out of three adults exceed recommended weight and considered overweight (Gagnon & Stephens, 2015). Obesity in adults seems to be stabilizing, but morbid obesity or BMI greater than 30 kg/m2 does not seem to be stabilizing but appears to be doubling, and BMI greater than 40 kg/m2 has quadrupled (Sturm & Hattori, 2013). As the obesity epidemic begins to show signs of reversing, other studies show the trend may not be equal across all populations. Some populations such as U.S. born Puerto Ricans and Mexicans show greatest increases in BMI with the slowest increase in BMI among foreign-born Chinese (Krueger, Coleman-Minahan, Rooks, 2014). Foreign nationals also seem to increase their BMI the longer they are in the U.S. (Krueger, Coleman-Minahan, & Rooks, 2014).

While the current trend in childhood obesity has been holding at 17%, this number is a concerning trend for several reasons. Children who are overweight or obese face shorter life expectancy, risk having a life of physical or emotional limitations,

increase risk of cardiovascular disease, stroke, diabetes and other comorbidities that may lead to premature death across the life span (Long, Mareno, Shabo, & Wilson, 2012). Another concern with childhood obesity is that it limits the number of healthy young adults for military service and weakens national defense, due to the inability of young adults to meet military weight standards and fitness requirement to be able to perform military service (Gagnon & Stephens, 2015). Being overweight is now the number one reason young adults fail to qualify for military service (Tanofsky-Kraff et al., 2013). Studies also show that recruits that struggle to make weight to enter military service often continue to struggle with weight and fitness standards during their careers and may face loss of opportunities and potential loss of military career (Tanofsky-Kraff et al., 2013).

Overweight and Obesity Trends among Navy Active Duty Members

Overweight and obesity is a commonly studied health issue among a variety of populations, however there are limited studies and data that look at the issue in a military population. In a study that analyzed five large population–based health-related behavior surveys, conducted from 1995 to 2008, that included personnel from the Army, Navy, Marine Corps, and Air Force, overweight and obesity in active duty personnel rose to more than 60% between 1995 and 2008 (Reyes-Guzman, Bray, Forman-Hoffman, & Williams, 2015). In that study, military women showed the largest increase in overweight and obesity and among all socio-demographic groups, warrant officers, senior enlisted personnel, and people aged 36–45 years showed significant increases (Reyes-Guzman et al., 2015). This survey's design weakness is that all BMI data come from self-reported height and weight. Other trends and statistics that include all active duty members

showed those that received at least one overweight/obesity-related diagnosis more than tripled with the highest prevalence of clinical overweight among females at 8.2%, health care workers at 8.0%, Air Force members at 7.2%, and those older than 40 years at 8.3% (Armed Forces Health Surveillance Center, 2011). This research used the survey data and compared participants self-reported BMI to the actually BMI recorded in electronic medical records. To gives a more accurate picture of overweight and obesity in the population because it is based on a face-to-face encounter by a medical provider, and compared it to those who self-reported height and weight on the survey.

Using the data from a 2008 Survey of Health Related Behaviors for military personnel, Jackson et al. (2013) found the majority of military personnel did not consume the recommended nutrients for the average adult with only 17% of women and 14% of men reported consuming the USDA-recommended servings of fruits and vegetables per day, which mirrored the general population of the United States. It may be that there are other similarities between the general population and the military population when it comes to weight management that can be explored. A limitation of the Jackson et al. (2013) is the study was based on self-reported health practices. This study was also based on a survey and self-reported health behaviors and may also not provide a true picture of the population's health practices.

Not only is it difficult to find data on military members' weight concerns, it is even more difficult to find data specific to only one branch of the military, such as Navy active duty members. This is important because the cultures, traditions, fitness requirements, and the mission of each branch of the armed forces can be very different.

One study done by Gantt, Neely, Villafana, Chun, and Gharabaghli (2008) looked at a large medical center Navy active duty population and found that 53% of the active duty staff that participated in the spring fitness assessment were overweight or obese based on their recorded BMI. Because of their high BMI, 746 of the 3,306 participants had to have a waist circumference measured to determine their body fat for the Body Composition Assessment (BCA). This quantitative study used actual height and weight measurement taken during the biannual BCA, which strengthens the accuracy of the prevalence of overweight and obesity in that population.

Smith et al. (2012) looked as socio-demographic predictors of overweight and obesity in active duty military members and found overweight to be significantly associated with being male, older, or married. Their findings in the military population were consistent with the US population, age, race/ethnicity, and marital status are associated with overweight and obesity (Smith et al., 2012). However, they did find that military women had lower prevalence of obesity than their male counterparts, which is opposite of the civilian population where women have higher prevalence of obesity (Smith et al., 2012). One weakness to the study was the height and weight was self-reported (Smith et al, 2012).

In 2012, Gregg II and Jankosky conducted a study to see if work environments such as living or working on a ship can affect weight management and found that among 26,341 members aboard small submarines (SS), large submarines (LS), and aircraft carriers (AC) that the odds ratio of obesity were increased on SS and LS compared to AC. However despite the limited space on the submarines their study found sailors

performance on their fitness test were comparable to the larger aircraft carriers (Gregg II & Jankosky, 2012). This study used a cross-sectional design and utilized actual height, weight, and Physical Readiness Test (PRT) scores from the U.S. Navy Physical Readiness Information Management System (PRIMS) to determine BMI across different types of ships. At the time this was the first known study to compare the physical readiness status between personnel assigned to three different U.S. Navy operational worksites (Gregg II & Jankosky, 2012).

Lennon, Oberhofer, and McQuade (2015), at the time of their study, only found the Gantt et al. (2008) study that looked at BCA failures in the Navy active duty population. Lennon et al.'s (2015) study was a retrospective review that studied the body composition (BCA) failure rates for all U.S. Navy active duty personnel obtained for the cycle 1,2012 Physical Fitness Assessment for all 313,513 sailors to identify subgroup with a failure rate 10% or greater. They found that 13.6% of members had a BMI of over 30 kg/m^2 and therefore considered obese (Lennon, Oberhofer, & McQuade, 2015). While their study showed alarming trends in the Navy, the Armed Forces Health Surveillance Center (2011) showed from 2004 to 2010, in each group older than 19 years, prevalence of clinical overweight was markedly lower in the Marine Corps and Navy than the other Services. The Armed Forces Health Surveillance Center (2011) used data from electronic medical records to determine the prevalence of overweight and obesity among members. This may be a result of CPG for overweight and obese members not being used equally across all military branches, BMIs not being recorded, or providers for the Navy and Marines personnel not coding members as overweight and obese at time of primary care

visit. At the time of this study, no study had been found that looks at the use of CPGs by Navy providers caring for Navy and Marine members.

Lentino, Purvis, Murphy, and Deuster‘s (2013) study was concerned about the quality of sleep in military members. Both poor sleep quality and inadequate quantity of sleep had gained attention as being strongly connected to lifestyle behaviors, daily nutrition, and fitness habits. They completed a quantitative study using a survey method to determine the quality of sleep among service members to determine its effects on members’ emotional, spiritual, social, family, physical, and nutritional fitness. Their study showed significant associations between quality of sleep and physical performance, nutritional habits, measures of obesity, lifestyle behaviors, and measures of psychosocial status. Poor sleeper were significantly more likely to participate less in healthy exercise and have good dietary behaviors than good sleepers (Lentino, Purvis, Murphy, & Deuster, 2013). They also found poor sleepers to have larger waist circumferences and higher BMI (Lentino et al., 2013). The weakness of this quantitative survey design was that all information was self-reported and actually height and weights were not taken. This could have over or under estimated the prevalence of overweight and obesity in the study.

Recent literature has looked at the effects of stress, depression and post-traumatic stress disorder on weight. This is a growing concern among military research due to over a decade of military forces supporting conflicts and operations across the globe. An earlier study by Barber, Bayer, Pietrzak, and Sanders (2011), found that being overweight was not associated with psychological distress among Operation Enduring

Freedom/Operation Iraqi Freedom Veterans. In 2013, Maguen et al. explored the relationship between body mass index (BMI) and posttraumatic stress disorder (PTSD) in Iraq and Afghanistan veterans, in a retrospective longitudinal cohort analysis of health records and found mental health conditions to be associated with increased risk of higher BMI. They concluded that collaborative care efforts among primary care and mental health clinicians be considered when taking weight status into account to best facilitate weight loss, and programs (Maguen et al., 2013).

Since then other studies have found PTSD to be associated with greater likelihood of overweight and obesity, and lifetime PTSD was associated with significantly increased odds of obesity (Smith, Tyzik, Neylan, & Cohen, 2015). Studies have shown PTSD and obesity link to be stronger for some groups, such as women and certain ethnic minority groups (Smith, Tyzik, Neylan, & Cohen, 2015). Hall et al. (2014) found that PTSD was associated with poor functional status and impaired physical performance after controlling for relevant demographic, biometric, and psychological factors. Several other studies have found a connection between PTSD and emotional eating and eating disorders among military veterans that may lead to weight issue (Talbot et al, 2013; Hoerster et al, 2015; Mitchell, Rasmusson, Bartlett, & Gerber, 2014).

Current Clinical Practice Guidelines for Overweight and Obesity

According to the 1998 "Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults The Evidence Report" by the National Institutes of Health, overweight is defined as a body mass index (BMI) of 25 kg/m^2 to 29.9 kg/m^2 and obesity as a BMI of greater than 30 kg/m^2 (Jensen et al., 2014). In 2012,

the U.S. Preventive Services Task Force (USPSTF) updated and confirmed its 2003 recommendations for clinicians to screen for obesity and offer or refer patients with a body mass index (BMI) of 30 kg/m^2 to intensive, multicomponent behavioral interventions (Bennett, Gudzune, Appel, & Clark, 2014). A summary of the CPG recommendations by the American College of Cardiology, the American Heart Association, and the Task Force on Practice Guidelines and The Obesity Society ACC/AHA/TOS on the treatment of overweight and obese patients includes the following:

1. Height, weight, and calculated BMI documented in the medical record, a waist circumference for patients with BMI 25-34.9kg/$m^{2.}$
2. Assessment and treatment of risk factors for Cardio Vascular Disease (CVD) and obesity-related comorbidities.
3. Assessment of weight and lifestyle history.
4. Assessment of need and readiness to lose weight.
5. Advice on diet and exercise.
6. Referrals to comprehensive life style interventions for all patients for whom weight loss is recommended (Jensen et al., 2014).

To date no research has been found that looks at the use of CPG for overweight and obese Navy service members and their effectiveness. Therefore the use of overweight and obesity CPG use and outcomes in prior studies was reviewed.

Bennett, Gudzune, Appel, and Clark (2014) conducted a qualitative research study of healthcare providers to understand their perceived role in weight loss

interventions. The common themes they found is that that providers' view their role in weight management as referring providers accountable to patients for routine monitoring and follow-up visits, "cheerleading" for patients, and maintaining trust and a longer-term relationship with the patients (Bennett, Gudzune, Appel, & Clark (2014). The study only looked at the role of providers in referring patients to a weight management intervention being implemented; it did not look at how providers practiced on a daily basis or how they refer to already existing resources or programs. There has been no study found examine military providers' referral rate for overweight and obese members, even though resources exist and are free to military members.

The CPGs have been reviewed and endorsed by several professional practice associations and organizations since the late 1990s. The most recent research found on the treatment of overweight and obese patients by military providers was done by Warner et al. (2008). Warner et al. (2008) found among 477 providers, that responded to a survey sent to 1,186 active duty providers, increased awareness of overweight and obesity and need to treat had increased from prior studies, however negative stereotypes toward overweight patients and providers feeling uncomfortable talking about weight management still remained. To date no current research on military providers care of overweight and obese members has been found. This raises the question if CPGs are being implemented and followed by military providers while caring for military members.

