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SOCIODEMOGRAPHIC FACTORS AMONG VETERANS RECENTLY SEPARATED
FROM THE MILITARY: EFFECT ON USING ALTERNATIVE MEDICINE

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ABSTRACT

Complementary and Alternative Medicine (CAM) is a form of care not typically seen as conventional medicine. It includes more holistic treatment approaches like acupuncture, yoga, or chiropractic care. This form of care avoids the possible side effects that are typically seen with conventional medicine. CAM has been growing in use in the general population, but is less studied in individuals who just separated from the military, although they are more likely to be suffering from illnesses ranging from chronic care to mental illnesses, conditions where CAM is often used. The purpose of this thesis is to study CAM use among veterans using data from The Veterans Metrics Initiative and determine if there are any significant relationships between its use and different sociodemographic factors. A summary of the literature, a statistical analysis of recent survey of veterans, and a discussion of the findings, including the limitations of the study, will be presented.

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Chapter 1

Introduction

When thinking about treatment options for health-related problems, many people will initially jump to the idea of surgeries, prescription drugs, or a type of medical therapy. The idea of complementary and alternative medicine (CAM) will often fly underneath the radar and not attract attention due to the unfamiliarity of the subject. By definition, complementary and alternative medicine is the term for medical practices that are not part of standard medical care (NIH, 2015). Standard medical care refers to treatments practiced by health professionals who hold the title of M.D. or D.O. that have also usually been examined through significant research processes to ensure they are safe and effective (NIH, 2015). Complementary medicine, on the other hand, involves treatments that are used alongside these medical treatments but are not considered standard (NIH, 2015). Alternative medicine, by contrast, are treatments that are used in lieu of standard medical treatments (NIH, 2015). Some examples of CAM include treatments such as acupuncture, yoga, chiropractic services, massage or diet therapy, and meditation.

While CAM may still be unfamiliar to many people, its use has been steadily growing. A study released by the National Center for Complementary and Integrative Health (NCCIH) in 2008 discussed who uses CAM the most, what therapies are used most frequently, and the type of health conditions that are most likely to lead to the use of CAM(Barnes et al., 2008). In the US, about 40% of adults and just over 10% of children use some form of CAM treatment annually (Barnes et al, 2008).

Of the population using CAM, there is a greater tendency of women and individuals with higher education and incomes to use CAM (Barnes et al., 2008). Additionally, American Indians had the highest percentage of CAM use (~50% of the population), followed by Caucasians and Asians (each ~40% of the population) (Barnes et al., 2008).

The most common type of CAM treatments (~37%) are taking supplements, including natural products like fish oil or glucosamine (Barnes et al., 2008). This is followed by deep breathing exercises at 12.7%, meditation at 9.4%, and chiropractic and osteopathic services at 8.6% (Barnes et al., 2008).

There are also patterns revolving around health problems and seeking CAM. The study revealed that some of the conditions that are most likely to lead to the use of CAM include musculoskeletal problems including neck or back pain, which accounted approximately 28% of individuals using CAM. Other common conditions among people using CAM include arthritis, anxiety, and high cholesterol (Barnes et al., 2008).

The trend to pursue CAM treatments, which has been steadily rising and will be detailed throughout this thesis, stems from the multiple advantages that individuals perceive to be associated with its use. This genre of treatments can often be seen to align with the individual's values and beliefs leading them to be more comfortable receiving this type of care (McEachrane-Gross et al., 2006). These values and beliefs can include the patient's trust with the provider or treatment option, or possibly religious beliefs that prohibit them from pursuing standard medical care. Also, many CAM treatment options, such as those listed above, may have no or few adverse effects unlike standard medical treatments which typically have some form of side effect, and sometimes even severe side effects (McEachrane-Gross et al., 2006). CAM treatments also have the advantage of typically being less expensive than standard medical treatments,

including prescription drugs or surgeries (McEachrane-Gross et al., 2006). For those who fear surgeries or operations, CAM use would also be less invasive than typical treatments depending on the illness (McEachrane-Gross et al., 2006).

With advantages, there are also some disadvantages that are associated with CAM treatments. One disadvantage is that there is not as much evidence for the effectiveness of CAM compared to standard medical treatments, largely due to its recent growth and limited funding (Reinhard et al., 2014). Also, there is not much regulation on many of the different treatment options and the duration or dose of treatments (Smith et al., 2007). Therefore, the treatment details are left up to the physician or provider. Another disadvantage is CAM typically relies on natural products, so the treatment can often take a longer duration than regular medical treatments (Micek et al., 2007). This coincides with the individual needing to take a more active role and being more persistent with the scheduling of treatments.

With the rise in awareness and usage of CAM treatments in the past few years, as well as the rise in the types of health conditions leading to the use of CAM (e.g. neck and back pain), one group of patients may appear to particularly benefit from this type of care. Veterans returning from deployment and in need of treatment often have conditions where CAM is highly used. According to a study published in 2017, over 22% of returning vets were diagnosed with non-traumatic joint disorder, 19% were diagnosed with a back disorder, and 9% had an osteoarthritis diagnosis (Goulet et al., 2017). With such a large percentage of veterans reporting some type of musculoskeletal problem, the use of CAM treatments might have a growing interest among veterans given how these similar conditions are the most typical reason for the regular population to pursue CAM treatment.

The research in this study is focused on veterans in the U.S. military who have just recently returned home from deployment. Focusing on veterans who have participated in some form of CAM will allow for whether certain factors impact their uses of CAM. Additionally, findings from this analysis will shed light on some possible issues related to CAM use and veterans returning home from deployment.

Veterans seeking health care after deployment will typically go through the Department of Veterans Affairs (VA). With the VA being the main provider of health care for veterans, VA policy has a direct influence on what type of care is offered, available, and covered for veterans. Since CAM is not considered to be a part of standard medical care, there is a possibility that not all (if any) CAM options are offered through the VA medical centers. This may reduce the availability of CAM treatments, which may influence veterans' decisions not to pursue CAM due to accessibility issues. In addition to the treatments provided, the VA might not recognize all the different types of CAM treatments as credible, which may lead to there being little to no coverage for certain treatment options. The lack of coverage by the VA could also directly impact whether or not veterans pursue this type of care due to the factor of paying for it out of pocket. Another factor limiting CAM use among veterans may be lack of awareness. Advertising and recommendations from physicians may greatly influence the use of CAM, and on the lack of both within the VA may mean that not every individual is aware of CAM treatments that they could receive.

Figure 1: Treatments that are covered and not covered by the VA

<u>CAM Treatments Covered by the VA</u>	<u>CAM Treatments Not Covered by the VA</u>
<ul style="list-style-type: none"> • Acupuncture • Yoga • Chiropractic Care • Massage Therapy • Meditation • Biofeedback • Tai Chi • Clinical Hypnosis • Guided Imagery 	<ul style="list-style-type: none"> • Diet Therapy • Natural Products <ul style="list-style-type: none"> ○ Nonvitamin and Nonmineral Plant Based Products • Deep Breathing Exercises • Homeopathic Treatment • Movement Therapies • Naturopathy • Traditional Healers

Factors that will be examined in this study include the veterans' branch of service, education level, income, rank, gender, and race. Going into this study, all of these factors are initially thought to have a role in whether or not the veteran pursues CAM. Being able to determine which of these factors has a significant impact on the use of CAM treatment will reveal where there is room for adjustments to attract more of the individuals who do not use CAM.

More specifically, this research will look at survey responses from veterans, collected through The Veterans Metrics Initiative (TVMI), who recently returned home from deployment to obtain socio-demographic information. The survey inquired whether veterans received any alternative care within the past six months. An analysis between the various socio-demographic factors and whether the veteran received any complementary and alternative medicine care will be conducted to assess if there are any significant relationships. Findings from this analysis will help determine if the use of CAM has any significant relationships with particular

sociodemographic factors. More specifically it will help answer the underlying questions of this study:

- Do veterans with higher education show any difference in CAM use?
- Does the service branch of the veteran influence CAM use?
- Does the income of the veteran reveal any differences in CAM use?
- Does the veteran's rank show any variation in use of CAM treatments?
- Does the veteran's gender or race show any differences in CAM use?

The outcomes of these inquiries will reveal where there are significant relationships in terms of sociodemographic factors.

