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Military Tobacco Dependence Treatment: Implications of Treatment Type on Abstinence and Weight Management Ability

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Military Tobacco Dependence Treatment: Implications of Treatment Type on Abstinence and Weight Management Ability

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DNP Capstone Overview

Among health risk behaviors, tobacco use remains the leading cause of preventable illness and death in the United States. Several thousand deaths from cardiovascular disease, respiratory disease and/or malignancy are associated with tobacco use each year (Centers for Disease Control, 2011). As recently as 2010, 19.3% of adults in the U.S. smoked. The highest prevalence was seen in the Midwest and Southern regions with smoking rates as high as 21.8% and 21.0% respectively. Annually, there are approximately 443,000 tobacco-related deaths with a national financial burden of $96 billion in direct medical expenses and $97 billion in lost productivity. Clearly addressing tobacco use cessation is clinically relevant (Centers for Disease Control, 2011).

Tobacco use is also prevalent in the U.S. Military. As recently as 2005, a Department of Defense Health Related Behavior survey found that 32.2% of service members' smoke and that 42.8% of military personnel 20 years or younger and 41% of those 21 to 25 years of age were current smokers (Smith & Malone, 2009). These two age groups comprise the bulk of tobacco users among military members (Green, Hunter et al., 2008) (Smith & Malone, 2009).

The potential physical and financial costs associated with this health risk behavior are well documented and can directly impact both the individual and their command. As an example, a 1995 study found that among active duty personnel, costs associated with smoke breaks and smoking related hospitalizations were estimated at $346 million (Helyer, Brehm et al., 1998). A retrospective review of 4.3 million participants, under the age of 65, enrolled in the TRICARE Prime program in 2006 found that the Department of Defense spent an estimated $2.1 billion per year for medical costs associated with tobacco use, excess weight and obesity, and excess alcohol consumption combined. Nonmedical costs for active duty personnel, such as potential

productivity losses due to high rates of absenteeism, lower than normal work productivity, and first-year attrition for military service, related to the same three factors were in excess of $965 million per year (Dall, Zhang et al., 2007). These facts, along with the significant prevalence of tobacco use among the younger members of the military, indicate a strong need for improved tobacco cessation efforts (Helyer, Brehm et al., 1998) (Dall, Zhang et al., 2007).

Tobacco cessation programs in the military encounter the same obstacles as non-military programs. Potential barriers to participation in these programs can include individual willingness to change, types and availability of support systems, and the kinds of programs available. In addition, some members are hesitant to stop smoking because of the risk of weight gain since studies show that up to 80% of smokers who stop using tobacco may gain weight. Weight gain is a major concern for military members as body weight indicates fitness for duty and continued service. The average weight gain can be as high as 13 pounds within one year of stopping tobacco use (Russ, Fonseca et al., 2001).

Given the high rates of smoking in the military and the influence post cessation weight gain may have on the willingness to engage in smoking cessation, the purpose of this capstone is to examine factors associated with tobacco use among military personnel and to examine tobacco treatment options that may be effective in assisting military personnel in their efforts at smoking cessation while maintaining weight standards. Outcomes of this capstone project include three articles prepared for submission to professional journals. The first article provides a brief systematic review of the literature that examines the background of tobacco use among members of the United States military as well as past and current tobacco cessation efforts and their efficacy. The second article takes a more in-depth look at military tobacco cessation efforts. Obstacles encountered, proposals to affect stronger anti-tobacco policies, and cessation efforts

within this community are discussed. The third article describes the outcomes of a pilot study examining tobacco dependence treatment and its relationship to abstinence and ability to maintain body weight among primary care patients in a community setting.