Noel et al.'s (2010) study questioned a gap in literature finding that most CPG for overweight and obese patients were based on carefully controlled trials with highly

motivated subjects with few looking at the extent to which obesity is managed or care for in clinical practice. Noel et al.'s (2010) found that studies examining provider diagnosis of obesity and brief physician counseling in the private sector to have suboptimal performance. Noel et al.'s (2010) looked at the use of CPG with a Veteran population and showed that only 28% of obese patients having a diagnosis of obesity in 2010, of which only 34% of these patients receiving counseling regarding nutrition and exercise. The limitations of this retrospective cohort study include its reliance on administrative height and weight data, and may have contained data entry errors, however height and weight data identified more obese patients than relying on ICD-9-CM codes only for obesity identification (Noel et al., 2010).

Another example of CPG for overweight and obese patients not being implemented or documented came from Stephens' (2011) study. Stephens (2011) completed a record review of over 3 million electronic health records and found that in people with complete height, weight, and BMI measures 15% had BMI measures exceeding 30 kg/m2, the National Heart Lung and Blood Institute's definition for obesity. Yet even with the CPG recommendations only 16% had an associated ICD-9 code for obesity in their EMR (Stephens, 2011). This may signal that the CPG is not being followed for patients with a BMI more than 30 kg/m2 or may mean providers do not code for obesity during acute visits (Stephens, 2011).

Despite the growing emphasis on quality indicators, there is little data or research that has been done on the quality of primary care provided to overweight and obese adults (Farran, Ellis, & Barron, 2013). The need to control healthcare cost through

preventive care placed emphases on healthcare quality indicators developed by organizations such as the National Committee for Quality Assurance (NCQA). For preventive care toward weight management, clear quality indicators other than BMI have not been established; therefore BMI remains the current standard to quantify overweight and obesity status (Farran et al., 2013; Barnes, Theeke, and Mallow, 2015). This is consistent with local policies seen in the Navy's population health indicators that do not track overweight and obesity data as a quality measure of the healthcare given at this time. The military health system uses the medical homeport model of care with NCQA certification sought by primary care clinics across the Navy as their standards of care requirements. The BMI is currently to be calculated at primary care visits by taking an actual height and weight and to be documented in the EHR.

Farran, Ellis, and Barron's (2013) study used a retrospective analysis of 420 encounter notes from overweight and obese adult patients in three primary care clinics to evaluate the use of obesity guidelines and practice among primary care providers. They reviewed three existing practice guidelines existing clinical guidelines utilized by primary care clinicians for management of overweight and obese adults and found the National Heart, Lung, and Blood Institute (Panel, 1998) to be the most comprehensive and easily incorporated in clinical practice. Their study found prior to provider education record reviews found overweight and obesity through BMI calculation only 37.1% of the time with a diagnosis in the patient's medical record occurred in only 23.8% of the records (Farran et al., 2013).

In a 2015, Barnes, Theeke, and Mallow reviewed the use of CPG to treat overweight and obese patients in primary care setting using a baseline retrospective chart audit followed by educational intervention to providers and medical staff. Prior to and following the education they looked for documented BMI, waist circumference, obesity diagnosis, co-morbidities, blood pressure, tobacco use, family history of heart disease, glucose and lipid testing, and documentation of weight loss plans and referrals. Their study found no increase in documentation of co-morbid diseases, calculated BMI, systolic blood pressure, diastolic blood pressure, fasting glucose or HDL levels between pre and post education intervention (Barnes et al., 2015). Routine documentation of BMI did increase 13% after education, but overall the changes in behavior post education documentation improvement occurred among non-license staff and suggested further research for provider behavior change (Barnes et al., 2015). It was suggested that provider behavior might be independent of knowledge or attitudes towards CPG and more toward an institutional policy change (Barnes et al., 2015).

Lugtenberg et al. (2011) looked at what barriers might keep providers from using recommended CPG for overweight and obese patient using a cross sectional research design. The survey, which 264 Dutch general practitioners (GP) completed, found 35% of the GPs reported difficulties in changing routines and habits to follow guidelines, however 89% believed that following guidelines leads to improved patient care. Findholt, Davis, and Michael (2013) looked at barriers of care for childhood obesity by conducting a qualitative study using interviews with 13 rural primary care providers. A few of the barriers found, that prevented providers from using the American Medical Association

Expert Committee recommendations for childhood obesity, included time restraints, lack of reimbursement, few opportunities to detect obesity, the clinician limited knowledge (Findholt, Davis, & Michael, 2013).

This literature review section covered overweight and obesity trends in the general population compared to the military population. It reviewed past research and variable that has been found to effect weight, and it reviewed current CPG for overweight and obesity treatment. It included both quantitative and qualitative studies that explored providers use and documentation of CPG to diagnoses, education and make referrals for patients with high BMI across several different civilian and military populations that included both adult and children obesity studies (Bennett, Gudzune, Appel, & Clark, 2014; Farran et al., 2013; Findholt et al., 2013; Lugtenberg et al., 2011; Noel et al., 2010; Stephens, 2011; Warner et al., 2008). However, it did not find studies that looked at how provider's interactions and care for overweight and obesity changed patients motivations to act on the weight management recommendations they received from primary providers or the effect it had on patients to take action toward a healthy lifestyle change. This relates back to the social capital theory of Coleman's (1988) and the importance of information sharing in social relations that can lead to action. This study focused on the gap identified from this literature review by asking overweight and obese patients to share information about the care received, the interactions they had with the primary provider, if their weight was addressed, and the effects it had on their motivation to act on a lifestyle intervention for weight control.

Methodology used in Prior Research Studies

This section looks at studies found during the literature review that used a similar quantitative survey designed used in this study. It looks at the methodology that was used in each study to compare how sample size, variables, and statistical analysis answered the research questions. This part of the literature review helped determine possible sample size, variables, and data analysis methods to use in this study to answer the research questions of the study.

In Reyes-Guzman, Bray, Forman-Hoffman, and Williams (2015) study, a large sample sizes from 12,756 (2002) to 28,546 (2008), was used to examine for association with overweight and obesity included age; gender; branch of Service; race/ethnicity; pay grade (rank); education; and marital status using a multivariate model and also examined the associations of exercise, depression, heavy alcohol use, and heavy smoking with overweight and obesity. Along with descriptive statistics to summarize demographic and weight-related characteristics of the active duty personnel surveyed, a multinomial logistic model examined the associations of socio-demographic characteristics, exercise, depression, and other psychosocial characteristics. Another study that used a survey design to look at associations between socio-demographic and obesity using a sample size of 12,756 and 16,146 between 2002 and 2008 analyzed the data for odds ratios multivariate logistic regression for binary outcome measures to determine the degree of association between each socio-demographic characteristic and BMI (Smith et al., 2012).

Lentino, Purvis, Murphy, and Deuster‘s (2013) study took a different approach and instead of looking at individual characteristics or sociodemographic, they looked at

sleep, health and obesity. They used the survey design to look for relationships between sleep quality and emotional, spiritual, social, family, physical, and nutritional fitness using (Lentino et al., 2013). They used a sample of 14,148 US Army Active, Reserve, and National Guard members, descriptive statistics, and binary logistic regression to obtain odds ratios (OR), to compare the relationships between sleep quality and nutrition, exercise, and lifestyle behaviors. In this study they also used a separate multiple linear-regression to predict poor sleep, with demographic variables (Lentino et al., 2013).

Another important factor for this study is to look at the use of Clinical Practice Guidelines (CPG) for overweight and obesity. However, this literature search found limited studies that used CPG as a variable in weight management. No study was found that used a quantitative survey approach to look at the use of CPG and weight management intervention. Most studies for use of CPG used a retrospective chart audit to determine the use of CPG in overweight and obese people (Barnes et al., 2015; Farran et al., 2013; Noel et al., 2010; & Stephans, 2011). Because of the limited research found that looks at the CPG as a variable in a survey design, each element of the CPG will evaluated for an association or correlation with weight management motivation using logistic regression.

Justification of Selected Variables

With limited past research on the military population and the issue of obesity, variables in this study, were closely related to variables used in past studies. This included looking at similar populations such as military dependents, military children, veteran populations, and college populations that have similar entry level ages as the

military population. In my review of the literature, I looked for independent variables that might affect the dependent variable of Navy member's motivation to participate in weight management interventions and healthy lifestyle interventions to maintain Navy weight standards. Variables such as social economic status (SES) or household income, sociodemographic such as age, gender, ethnicity, marital status, work environment, have all been found in prior studies on overweight and obese individuals.

Winegarner (2015) looked at social economic status (SES) as a variable of military families and used epidemiologic data on military dependents to compare the BMI of military-dependent spouses based on the rank of their active duty military family member its effects on obesity. Looking at SES in a military population is interesting as differences between the groups in this population are easily seen between military ranks that are often associated with income, education, and their housing allowance as well as possibly race and ethnicity (Winegarner, 2015). The study found that BMI was 2.6 to 4.8 points higher in the enlisted spouses that tend to be of lower SES (Winegarner, 2015). This demonstrated that SES in the military population might also play a part in the active duty members. Therefore rank was collected as demographic statistic in this study since it is has been associated with income, education level, and housing allowance.

In Stephens' (2011) study, the variable of BMI was reviewed in military electronic medical records and found that 15% had a BMI of greater than 30 kg/m2, yet only about 16% had the diagnoses of obesity coded in their record. Hitchcock et al. (2010) looked at BMI recorded in the electronic medical record of veteran's and found that 20% of primary care patients did not have sufficient height or weight data to

calculate their BMI, and 72% of obese primary care patients did not have obesity diagnoses recorded when warranted. This variable was important to use in this study to not only determine the prevalence of overweight and obese in this Navy active duty population, but to also determine its recognition and treatment of overweight and obesity by providers serving the Navy active duty members. Therefore the study used BMI by asking for height and weight on participant's surveys and then the BMI was calculated by the researcher. In addition, this study used BMI documented in the electronic health records to determine the prevalence of overweight and obesity in the population. This allowed for a comparison of actual documented BMIs of the population to the self-reported height and weight for a calculated BMI by participants in the survey.

Due to the fact that Gregg II and Jankosky (2012) showed that BMI varies between different ship duties in the Navy and Jackson et al. (2013) showed a variation in Army leaders influence on eating and exercise in different environments (e.g. training versus operational), this suggests that work location may be a demographic variable that needs to be used for this study. This is also important since the Armed Forces Health Surveillance Center (2011) found healthcare workers to have a higher prevalence of being clinically overweight. As work location has been shown by Gregg II and Jankosky (2012) to affect weight, this study controlled for work location by collecting weight status only from active duty navy members assigned to the medical treatment facility. Active duty members that are not assigned to the location of the study were not used in the study.

Das and Evans (2014) looked at first year college students as they transition to an environment with different social and built environments, more lifestyle freedom, and changes in schedules to determine the effects on weight management. Das and Evans (2014) used the health belief model and found that the students' gender affected their perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, self-efficacy, and cues to action to toward weight issues. Not only is the age of first year college students similar to the military population entering the service for the first time; some of the changes in environment are similar, such as dorm or barracks living, new and stressful work hours, and new independent living that might affect weight management barriers. Therefore age and military rank were demographic variable included in the study. Military rank can be used in place of knowing living quarters, since housing allowance is based on a person's military rank.

Similar to the age and gender of individuals that were variables in Das and Evans' (2014) study, age and high risk populations were used in Spieker et al. (2015) that looked at three different high risk periods for unhealthy weight gain from birth to young adulthood, divided into pregnancy and early infancy, adolescence, and the first tour of duty after boot camp for early career. This showed that not only age but also transitional periods in life could affect one's ability to control weight. Again age was a variable pulled from the population's health records and well as asked in the survey. Not knowing about the potential high-risk period in individuals' lives may be a weakness of the study. There is no field in the electronic medical record that would pull the transition periods, and this was not asked on survey do to sensitivity. However, pregnancy status will be

asked on the survey, but pregnant active duty members will not be excluded from the data analysis.