There is a dearth of research on CAM treatment, due to limited funding, however, it is slowly gaining more attention. Although it has little history, there have been some previous studies examining individuals who participated in CAM treatments, including veterans use of this type of care. This study extends knowledge in this growing area of care by analyzing survey results to see which sociodemographic factors play the biggest role in whether an individual uses CAM or not. Findings from these previous studies, as well as critical gaps in the literature, will be discussed in Chapter 2: Literature Review. Following this discussion, Chapter 3: Methods, will discuss detailed information of the data and how it was collected, in addition to the analysis used to dissect the data. The results of the analysis will then be discussed in Chapter 4: Results, which will then be followed with an explanation of what the findings mean regarding the use of CAM treatments among veterans in Chapter 5.

Chapter 2

Literature Review

Complementary and Alternative Medicine (CAM) are defined as treatments used either alongside or instead of standard medical practice. There are a number of treatment examples that fall under this description, and these CAM treatments can be categorized based on several themes. One category includes alternative medical systems which are based on a theory and practice of illness and/or care that differs from standard medical practice and include treatments like acupuncture, homeopathy, or naturopathy (NIH, 2012). Manipulative and body-based methods is another category stem from the adjustment or movement of body parts (NIH). Some treatments within this area are chiropractic therapies, therapeutic massage, and osteopathy (NIH). A third category labeled mind-body interventions looks to improve the mind's ability to affect bodily functions and includes treatments like meditation, hypnosis, or music therapy (NIH). The remaining categories include energy and exercise therapies like therapeutic touch or tai chi, nutritional therapeutics including vitamins and vegetarianism, spiritual therapies like spiritual healing, and pharmacological and biologic treatments including supplements like melatonin or herbs and herbal extracts (NIH).

Some CAM treatments have been used for thousands of years across a wide variety of cultures (Tabish, Syed Amin, 2008). While some of these treatments were popular among small proportions of the population in the United States, its use has been steadily growing, both within the U.S. and other developed nations. There has been a series of studies related to CAM examining the prevalence of care both within and between countries. One study conducted by

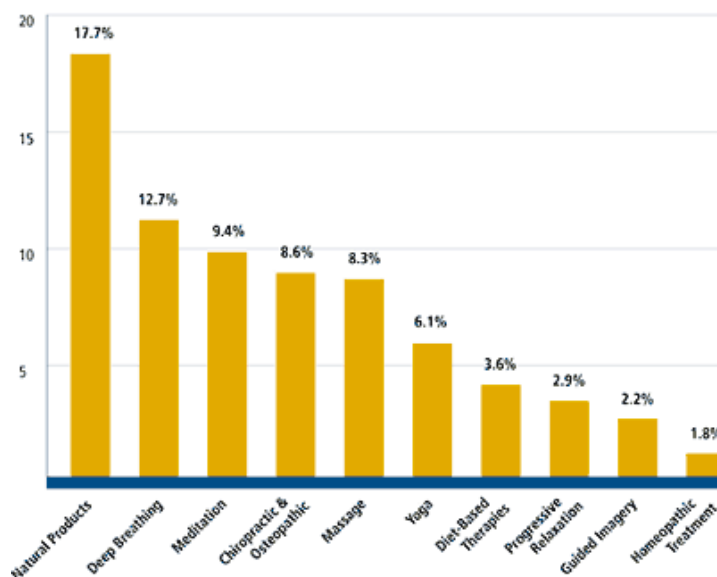
Harris et al. (2012) examined the prevalence of CAM use by the general population compared to the past. The researchers they found that the use of CAM has been on the rise and increased from 28.9% in 1999 to 36% in 2002, and finally to 38.3% in 2007.

Another study was performed in Germany by the Robert Koch Institute in 2002, showed similar results (Frass et al., 2012). Using survey data from 1970, 1997, and 2002 about the use of CAM within the previous three months, researchers found that in the year 1970, only 14% of respondents used CAM. This number doubled to 28% in the year 1997 and increased to 34% in the year 2002. Even though the studies were conducted in two different countries and spanned a number of years, the percentage of individuals who used CAM significantly increased in both studies.

The rise in usage can be due to a number of factors, as mentioned by Jacobsen et al (2009). There might have been an improvement in the accessibility of CAM by more locations that offer the treatments. Another reason is that individuals using CAM could have just been unsatisfied with the care that they were being offered at the time, leading them to look for other options and eventually discovering the precise CAM treatment they received.

A survey performed by the National Center for Complementary and Integrative Health (NCCIH) investigated the CAM therapies used most often in 2008. The findings revealed that the most common CAM therapy included natural products, which was used by 17.7% of people using CAM (this includes herbal medicines, plant-based products, and probiotics). This was followed by the use of deep breathing at 12.7%, meditation at 9.4% (a mind-body intervention), and chiropractic and osteopathic therapy at 8.6% (a manipulative and body-based method).

Figure 2: 10 Most Common CAM Therapies Among Adults in 2007



From: The use of complementary and alternative medicine in the United States. (2011, December 22). NCCIH. https://nccih.nih.gov/research/statistics/2007/camsurvey_fs1.htm

The NCCIH also revealed information relating to what health conditions were most likely to prompt the use of CAM. This information showed that back, neck, or joint pain are the most likely to cause individuals to seek out CAM with 28% of users reporting these conditions. Following these are arthritis with 3.5%, anxiety with just below 3%, cholesterol with 2%, and other musculoskeletal conditions at just below 2%, among others.

Given the prevalence of using CAM for back, neck, or joint pain, research has examined its effectiveness for this condition. A study performed looking at the benefit of CAM for back pain found that a large number of participants reported a great deal of benefit for reducing their back pain (Kanodia et al. 2010). The primary treatments that were associated with the perceived benefits included acupuncture, yoga/tai chi, and chiropractic services. These CAM treatments, by comparison to conventional medicine treatments for back pain, tends have fewer side effects or risks.

For example, prescription medications is a commonly recommended treatment for back pain in standard medical treatment. Unfortunately, frequent use and possible combination of multiple prescriptions can eventually lead to negative effects. This type of problem may be linked to one of the most challenging problems for health care in America, opioid addiction. In a study performed by Deyo et al. (2015), the prevalence of opioids being prescribed for back pain has been increasing. From 1999 to 2010, the percent of visits for back or neck pain resulting in an opioid prescription has increased from 19% to 29% (Deyo et al., 2015). This number rises to 42% looking at the number of individuals receiving a prescription for opioids within a year of diagnosis of back pain. When looking at the effect opioids can have, out of the number of individuals being prescribed opioids, between 21% and 29% misuse the medication in some way (NIT, 2019). Of these percentages, roughly 8% to 12% eventually develop an opioid use disorder and 4% to 6% who misuse opioids transition to heroin (NIT, 2019). This is just one example for one type of conventional medicine which is related to a severe side effect. The use of CAM is associated with significantly lower side effects than treatments like prescription opioids and may be just as successful in the reduction of symptoms.

Besides reducing symptoms and improving pain management, research suggests CAM treatments are also beneficial for patients because they allow for individuals to feel psychologically better. For example, some studies have shown mindfulness treatments such as meditation, yoga, and certain psychotherapeutic approaches are associated with reduced symptoms of PTSD and depression (Lang et al. 2017). Mindfulness treatment is posited to achieve these effects as a result of opposing and minimizing the avoidance of thought suppression which is typically associated with PTSD.

These two examples demonstrate the ways CAM treatment may be preferable to standard medical treatment. In situations where standard medical treatment has low effectiveness and/or high potential for harm, CAM treatment may offer similar benefits with less invasive features, lower risks, and lower costs. Since many of the condition's veterans face fall into these areas of care, understanding current and potential use of CAM by veterans may offer significant benefits for the population.

Research on Veterans Use of CAM

There has been an average of around 250,000 service members leaving the military annually between the years 2003 and 2014 (Zogas, 2017). Many service members coming home from deployment will have acquired some sort of mental or physical health condition. Zogas (2017) mentions that reports regarding post-9/11 veterans have consistently revealed that the most common diagnoses include musculoskeletal ailments, mental disorders, and general symptoms like headaches or fatigue. A study performed by the RAND Center for Military Health Policy Research revealed that 20 percent of veterans who served in either Iraq or Afghanistan suffer from severe depression or PTSD (National Veterans Foundation, 2016). The NIH reported that 65.6% of veterans reported having pain from musculoskeletal ailments over a three-month period (NIH, 2018). Within this category of veterans reporting musculoskeletal pain, 9.1% reported having severe pain which is almost twice as high among veterans compared to non-veterans (NIH). Additionally, when looking at veterans over time who reported some type of illness or condition, over 1.2 million veterans since 2001 have used VA health care (VA, 2017). Between the years of 2014 and 2015, 60% of these individuals accessed VA health care (VA).