Targeted Tobacco Dependence Intervention to Reduce Tobacco Use at the Military Unit Level: A Review of the Literature

Journal proposed for submission: Military Medicine Journal

The U.S. military is comprised of approximately 1.3 million active duty personnel. Military members are a prime market for the tobacco industry because the majority are junior enlisted personnel (i.e. those individuals in the 18-25 year age group who are more likely to use tobacco). As of 2005, the smoking prevalence among service members was approximately 32.2% (Smith & Malone, 2009). Interestingly, this percentage is only slightly lower than in 2002, when 33.8% of military members smoked. Military personnel who smoke also experience financial hardship. Financial stress among military households is 1.5 times higher than in those with nonsmokers (Pyle, Haddock et al., 2007). The odds of extreme financial stress are twice as high in smoking versus nonsmoking households (Pyle, Haddock et al., 2007). While there is no comparison to nonsmokers, heavy smokers have an average of $8300 net worth deficit, light smokers a $2000 net worth deficit, and each year of smoking is associated with a 4% decrease in overall net worth (Pyle, Haddock et al., 2007).

This first article serves as a global review of the literature which examines the success of current military tobacco cessation programs and their various components (i.e., use of counseling or pharmacotherapy treatment modalities). Given that there remains a high cost from tobacco use to both the military organization (e.g. mission readiness) and the personnel (e.g. personal health),

there is the need to institute evidence-based modalities of tobacco treatment that are tailored to this unique patient population. The overall goal of this integrative review is to provide a comprehensive examination of military tobacco cessation for U.S. military personnel. Successful program components are identified which may lead to higher success in tobacco treatment among military personnel, especially in Navy and Marine Corps units who have the highest tobacco use rates as compared to the other services.

Changing to a Tobacco Free Military:

Seeking a Policy Paradigm Shift in a High Use, Pro-Tobacco Subculture

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This second article examines military tobacco cessation efforts and associated policy change. Strategies and approaches based on Kingdon's conceptual framework / streams model that could affect policy change for the U.S. military (Kingdon, 2011) are also addressed. The military has attempted to diminish tobacco use by developing a policies that include: a) banning tobacco use by military healthcare providers while on duty, b) prohibiting cigarette promotions aimed at military members, c) banning tobacco use in all services during basic training, d) providing free tobacco dependence treatment and e) increasing the price of tobacco products to within 5% of civilian sector prices (Poston, et al., 2010). However, tobacco control is not a strong priority among various service policy leaders and tobacco control managers. Those individuals involved in developing and implementing tobacco control policies within the Department of Defense (DoD) believe that military leaders view tobacco control issues as a very low priority with little to no impact on meeting their respective missions or 'bottom lines'. Even more perplexing is the lack of consistent enforcement of current tobacco control policies within the various services under DoD (Kingdon, 2011) (Poston, et al., 2010).

The fight to go tobacco free within the Department of Defense continues. A recent article from the Navy Times, in November of 2012, reveals that "the smoking lamp will stay lit", at least for now, within the Navy and Marine Corps. According to the assistant Secretary of the Navy for Manpower and Reserve Affairs Juan Garcia, "There are no plans to turn out the smoking lamp across the fleet… We want to reduce tobacco consumption and ultimately work toward a tobacco free Navy but in a voluntary manner" (Stewart, 2012).

It seems, at least for now, the political will to make the military tobacco free is not present at the senior levels due to lack of support from civilian political leaders. At least the strategies to affect change are present. One has only to wait, as Kingdon (2011) suggests; eventually, opportunities may arise as political representatives and administrations change. In that light, the message of the detrimental effects of tobacco use upon the military service, the health of its members, and negative impact on the ability to maintain mission readiness need to be put forth in the public arena and to political leadership on a consistent, regular basis (Kingdon, 2011).

Tobacco Dependence Treatment and its Relationship to Abstinence and Weight Gain: A Pilot Study

Prepared for submission to: Journal of the American Academy of Nurse Practitioners

Military readiness, employer productivity and individual health are impacted by the high rates of tobacco use. The objective of this pilot study, and third article related to this capstone project, was to explore tobacco use within a civilian population to determine what, if any, relationship there might be among those seeking to quit tobacco use regarding the type of treatment received, smoking abstinence rates and maintaining body weight (e.g. avoid weight gain). The intent was also to provide guidance on enhancing current cessation efforts that result

in the member's ability to maintain body weight and long-term abstinence from tobacco use among U.S. Navy personnel. Current research suggests that use of brief, individually tailored behavioral modification strategies over group therapy is most effective (Klesges, DeBon, et al., 2006).