Reyes-Guzman, Bray, Forman-Hoffman, and Williams' (2015) thirteen year perspective on active duty military overweight and obesity trends showed that age and gender were the strongest predictor of overweight and obesity across all branches of the military and will be the focus variables for this study. Kennedy-Armbruster, Evans, Sexauer, Peterson, and Wyatt (2013) studied Navy members over the age of forty that had more sedentary roles as their careers advanced to quantify the relationships among fitness, and sedentary time (sitting time), functional movement ability, and perceived and self-reported fatigue. They found that among the 690 participants that completed self-reported surveys and fitness tests that less sitting time was associated with less fatigue, and greater flexibility and strength as well as decreased waist circumference. Smith et al. (2012) also showed age and gender to be predictors of obesity and were included as independent variables. This study explored the use of CPGs among all age ranges of active duty Navy members to look for relationships between variables of CPG use and the members motivation to participate in weight management interventions.

Summary

Currently there is limited knowledge and information about support for weight management for active duty Navy members in the literature. This study used the social capital theory to support the relationship of the provider and their use of the CPG as a resource to the individual members and the community. The theory of social capital was used to determine if weight management interaction between provider and patient within

the military setting could increase not only individual's participation in healthy lifestyles and intervention, but also lead to greater community level health. The results from this study may help to determine if the provider is a link between the Navy members and the education and resources needed to motivate Navy members into action to make healthy lifestyle changes to maintain Navy weight standards. I studied the provider and the CPG as social capital sources and their effects on the member's participation and willingness to engage in weight management interventions and maintain Navy weight standards.

This study can provide additional knowledge about an understudied population and provide updated information on the prevalence of overweight and obesity among Navy members and their demographics. The use of CPG by the providers and their effects on the weight of this population may provide knowledge of the CPG effectiveness on weight management. It could also provide knowledge of how providers may be an active component in the individual and community toward building social capital toward a healthier lifestyle. Information learned from this study may help fill a gap in knowledge which could lead to positive social change within the community that could affect an individual's ability to maintain Navy weight standards, careers, and potentially lead to positive lifestyle changes. Chapter 3 will provide information about the study design, methodology, variables, data collection, and analysis.

Chapter 3: Research Method

Introduction

The purpose of this study was to determine if there is a correlation between the use of CPG by healthcare providers for overweight and obese Navy active duty personnel and the motivation these Navy active duty personnel have to participate in weight lose interventions to maintain Navy weight standards. This chapter will review the study's design and why it was selected. It will also describe the variables in the study and the sources the data came from to study these variables. It will provide a detailed description of the population of interest, and sampling strategies used to pull data from the secondary data sets. This chapter will explain how the data from various sources was gathered, complied, and prepared to analysis. Finally, this chapter will describe any threats to validity and how they were addressed along with explain any ethical concerns.

Research Design and Rationale

This quantitative study used secondary data analysis and a cross sectional survey design. Data from the MHSPHP tool was used to evaluate the last BMI documented for enrolled active duty military assigned to study location from time of study IRB approval in July 2017, to all data available prior to July 2017. This provided information on the current trends of overweight and obesity within the population of study. All active duty members received a request via email to participate in a health survey related to weight management, as well as a paper survey was available in weight management classes. The email and paper survey explained the purpose of the survey. If members elected to participate they went to the link provided and took the survey. The survey was intended

to be open for 60 days from time of initial IRB approval; in order to reach at least 200 participates. However, due to high response rate, the survey was closed on Day 37 with 352 complete and incomplete surveys. The survey was designed to evaluated weight management care provided from a patient perspective.

Methodology

Population

In terms of individual characteristics, the military as a whole is primarily young, with the average age between 28.6 and 32.1 years of age, male Caucasian, with less than one third of active duty members identifying as a racial minority (Redmond et al., 2015). Additional demographics for all military branches educational background is 79% having high school/GED/or some college, 11 % having a Bachelor's degree, and 7% having advanced degrees (Clever & Segal, 2013). Across all branches gender is approximately 84% male and 16% female (Demographics, 2015). Across all branches of the military Caucasian make up 68.7%, Black or African American make up 17.3%, Asian, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander members make up 4.2%, 1.3%, and 1.1%, respectively, and 3.2% report themselves as multiracial (Demographics, 2015).

The community of interest in this study is active duty members at a Naval medical center on the east coast. This community is largely made up of medical personnel that support Marine units and their families. The population demographics come from a MHSPHP app, known as Care Point, used to manage the health of the enrolled patient populations (Care Point, 2017). Per the MHSPHP on July 16, 2017, the population used

for this study included 2,036 active duty Navy members. The gender for this population was 1,607 males and 473 females. Therefore, the population from which the sample came from already had a higher percentage of females at 23% when the military's average is only around 16% (Demographics, 2015). This may be due to the area being a medical community where more females serve in military roles. The largest age group in this population is 18-39 years of age, but this included all active duty and their family members (Care Point, 2017). This study only looked at the age of the active duty members.

In 2012, obesity across the Navy was 13.6% (Lennon, Oberhofer, & McQuade, 2015). The most recent data from the HRA found that Navy wide the current BMI based on members self-reported height and weight classed 50.88% of members as overweight and 15.31% as obese according to the Centers for Disease Control and Prevention BMI standards (Navy and Marine, 2016). The population of interest for this study at Camp Lejeune was about 58% overweight based on a 2016 HRA that was done by 610 Navy active duty members at the Naval Hospital Camp Lejeune between January 1, 2016 to December 31, 2016 (HRA Commanding Officer Report, n.d.). The population of interest at Camp Lejeune had 1,863 active duty member that had a BMI in the system before Jun 2017, of which 867, or 46.53%, had a BMI greater than 25 kg/m2 and was considered overweight and 575, or 30.86%, had a BMI greater than 30 kg/m2 and was considered obese per review on July 2017 (Care Point, 2017). Therefore, the population of interest has a higher percentage of obese members then the Navy average of 15.31% (Navy and Marine, 2016).

Sampling and Sampling Procedures

The active duty members included in this study are stationed at a Navy military treatment facility command on the east coast. The location has a large diverse population in age ranges, race, educational levels, social economic status, and is a hospital setting with varies demanding duties and schedules. The population provides a mix of individuals that may represent the Navy as a whole. An updated demographic data pull was done as part of the descriptive statistics portion of the study, during the analysis of data.

This study used a cross sectional survey design with a convenience sample. This sampling strategy was selected based on the access to a Navy population on the east coast. Approximately 1,100-1,200 sailors complete their height, weight and fitness test every 6 months at the selected location, but the active duty enrollment pulled on 7/14/2017 was1,863 of which 480 or 34% were obese based on their BMI (Care Point, 2017). A limitation of the convenience sample is that the study's results may only show factors of health and weight management for east coast shore commands, but may not represent the west coast, sea commands, or overseas locations and populations. The descriptive statistics in the study described the population from which the participants are a part of and the descriptive statistics of the participants that took part in the survey. If the convenience sample does not result in a group comparable to the population as a whole, this might be a limitation of the study and prevent generalizability. While the sample for this study is being drawn from a diverse Navy location, it may still not represent the Navy as a whole, and those that participate in the survey may not be representative of the

local population and the health condition of obesity within the local population. At the time of the survey a convenience sample taken from approximately 1,863 active duty members with about 867 or 46.53% being overweight and 575 or 30.86% being were obese based on BMI (Care Point, 2017).

The sampling strategy used the MHSPHP tool that provides not only basic demographics of the population at the time of the data pull but can also be used to filter data into the variables of interest. For this step of the sample procedure, the information was filtered to look for only Navy active duty members with BMI entered into the system on or before June 1, 2017. This provided a pool of possible participants that were currently underweight, normal weight, overweight, or obese. All members were included into the study if they completed the survey, but the demographics for those with BMI less than 25 kg/m2 was explained in the descriptive statistics of the study. The study collected as many demographics from the MHSPHP tool for the descriptive section of the research design. The demographics in MHSPHP tool are entered into the system by the Navy's electronic health system. It has age, gender, and the BMI recorded from the last primary care visit. The study then used a survey design and reached all members via email and paper surveys.

Prior to conducting the sampling, it is important to determine the sample size. Using the Survey Monkey sample size calculator for a population size of approximately 600 obese members, confidence level of 95%, margin of error 5%, and normal distribution of 50%, the sample size needed would be 235 (Survey Monkey, 2016). All active duty members were asked to participate. It was expected that approximately 20%

or 200 participants were needed to complete the survey for a sample size. This study used the 321 surveys collected that were both complete and incomplete.

Data Collection

The archived data used for this study was collected during Navy member's visits to their providers, during their annual preventive health assessment, or during other primary care visits. Comparison of how provider's care affects Navy member's motivation to participate in weight management interventions was based on a motivational score calculated on participants completed survey score. The study participants must see a medical provider at least once a year during their birth month to complete all preventive health screenings and a self- HRA, this process is known as the member's PHA. The HRA is a database that can be used to pull information on this population. While the HRA database is required to be completed for annual PHA, not all commands or provider make members enter the HRA portion of the PHA into the computer system. Therefore, the HRA database may not have data on the whole population.

The process to assess the independent variable was started by retrieving data from the MHSPHP tool. This tool and database can be used to pull information out of a large amount of outpatient records and filter data to the needs of the user (Care Point, 2017). For this study the MHSPHP tool was used to filter down to only active duty Navy members with BMI in the system prior to June 1, 2017. The use of CPG was pulled from the participants reports on the survey of the care they received during their annual PHA visits or other primary care visits over the past year. This was done to see if overweight

or obese members were diagnosed, treated, or referred for weight management per the CPG. The age, gender, rank, ethnicity, marital status, and self-reported height and weight were collected from returned surveys and the BMI was calculated by members reported height and weight. If members elected to participate they went to the link provided in an email, read a consent form, and then preceded to survey. The survey was open for 36 days from time of initial email is sent to all active duty members for volunteer participation. A paper version of the survey was also available in weight management classes and placed in a secure locked box by participants during class. Personal identifiable information (PII) is available in the systems mentioned where the data was pulled from to identify possible participants for the survey. HIPAA training is required annually for all users of the systems and HIPAA training was current for all members retrieving information from the data sources. Data was exported to an Excel spreadsheet with all PII such as names, date of birth, social security numbers, and contact information removed before data was analyzed.

To gain access to this system as a researcher, it was required to have an educational partnership agreement between Walden University and Naval Medical Center Camp Lejeune for active duty Navy student to complete research toward requirements to fulfill PhD graduation requirements. I was required as a student to have a Navy researcher support this educational study and requirement to assist not only with access to the data bases, but also to assist with the Navy IRB process. This research completed not only the Walden IRB process, but also the Navy IRB process. My current role in the

Navy gives me access to the data to complete daily analysis, however, I obtained the necessary IRB approvals prior to using the systems for the intention of this research.

Operationalization

The survey used (Appendix A) was developed using demographic questions, questions on the use of CPG, and motivation questions used in prior research studies (Barnes et al., 2015; Brownell & Leemakers, 2004). Reliability and validity values for this tool were not available. The tool used questions from other research studies and questions from Navy weight management classes to determine readiness to change. The survey tested for the independent variables of age, gender, ethnicity, military rank, marital status, and CPG used from the participant's perspective. It also tested for the dependent variable of motivation for lifestyle change. The three sections of the survey were general demographics, questions on CPG, and motivation questions. The first section will be the demographics and include height, weight, age, gender, ethnicity, military rank, and marital status. The independent variables and the coding used are in Table 1. No PII was collected for the survey. However, the demographics of the respondents were compared to the overall demographics of the population using data pull from a secondary source that does contain PII. This system allows for data to be exported with all PII removed prior to the export. This was done in this study prior to exportation or storage of any data.

The second section of the survey looked at the independent variables by focusing on the CPG. The CPG use was tested with five questions used in Barnes et al., (2015) study on GPC adherence, which were based off of the National Institute of Health

guidelines. These guidelines are aligned with the VA/DOD guidelines used by military primary care providers. The survey asked yes or no questions for each element in the CPG (Department of Veterans Affairs, 2014):

1. Informed of being overweight or obesity,
2. Counseled on health risk related to weight,
3. Evaluated for family health history and effects of weight,
4. Ordered labs or evaluated for obesity related health conditions, and
5. If discussed weight loss plan or given weight loss referral.