When looking at the Veterans' Affairs department and what treatments they cover, they apparently provide coverage for a wide variety of CAM. Overall, the CAM treatments that are

covered by the VA include: acupuncture, yoga, chiropractic services, massage therapy, meditation, biofeedback, tai chi, clinical hypnosis, and guided imagery. Even if the VA facilities do not offer the treatment, they will pay for the treatment at a location that does offer it. For example, they provide 100% coverage for acupuncture treatments for those who qualify, even if the treatment is not provided at a VA facility (Postolov, 2014). The same can be said for chiropractic treatment which was guaranteed for all eligible VA patients by President Bush in 2002 (Hauck, 2017).

Several studies have looked at the factors that influence CAM use among veterans. Gender has been a characteristic most commonly seen to have a significant relation with using CAM. One study focusing on gender relationship to CAM use focused on veterans who have chronic musculoskeletal pain and received care provided by the VA. The category of musculoskeletal pain involves pain that affects the muscles, ligaments, tendons, and bones, therefore, some diagnoses under this category also include neck pain, back pain, and joint pain (WebMD, 2019). The aim of this study was to see if the use of CAM was significantly related to the key independent variable of gender while also looking at other moderator variables, such as race/ethnicity, age, marital status, and insurance status (Evans et al. 2018). Women were significantly more likely to use CAM therapies than men, with 35% of women using CAM compared to 25% of men (Evans et al., 2018). The study also used a multivariate binary logistic regression model for men and women separately to assess and relationships present between using CAM therapies and other moderator variables like age and race. When looking at these results, it was also deemed that the relation with using or not using CAM was significant with all of the variables considered (Evans et al., 2018). For example, among older women, Hispanic/Latina women are 5% more likely to use CAM compared to non-Hispanic white

women. Across all age categories, black women have a smaller likelihood in using CAM compared to other races (Evans et al, 2018).

The characteristic of gender playing a role with using CAM appeared again in a study looking at veterans to explore the characteristics of CAM users (Reinhard et al., 2014). The results of this study revealed that females were significantly more likely to use CAM where CAM use was defined as use of any CAM treatment in the previous 12 months (Reinhard et al., 2014). According to the statistics, women who are deployed are 1.64 times more likely to have used CAM, and women in the services who are nondeployed are 1.87 times more likely to have used CAM when compared to men (Reinhard et al., 2014). Similarly, in a study analyzing the development, use, and characteristics of the participants involved in the Integrative Health and Wellness (IHW) Program, which is a CAM clinic offering various types of CAM to qualified veterans, gender came out to be a determining factor again (Hull et al., 2015). The results of this study showed that 82% of women were service users compared to 69% of men, which was a significant difference (Hull et al., 2015).

Aside from gender, education and insurance also appeared in a number of studies revealing some type of relationship with CAM use. The education level of the individual was a consistent determinant of whether the individual used CAM. When compared to those who just had their high school degree or GED, deployed veterans have a larger probability of using CAM with every higher level of education (Reinhard et al., 2014). It started with the individual having some college experience where they had 1.23 times the chance of using CAM compared to those with just a high school degree, and continued up to where the participant had a masters, doctorate, or professional degree and would be 1.58 times more likely to use CAM (Reinhard et al., 2014). Similar results were found for nondeployed veterans where the significance ranged

from 1.57 times as likely to 1.87 times as likely depending on the individual's education level (Reinhard et al., 2014).

Another characteristic that appeared to be significantly associated with CAM use is whether the individual had insurance or not. In a study looking at the characteristics of veterans attending oncology and chronic pain clinics, it was reported that just over 60% of CAM users had insurance additional to their Department of Defense or VA coverage compared to around 39% of nonusers (McEachrane-Gross et al. 2006). When compared to individuals who did not use CAM, only about 40% of the individuals had insurance while 60% did not.

A less consistent pattern of results is found in looking at the influence of age of the veteran on CAM use. In a study looking at the characteristics of veterans who were deployed during certain time periods, age was one of the more robust predictors of CAM use (Park et al., 2016). More specifically, older veterans had higher use of meditation, spiritual prayer, and any CAM product (Park et al., 2016). The Reinhard study, however found results not as strong in terms of age. Out of the four different categories of age listed, not one had a significant relationship when it came to CAM use in the past 12 months (Reinhard et al., 2014).

The same issue can be seen for the characteristic of race. Going back to the Park study, race was mentioned to be a large predictor of CAM use just like age (Park et al., 2016). More specifically, the study reported that being non-white was a significant predictor for CAM use. Similar to age, this predictor was largely significant for treatments like meditation and spiritual prayer (Park et al., 2016). However, according to the Hull study, which looked at individuals partaking in the Integrative Health and Wellness Program, race was not seen to be a significant factor in determining CAM use (Hull et al., 2015).

Methodological Issues in Research on CAM Use by Veterans

The prior research on CAM use by veterans has often suffered from some weakness in research methodology. For example, several of the studies relied on convenience samples and collected data from individuals who are already in health facilities. In one study looking at CAM use in veterans with cancer or chronic pain, the study took names from a database of participants who attended the outpatient oncology and pain clinics at the Jamaica Plains campus of the VA Boston Health Care System (McEachrane-Gross et al., 2006). The participants had to have attended the clinics at least once in the previous 12 months prior to when the study began. In another study looking at CAM use among veterans with chronic noncancer pain, the study recruited participants by two different ways. They either reached out to individuals with upcoming primary care appointments through email or posted flyers at medical centers and clinics (Denneson et al., 2011). From those that were either contacted through email or saw the flyers, only those interested in the study contacted the study office to move on to the next process. Convenience samples such as these can cause some sample bias since only those interested in the study get involved, (e.g. those who have better health are more likely to get involved in the study). Selecting individuals who are already in health facilities take away from those who could be attending CAM therapies that are outside of the VA. Also, it minimizes the range of individuals that could be involved in the sample because the studies are only looking at those receiving care at certain medical facilities.

Another theme seen in the methodology for how participants are selected is that they have been referred by physicians in a number of studies. For example, the participants in the Hull study included those who were referred by a VA provider and who were willing to provide

informed consent (Hull, 2015). In another study looking at CAM use among gulf war veterans, participants were also referred by providers (Brooks et al., 2014). In greater detail, the study only examined veterans who were referred to the Integrative Health and Wellness program, which, as previously stated, is a CAM clinic for veterans and ended up enrolling in the services (Brooks et al., 2014). With the participants being referred to CAM services, this looks at only those who have been influenced to partake in CAM services by the providers. It takes away from the ability of being able to connect sociodemographic factors at the population level with using CAM due to how everyone is already partaking in a CAM therapy due to the referral.

The final methodological weakness that appears throughout the literature is that the studies do not include random samples from the population of veterans. There have been few studies that rely on random samples of veterans, including individuals with and without CAM exposure. The analysis of individuals will be more significant because there would then be the ability of comparing the groups to see what factors are truly more common in the different levels of CAM exposure.

Besides looking at common methodology themes, there are also certain limitations that are seen in a few studies covering CAM use among veterans. One limitation has been questions asked only about a few CAM therapy examples and not all types. One example of this can be seen in the McEachrane-Gross study when the participants were completing the mail-in survey and when asked about their use of CAM, it only listed six possible examples of CAM therapies (2006). Another example includes the Reinhard study where the individuals were asked if they used CAM services and included twelve of the possible CAM therapies (2014). With studies only listing a few CAM therapies for examples, this can give the individuals a limited idea on what classifies as CAM therapies. This effect could cause the individuals to mistakenly respond

with no previous or current use of CAM due to not realizing all of the therapies that are considered to fall under this category of treatment.