An Observational Cohort Study with 2 nonequivalent groups, using a Control Group Post-Test Only Design with repeated measures was implemented for the purposes this study. This study looked at 2 unequal cohorts: Tobacco Dependence treatment received on individual basis (e.g. Primary Care Provider or Tobacco Cessation Specialist); or Tobacco Dependence Treatment (Group). As all participants were referred to the group program – this was the standard (or the control group). The Fagerstrom Nicotine Dependence Assessment Tool was administered at baseline and as a Post Test after treatment (individual or group) for those who continued to smoke. Repeated measures to include weight and abstinence status were measured at 1 and 3 months during clinic follow up.

Data from a convenience sample of all participants attending a local community Tobacco Cessation program (e.g. group tobacco dependence treatment) or tobacco cessation counseling in a primary care setting (e.g. one-on-one by the Primary Care Provider or Tobacco Cessation Specialist) was collected for one month. No statistically significant relationships were found among: the type of tobacco dependence treatment received, the ability to maintain body weight and abstinence rates. Abstinence rates at 90 days among those receiving treatment in primary care was slightly better than national statistics on abstinence rates among patients attempting to quit with no help at all. Sample size prevented using inferential statistics on data from the remaining 2 cohorts – those who received individual counseling and those who attended group treatment. Descriptive statistical analysis demonstrated that a majority were able to either

maintain their body weight or lose weight at 30 and 90 days as well as demonstrate a decrease in nicotine dependence scores from baseline measurement during their cessation attempt(s).

The results of this pilot study suggest that research using a larger sample and randomizing participants to treatment groups is warranted. Additionally, the experiences and lessons learned by the investigator while conducting this pilot will prove invaluable in conducting future research in a similar patient population.

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Targeted Tobacco Dependence Intervention to Reduce Tobacco Use at the Military Unit Level:

A Review of the Literature

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Abstract

Military readiness and individual health are significantly impacted by the high rates of tobacco use within the U.S. military. The purpose of this review is to explore tobacco use within the military subculture and identify implications for the development of targeted tobacco dependence interventions for active service members in a U.S. Navy unit. The intent is to provide guidance on enhancing current cessation efforts and promoting long-term abstinence by using evidence-based, brief, individually tailored behavioral modification strategies.

Targeted Tobacco Dependence Intervention to Reduce Tobacco Use at the Military Unit Level: A Review of the Literature

1. Introduction

The U.S. military is comprised of approximately 1.3 million active duty personnel. Military members are a prime market for the tobacco industry. The majority are junior enlisted personnel; i.e. those individuals in the 18-25 year age group who are more likely to use tobacco. As of 2005, the smoking prevalence among service members was near 32.2% (Smith and Malone, 2009); slightly lower than in 2002, when 33.8% of military members smoked. Military personnel who smoke also experience financial hardship. Financial stress among military households is 1.5 times higher than in those with nonsmokers (Pyle, Haddock et al., 2007) and the odds of extreme financial stress are twice as high in smoking versus nonsmoking households (Pyle, Haddock, et al., 2007). While there is no comparison to nonsmokers, heavy smokers have an average of $8300 net worth deficit, light smokers a $2000 net worth deficit, and each year of smoking is associated with a 4% decrease in overall net worth (Pyle, Haddock et al., 2007).

Ironically, the tobacco industry has had a long relationship with the military. Cigarette distributors have sponsored events for military personnel. As recently as 1975, service members were issued cigarettes with their rations, which may explain, in part, the higher rates of tobacco use in the military as compared to the general public. To quote a famous General, John J. Pershing, the importance of tobacco for military leaders is evidenced by his statement “You ask me what we need to win the war? I answer tobacco as much as bullets.” While this attitude has changed within military leadership circles, many challenges still remain (Nelson & Pederson, 2008).