These questions and the coding are in Table 1 separately, and then totaled to provide a total care score of 0-5. The last section of the survey determined the motivation level, the dependent variable in the study, using the Weight Loss Readiness Test II, used by Navy weight loss program Ship Shape to determine members motivation score (Brownell et al., 2004). While the Weight Loss Readiness Test II is 27 questions, only the five motivation questions use a Likert scale; 0- Not at all motivated 1- Slightly motivated 2- Somewhat motivated 3- Quite motivated 4- Extremely motivated, will be used to produce a score for the range of motivation seen in table 1. The five questions are:

1. Compared to previous attempts, how motivated are you to lose weight this time?
2. Compared to previous attempts, how motivated are you to change your eating habits this time?
3. Compared to previous attempts, how motivated are you to increase your physical activity this time?

4. How motivated are you to stay committed to a weight loss program for the time it will take to reach your weight loss goal?
5. How motivated are you to try new strategies/techniques for changing your eating, exercise, and other behaviors?

The surveys that were completed electronically were exported to an Excel spreadsheet at the end of the data collection period. The paper surveys had to be collected from the secured box and then manually entered into the spreadsheet. Both types of surveys were identified as either an electronic or written survey type. The main independent variable of interest was the use of CPG for treatment of overweight and obese Navy service members. Other independent variables used in this study were BMI, age, gender, ethnicity, military rank, and marital status. These were independent variables found to effect weight in prior studies discussed in Chapter 2, and/or are components of social capital, such as the rank and status within the community, and social support such as marital status. The descriptive statistics of the study showed both the eligible population demographics from secondary source and compared the data to the demographics of the Navy members that participated in the survey. The dependent variable for this study was the Navy member's motivation to participate in weight management interventions recommended by providers based on the CPG to maintain Navy weight standards. The dependent variable was evaluated by the patient's survey questions and motivation score provided from the Weight Loss Readiness Test II category 1: Motivation, in which the Navy already has permission to use for weight

management course and researcher had permission to use for this study (Brownell et al., 2004).

For this study, the demographics of the population were also treated as independent variables to look for a relationship with the dependent variable, the Navy member's motivation to act on and participate in weight management interventions to maintain Navy weight standards. The independent variable, treatment with or without CPG elements for overweight and obese members, was also studied for its relationship or correlation to Navy member's motivation to act and participate in weight management interventions to maintain Navy weight standards. The independent variables will include several demographics of the population such as BMI, age, gender, ethnicity, military rank, and marital status. The demographics used nominal and ordinal levels of measurements. It has been shown in prior studies that these variables can have a relationship to the outcome of weight management, but there are limited studies using these variables for Navy active duty member and their relationship to motivation to participate in weight management interventions. The CPG and treatment of overweight and obese service members was broken down into a nominal measurement for each of the five recommendations. The description of the study variables, level of measurement, and variable scale score is seen in Table 1.

Table 1
Variable Characteristics

Variable Type	Variables	Level of Measurement	Scale score
Independent Variable (Demographics)	BMI	Ratio	Descriptive Statistics
	Gender	Nominal	Male=1 Female=2
	Ethnicity	Nominal	African American=1 Hispanic= 2, Asian=3 Caucasian=4, Other=5
	Age	Ratio	Descriptive statistic Mean, median, mode
	Marital Status	Nominal	Married=1, Single=2 Separated=3
	Military Rank	Ordinal	E1-E4=1,E5-E9=2 O1-O3=3, O4-O9=4
Independent Variable (Treatment of obese members by patient reports) CPG elements	Informed of being overweight or obesity	Nominal	No=0, Yes=1
	Counseled on health risk related to weight	Nominal	No=0, Yes=1
	Evaluated for family health history and effects of weight	Nominal	No=0, Yes=1
	Ordered labs or evaluated for obesity related health conditions	Nominal	No=0, Yes=1
	Discussed weight loss plan or given weight loss Referral	Nominal	No=0, Yes=1
	Total Care Score	Ratio	0-5
Dependent Variable	Motivational Score	Ratio	0-20

Data Analysis Plan

For this study IBM SPSS version 21statistical software was used for data analyses. The data was entered into SPSS using the descriptions and codes listed in table 1. Chi square analysis was done on research questions that are looking for an association between variables. The Chi square was used to look at each independent variable and for an association on the dependent variable. A logistic regression analysis was performed for research questions that are looking for a relationship or correlation between variables. A multiple logistic regression was performed to determine if any of the independent variables act as predictive factors on the dependent variable of motivation to participate in weight management interventions. For all statistical analysis the statistical significance was based on a *p*-value of less than 0.05 to reject the studies null hypothesis. The research questions, hypotheses, and the statistical analysis used to answer the question are described.

RQ1: Is there a correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$1: There is no correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a1: There is a correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, and military rank.

For RQ1 each variable of BMI, age, gender, ethnicity, military rank, and marital status will be analyzed using the Pearson correlation to look for a correlation between the variables and the members reported care received in regards to weight management. The

RQ1 was related to the demographics of the population. Data retrieved from the MHSPHP tool provided the reader with the mean, median, mode, and standard deviation of each independent variable related to the characteristics of the population as a whole and the characteristics of the possible participants in the study. This was used to compare the summary of the population to the survey data received. Demographic information from the survey such as age, gender, ethnicity, military rank, and marital status were treated as independent variables, and inputted into SPSS using the coding listed in Table 1. A Pearson correlation tested if there is a correlation between age, gender, ethnicity, marital status, and military rank and Navy active duty member reported care and weight management education received at primary care visits.

RQ2: Is there a correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$2: There is no correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a2: There is a correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

Since RQ2 was also looking for a correlation between the independent variables and the dependent variable of categorical data a Pearson's Chi-square was used to look for the correlation. For RQ2 each demographic was tested to see is there is a correlation

with Navy member's motivation to take recommendations from providers that are based on the CPG and participate in weight management interventions to maintain Navy weight standards.

RQ3: Is there a correlation between reported obesity care and education provided during primary care appointment and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$3: There is no correlation between reported obesity care and education provided during primary care appointments and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a3: There is a correlation with reported obesity care and treatment provided during primary care appointments and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

For this research question I looked for which of the CPG elements used by the providers as reported by members correlates to Navy member's motivational score. It was also able to determine if a combination of the treatments and education used predict a higher motivational score.

RQ4: Is there a predictive value between Navy member's BMI, age, gender, ethnicity, military rank, marital status, and total care on motivation for weight control?

$H_0$4: There is no predictive value between Navy member's BMI, age, gender, ethnicity, military rank, marital status, and total care on motivation for weight control.

H_a4: There is a predictive value between Navy member's BMI, age, gender, ethnicity, military rank, marital status, and total care on motivation for weight control.

This research question will be used to determine if any individual characteristics or social factors predict level of motivation for change and weight management. Completing a multiple regression analysis using the independent variable of BMI, age, gender, ethnicity, military rank, marital status, and total care on the dependent variable of motivation to change was done.

Threats to Validity

This study used secondary data that controlled for some internal threats to validity such as participants history, loss of participants through mortality or dropping out of study, and maturation since this study is actually looking for change using a cross sectional design that limits the time frame from which data will be collected. This study limited the data collection using a survey design available for one to two months that asked about treatment they received for weight management over the last year. The one threat to external validity in a survey design is the response rate. A low response rate or high rate of non-responders with certain characteristics may limit generalizability (Frankfort-Nachmias & Nachmias, 2008). Prior to the survey it was unknown how many overweight and obese Navy members would have seen a provider that uses the recommended CPG. There is currently no research found in the literature review that has studied Navy provider's use of CPG to treat overweight and obese Navy members based

on reports of the patients. The use of a survey design may result in either a large or small sample size.

In every study there may be internal and external threats to validity. It is important to identify and control for known threats throughout the research process. As discussed in prior sections one external threat to this study will be comparing the population of the study to the population of the Navy active duty population as a whole. To prevent this threat, a large population was selected with approximately 2,000 Navy active duty members. The demographic of the Navy as a whole was compared to the sample population and the descriptive statistics will provide the reader knowledge on how the population of the Navy differs from the population of the sample. This will prevent generalizability to a population that does not look like the study group.

Ethical Procedures

This population has full medical coverage and electronic health records that track all primary and specialty care. This brings up a sensitive issue of privacy of their health records. This has been a concern for active duty members that seek care for other health issues such as for mental health concerns. Barriers to care have been related to confidentiality and fear of being labeled, negative impact on career, self-perceptions, and command climate or leaderships support to seek care (Dean & Mcneil, 2012). Failure to maintain weight standards can impact one's career and may have a stigma as a health issues that the member should have control of with self-discipline. It is for this reason that all precautions to protect the health information of the participants were taken, and all recommendation from the Navy Institutional Review Board (IRB) were followed.

Prior to starting any data pull from secondary sources or sending surveys, all methods of how data was to be pulled and how it would be stored was submitted to the Naval Hospital Camp Lejeune Institutional Review Board (IRB). Approval was received from Walden University IRB (#07-12-17-0349397) and the Navy IRB (#NHCL.2017.0006). Due to the nature and sensitivity of the health issue it was important to safeguard all medical information collected and to remove all patient identifiers prior to inputting information in the data analysis tool. No participant's personal identifiable information (PII) was asked on the survey. However in the data base that pulls information from the electronic health record, the researcher was able to see PII that is available. For this reason all PII was filtered out before exporting the data to an Excel spread sheet. The only information from the secondary data base exported was BMI, age, gender, and ethnicity. The information from the secondary database was only used to determine the demographics of the population of interest and to provide prevalence rates for overweight and obesity. The information pulled out of the secure database was kept in an H drive that only the researcher can access. The H drive can only be accessed by a military computer access card with the correct access code entered. Participant's data cannot be downloaded on to external hard drive or thumb drives of any kind, and will remain on government computer only, protected by firewalls. For this study all required HIPAA, cyber awareness and PII training was completed and kept up to date. In addition security clearance was maintained throughout the study, and all data collected will be kept secure for five years after the study.

For this study the location and participant's data was pulled from Naval Hospital Camp Lejeune Jacksonville, NC. As the researcher for this study all required research training courses were completed before any data was collected. All work for the study was done outside of normal working hours or during working hours with permission from command. This included evenings and weekends. Government computes at place of work were used, and no data with PII was removed from the work site.

Summary

This chapter reviewed the purpose of this study and expanded to cover the design, methodology, population, sampling, data collection, operationalization of variables, and concerns of threat to validity and ethical procedures. The next chapter will cover how the data was collected; describe any missing data and issues that developed during the data collection, and overall descriptive statistics from all records that met inclusion into the study. It will also describe any exclusion that was found during the data collection phase. It will provide an updated population size at time of data collection, sample size drawn, and the demographics of both the population and the sample collected. Chapter four will review the research questions and hypothesis and analyses the data results to look for a correlation between the independent and dependent variables describes in chapter three.

Chapter 4

Introduction

The purpose of this study was to learn about weight management care currently practiced and how it affects active duty Navy member's motivation for weight management or lifestyle changes using the social capital theory to determine independent variables of interest. The study looked at the links between members of a community and resources used to maintain a healthy lifestyle and at the care provided by healthcare providers to connect the community to other community resources to promote health.

This chapter will explain the demographics and descriptive statistics of the community taken from a secondary database that retrieves information from the electronic health record as well as from survey participants. The statistical analysis was completed using Chi-square and multiple logistic regression. The results can provide a better understanding of the correlation and relationship between treatment of overweight and obese active duty Navy members and the motivation to participate in healthy lifestyles to maintain lose or maintain a healthy weight.