Another limitation that can be seen in various studies is the reporting of the frequency that the individuals use or have used the treatment. In the Jacobson et al (2009) study covering health symptoms and conditions among CAM users, the survey asked participants questions dealing with what CAM therapies they have used in addition to other questions covering demographic information. The study never followed up with the individuals on the dosage of the therapies or how frequently they received the treatment. The Park et al (2016) study is a similar example that has the same limitation. In this study, the participants were only asked if they had used any of the listed CAM treatments in the past 12 months, as well as other information like military exposure and demographic information. The study never asks how many times the individual used the treatment or the dosage of each particular usage. This limitation fails to classify how often an individual has used a CAM treatment, which can be used to determine the satisfaction or significance of the usage. For example, if the frequency or dosage of the individual's CAM use is not known, then those who have used a treatment just once could be clumped up with individuals who used the treatment many times. This can alter the outcome of the analysis when referring to the success of treatments because those only going to one treatment will not receive the same effect of an individual that goes to six treatments. So, being able to categorize the frequency of use that individuals have with CAM treatments will reveal the impact on the individual's health that each usage has.

Aside from common methodological weaknesses, there are also some gaps that have been found within the literature dealing with CAM use among veterans. One gap relates to the factors in influencing CAM use. For the most part, research has only focused on a few socio-

demographic factors influencing CAM use among veterans. Throughout all of the articles discovered, a majority focus solely on demographic factors among individuals and how these play a role in the use of CAM therapies. Sociodemographic factors cannot be the sole determinant of individuals seeking CAM, so it is important to be aware of non-sociodemographic factors that also have the ability to cause someone to pursue CAM treatments. One that was briefly mentioned was the individual's perception of conventional medicine, which was part of a study looking at the veteran's perceptions of conventional medicine and their use of CAM (Kroesen et al., 2002). In the focus groups that were a part of the study, the participants were asked about their CAM use in relation to satisfaction or dissatisfaction with conventional medicine. Most responses connected their CAM use to dissatisfaction with certain aspects of conventional medicine (Kroesen et al., 2002). The aspects with conventional medicine that were disliked the most included the following, as stated in the Kroesen article:

- Prescription side effects, clinician drug monitoring and pharmaceutical industry.
- Lack of emphasis on nutrition, exercise, and preventative medicine.
- Desire for more holistic health care.

The above aspects reveal what the main problems are with conventional medicine, causing the individuals to seek out CAM care. The main message that comes across when studying the above list is how the individuals are looking for a more active role in the decision process and treatment. This includes care that emphasizes more personal activities like yoga, meditation, or following certain exercise routines.

This study is looking to fill in the above gap regarding randomized samples that include individuals who both use and have not use CAM, as well as adding in data regarding the frequency of CAM use to reduce common limitations. Being able to analyze the multiple

demographic factors that were included in the survey among those who used CAM and those who did not will provide which factors have a strong association with CAM use. This will also be able to show not only which factors tend to cause individuals to seek out more CAM but will also reveal which factors reduce the tendency of CAM use. This can then be used to develop strategies to focus on the demographics unlikely to lead to CAM usage and counter this association in order to increase the use of these therapies.

Chapter 3

Methods

This study used data that was provided by Clearinghouse for Military Family Readiness at Penn State (CMFR) and was collected through The TVMI study. The CMFR is a team of professionals located at The Pennsylvania State University who looks to support those who provide programs to the families of military personnel. More specifically, they use applied science to provide various services including research, curriculum development, and program implementation, evaluation, and selection. A lot of these services revolve around performing studies to relay the results to professionals in order "... to help identify, select, develop, implement, and evaluate evidence-informed and evidence-based programs and practices to improve the well-being of service members and their families." (PSU).

In terms of the TVMI study, this was a longitudinal assessment of the well-being of US veterans and program use within the first three years after they returned home from deployment and departed from the military (Vogt et al. 2018). The key goals of this study were to assess the health of the veterans, discover any programs that the veterans were using at the time to allow proper transition back into civilian life, and to examine the relationship between the veterans well-being and program use. The questions that were asked within this study consist of the individual's military branch, paygrade, primary occupation, gender, ethnicity, race, education experience, health coverage, marital status, expected income, number of people supported by their income, and the use of alternative medicine.

The sample selection for this study consisted of a goal to include veterans from all branches, both men and women, and former officers and enlisted personnel. To accomplish this goal, over 35,000 veterans were randomly selected from each of the three groups, as well as an additional 2,000 veterans from the general pool, for the initial study. The information for these veterans were found by using the VA/DoD Identity Repository, which is a VA-managed dataset containing contact information for all veterans separated from the military (Vogt et al.)

The main form of data collection for the initial survey consisted of a mail survey procedure. This referred to originally mailing an introduction of the study to the individual, which was then followed by a letter on how to participate in the study. Additionally, there was a pre-incentive of five dollars cash as well as a \$20 electronic gift card sent if the survey was completed. There were five more surveys planned at six-month intervals for the first wave of data, and with each survey round came another incentive which increased by five dollars for every completed follow-up. All participants were also entered into random drawings for more gift cards or little ‘tokens of appreciation’. These surveys consisted of 37 questions and on average took approximately 37 minutes to complete.

Overall, there were 9,566 veterans who completed the first assessment within the allowed timeframe. This resulted in a 23% response rate after adjustments for known mail surveys unable to be delivered. When analyzing the data, only the results from the initial survey assessment were used due to the goal of this thesis revolving around determining any socio-demographic factors possibly related with the use of CAM. The use of multiple assessments could be used at a later time in order to track the use of certain services, given the access to such data. Within this data, there was some differences regarding the response rate of certain demographic variables. More specifically, this is referring to how the response rate was noticeably less for the lower

level enlisted veterans compared to the older veterans (Vogt et al.). This was the same case when looking at the response rate for the National Guard or Reserve veterans when compared to the response rate of those who were still active duty at the time (Vogt et al, 2018).

Examining the unweighted sample of 9,566 individuals, just under 82% of survey respondents were male and 18% were female. In terms of age, there was over 41% of individuals between the age of 19-29, 28% being between 30-39, and around 30% being over the age of 40. A large majority of the sample was not a minority in terms of race at just under 66% of the sample with just over 34% being a minority.

The branch where the most participants served in was the Army at just over 33.3%. Following this was the Navy at 19.2%, the Air Force with 18.9% of the respondents, then the Marines at 15.9%, and finally the National Guards or Reserves with 12.7% of the sample. The individuals with a paygrade between E5-E6, which is termed mid-grade enlisted, had the largest percentage of the sample with 30%. Following this was the junior enlisted, or E1-E4, at just over 28% of the participants. Then there was the senior enlisted (E7-E9) at over 17%, the senior officers (O4-O10) at 14%, the junior officers (O1-O3) at 8.7%, and then the warrant officers (W1-W5) with just over 1% of the sample.

Looking at the individual's income, 6% had an income less than \$15,000. Just over 31% of the sample had an income between \$15,000 and \$45,000. There was a total of 40% of the sample that had an income between \$45,000 and \$100,000, and then around 20% being above \$100,000. When looking at education, over 47% of the individual's highest level of education was either a high school diploma, some form of vocational or technical training, or some college. A total of 33% received either an associate degree or bachelor's degree and around 20% received a degree higher than a bachelors, so either a masters, doctorate, or professional degree.

Comparing the number of individuals dependent on the veteran who responded to the survey, around 20% had either zero or one dependents. Just over 42% of the respondents had either two or three dependents and just under 30% had four or five. Only 6% of the sample had six or more dependents being supported by the individual's income. With the location of where the individual lives having been asked, the results revealed that just 6% lived in a city setting while about 14% lived in a rural area and around 60% lived in an urban area.

To finish off the survey results, when the individuals were asked about their past CAM use, just over 8% admitted to using some type of CAM at least once while just under 90% reported never using CAM.