Costs associated with tobacco use are a concern of the military establishment. Among active duty personnel, costs associated with smoke breaks and smoking related hospitalizations have been estimated at $346 million (Helyer, Brehm et al., 1998). A retrospective review of 4.3 million participants, under the age of 65, enrolled in the TRICARE Prime program found that the Department of Defense spent an estimated $2.1 billion per year for medical costs associated with tobacco use, excess weight and obesity, and excess alcohol consumption combined (Dall, Zhang et al., 2007). Nonmedical costs, such as potential productivity losses due to high rates of absenteeism, lower than normal work productivity, and first-year attrition for military service, related to the same three factors (e.g. looking at only the active duty population) were in excess of $965 million per year (Dall, Zhang et al., 2007).

The financial impact of tobacco use is also evident at the individual level. The average expenditures related to tobacco use for junior enlisted personnel amount to as much as 10% of their annual base pay, or essentially an entire month's pay (Pyle, Haddock, et al., 2007). For those in the military at the rank of E1 (lowest enlisted rank), smoking a half a pack a day to two packs per day consumes as much as 4.8% to 19.3% of their annual income; for those at the E2 rank, 4.3% to 17.2% of their annual income is spent on tobacco products; and for those at the E3 level, 3.6% to 14.5% of their annual income is spent on tobacco use (Pyle, Haddock et al., 2007).

Although tobacco use has a greater impact on overall military readiness than weight problems, there are currently no negative consequences for tobacco users. A 2001 study, assessing an Air Force tobacco cessation program, found an association between concerns about weight and trying to stop smoking (Russ, Fonseca et al., 2001). In the study, participants thought that tobacco use cessation could cause undesirable weight gain, which would adversely affect their ability to continue their military career. Nearly 80% of smokers who quit tobacco gained an

average of 10 pounds at the end of the program and up to 13 pounds within a one year period of abstinence. In addition women tended to be more concerned about gaining weight than their male counterparts and there was a higher rate of anticipated relapse among participants who were close to their maximum weight (Russ, Fonseca et al., 2001).

Unfortunately, many military commanders and active-duty members perceive that tobacco use aids in stress management although the opposite is true. The physiological and psychological changes induced by nicotine addiction serve to increase the stress response (Stein, Pyle et al., 2008). Those individuals who repeatedly try to quit become more anxious and agitated. Stein, et. al (2008) studied individuals using multiple tobacco products and discovered a relationship between use of multiple tobacco products and stressful coworker relationships. Among multi-product users, 90% were more likely to report stressful coworker relationships. Current smokers were 55% more likely to do so. Additionally, as compared to those who never used tobacco, those who used tobacco of all forms were less likely to employ positive coping strategies in dealing with stress (Stein, Pyle et al., 2008).

While a zero-tolerance policy, such as in basic military training, provides a good opportunity to enhance tobacco cessation, forced abstinence without behavioral intervention may not lead to sustained tobacco quit rates. Some studies found that rates of recidivism in both male and female recruits after basic military training were as high as 68% to 84% (Nelson & Pederson, 2008). These recruits returned to tobacco use within the first month after basic military training was completed. Additionally, according to Nelson and Pederson (2008), smokeless tobacco is becoming a commonplace substitute among military recruits and other regular active-duty members. It is generally seen as a safer alternative to smoking and is often perceived to not

negatively impact the overall health status of a service member as drastically as smoking (Nelson and Pederson, 2008).

According to Green, et. al (2008), 8% to 10% of non-smokers began smoking during the first year military service despite the enforced absence during basic military training. A 2005 health-related behavior survey by the Department of Defense found that 42.8% of military personnel 20 years and younger and 41% of those 21 to 25 years of age were current smokers (Smith & Malone, 2009). Additionally, former smokers were more likely to resume smoking if there was a perception that the majority of their peers smoked and if their military instructor also used tobacco. Previous smokers demonstrated similar traits with regards to peer tobacco use and recidivism. Findings suggests that military role models who use to tobacco, along with smoking behavior and perceived norms, increase the likelihood of new military personnel initiating tobacco use (Green, Hunter et al., 2008).

The purpose of this study is to review the literature to assess current military tobacco cessation programs and their various components (i.e., use of counseling or pharmacotherapy treatment modalities). Given the high cost of tobacco for both the military organization (e.g. mission readiness) and personnel (e.g. personal health), the need exists to institute evidence-based modalities of tobacco treatment that are tailored to this patient population. The goal of this integrative review is to:

1. Examine the efficacy and effectiveness of tobacco cessation efforts for active service members in the U.S. military.
2. Determine components from successful programs which may lead to higher success in tobacco treatment among military personnel, especially in Navy and Marine Corps units who have the highest tobacco use rates as compared to the other services.