Data Collection

For this study the data collected from the MHSPHP tool was done in July 2017. The population of study had 1,863 members (1,409 males and 454 females). The data collected for this population from MHSPHP found that the average BMI was 28%, with 46.54% of members considered overweight and 30.86% considered obese based on BMI (Care Point, 2017). In 2012, Lennon et al.'s study found that among all 313,513 Navy service members the rate of obesity was 13.6 % based on BMI and body fat (Lennon et

al., 2015). Females made up 24.37% of the participants that completed the survey for my study, which is higher than in the military's average, which is around 18% (Demographics, 2015). The average age of this study's population was 35, when the average age in the military is between 28.6 and 32.1 years of age (Redmond et al., 2015). Therefore, the population used in my study had a higher rate of obesity compared to the Navy as a whole, a higher percentage of females, and an older average age than the military's average age.

In addition to the secondary data pulled to define the population of the study as a whole, a survey with 43 questions consisting of demographics, reported past care received, and weight management readiness was sent to the population of interest via an all hands email to request active duty members to participate. At the same time, the survey was available in written form at a weight management class in July 2017. The electronic survey was sent out to all members of the community and requested that active duty member's review and complete voluntary survey. The survey was to run for 60 days after the initial email. It only ran for 37 days due to high response rate that surpassed the approved IRB number of 200. At 37 days, the survey had reached approximately 350 completed and partially completed surveys. At that time the survey was temporarily suspended, and IRB was notified. Approval to use all collected surveys was granted by IRB through a deviation form submission. The electronic survey had 279 completed and partially completed surveys where BMI could be calculated, and there were 17 written versions of the survey that were completed or partially completed where BMI could be calculated for a total of 296 surveys.

The survey allowed for more in-depth collection of demographics by asking questions about height and weight used to calculate BMI, age, gender, ethnicity, military affiliation, branch of service, military rank, and marital status. These variables were important to collect as factors that may increase or decrease one's social capital and lead to greater health through use of available resources. The demographics collected in the study were also used to determine if there was a difference in care reported based on social or cultural factors. Collecting responses on five motivation questions tested the dependent variable in the study. Using the social capital theory and Coleman's (1988) explanation of social capital theory, motivation for change found in this study may be a sign of increased social capital, through changes in relations among persons that facilitate the action and that building social capital through information sharing can lead to action (Coleman, 1988).

Results

The data collected and analyzed from MHSPHP was broken down to determine average age and gender in each weight category of underweight, normal weight, overweight, and obese, based on BMI. I was not able to collect any other demographic of the population of study such as ethnicity, military rank, or marital status with this data source. What I found in the secondary data was that in both men and women the mean age increased as the weight categories increased from under and normal weight to overweight and obese (Table 2). However, female's average age in each weight category was younger than males, showing females being overweight and obese at a younger age (Table 2). The secondary data did show the population used in the study had a lower

percent of females obese at 20.93% versus the percentage of the male population in the obese category at 34.07% (Table 2). This is consistent to a prior study found during literature review, in which Smith et al. (2012) found that military women had lower prevalence of obesity than their male counterparts, which is opposite of the civilian population where women have higher prevalence of obesity. This contradicts an Armed Forces Health Surveillance Center (2011) report that found females that had received at least one overweight/obesity-related diagnosis more than tripled and females had the highest prevalence of clinical overweight.

Table 2

Population Data

	Male (n = 1409)				**Female** (n = 454)			
BMI[a]	n	% total male	Mean age (yrs)	Mean BMI (kg/m^2)	n	% total female	Mean age (yrs)	Mean BMI (kg/m^2)
Underweight	5	0.35	30.40 (SD = 7.80)	8.16 (SD = 8.26)	2	0.44	27.00 (SD = 5.66)	17.88 (SD = 0.19)
Normal	233	16.54	32.98 (SD = 9.87)	23.15 (SD = 1.40)	181	39.87	30.94 (SD = 8.48)	22.45 (SD = 1.68)
Overweight	691	49.04	36.05 (SD = 9.94)	27.54 (SD = 1.35)	176	38.77	30.61 (SD = 8.79)	27.02 (SD = 1.22)
Obese	480	34.07	38.32 (SD = 9.39)	33.12 (SD = 2.62)	95	20.93	31.26 (SD = 9.24)	33.04 (SD = 2.52)

[a]Underweight = BMI ≤ 18.49 kg/m^2, Normal 18.5-24.99, Overweight 25-29.99, Obese ≥ 30

Descriptive Statistics of Electronic Survey Participants

The data collected was able to provide more descriptive statistics on the sample of the populations that completed the survey. There were 321 electronic surveys accessed, but only 279 had some or all questions completed. Out of the 279 surveys with data, only 241 were active duty Navy. The survey was designed to study the weight management care received and the motivation to change of active duty Navy only. Therefore, the descriptive statistics and analysis only looked at the 241 surveys completed by active duty Navy members.

For the electronic surveys, the average BMI was 26.92%, which is lower than the 28% BMI of the population as a whole. The number of survey participants with a BMI above 25 kg/m2 was 163 or 68% of the participants. The age of those completing the electronic survey was 32.06, which is younger than the average age of this studied population, which is 35, but within the average age range of the military, which is between 28.6 and 32.1 years of age (Redmond et al., 2015). The older average age in the studied population maybe related to the population being primary a medical professional community. The gender of the electronic survey participants was 53.2% male, 46.8% female, when the population from which the sample came from was around 23% females and the military's average around 16% female (Demographics, 2015). Again, the higher rate of female participants of the survey, and within the population of which the sample was drawn, may be related to the studies population was a military medical command, where more females may function in military roles.

The electronic survey ethnicity was 9.5% African American, 11.6% Hispanic, 5.0% Asian, 64.7% Caucasian, and 9.1% other. This is comparable to the ethnicity reported in the military with Caucasian make up 68.7%, Black or African American make up 17.3 %, Asian, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander members make up 4.2%, 1.3%, and 1.1 % respectively, and 3.2% reporting themselves as multi-racial (Demographics, 2015). The rank in those surveyed was E1-E4 36.1%, E5-E9 18.3%, O1-O3 22%, and O4-O9 23.2%. There was no rank information gathered from the population as a whole. The marital status of the

participants was 67.2% married, 27.8% single, and 4.1% separated. There was no information on the marital status of the population as a whole.

The independent variable of the use of CPG to identify and treat active duty members for weight concerns used five basic CPG recommendations: informed of being overweight or obesity, counseled on health risk related to weight, evaluated for family health history and effects of weight, ordered labs, or evaluated for obesity related health conditions, and discussed weight loss plan or given weight loss referral. The survey determined how many of the five recommendations were reported by the participants in the survey. The survey found 53.6% reported no CPG used, 23.7% reported one CPG used, 10.4% reported two CPG used, 4.1% reported three CPG used, 4.1% reported four CPG used, and 2.5% reported all five CPG recommendations were used (Table 3). The dependent variable in the survey was the motivation to change or participate in lifestyle change. The survey found 30.3% of participants had a low motivation to change, 39.4% had moderate motivation for change, and 30.3% had a high motivation to change (Table 4).

Table 3

Total Care Score

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	133	53.6	55.2	55.2
	1 CPG used	57	23.0	23.7	78.8
	2 CPG used	25	10.1	10.4	89.2
	3 CPG used	10	4.0	4.1	93.4
	4 CPG used	10	4.0	4.1	97.5
	5 CPG used	6	2.4	2.5	100.0
	Total	241	97.2	100.0	
Missing	System	7	2.8		
Total		248	100.0		

Table 4

Motivation Score to Change

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	73	29.4	30.3	30.3
	Moderate	95	38.3	39.4	69.7
	High	73	29.4	30.3	100.0
	Total	241	97.2	100.0	
Missing	System	7	2.8		
Total		248	100.0		

Descriptive Statistics of Written Survey Participants

The reason the electronic responses and written responses were separated for the descriptive statistics is that the written surveys were filled out by active duty members that had already been referred to a weight management program due to failing weight standards or physical fitness standards of the Navy. I expected their demographics might be different since they had already faced difficulties meeting weight or physical fitness standards. There were 17 participants of the written survey with the average BMI of 30%, average age was 25 years old, 41% female, 6% African American, 18% Hispanic, 12% Asian, 53% Caucasian, and 12% other. Since it was a Navy weight loss program, it was not surprising that 100% of the participants for the written survey reported they were active duty Navy members. For those that completed the military rank and relationship question, 71% were E1-E4, 24% were E5-E9, 41% were married, 47% were single, and 6% were separated. Overall, the written survey participants had a higher BMI, were younger, and there were no Navy officers in the written sample.

On the written version of the survey 76% reported seeing a provider in the last year and reported 12% of their primary provider and medical team had discussed health risks related to your weight such as blood pressure, cholesterol, heart disease, depression, arthritis, or sleep apnea, to name a few conditions that weight can affect. Based on care over the last year, 41% reported their primary provider or medical team asked questions related to their family health history, such as heart disease and diabetes, and the impact of weight on the disease process. In this survey, 6 % reported their primary provider ordered labs or evaluated them based on their weight to check for health conditions, 12 % reported their providers diagnosed them as overweight or obese based on their weight, and 18% reported their primary provider or health team had discussed a weight loss plan such as increased physical activity, decreased calorie intake, or health food choices, or provided a referral for nutritionist, weight program, or fitness plan. The participants' average motivation score was 10.47 meaning they fell within the range of being close to being ready to be in a weight loss program, but should find ways to increase motivation before beginning (Brownell &Hager, 2004). This means the written survey participants also fell in the moderate motivation to change category, which is the same as the electronic survey participants.

Statistical Analysis

RQ1: Is there a correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$1: There is no correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a1: There is a correlation between reported obesity care and education received and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

A positive correlation is significant at the 0.01 level between BMI in the obesity range and total care score at .238, and a positive correlation at .187 between age in years and total care score, and between Asian and total care score at .223 (Table 5). There were also negative correlations significant at the 0.05 level between Caucasians and total care score at -.145, and normal weight at -.163 (Table 5). There is no other significant correlation between other active duty demographic characteristics and their total care reported. The null hypothesis is rejected because there was a statistically significant correlation at $p < 0.01$ between BMI, age in years, Asians, and the total care reported. The null hypothesis was also rejected for the statistically significant negative correlations at the $p < 0.05$ for the independent variables of Caucasians, and normal weight. Social factors of rank, which is related to social economic status and marital status, were looked at to determine if there was a correlation between social factors and to test the social capital theory within this population. There was a positive correlation at the 0.05 level between E5-E9 military rank and total care score at .139 (Table 6). No other social factors correlated to total care received.

Table 5

Correlations Between Physical Characteristics and Total Care Score

		Total care score
Total care score	Pearson Correlation	1
	Sig. (2-tailed)	
	N	241
Age in years	Pearson Correlation	.187**
	Sig. (2-tailed)	0.004
	N	240
African American	Pearson Correlation	0.048
	Sig. (2-tailed)	0.460
	N	241
Hispanic	Pearson Correlation	-0.011
	Sig. (2-tailed)	0.867
	N	241
Asian	Pearson Correlation	.223**
	Sig. (2-tailed)	0.000
	N	241
Caucasian	Pearson Correlation	-.145*
	Sig. (2-tailed)	0.024
	N	241
Other	Pearson Correlation	0.036
	Sig. (2-tailed)	0.582
	N	241
Males	Pearson Correlation	0.043
	Sig. (2-tailed)	0.507
	N	241
Females	Pearson Correlation	-0.051
	Sig. (2-tailed)	0.434
	N	241
Normal WT	Pearson Correlation	-.163*
	Sig. (2-tailed)	0.011
	N	241
Overweight	Pearson Correlation	-0.039
	Sig. (2-tailed)	0.545
	N	241
Obese	Pearson Correlation	.238**
	Sig. (2-tailed)	0.000
	N	241

**. Correlation is significant at the 0.01 level (2-tailed.

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6

Correlations Between Social Characteristics and Total Care Score

		Total care score
Total care score	Pearson Correlation	1
	Sig. (2-tailed)	
	N	241
Married	Pearson Correlation	-0.008
	Sig. (2-tailed)	0.901
	N	241
Single	Pearson Correlation	0.018
	Sig. (2-tailed)	0.780
	N	241
Separated	Pearson Correlation	0.007
	Sig. (2-tailed)	0.916
	N	241
E1E4	Pearson Correlation	-0.095
	Sig. (2-tailed)	0.143
	N	241
E5E9	Pearson Correlation	.139*
	Sig. (2-tailed)	0.031
	N	241
O1O3	Pearson Correlation	-0.076
	Sig. (2-tailed)	0.239
	N	241
O4O9	Pearson Correlation	0.062
	Sig. (2-tailed)	0.339
	N	241
No care	Pearson Correlation	-.760**
	Sig. (2-tailed)	0.000
	N	241

**. Correlation is significant at the 0.01 level (2-tailed.

*. Correlation is significant at the 0.05 level (2-tailed).