Table 1: TVMI Sample Results

Open access 6			
Table 1 Comparison of unweighed sample, sampling frame and weighted sample			
	Unweighed sample (n=9566), %	Sampling frame (n=48 965), %	Weighted sample, %
Gender			
Male	81.8	84.1	84.1
Female	18.2	15.9	15.9
Age (years)			
18-24	19.4	28.6	26.6
25-29	22.3	25.2	25.4
30-34	15.1	13.8	15.0
35-39	13.1	10.8	11.2
40-44	13.4	10.5	9.9
45-49	10.0	7.0	7.2
50+	6.8	4.2	4.9
Racial ethnic/minority status			
Not minority race/ethnicity	65.8	63.5	63.4
Minority race or ethnicity	34.2	36.5	36.6
Service branch/component			
Army	33.3	32.1	32.1
Navy	19.2	18.8	18.8
Air Force	18.9	13.5	13.5
Marines	15.9	17.2	17.2
National Guard/Reserves	12.7	18.4	18.4
Paygrade			
E1-E4 junior enlisted	28.3	41.4	41.4
E5-E6 mid-grade enlisted	30.0	29.5	29.5
E7-E9 senior enlisted	17.2	13.4	13.4
W1-W5 warrant officers	1.5	1.1	1.1
O1-O3 junior officers	8.7	6.4	6.4
O4-O10 senior officer	14.1	8.1	8.1

From: Vogt, D., Perkins, D. F., Copeland, L. A., Finley, E. P., Jamieson, C. S., Booth, B., Lederer, S., & Gilman, C. L. (2018). The Veterans Metrics Initiative study of US veterans' experiences during their transition from military service. *BMJ Open*, 8(6), e020734. <https://doi.org/10.1136/bmjopen-2017-020734>

Being able to access the TVMI study and all the collected data from the completed surveys will provide the ability to answer the research questions and determine the significance in possible relationships between CAM use and socio-demographic factors. The data will be imported into STATA software where a majority of the analysis will be completed. This is where the data will be cleaned up and brief tabulations will be performed to get an idea on possible significant relationships before the statistical analysis is performed. With the outcomes revealing the different responses in CAM use paired with every variable, graphs are able to be developed to put the relationship into view. This is done once all of the results are transported to Excel where bar graphs will be constructed for every variable revealing which have the most obvious relationships and which might not be worth looking into. Additionally, this is where edits to the data are brought up and suggested, including the minimization of data to make it easier to read and what to do with missing data. This is all leading up to the final statistical analysis that will be performed on STATA revealing which variables actually have a significant factor in determining the use of CAM or not.

Chapter 4

Results

The data in this study was analyzed using Stata Software 16.0, which allowed for the various statistical tests performed. Tabulations were initially performed to see the relationship between CAM use and all the independent variables. These tests included three different versions of tabulations: a regular two-way table to summarize the statistics, a chi-squared of the table to get an estimate of the significance, and a two-way table which was adjusted with the weight to more accurately reflect the population. Following these tests, both a linear regression and logistic regression were performed to get the estimated coefficients of the relationship between CAM use and the different socio-demographic factors. Additionally, marginal analysis was performed with the logistic regression to get the marginal effect of the independent variables on the probability of CAM use. After looking over the data and observing the use of CAM across the participants, the logistic regression was determined to be more appropriate and is reported below. This was expected due to how the low prevalence of CAM was in the data, only accounting for 8.62% of the respondents.

Table 2: Chi Squared with Any CAM Use and Some Post High School Education

Some_Post_Hs			
Any_CAM	Yes	No	Total
Blank	30	28	58
	0.73	0.53	0.62
Never	3,721	4,796	8,517
	90.62	90.87	90.76
Yes	355	454	809
	8.65	8.60	8.62
Total	4,106	5,278	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 1.5170	Pr = 0.468	

Table 3: Chi Squared with Any CAM Use and a bachelor's Education

Bachelor's			
Any_CAM	Yes	No	Total
Blank	11	47	58
	0.58	0.63	0.62
Never	1,686	6,831	8,517
	89.30	91.33	90.76
Yes	191	618	809
	10.12	8.24	8.62
Total	1,888	7,496	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 6.7345	Pr = 0.034	

Table 4: Chi Squared with Any CAM Use and Graduate School Education

Gradschool			
Any_CAM	Yes	No	Total
Blank	10	48	58
	0.54	0.64	0.62
Never	1,650	6,867	8,517
	89.92	90.97	90.76
Yes	175	634	809
	9.54	8.40	8.62
Total	1,835	7,549	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 2.5945	Pr = 0.273	

Table 5: Chi Squared with Any CAM Use and Hispanic Race

Hispanicrace			
Any_CAM	Yes	No	Total
Blank	4	48	58
	0.31	0.67	0.62
Never	1,211	7,305	8,516
	92.87	90.43	90.77
Yes	89	719	809
	6.83	8.90	8.61
Total	1,304	8,078	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 8.7275	Pr = 0.013	

Table 6: Chi Squared with Any CAM Use and Other Race

OtherRace			
Any_CAM	Yes	No	Total
Blank	2	56	58
	2.15	0.60	0.62
Never	76	8,440	8,516
	81.72	90.86	90.77
Yes	15	793	808
	16.13	8.54	8.61
Total	93	9,289	9,382
	100.00	100.00	100.00
	Pearson chi(2) = 10.5776	Pr = 0.005	

Table 7: Chi Squared with Any CAM Use and Paygrade of E7 to E9

E7toE9			
Any_CAM	Yes	No	Total
Blank	16	42	58
	0.95	0.55	0.62
Never	1,489	7,028	8,517
	88.16	91.33	90.76
Yes	184	625	809
	10.89	8.12	8.62
Total	1,689	7,695	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 1.5170	Pr = 0.468	

Table 8: Chi Squared with Any CAM Use and Branch of National Guard or Reserves

NationalGuardOrReserve			
Any_CAM	Yes	No	Total
Blank	7	51	58
	0.57	0.62	0.62
Never	1,099	7,418	8,517
	89.86	90.90	90.76
Yes	117	692	809
	9.57	8.48	8.62
Total	1,223	8,161	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 1.6315	Pr = 0.442	

Table 9: Chi Squared with Any CAM Use and Living in Urban Location

Urban			
Any_CAM	Yes	No	Total
Blank	29	29	58
	0.81	0.50	0.62
Never	3,239	5,278	8,517
	90.07	91.19	90.76
Yes	328	481	809
	9.12	8.31	8.62
Total	3,596	5,788	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 5.3439	Pr = 0.069	

Table 10: Chi Squared with Any CAM Use and Branch of Navy

Navy			
Any_CAM	Yes	No	Total
Blank	11	47	58
	0.61	0.62	0.62
Never	1,653	6,864	8,517
	91.83	90.51	90.76
Yes	136	673	809
	7.56	8.87	8.62
Total	1,800	7,584	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 3.2170	Pr = 0.200	

Table 11: Chi Squared with Any CAM Use and Branch of Airforce

Airforce			
Any_CAM	Yes	No	Total
Blank	8	50	58
	0.45	0.66	0.62
Never	1,634	6,883	8,517
	91.59	90.57	90.76
Yes	142	667	809
	7.96	8.78	8.62
Total	1,784	7,600	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 2.3111	Pr = 0.315	

Table 12: Chi Squared with Any CAM Use and Applying for Disability Status

VADoD_App			
Any_CAM	Yes	No	Total
Blank	13	45	58
	0.39	0.74	0.62
Never	3,102	5,415	8,517
	94.23	88.89	90.76
Yes	177	632	809
	5.58	10.37	8.62
Total	3,292	6,092	9,384
	100.00	100.00	100.00
	Pearson chi(2) = 72,7189	Pr = 0.000	

Logistic Regression

Table 1 reveals the results of the logistic regression and what variables hold a significant standard score with CAM use. The determined levels of significance include extremely significant if the Z-score is below .01; very significant if the Z-score is below .05; significant if the Z-score is below 0.1.