3. Identify factors associated with tobacco use and cessation among U.S. military personnel.

2. Materials and Methods

A comprehensive literature search was conducted by examining multiple electronic databases including CINAHL®, the Cochrane Library and PubMed. The search was limited to articles published from July 1996 to October 2011. Keywords included: tobacco use, U.S. military, Navy, Marine Corps, tobacco cessation, smoking, smokeless tobacco, Department of Defense, and nicotine replacement therapy. Inclusion criteria were limited to: 1) primary and secondary research studies that examined tobacco use exclusively in the U.S. military, or one or more of its individual branch services when possible. Due to a limited availability of such studies, civilian research was considered as well; 2) morbidity, mortality, and cost related to tobacco use within the Department of Defense (DoD); 3) behaviors influencing tobacco use, its incidence and prevalence; and 4) analysis of tobacco cessation efforts, and implications for strategies to improve their efficacy for the active duty military population. After conducting several online searches, 30 articles were found that fit the inclusion criteria established for this review. Each study was reviewed and classified according to the levels of evidence, and grades of recommendations from the text Evidence-Based Medicine: How to Practice and Teach EBM , 2nd ed. (Sackett, D. L., Straus, S. E., Richardson, W. S., Rosenberg, W., & Haynes, R. B., 2000).

3. Results

3.1 Description of selected studies

Of the studies retrieved from the literature review, ten were either randomized controlled trials or meta-analyses of randomized controlled trials (Bushnell, Forbes et al., 1997; Ebbert, Montori et al. 2007; Klesges, DeBon et al., 2006; Lancaster and Stead, 2005; Parsons, et al., 2009; Pesis-

Katz, et al., 2011; Reda, et al., 2009; Stead, Bergson & Lancaster, 2008; Stead, Perera, et al., 2008; Severson, Peterson et al., 2009). These ten studies are the focus of this review and provide the strongest evidence regarding interventions for tobacco cessation for Military servicemen. There were three additional cohort studies (Table 3) focusing primarily on the problem of tobacco use influences within the U.S. military, as well as best use of Nicotine Replacement therapy (NRT). The remaining studies included seventeen quantitative and/or qualitative studies and four additional descriptive studies. Although less rigorous in methodology, these studies can contribute to overall knowledge of the problem of tobacco use within the military culture.

3.2 Results of Cessation Strategies

From the review of the literature, four randomized controlled trials examined interventions to promote tobacco cessation and abstinence (Table 1). In one study, a randomized control trial was conducted with 512 Department of Defense healthcare beneficiaries. Subsets of this sample included active-duty, 52%, family members 29%, retired personnel 11% and civilians 8%. The purpose of the study was to examine the differences in smoking cessation outcomes between the American Cancer Society Fresh Start Program and a program from Vanderbilt Medical University. The Fresh Start program is a four-week course consisting of one our group sessions with a maximum of 50 participants. The Vanderbilt program utilizes a relapse prevention model with smaller group size of 15 participants. Of the total number starting the program, 75% of the civilian participants completed the courses. As evidenced by completion rates, 84.2% of the civilian population who attended the Vanderbilt program completed the course and were able to remain abstinent versus 59.6% of active-duty participants who completed the Fresh Start program with a confidence interval of $p < 0.01$. The differences in abstinence rates remained significant between the two groups at three-month follow-up with a 40.4% abstinence rate

among civilians from the Vanderbilt program versus a 24.6% abstinence rate among active-duty who participated in the Fresh Start program (Bushnell, Forbes et al., 1997).

Klesges, DeBon et al. (2006), conducted another randomized control trial among active-duty enrollees in a basic military training course within the United States Air Force using 33,215 participants and found that smokers who received brief, tailored individual tobacco cessation interventions were significantly 1.23 times more likely to be abstinent at the one-year follow-up point. Smokeless tobacco users were significantly 1.33 times more likely to remain abstinent at the one-year follow-up time point. Brief forms of smoking cessation programs, like individual counseling by healthcare providers showed consistent change in smoking behaviors (Klesges, DeBon et al., 2006).