RQ2: Is there a correlation between reported total motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$2: There is no correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a2: There is a correlation between reported motivation score to participate in weight management interventions and Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

There was a 0.171 positive correlation significant at the 0.01 level between obese and participant's motivation to change score (Table 7). There is a -0.220 correlation of significance at the 0.01 level between normal weight and motivation to change. The null hypothesis is rejected because there was a statistical significant correlation at $p < 0.01$ between obese and motivation score to change, and a negative statistically significant correlation at $p < 0.01$ between normal weight and motivation to change. There were no positive or negative correlations between participant's social characteristics of military rank or marital status on motivation for change (Table 8).

Table 7

Correlations Between Individual Physical Characteristics and Motivation Total Score

		Motivation Total score
Motivation Total score	Pearson Correlation	1
	Sig. (2-tailed)	
	N	241
Age in years	Pearson Correlation	.041
	Sig. (2-tailed)	.523
	N	240
African American	Pearson Correlation	.014
	Sig. (2-tailed)	.824
	N	241
Hispanic	Pearson Correlation	.038
	Sig. (2-tailed)	.561
	N	241
Asian	Pearson Correlation	.034
	Sig. (2-tailed)	.596
	N	241
Caucasian	Pearson Correlation	.012
	Sig. (2-tailed)	.856
	N	241
Other	Pearson Correlation	-.102
	Sig. (2-tailed)	.115
	N	241
Males	Pearson Correlation	-.111
	Sig. (2-tailed)	.086
	N	241
Females	Pearson Correlation	.115
	Sig. (2-tailed)	.076
	N	241
Normal wt	Pearson Correlation	-.220**
	Sig. (2-tailed)	.001
	N	241
Overweight	Pearson Correlation	.068
	Sig. (2-tailed)	.293
	N	241
Obese	Pearson Correlation	.171**
	Sig. (2-tailed)	.008
	N	241

**. Correlation is significant at the 0.01 level (2-tailed.

*. Correlation is significant at the 0.05 level (2-tailed).

Table 8

Correlations Between Individual Social Characteristics and Motivation Total score

		Motivation Total score
Motivation Total score	Pearson Correlation	1
	Sig. (2-tailed)	
	N	241
Total care score	Pearson Correlation	.188**
	Sig. (2-tailed)	.003
	N	241
Married	Pearson Correlation	.030
	Sig. (2-tailed)	.644
	N	241
Single	Pearson Correlation	.003
	Sig. (2-tailed)	.963
	N	241
Separated	Pearson Correlation	-.009
	Sig. (2-tailed)	.886
	N	241
E1E4	Pearson Correlation	-.015
	Sig. (2-tailed)	.820
	N	241
E5E9	Pearson Correlation	.106
	Sig. (2-tailed)	.102
	N	241
O1O3	Pearson Correlation	-.029
	Sig. (2-tailed)	.652
	N	241
O4O9	Pearson Correlation	-.035
	Sig. (2-tailed)	.585
	N	241
No care	Pearson Correlation	-.119
	Sig. (2-tailed)	.065
	N	241

RQ3: Is there a correlation between reported obesity care and education provided during primary care appointment and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status?

$H_0$3: There is no correlation between reported obesity care and education provided during primary care appointments and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

H_a3: There is a correlation with reported obesity care and treatment provided during primary care appointments and reported motivation score to participate in weight management when controlling for Navy member's BMI, age, gender, ethnicity, military rank, and marital status.

There is a 0.188 positive statistical significant correlation at the 0.01 level between total care score and motivation to change score (Table 8). The null hypothesis is rejected because there was a statistically significant correlation at $p < 0.01$ between total care received and motivation to change. Because RQ3 showed a positive correlation between reported care, based on the CPG, and the active duty navy members motivation to change score, additional statistical analysis was completed to look for predictive variables for motivation to change.

RQ4: Is there a predictive value between Navy member's BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control?

$H_0$4: There is no predictive value between Navy member's BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control.

H_a4: There is a predictive value between Navy member's BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control.

A multiple linear regression analysis was done and the independent variables of BMI (normal, overweight, obese) age, gender, ethnicity, rank, marital status, and total care received had an adjusted r^2 of .139 which means that the independent variables accounted for about 14% of the variability in the dependent variable of motivational score to make lifestyle change (Table 9). The ANOVA shows the Sig for the independent variables is .018 which is $p < .05$ and even $p < .01$ therefore the null hypothesis is rejected (Table 10). For RQ4 the null hypothesis was that there is no predictive value between BMI, age, gender, ethnicity, military rank, and marital status on motivation for weight control. The multiple linear regression analysis also showed that the independent variables had predictive value on the dependent variable. However, only being overweight or obese had a statistical significant predictive value at $p < .01$ (Table 11). The multiple linear regression analysis did not show total care score to have a predictive value on motivation to change (Table 11).

Table 9

Regression Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.373[a]	.139	.065	5.959	2.089

a. Predictors: (Constant), Obese, O4O9, Two CPG, Separated, Females, Three CPG, other, Four CPG, African, Single, Asian, One CPG, Five CPG, Hispanic, E5E9, O1O3, Overweight, Age in years, Males

b. Dependent Variable: Motivation Total score

Table 10

Regression ANOVA[a]

Model		Sum of Squares	*df*	Mean Square	F	Sig.
1	Regression	1260.304	19	66.332	1.868	.018[b]
	Residual	7812.429	220	35.511		
	Total	9072.733	239			

a. Dependent Variable: Motivation Total score

b. Predictors: (Constant), Obese, O4O9, Two CPG, Separated, Females, Three CPG, other, Four CPG, African, Single, Asian, One CPG, Five CPG, Hispanic, E5E9, O1O3, Overweight, Age in years, Males

Table 11
Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	6.586	2.976		2.213	.028	.721	12.451
	Age in years	.055	.068	.084	.812	.418	-.079	.189
	Caucasian	Reference						
	African American	-1.168	1.446	-.056	-.808	.420	-4.017	1.681
	Hispanic	-.327	1.350	-.017	-.242	.809	-2.987	2.332
	Asian	.977	1.913	.035	.511	.610	-2.793	4.747
	other	-2.540	1.444	-.119	-1.759	.080	-5.386	.306
	Married	Reference						
	Single	.676	.951	.049	.711	.478	-1.198	2.550
	Separated	-.411	2.008	-.013	-.205	.838	-4.369	3.547
	E1-E4	Reference						
	E5E9	.445	1.323	.028	.337	.737	-2.161	3.052
	O1O3	-.169	1.251	-.011	-.135	.893	-2.633	2.296
	O4O9	-1.157	1.696	-.079	-.682	.496	-4.499	2.185
	Males	-1.887	2.297	-.153	-.821	.412	-6.414	2.641
	Females	.730	2.297	.059	.318	.751	-3.796	5.257
	No CPG	Reference						
	One CPG	-.018	.962	-.001	-.019	.985	-1.913	1.877
	Two CPG	1.726	1.341	.086	1.287	.199	-.917	4.369
	Three CPG	2.684	2.022	.087	1.328	.186	-1.300	6.668
	Four CPG	1.187	2.076	.039	.572	.568	-2.903	5.278
	Five CPG	3.092	2.658	.079	1.163	.246	-2.147	8.331
	Normal	Reference						
	Over weight	3.137	.965	.255	3.249	.001	1.234	5.040
	Obese	4.383	1.263	.287	3.471	.001	1.894	6.872

a. Dependent Variable: Motivation Total Score

Summary

Secondary data collected from the MHSPHP tool that collects data from actual patient encounters and electronic medical record was analyzed to better understand the population of interest and the prevalence of overweight and obesity within the community. I looked at data from a quantitative survey, to determine the demographics and descriptive statistics of the participants of the survey to compare to the population as a whole. In the analysis I looked for correlation and predictive values among and between independent variables and the effect they had on the dependent variable of motivation to change. The data analysis found that being overweight and obese had the greatest predictive value on motivation to change, and found that the CPG or the care received did not have effect on the motivation to change. Based on the social capital theory individuals factors and resources, such as care provided, would have increase the motivation to change for the individual and improve social capital for individual and community. This chapter provided information about the population's demographics, participants' demographics, and current cares practices to gain knowledge of factors that may increase social capital among the study populations and to evaluate possible changes to increase social capital in the population in the future to improve health. Chapter 5 will review the findings of the study, identify limitations of this study, provide recommendations for future research and knowledge to address the health concern of overweight and obesity in our military population, and look at implementation of this study's findings.

Chapter 5

Introduction

Overweight and obesity is a chronic condition that affects many members of the Navy community and decreases physical and mental resiliency to the harsh work environments and schedules. This leads to the concern of military readiness for national defense and escalating cost of military health care due to injuries caused by excessive weight and long-term chronic health problem and comorbidities (Spieker et al., 2015). The purpose of this study was to learn about existing weight management care currently practiced and how it affects active duty Navy member's motivation for weight management or lifestyle changes. The data analysis completed looked for correlations between independent variables and the dependent variable as well as predictive value of the independent variables on the dependent variables. The analysis found there was a positive correlation between obesity, age in years, Asian ethnicity, military rank of E5-E9, and care reported. I found a correlation between obesity and motivation to change lifestyle to maintain weight and found a correlation between total care reported and motivation to change lifestyle to maintain weight. A multiple linear regression was completed and only showed overweight and obesity to have statistical significant predictive value on motivation to change. The multiple linear regression analysis did not find total care reported to predict motivation for lifestyle to maintain weight.

Interpretation of the Findings

RQ1 focused on active duty Navy members perceived care provided by Navy providers in regard to weight management using survey questions based on CPG to see if

there were any correlations between individuals' characteristics or social factors and the care they reported. This was used to determine if there were any possible disparities in care among active duty Navy members. This study may show that among active duty Navy members, the care they perceive in regard to weight management is equal across the community. There was a positive correlation between being Asian and receiving weight management care, and a negative correlation between being Caucasian and reports of weight management care. Statistical analysis did not look at BMI differences between ethnic groups. It was not determined if the correlation was related to different BMI among ethnic groups and cannot determine disparity in care. RQ2 only found that obese participants in the study had a correlation with motivation for change and participate in lifestyle and weight management interventions; no other individual characteristics correlated with motivation for change. For RQ3, there was a statistically significant correlation of $p < 0.05$ level between the participants reported total care score and the motivation to change score (Table 6). However, when a multiple logistic regression was run to determine predictive value of the independent variables on the dependent variable of motivation for change, the CPG and total care score had no predictive value for motivation to change.

Several findings in this study may lead to areas of improvement in weight management practices within the active duty military community. Over 53% of active duty Navy members reported no CPGs were used during their primary care visits, and only 2.4% could recall all five elements of care being completed during their visits. This finding is consistent with the low reported use of CPG found in the literature review on

current overweight and obesity treatment and could be explained as the result of recall bias. The literature included both quantitative and qualitative studies that explored providers use and documentation of CPG to diagnose, educate, and make referrals for patients with high BMI across several different civilian and military populations that included both adult and children obesity studies (Bennett, Gudzune, Appel, & Clark, 2014; Farran et al., 2013; Findholt et al., 2013; Lugtenberg et al., 2011; Noel et al., 2010; Stephens, 2011; Warner et al., 2008). Further research is needed to determine if active duty Navy members are receiving the care recommended by the CPG in regard to overweight and obesity concerns. If further research determined low rates of CPG implementation, education to providers may improve the percentage of active duty members receiving the health care and education needed to address overweight and obesity concerns.