Table 13: Logistic Regression of CAM use and all Independent Variables

Logistic Regression				Number of obs = 9,382	
Log Pseudolikelihood = -13914.057				Wald chi2(35) = 138.38	
				Prob > chi2 = 0.0000	
				Pseudo R2 = 0.0307	
Any CAM	Odds Ratio	Robust Std. Err.	Z	P> z	95% Conf. Interval
Gender – Male	.9141433	.096492	-0.85	0.395	.7433033 – 1.124249
VADoD_App – Yes	2.095806	.2113488	7.34	0.000***	1.719938 – 2.553814
Insurance – Yes	1.332428	.1683675	2.27	0.023**	1.040123 – 1.706879
Some_post_hs - No	.7378092	.0973809	-2.30	0.021**	.5696353 – .9556332
Bachelors – no	.7013767	.1104499	-2.25	0.024**	.5151191 - .9549816
Gradschool – no	.661262	.1326649	-2.06	0.039**	.4462747 - .9798167
Dependent1 – no	1.053493	.2459337	0.22	0.823	.6666876 – 1.66472
Dependent2 – no	.9852656	.2336449	-0.06	0.950	.6190137 – 1.568218
Dependent3 – no	1.092556	.2656605	0.36	0.716	.6783752 – 1.759615
Dependent4 – no	.9878455	.2414453	-0.05	0.960	.6118454 – 1.594911
Dependent5andup – no	.9730856	.9730856	-0.11	0.911	.60197 – 1.572994
Hhincome_15000to45000 – no	.9285453	.1448858	-0.48	0.635	.683889 – 1.260726
Hhincome_45000to100000 – no	1.026866	.1648189	0.17	0.869	.7497043 – 1.406492
Hhincome_above100000 – no	.9984843	.1887845	-0.01	0.944	.6892927 – 1.446368
Blackrace – no	.9582631	.1217205	-0.34	0.737	.7470737 – 1.229153

Asianrace – no	.8430361	.169889	-0.85	0.397	.5679521 – 1.251355
Hispanicrace – no	1.308892	.1648399	2.14	0.033**	1.022598 - 1.67534
Multiracial – no	.861363	.1472426	-0.87	0.383	.6161417 – 1.204181
Otherrace – no	.525722	.1586809	-2.13	0.033**	.2909607 - .9499
E5toE6 – no	.8630074	.0927129	-1.37	0.170	.6991493 – 1.065269
E7toE9 – no	.7772669	.1048563	-1.87	0.062*	.5966777 – 1.012513
W1toW5 – no	.881631	.2515449	-0.44	0.659	.5039924 – 1.542232
O1toO3 – no	1.009189	.1843566	0.05	0.960	.7054675 – 1.443671
O4toO7andUp - no	.9980101	.2048474	-0.01	0.992	.6674533 – 1.492275
Navy – no	1.296929	.1495042	2.26	0.024**	1.034649 – 1.625693
Airforce – no	1.335748	.154364	2.51	0.012**	1.065017 – 1.6753
Marines -no	1.170293	.1444882	1.27	0.203	.9187613 – 1.490688
NationalguardOrReserves – no	.7894775	.0978273	-1.91	0.056*	.6192472 – 1.006504
Married - no	1.013004	.1359207	0.10	0.923	.7787547 – 1.317717
DivorcedSeparatedWidowed – no	.8484689	.1305299	-1.07	0.285	.6276038 – 1.14706
CombatSupport – no	1.113967	.1167962	1.03	0.303	.9070401- 1.368102
ServiceSupport – no	1.028127	.1112272	0.26	0.798	.8316877 – 1.270965
City – no	.9881225	.1722582	-0.07	0.945	.702137 – 1.390592
Rural – no	.955963	.1286518	-0.33	0.738	.7343242 – 1.244498
Urban – no	1.207916	.1282501	1.78	0.075*	.9809817 – 1.487349
_cons	.2411411	.2922483	-1.17	0.241	.0224216 – 2.593436

*** - Extremely Significant

** - Very Significant

* - Significant

The sole extremely significant variable was whether the individual applied for VA disability status (Table 13). To achieve such a status, it has to be determined that the individual is disabled by a certain condition which was initiated during active duty (VA, 2015). If the individual has applied, the odds ratio for use of CAM is 2.09 times larger than for individuals that have not applied ($p < .01$). Those that have health insurance in addition to their VA coverage have an odds ratio of 1.33 times larger for use of CAM compared to those uninsured, except through their VA coverage ($p < .05$). When looking at the results of education, the farther an individual goes in achieved education, the more likely they were to use CAM. When an individual does not acquire some form of education past high school, like an associate degree, their odds ratio to use CAM is more than 25 percent lower compared to those who do have some form of post high school ($p < .05$). An individual has a 30 percent lower odds ratio for CAM use when they do not have a bachelor's degree compared to those who do ($p < .05$). When an

individual does not have a graduate or professional degree compared to those who do, the odds ratio for use of CAM is more than 30 percent lower ($p < .05$).

Moving on to the race of the individual, those who are not Hispanic have an odds ratio 1.3 times larger to use CAM compared to those reporting to be Hispanic ($p < .05$). For the variable recording if the individual is an 'other race', or a race that was not listed, those that did not report this as an answer have an odds ratio nearly 50 percent lower of using CAM compared to those considered 'other race' ($p < .05$). When individual responds with a paygrade category other than E7 to E9, their odds ratio for CAM use more than 20 percent smaller to use CAM ($p < 0.1$). More specifically, the paygrades listed here deal with an average pay range between \$37,372 to \$101,970 (Federal Pay, 2020). In terms of the branch of service, those reporting being involved in a branch other than the Navy have an odds ratio 1.3 times larger to use some form of CAM ($p < .05$). When being in a branch other than the Air Force, the odds ratio for CAM use is 1.34 times larger ($p < .05$). For those not reporting being in the National Guard or Reserves, their odds ratio is about 20 percent lower to pursue CAM ($p < 0.1$). The final significant result deals with the location that the individual lives. If they report living in either a city or rural area, their odds ratio for CAM use is 1.2 times larger compared to those living in an urban area ($p < 0.1$).

Marginal Analysis

Table 2 includes the results of the marginal analysis performed after the logistic regression. It includes the marginal effect of all of the variables and the impact that each variable has on the probability of the individual's use of CAM.

Table 14: Marginal Analysis of CAM use and Independent Variables

Predictive margins				Number of obs = 9,382	
Model VCE:	Robust				
Expression:	Pr(Any_CAM), predict()				
	Margin	Delta Method Std. Err.	Z	P> z	95% Conf. Interval
Gender – Female	.0948974	.0078045	12.16	0.000	.079600 - .1101939
Gender – Male	.0875967	.0034608	25.31	0.000	.0808136 - .0943797
VADoD_App – No	.0570724	.0042934	13.29	0.000	.0486574 - .0654874
VADoD_App – Yes	.1118159	.0049727	22.49	0.000	.1020696 - .1215622
Insurance – No	.0711263	.0075536	9.42	0.000	.0563215 - .0859311
Insurance – Yes	.0922029	.0034965	26.37	0.000	.0853498 - .099056
Some_post_hs – Yes	.1025177	.00723	14.18	0.000	.0883473 - .1166882
Some_post_hs – No	.0781702	.0050976	15.33	0.000	.0681791 - .0881614
Bachelors – Yes	.114622	.0133523	8.58	0.000	.088452 - .140792
Bachelors – No	.0837962	.0035297	23.05	0.000	.0766697 - .0909228
Gradschool – Yes	.1216203	.0187428	6.49	0.000	.0848851 - .1583556
Gradschool – No	.0845487	.0035297	23.95	0.000	.0776305 - .0914668
Dependent1 – Yes	.0854419	.0150393	5.68	0.000	.0559655 - .1149184
Dependent1 – No	.0895262	.0045378	19.73	0.000	.0806322 - .0984201
Dependent2 – Yes	.0896924	.0147175	6.09	0.000	.0608465 - .1185382
Dependent2 – No	.08851	.0054946	16.11	0.000	.0777407 - .0992792
Dependent3 – Yes	.0833001	.0149341	5.58	0.000	.0540298 - .1125705
Dependent3 – No	.0901824	.0049597	18.18	0.000	.0804616 - .0999032
Dependent4 – Yes	.0895848	.0161183	5.56	0.000	.0579936 - .121176
Dependent4 – No	.0886107	.0048162	18.40	0.000	.0791711 - .0980502
Dependent5andup – Yes	.09064	.0170179	5.33	0.000	.0572855 - .1239945
Dependent5andup – No	.0884569	.0043091	20.53	0.000	.0800112 - .0969026
Hhincome_15000to45000 – Yes	.0927239	.0089844	10.32	0.000	.0751148 - .110333
Hhincome_15000to45000 – No	.00867832	.0051759	16.77	0.000	.0766385 - .0969279
Hhincome_45000to100000 – Yes	.0874521	.0089844	10.21	0.000	.0706636 - .1042406
Hhincome_45000to100000 – No	.0895511	.0055949	16.01	0.000	.0785854 - .1005169
Hhincome_above100000 – Yes	.0888951	.0124323	7.15	0.000	.0645282 - .1132619
Hhincome_above100000 – No	.0887746	.0042826	20.73	0.000	.0803808 - .0971684
Blackrace – Yes	.0918286	.009678	9.49	0.000	.0728602 - .1107971
Blackrace – No	.0883985	.0032926	26.85	0.000	.081945 - .094852
Asianrace – Yes	.1026076	.0177735	5.77	0.000	.0677723 - .1374429
Asianrace – No	.0881854	.0031231	28.24	0.000	.0820641 - .0943066
Hispanicrace – Yes	.0718545	.0076758	9.36	0.000	.0568101 - .0868988
Hispanicrace – No	.0916475	.003429	26.73	0.000	.0849268 - .0983683
Multiracial – Yes	.1007011	.0146925	6.85	0.000	.0719043 - .1294979
Multiracial – No	.0882014	.0031534	27.97	0.000	.0820208 - .094382
Otherrace – Yes	.1534509	.0388387	4.06	0.000	.0792884 - .2276133
Otherrace – No	.0881751	.0030819	28.61	0.000	.0821346 - .0942156
E5toE6 – Yes	.0973156	.0067746	14.36	0.000	.0840377 - .1105935
E5toE6 – No	.0853378	.0041534	20.55	0.000	.0771973 - .0934783
E7toE9 – Yes	.1069335	.0105541	10.13	0.000	.0862479 - .1276192
E7toE9 – No	.0855026	.0036848	23.20	0.000	.0782806 - .0927246
W1toW5 – Yes	.0991593	.0245319	4.04	0.000	.0510776 - .147241
W1toW5 – No	.0886565	.0031176	28.44	0.000	.0825461 - .094767
O1toO3 – Yes	.0881205	.013437	6.56	0.000	.0617845 - .1144564

O1toO3 – No	.0888446	.0033268	26.71	0.000	.0823243 - .095365
O4toO7andUp – Yes	.0889416	.0146726	6.06	0.000	.0601838 - .1176994
O4toO7andUp – No	.0887833	.0036254	24.49	0.000	.0816776 - .095889
Navy – Yes	.0731495	.0069788	10.48	0.000	.0594713 - .0868278
Navy – No	.0924865	.0035155	26.31	0.000	.0855963 - .0993767
Airforce – Yes	.070865	.006868	10.32	0.000	.057404 - .0843259
Airforce – No	.0920455	.0034366	26.78	0.000	.0853098 - .0987811
Marines – Yes	.0788267	.0080045	9.85	0.000	.0631382 - .0945153
Marines – No	.0908038	.0034724	26.15	0.000	.083998 - .0976097
NationalguardOrReserves – Yes	.1051484	.0102983	10.21	0.000	.0849642 - .1253326
NationalguardOrReserves – No	.0852496	.0032669	26.09	0.000	.0788465 - .0916526
Married – Yes	.0884536	.0046656	18.96	0.000	.0793092 - .097598
Married – No	.0894814	.0078111	11.46	0.000	.074172 - .1047908
DivorcedSeparatedWidowed –Yes	.1009313	.0125134	8.07	0.000	.0764056 - .1254571
DivorcedSeparatedWidowed –No	.0872142	.0033584	25.97	0.000	.0806317 - .0937966
CombatSupport – Yes	.0837476	.0056244	14.89	0.000	.0727239 - .0947713
CombatSupport – No	.092246	.0046382	19.89	0.000	.0831554 - .1013366
ServiceSupport – Yes	.0874418	.0061078	14.32	0.000	.0754707 - .099413
ServiceSupport – No	.0896388	.0044857	19.98	0.000	.0808471 - .0984306
City – Yes	.0896791	.0133191	6.73	0.000	.0635741 - .1157841
City – No	0.0887263	.0032323	27.45	0.000	.0823911 - .0950616
Rural – Yes	.091849	.0097787	9.39	0.000	.0726831 - .1110149
Rural – No	.0882279	.0035	25.21	0.000	.081368 - .0950878
Urban – Yes	.0829413	.0043022	19.28	0.000	.081368 - .0950878
Urban - No	.0981874	.0064699	15.18	0.000	.0855066 - .1108681

When looking at the same variables that had significant results in the logistic regression, it is much easier to interpret and understand the true impact that each variable has on CAM use which can be seen in Table 14. Going back to applying for disability status, those who applied for this status are 4.5% more likely to seek CAM than those who do not apply. This represents almost a doubling in the probability of CAM use compares to those who have not applied for disability status. In terms of health insurance, 2.1% more of those that are covered by insurance have used CAM compared to those who or uninsured. The smaller impact of insurance here may be due to the fact that the VA does provide some coverage for all respondents and does cover some types of CAM. So, the impact of insurance may be limited to those CAM treatments not covered by VA care.

Moving on to education, those who achieved some form of education past high school have a probability of CAM use about 2.5% higher than those who have not been educated in high

school. Persons receiving a bachelor's degree have their probability of using CAM increased by about 2.8% compared to those not receiving a bachelor's degree. Finally, respondents receiving either a master's or professional degree have the greatest probability of CAM use. Thus, the probability of CAM use shows a clear and consistent increase with educational level. Persons with no more than high school education have about a 7.8% probability of CAM use; those with high school education have a 10.3% probability, those with a bachelor's degree have an 11.5% probability of CAM use, and those with graduate school education have a 12.2% chance of using CAM.

Regarding race, those reporting to be Hispanic are 2% less likely to use CAM when compared to those not reporting to be Hispanic. When focusing on the option of being 'other race', there is a 6.5% increase in CAM use for those who reported to be another race compared to those not reporting to be another race.

The only significant paygrade of E7 to E9 revealed a 2.1% increase in using CAM. When referring to military branches, there is a 1.9% decrease in CAM when the individual is in the Navy compared to individuals in other branches. The Airforce has similar results where there is a 1.9% decrease in CAM use than those in military branches other than the Air Force used CAM. For the National Guard, there was a 2% increase in CAM use compared to those in other branches.

The final significant variable, related to living in an urban area, revealed a 1.5% decrease in likelihood for CAM use compared to those living in either the city or a rural area. This can be seen in the 8.2% probability of using CAM reported in the survey for those living in an urban area compared to those who do not live in an urban setting who reported a 9.8% probability.

Both city and rural reporting individuals did not have any significance in CAM use. An example

of this can be seen for city living individuals, where there was an 8.9% probability compared to an 8.8% probability for those not living in a city.

Chapter 5

Discussion

With CAM being an alternative to conventional medicine and not having some of the common side effects of conventional medicine, it would be important to see which demographic factors are associated with using CAM and which groups might need more awareness or information about this category of care. Especially with CAM steadily becoming more popular across the population, it would be best to discover the trends now and make necessary adjustments to the promotion or advertising of CAM. The population of veterans would appear to be one group for whom use of CAM might be expanded because of the types of illnesses and conditions that are prevalent among them. For example, looking at the general population, the condition with the highest rate leading to CAM includes musculoskeletal problems like back pain, neck pain, or joint pain. In addition, conditions like mental illness or PTSD are also common among individuals who seek to use CAM. The relationship between these conditions and CAM use suggests that there may be many veterans who would be interested in the option of using CAM.

This thesis used a comprehensive survey of veterans to understand their patterns of use of CAM and the factors that influence that use. While the cross-sectional survey is limited to only examining the correlates of CAM use, this research has highlighted several factors that have not been previously noted in looking at CAM use by veterans.

Looking at the results and all of the variables tested, the only ones revealing to have some significance with the individual using CAM are whether or not they applied for disability status,

insurance, education, race, paygrade, branch, and where the individual lives. For the variables of race, paygrade, branch, and where the individual lives, not all categories under the variable were significant. For example, when talking about race only the categories of Hispanic and 'other race' ended up being significant with CAM use. Reporting a race of black, Asian, or multiracial did not end up being significant.

The variable that was most significant, and only one classified as extremely significant, was applying for VA disability status. Having this information and seeing how those seeking disability status are likely to use CAM can be used to promote CAM to certain groups of people, as well as imply certain things about these individuals. Analyzing this result, it is likely that veterans who are applying for disability status must be suffering from some type of condition for a period of time. Having a condition for a lengthy time can lead to trying numerous treatments without much resolve due to the action of applying for disability status. So, there is most likely a significant relationship between the two variables because the individual is still suffering from some type of condition and still looking for treatments that work. Knowing this, there may be an opportunity for early outreach among veterans prior to the time they apply for disability status. Veterans who have chronic conditions that are not responding to conventional medical treatments might be targeted by the VA to see if early CAM use might be provided and could prevent disability status and help reduce the pain or condition.