Based on a social capital approach to look for motivation to change factors, this study found that for individuals, that participated in the survey, obesity was the most predictive values toward change, and the role of the provider or the care received did not affect individual motivation to change to promote individual health and overall improved health of the community.

Limitations of the Study

There were some limitation and concerns noted in Chapter 1. One limitation was that a survey design might have a low response rate and limiting generalization to the general population. It was predicted for this study that a 20% of the total 2,000 in the population would need to complete the survey for generalization of results to population

from which sample was obtained. The survey design was able to collect over 350 surveys, but the active duty member population for which the survey was intended completed only 241. This however did meet the generalization threshold of 20% or 200 surveys for the study.

Another concern noted prior to the study is that the nonresponders to the survey may differ from the population from which the survey sample was drawn. The descriptive statistics in chapter four compared the population from which the sample was has drawn to the participants of the survey and found a representative sample was achieved. Prior to the study the concern was that the survey would not reach the intended members or those weight management concerns, or those with weight management concerns might be less likely to complete the survey. There was concern that self-reported BMI would not compare to the population BMI that were taken from actual patience encounters and stored in the secondary database. However, 163 or 68% of the participants had a BMI above 25 kg/m^2. The population from which the participants came from had 77% of the population with a BMI above 25 kg/m^2 (Care Point, 2017). The respondents in the survey had a lower BMI average of 26.92 kg/m^2 verses 28 kg/m^2 BMI of the population as a whole. This may have skewed the outcome as those closer to a normal BMI of 25 kg/m^2 may be less likely to implement or have the motivation to change. In addition to BMI correlating with motivation to change, other factors that might limit the BMI calculated in this study is that it was calculated on self-reported height and weight. The BMI of the participants of the survey was lower at 26.92% compared to 28% BMI of the population as a whole. The BMI of the population was calculated with actual height and weight

taken during prior medical visits. Therefore, either participant could have underreported their actual height and weight or the respondents of the study on average had a lower BMI.

Recall bias was also a concern prior to the use of a survey design, but this study found the self-reported care based on the CPG were consistent with prior studies that used chart audits to determine use of CPG by providers in practices outside of Navy medicine. This study relied on participant's recall of care they had received over the last year related to their weight. Overall, the care reported for each CPG was low, with 53.6% of participants reporting they did not recall any of the CPG used to address weight during their primary care visits. However, there was a positive correlation between BMI in the obesity range and total care score. This may suggest that participants with higher BMI did receive more care in line with the suggested CPG.

There were limitations found or encountered throughout the research process. One limitation in regard to ethnicity is that the survey allowed participants to select more than one ethnicity. When data was reviewed and coded, those that selected more than one ethnicity had to be coded as other. This may have not been what the participants intended when self-reporting their ethnicity. It may have been that members identified with one race more than another, but there was no way for me to determine which race. For this reason, all members that selected multiple races were coded as other.

Recommendations

Recommendations for future research, include a qualitative study to address feeling or perceptions of the care delivered to look at the quality of care, would provide

additional understanding of how weight management is treated and received by active duty Navy members. The use of qualitative data could ensure the voice of the population and what they actual experienced when interacting with providers and discussing weight management. In addition, future survey designs should limit participants to selecting only one ethnicity or selected other. This would eliminate researcher confusion as to which ethnicity the participant most identifies with. This would help provide a clearer picture of the participant's demographics to compare to the population demographics.

Since BMI did correlate with motivation to change, future research should consider only looking at those that are considered overweight or obese and how it effects their reporting of care and their motivation scores; one possible why to do this would be to exclude Navy members with normal BMI to better understand the correlation between BMI and motivation to change and collect a more accurate BMI of the participants. Another option would be to use actual height and weight collected during a Navy bi-annual body composition assessment (BCA), and for members with a high BMI, research their experience with weight management using both quantitative and qualitative methods.

Implications

There are several potential contributions to weight management knowledge in the Navy active duty population this study may impact. First it is unknown what percentage of Navy providers follows the CPG for overweight and obesity when seeing a patient for their annual health assessment or other primary care visits. Knowing if there is a low or high percentage of the CPG usage may help determine if provider training on the

overweight and obesity guidelines is needed, or if there is a need to training on communication with patients. Second, there has been no research currently found that determines the effectiveness of the current CPG for weight management in this population.

The knowledge gained from this study may lead to improved education and training for providers caring for overweight and obese service members, or may show the need for changes in communication to build trust and increase social capital for members to participate in recommended programs and resources to help members reach their weight goals. A correlation between providers use of CPG to treat overweight and obese service members and a positive outcome on members motivation to maintain Navy weight standards may lead to a positive social change as knowledge is gained on the importance of the provider's role in addressing weight management issues and using the CPG. Positive social change may come in the form of lower cost to the nation for national defense through increased retention of highly trained members, decreased chronic health conditions, lower cost of military health care, and more fit Navy force. Changes in provider's treatment for overweight and obese members may lead not only to a healthier active duty Navy population, but in the long run may also affect the care for their families and their communities.

Positive Social Change

This study aimed to find personal characteristics, social factors, current policies in place, and current care practices in regards to weight management and healthy lifestyle among active duty Navy member and their community. The principles of the social

capital theory from Putland et al. (2013) were used to look at policy and focus on what could be done at both an individual and an organizational level to improve the health of a population. The literature review covered current Navy policies and regulation to address weight management at the primary care level. The study used secondary data to understand the population's demographics as a whole and was designed to understand personal and social characteristics and the relationship to motivation for weight management and healthy lifestyles. At the community level, this study looked at the policies and use of CPG as the standard of care in a population that has full medical access and values health as a means to complete its mission.

The implications for positive social change are a greater understanding of how the principles of social capital theory, both individual and social factors, policies, and current practice may lead an individual, the community, or both to action and promote a healthier active duty population. At the time of this study the CPGs were the recommended standard of care, but limited use of CPG among Navy providers was found based on Navy service member's perception of care. This study showed a correlation between CPG used for weight management and active duty Navy members' motivation for change, but not a predictive value on level of motivation for change. This may lead to a review of the Navy's policies and recommended care for overweight and obese active duty members. The positive correlation between Navy providers use of CPG to treat overweight and obese service members and a positive outcome on members motivation to maintain Navy weight standards, shows the importance of the provider's role in addressing weight management issues. Navy leadership and Navy providers' full support

and use of CPG for overweight and obesity care among active duty may lead to higher motivation to maintain a healthy weight and healthy lifestyle. Positive social change may lead to better patient and provider coordination of care for weight management, and a higher motivation for weight control among active duty members could lead to decreased chronic health conditions, lower cost of military health care, and a more mentally and physically fit Navy force.

Conclusion

To date, no study has been conducted that looks at the outcomes and effects of using CPG in regards to weight management from an active duty Navy service members perspective. This study was important to look at the communication between Navy providers that provided care to the active duty Navy service members and the active duty members to determine if the messages providers are sending about the importance of weight management are received. It looked at the relationship between Navy provider and Navy service member to determine if there is a correlation and potential to improve motivation to lead to healthy lifestyles and weight management. Prior studies used either carefully controlled trials with highly motivated subjects or a focused evaluation of CPG usage by chart audits of patient encounters. Past studies found a low rate of documentation of recognition, diagnosis, and treatment of weight related concerns (Barnes et al., 2015; Farran et al., 2013; Noel et al., 2010; Stephens, 2011).

This study's results appear consistent with the prior studies that used the chart audit approach to determine use of CPG for weight management. Similar to those prior studies, this study found low use of CPG through member's perception and reports.

Despite the growing emphasis on quality indicators, there is limited research on Navy providers in primary care use of CPG to recognize and treat active duty Navy service members health concerns of overweight and obesity. This is consistent with local policies seen in the Navy's population health indicators in that the Navy does not track overweight and obesity data as a quality measure of provided healthcare at this time. In order to ensure a fit fighting force, the Navy must make this a priority quality care measure. Weight management issues often are a precursor to many of the chronic conditions that we track as quality measures, such as diabetes. If healthcare providers could shift focus to conditions such as overweight and obesity before these chronic health conditions set in, the U.S. could maintain a more ready force, decrease government spending on military healthcare, and improve the health and longevity of those that have given all they have to protect the nation.

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Appendix A: Survey

Weight Management treatment received in Primary Care
The purpose of this study is to evaluate how Navy service members report treatment related to their weight, and if the care provided by their primary care providers motivates them to participate in weight management interventions and lifestyle changes.

INFORMATION SHEET FOR VOLUNTARY PARTICIPATION IN A SURVEY at Naval Medical Center Camp Lejeune
Please read this form carefully. Take time to ask the study doctor or study staff as many questions about the study as you would like. If there are any words or information that you do not understand, the study doctor or study staff will explain them to you. Reading this form and talking to the study doctor or study staff may help you decide whether to take part or not. Before you take part in the research study, you must sign the end of this form.

Study Title:
You have been asked to voluntarily participate in a questionnaire entitled NHCL.2017.0006 "*Primary Providers Treatment for Overweight Navy Members and the Effect on Motivation for Lifestyle Changes*" being conducted at the Naval Hospital Camp Lejeune by medical researchers from the Directorate of Public Health.

Why Is This Study Being Done?
The purpose of this study is to evaluate how Navy service members report treatment related to their weight, and if the care provided by their primary care providers motivates them to participate in weight management interventions and lifestyle changes.

Why Are You Being Asked To Take Part?
You are being asked to take part in this study because you are a Navy active duty service member who must meet weight standards and maintain fitness to meet physical and mental challenges of military service. This study can be used to better understand an active duty member's motivation in regards to weight management issues in relationship to the reported care they receive in the primary care setting in regards to weight management. This may lead to future research to improve weight management resources, education, and treatment options within the active duty's primary care clinics and lead to better collaborative efforts to address this health concern.

What Is Involved In This Study?
If you choose to take part in this study, you will complete a survey that will ask general questions about your height, weight, age, gender, race, military rank, and marital status. There will be no personal identifiable questions asked. In addition, questions will pertain to the care you have received from your primary care providers and health care team over the last year, and your motivation for weight management.

How Many People Will Take Part In This Study?
A total number of approximately 250 subjects are expected to participate in this survey.

How Long Will You Be In This Study?

To participant in the survey you will need to plan on approximately 20 minutes to review the information form and either complete the paper form or use the electronic link to the survey found in the email. This study includes only those people who choose to take part. You can skip any questions you are unsure of or uncomfortable with. You may exit out of the survey at any time prior to submission if you are taking the electronic survey. If you have been given the paper survey form during your fitness enhancement programs (FEP), dietitian appointments, ship shape classes, or simply fit class you can choose to complete, answer what you feel comfortable answering, or choose not to turn in the survey at all.

When Should You Not Take Part?

If you meet any of the following you should not take part in this study: If you have NOT had a medical appointment with your primary care provider or received care in the military system within the last year or are not currently a Navy active duty member, your survey responses will not be calculated and included in the study.

What Are The Risks Of The Study?

The risks and side effects related to the survey used in this study may include:

Rare

- Questions that may be sensitive in nature. The questions used in the survey have all been used in prior studies without known **psychological distress.** Surveys are at risk for loss of confidentiality. All measures have been taken to secure confidentiality of survey answers by asking no personal identifiable information, and using broad categories for individual characteristics. The electronic version will be completed through a link outside of the command tracking capabilities. Paper forms of the survey will be dropped into closed containers which will only be opened only by members of the research team.

Are There Benefits To Taking Part In This Study?

If you agree to take part in this study, there will be no direct benefits to you. The goal is that the information learned from this study will benefit our Navy weight management programs, resources and education in the future here at Naval Hospital Camp Lejeune and possibly Navy wide.

What about Confidentiality?

We plan to hold all health information in strict confidence, but we cannot guarantee absolute confidentiality. Your survey answers, which contain no personal identifiable information, may be disclosed if required by law. Authorized personnel from (the Institutional Review Board, Department of the Navy, and Department of Defense may have access to your survey questions that you submit, including verification that your rights have been safeguarded.

Privacy Act Statement

In accordance with the Privacy Act of 1974 (Public Law 93-579), this notice informs you of the purpose of this form and how it will be used. Please read it carefully.

1. Authority. Public Law 104-191; E.O. 9397 (SSAN); DoD 6025.18-R.

2. Purpose. Medical research information will be collected to enhance basic medical knowledge or to develop tests, procedures, and equipment to improve the diagnosis, treatment, or prevention of illness, injury, or functional impairment. This form is to provide the Naval Hospital Camp Lejeune/TRICARE Health Plan with a means to request the use and/or disclosure of your protected health information.

3. Use. To any third party or the individual upon authorization for the disclosure from the individual for: personal use; insurance; continued medical care; school; legal; retirement/separation; or other reasons.

4. Disclosure. Voluntary. Failure to sign the authorization form will result in the non-release of the protected health information. This form will not be used for the authorization to disclose alcohol or drug abuse patient information from medical records or for authorization to disclose information from records of an alcohol or drug abuse treatment program. In addition, any use as an authorization to use or disclose psychotherapy notes may not be combined with another authorization except one to use or disclose psychotherapy notes.

HIPAA: Release Authorization

a. You have the right to revoke this authorization at any time. Your revocation must be in writing and provided to the facility where the research is being conducted. You are aware that if you later revoke this authorization, the research facility may have used and/or disclosed your protected information on the basis of this authorization.

b. If you authorize your protected health information to be disclosed to someone who is not required to comply with federal privacy protection regulations, then such information may be re-disclosed and would no longer be protected.

c. You have a right to inspect and receive a copy of your own protected health information to be used or disclosed, in accordance with the requirements of the federal privacy protection regulations found in the Privacy Act and 45 CFR 164.524.

d. The Military Health System (which includes the TRICARE Health Plan) may not condition your treatment in MTFs/DTFs, payment by the TRICARE Health Plan, enrollment in the TRICARE Health Plan or eligibility for TRICARE Health Plan benefits on failure to obtain this authorization. (i.e. The MHS may not alter, deny, or make your legal entitlement to benefits a condition of your participation in this study or your decision to provide consent to use your protected health information).

By signing this consent, you are authorizing NH Camp Lejeune to obtain and release the information as described in this consent form. You have the right to refuse to sign this permission form.

5. Disclosure. All information contained in this Consent Statement or derived from the medical research study described herein will be retained permanently at Naval Hospital

Camp Lejeune and salient portions thereof may be entered into your health record. You voluntarily agree to its disclosure to agencies or individuals identified in the preceding paragraph. You have been informed that failure to agree to such disclosure may negate the purposes for which the research study was conducted.

Will You Get Paid For Participation?
You will not be compensated for your participation in this study.

What Are Your Rights As A Participant?
Your participation in this study is voluntary and your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled under applicable regulations. If you choose to participate, you are free to withdraw from the survey at any time prior to submitting the on line survey or written version of the survey.
If you do not complete or submit your survey, your data will not be included in the data analysis for this study.
Who Can You Call If You Have Questions Or Concerns About This Study?
If you have any questions regarding this research project, you may contact CDR Misty Scheel
If you feel you have suffered an injury as a result your participation in this research project or if you have any questions regarding your rights as a research subject at Naval Hospital Camp Lejeune, you can contact the Department Head, Clinical Investigations, the Chair, Institutional Review Board at Naval Medical Center Portsmouth, or the Head, Clinical Investigation Department at Portsmouth.

There are 43 questions in this survey

Demographic						
1.	Have you seen your primary provider or their healthcare team any time in this past year?				☐ Yes	☐ No
2.	What is your height in inches? (please answer in inches, there are 12 inches in a foot)				inches	
3.	What is your weight in pounds?				Lbs	
4.	Age in years?					
5.	Are your currently pregnant?				☐ Yes	☐ No
6.	Gender				☐ Female	☐ Male
7.	Ethnicity					
	☐ African American	☐ Hispanic	☐ Asian	☐ Caucasian	☐ Other	☐ Other:
8.	Military Affiliation	☐ Active Duty	☐ Dependent	☐ Retiree		

	☐ Government Employee	☐ Contract Employee	☐ Reserve	☐ Other:	
9.	Branch of Service (please choosae **all** that apply)				
	☐ Navy	☐ Army	☐ Marine Corps	☐ Air Force	☐ Coast Guard
10.	Military Rank Range				
	☐ E1 –E4	☐ E5 – E9	☐ WO1 - WO3	☐ O1 –O3	☐ O4 - 09
11.	Marital Status	☐ Married	☐ Single	☐ Separated	

Care Received: The next set of questions is about the care you have received over the past year in regards to weight management.

12.	Over the last year has your primary provider and medical team discussed health risks related to your weight such as blood pressure, cholesterol, heart disease, depression, arthritis, or sleep apnea to name a few conditions that weight can effect?	☐ Yes	☐ No
13.	In the last year has your primary provider or medical team asked you questions related to your family health history such as heart disease and diabetes and the impact of weight on the disease process?	☐ Yes	☐ No
14.	In the last year has your primary provider ordered labs or evaluated you based on your weight to check for health conditions?	☐ Yes	☐ No
15.	Over the last year has your Primary Provider diagnosed you as overweight or obese based on you height and weight?	☐ Yes	☐ No
16.	In the last year has your primary provider or health team discussed a weight loss plan such as increased physical activity, decreased calorie intake, or health food choices, or provided referral for nutritionist, weight program, or fitness plan? *	☐ Yes	☐ No

Motivation: Please answer the following questions on how ready you are at this time to start a weight management lifestyle change.

17.	Compared to previous attempts, how motivated are you to lose weight this time? Please choose **only one** of the following:				
	☐ Not at all motivated	☐ Slightly motivated	☐ Somewhat motivated	☐ Quite motivated	☐ Extremely motivated
18.	Compared to previous attempts, how motivated are you to change your eating habits this time? Please choose **only one** of the following:				

	☐ Not at all motivated	☐ Slightly motivated	☐ Somewhat motivated	☐ Quite motivated	☐ Extremely motivated
19.	Compared to previous attempts, how motivated are you to increase your physical activity this time? Please choose **only one** of the following:				
	☐ Not at all motivated	☐ Slightly motivated	☐ Somewhat motivated	☐ Quite motivated	☐ Extremely motivated
20.	How motivated are you to stay committed to a weight loss program for the time it will take to reach your weight loss goal? Please choose **only one** of the following:				
	☐ Not at all motivated	☐ Slightly motivated	☐ Somewhat motivated	☐ Quite motivated	☐ Extremely motivated
21.					
	How motivated are you to try new strategies/techniques for changing your eating, exercise, and other behaviors? Please choose **only one** of the following:				
	☐ Not at all motivated	☐ Slightly motivated	☐ Somewhat motivated	☐ Quite motivated	☐ Extremely motivated

Expectations: Please answer the following questions on expectations. 0=very unrealistic, 1=somewhat unrealistic, 2=moderately unrealistic, 3= somewhat realistic, 4=very realistic

22.	Think honestly about how much weight you hope to lose and how quickly you hope to lose it. Figuring a weight loss of one to two pounds per week, how realistic is your expectation? Please choose **only one** of the following:				
	☐ 0 Very unrealistic	☐ 1 Somewhat unrealistic	☐ 2 Moderately unrealistic	☐ 3 Somewhat realistic	☐ 4 Very realistic
23.	How satisfied would you be if you achieved a 10% weight loss? Please choose **only one** of the following:				
	☐ 0 Very unrealistic	☐ 1 Somewhat unrealistic	☐ 2 Moderately unrealistic	☐ 3 Somewhat realistic	☐ 4 Very realistic
24	If you achieved a 10% weight loss that significantly improved your health, how				

.	satisfied would you be? Please choose **only one** of the following:				
	☐ 0 Very unrealistic	☐ 1 Somewhat unrealistic	☐ 2 Moderately unrealistic	☐ 3 Somewhat realistic	☐ 4 Very realistic
25.	If you achieved a 10% weight loss that significantly improved your quality of life, how satisfied would you be? Please choose **only one** of the following:				
	☐ 0 Very unrealistic	☐ 1 Somewhat unrealistic	☐ 2 Moderately unrealistic	☐ 3 Somewhat realistic	☐ 4 Very realistic
Confidence: When answering next set of questions, consider all outside factors at this time in your life (the stress you're feeling at work and/or home, your obligations, etc.).					
26.	People who want to achieve long-term weight control need to spend time every day trying to change their eating, exercise, and thinking habits. You probably know the time and commitment necessary for you to be successful. How confident are you that you can devote this amount of effort, both now and over the next few months? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
27.	How confident are you that you will be able to attend program meetings regularly or (if you're not in a formal program) follow your own program regularly? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
28.	How confident are you that you will be able to record everything you eat and drink, and your exercise, most days of the week? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confiden	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident

		t			
29.	How confident are you that you will be able to change your eating habits? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
30.	How confident are you that you will be able to work regular physical activity into your daily schedule? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
31.	How confident are you that you will be able to exercise at least five days per week, most weeks? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
32.	How confident are you that you will be able to maintain your healthy eating habits for one year or longer? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
33.	How confident are you that you will be able to continue exercising regularly (at least five days per week) for one year or longer? Please choose **only one** of the following:				
	☐ 0 Not at all confident	☐ 1 Slightly confident	☐ 2 Somewhat confident	☐ 3 Quite confident	☐ 4 Extremely confident
Hunger and Eating Cues					
34.	When food comes up in conversations or in something you read, do you want to eat even if you are not hungry? Please choose **only one** of the following:				

	☐ 0 Never	☐ 1 Rarely	☐ 2 Occasionally	☐ 3 Frequently	☐ 4 Always
35.	How often do you eat because of physical hunger? Please choose **only one** of the following:				
	☐ 0 Never	☐ 1 Rarely	☐ 2 Occasionally	☐ 3 Frequently	☐ 4 Always
36.	Do you have trouble controlling your eating when your favorite foods are around the house? Please choose **only one** of the following:				
	☐ 0 Never	☐ 1 Rarely	☐ 2 Occasionally	☐ 3 Frequently	☐ 4 Always
Binge Eating and Purging					
37.	Aside from holiday feasts, have you ever eaten a large amount of food rapidly and felt afterward that this eating incident was excessive and out of control? Please choose **only one** of the following:			☐ Yes	☐ No
38.	If you answered yes to question above, how often have you engaged in this behavior during the last year? Please choose **only one** of the following:				
	☐ 0 Less than once a month	☐ 1 About once a month	☐ 2 A few times a week		
	☐ 3 About once a week	☐ 4 About three times a week	☐ 5 Daily		
39.	Have you ever purged (used laxatives, diuretics, or induced vomiting) to control your weight? Please choose **only one** of the following:			☐ Yes	☐ No
40.	If you answered yes to last question, how often have you engaged in this behavior during the last year? Please choose **only one** of the following:				
	☐ 0 Less than once a month	☐ 1 About once a month	☐ 2 A few times a week		
	☐ 3 About once a week	☐ 4 About three times a week	☐ 5 Daily		

Emotional Eating					
41.	Do you eat more than you would like to when you have negative feelings, such as anxiety, depression, anger, or loneliness? Please choose **only one** of the following:				
	☐ 0 Never	☐ 1 Rarely	☐ 2 Occasionally	☐ 3 Frequently	☐ 4 Always
42.	Do you have trouble controlling your eating when you have positive feelings – do you celebrate feeling good by eating? Please choose **only one** of the following:				
	☐ 0 Never	☐ 1 Rarely	☐ 2 Occasionally	☐ 3 Frequently	☐ 4 Always
43.	When you have unpleasant interactions with others in your life, or after a difficult day at work, do you eat more than you would like? Please choose **only one** of the following:				
	☐ 0 Never	☐ 1 Rarely	☐ 2 Occasionally	☐ 3 Frequently	☐ 4 Always

Submit your survey.
Thank you for completing this survey.