With education, what was found was that as the individual achieved a greater education, the more likely they are to have used CAM. This can be seen with how individuals who received some post-high school education reported a 10% likelihood of using CAM. This jumped up to 11% with a bachelor's level of education, and then to a 12% likelihood if the individual holds a master's level degree or higher. This could be due to a number of factors, one being that those

with lower education did not learn anything about potential CAM treatments due to the limited schooling. This could reduce the potential of seeking out CAM. Also, less schooling tends to be associated with lower literacy rates, including health literacy. So, those experiencing less education could not have the literacy rate to fully understand all of the details about certain CAM treatments. Taking this information into account, the VA could hold informational meetings or provide newsletters to veterans that detail the different CAM treatments available and do so in a way that can be easily understood by all, no matter the literacy rate.

Those reporting to be Hispanic were revealed to be less likely to seek CAM compared to others. It is not clear why this effect is found, since the literature on CAM use in the general population does not indicate that individuals of Hispanic ethnicity are less likely to use CAM. It is possible that the VA could improve in its outreach regarding CAM through Hispanic veteran of community groups or Spanish language materials or advertisements to make sure that these veterans are aware of the role that CAM can play in their treatment.

The only paygrade that turned out to be significant were those in the middle, reporting to be in the E7 to E9 category, who were more likely to use CAM. Again, it is not clear why this relationship would be found since there is not a similar pattern in the general population. If the result is driven by income and out of pocket payments for CAM, we would expect that individuals in higher paygrades would also show higher levels of CAM use. Instead, those who are at the high-level paygrades are less likely to use CAM. This relationship may require additional data collection and analysis to understand why those in the middle of the paygrade distribution are the most likely to choose CAM treatment.

One of the interesting opportunities from a comprehensive survey like the one used in this study is being able to look at groups that were previously unexamined. The data allow us to

look at CAM use by branch of the armed services, and the study finds a significant relationship here. Individuals enlisted in both the Navy and Air Force were less likely to be using CAM while individuals enlisted in the National Guard or Reserves had a higher chance of seeking CAM use. It is not clear from the data or other sources why these differences would occur by service branch. It is possible that this relates to different types of medical conditions across the services, differences in awareness of CAM, or a number of other factors. So, this could call for more outreach to veterans that were enlisted in either the Navy or Air Force to promote the different types of CAM to ensure that they are aware of the various types of care, as well as additional research to understand why these differences exist.

The final significant variable was living in an urban location which was associated with a smaller chance of using CAM. The higher rate of CAM use in rural areas could be to the availability of conventional medical treatments in rural areas. Living in a rural area is likely to make access to certain standard medical treatments difficult due to long commutes. So, this could lead to the individuals choosing to take advantage of care that could be performed in the comfort of their own home without the need of a professional or that is closer to their home. This could include many types of CAM due to the ability to perform some treatments alone including meditation, yoga, tai chi, diet therapy, or natural products, among others.

Comparing these results to the literature and past studies that have been performed, there were some variables that stayed consistent, and others that revealed go the other way. There were some variables, like having insurance or the individual's education level, which stayed consistent with past studies and had a significant relationship with CAM use. Gender, however, was a variable that was consistently found to be significant with CAM use across multiple studies. Although this was the case, in this study the statistical tests did not reveal any significance in

CAM use relating to either gender. This difference can be due to the pool of veterans that were randomly selected, or it can also be have some relation to how the study made sure to have a well-represented sample of both men and women. This could have caused the results of this study to be differed compared to past studies that did not ensure a well-represented sample of both men and women.

Limitations

There are several limitations to the results of this study. One limitation was a number of variables that had to be removed because of missing observations of other data problems. The variables that were omitted includes the individual's salary, the overall VA disability rating, and their disability rating for their physical and mental health.

Another limitation within this study was the low R-Squared which came out to be 3%. Despite the fact that the research included a large number of variables, the variables tested in this study only account for a small portion of the variation in the explanation of why individuals seek out and use CAM. In a future study, it might help to have a lot more variables covering numerous variables, that in return, could help raise the R-Squared. There may also be a need for further qualitative and exploratory studies to understand better why veterans choose to use CAM.

The final limitation that appeared in this study had to do with the survey. With the questions that asked on the survey, there was nothing dealing with the type of treatments that the individual used, how long they have been using the treatments, if they will continue to use the treatments, what type of condition lead to them using CAM, and how effective the treatments have been. So, on the survey and asking more questions relating to the CAM use will help extend

the results of this study significantly, especially regarding the impact CAM has on different health conditions.

In summary, the thesis sought to explore the sociodemographic relationships among veterans of their use of CAM. Over the past number of years, the use of CAM has been seen to be significantly growing. With the popularity growing, there have been various studies to determine what are common factors leading individuals to use CAM. These have found variables ranging from the type of condition an individual is suffering from, to factors like gender or education, can play a role in the seeking CAM. In this study, we used data collected through the Veterans Metrics Initiative which had variables including the individuals military branch, race, income, and marital status, among others. These variables were then all analyzed on STATA with a logistic regression, marginal analysis, and chi-squared test to determine their relationship to CAM use. Overall, the variables to show significance to CAM use include applying for disability status, education level, race, paygrade, military branch, and the type of area the individual lives in. These findings reveal that there are certain sociodemographic factors that play a role in whether or not an individual uses CAM.

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ACADEMIC VITA
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EDUCATION

The Pennsylvania State University, University Park, PA

Aug 2019 – May 2020

College of Health and Human Development

Bachelor: Health Policy and Administration (BS) Minor: ISHPA and Business Administration

Schreyers Honors College

- Honors Program includes advanced academic coursework, thesis, internship, ethics study, and leadership/service commitment

RELEVANT

Temple University Hospital

Philadelphia, PA

Project Management Intern

May 2019 – July 2019

- Worked in outpatient pharmacy to lower the through put of prescriptions to meet the national average of 60 minutes or less
- Led a project using 6S methodologies to standardize and organize supply areas within the hospital
- Presented supply waste management project strategies and progress to appropriate stakeholders
- Developed and adjusted Excel spreadsheets dealing with projects ranging from bed turn-around time to fiscal year projections

St. Luke's University Health Network

Bethlehem, PA

Research Intern

June 2018 – August 2018

- Worked on various projects including updating IND safety reports, informed consent forms, filling out IRB Amendment forms, and chart reviews
- Observed IRB meetings, Research Faculty Councils, curriculum lectures, and research symposiums
- Shadow research nurses and coordinators dealing with oncology
- Gained experience in multiple departments within research including finance, regulatory, and IRB

American College of Health Care Administrators (ACHCA)

State College, PA

Vice President

August 2018 – Present

- Discussed issues faced and job opportunities in nursing home administration
- Provided opportunities to meet and network with experienced professional leaders in long-term care
- Involved in community service events held throughout community

Health Policy and Administration Club

State College, PA *Member*

August 2018 – Present

- Held workshops and special events to learn from guest speakers and alumni who are experienced in various areas within the health care profession
- Participated in service events held throughout community and promotion of student/faculty relations

WORK EXPERIENCE

Jeffrey A. Miller Catering

Philadelphia, PA

Head Waiter (2017-2018) and Server (2016-2017)

April

2016 – August 2018

- Accommodated guests throughout ceremony and dinner service with any questions, concerns, and requests
- Assisted less experienced co-workers with required tasks by answering any questions and giving helpful advice
- Primary helper for managers dealing with any urgent tasks or important jobs

ACTIVITIES

The Swedish Experience Embedded Program

May 2019

- Visited the Qulturum and talked about the Sweden tax system and preventative measures
- Discussed workplace burnout and the relationship between women, work, and stress at the Karolinska Institute

SKILLS/CERTIFICATES

Lean Six Sigma Yellow Belt Certification

Knowledge in Stata Software

Francis Hoffman Award for Excellence in Writing

August 2018 – April 2019

- Recognized as student who demonstrates excellence in writing as determined by submitted paper

The President's Award

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- Earned 4.00 Cumulative Grade-Point Average