Using a civilian population, another study by Pesis-Katz, et al. (2011) explored the cost-efficacy of basing a tobacco cessation intervention on self-determination theory. Established national guidelines for treatment of tobacco dependence were also used. Specifically, seven-day point-prevalence of tobacco abstinence and cost effectiveness of the intervention for 737 adult smokers with health insurance coverage were examined. The control group received only literature and program information, whereas the experimental group received 4 additional, intensive counseling sessions over 6 months. Smokers in the intervention group were more apt to be tobacco free at 6 months and had an estimated incremental cost-effectiveness ratio of $1258 per quality-adjusted life year saved (Pesis-Katz, et al., 2011).

Another randomized controlled trial examined the efficacy of minimal contact, in the form of telephone counseling, on tobacco cessation outcomes among 785 active-duty personnel who were smokeless tobacco users (Severson, Peterson et al., 2009). Participants were recruited from military dental clinics across the United States. At six-month’s follow-up, 25% of smokers were

abstinent, whereas 16.8% of smokeless tobacco users were abstinent at six months. The results of the study suggests that the use of minimal contact behavioral interventions such as telephone counseling can have a significant impact on cessation rates among smokers and smokeless tobacco users (Severson, Peterson et al., 2009).

Given the lack of experimental research within the military, six other civilian studies from the Cochrane Library were reviewed. These studies were meta-analyses of randomized controlled trials (Table 2). The first study examined the effects of behavioral pharmacotherapy interventions and smokeless tobacco use. These authors found that behavioral interventions were effective in helping smokeless tobacco users quit. Pharmacotherapy showed no significant effect on long-term effect on abstinence rates (Ebbert, Montori et al., 2007). A second study by Lancaster & Stead (2005), reviewed 68 trials to determine the effectiveness of self-help materials, adjuncts, and approaches tailored to the individual compared with no treatment. Even when combined with nicotine replacement therapy, the benefits of self-help materials, regardless of type, was very small. Self-help strategies tailored more to the individual led to a slightly higher benefit for those studied (Lancaster and Stead, 2005). Two additional studies focused on cessation efforts in primary care (Stead, Bergson & Lancaster, 2008) and the efficacy of variations of use of Nicotine Replacement (NRT) in sustaining tobacco abstinence (Stead, Perera, et al., 2008). Findings from both studies suggest that simple quit advice in primary care increased overall tobacco abstinence from 1-3% (from an unassisted quit rate of 2-3%) and that NRT use (regardless of setting) increased quit rates by 50-70% without increased individual support (Stead, Bergson & Lancaster, 2008) (Stead, Perera, et al., 2008).

Two additional descriptive studies are noteworthy of mention. One of these was a descriptive, retrospective study (N=40) conducted at Naval Medical Center San Diego, California (McMurry,

2006). The study examined differences in relapse rates of military personnel using pharmacotherapy agents at one month, three months, and six months. Of the 40 participants, 10 were on Zyban (e.g. an antidepressant with unclear qualities that assist in tobacco cessation) only, 10 were on nicotine patches only, 10 were on Zyban and nicotine patches and another 10 participants were using both nicotine patches and gum. In the end, there was no significant difference in treatment regimen other than a moderate increase in being tobacco free related to the length of the program. Medication cost for nicotine replacement was prohibitive for some patients in the third cohort of this study. They were found to relapse when it was not available (McMurry, 2006). Similarly, in a second descriptive study within another civilian population, Saul et al. (2011) found that, when examining NRT shipment protocols in conjunction with a tobacco quit line, no significant difference in 30-day point prevalence quit rates at seven months was noted. The major difference was in cost to the facility pertaining to quantity of NRT used and the number of shipments involved (Saul, et al., 2011).

4. Limitations of the Review

The focus of this review was on military personnel and smoking cessation, however, given the dearth of randomized controlled trials using this population, research on civilians is also described. Findings from these studies may not be generalized to the military.

5. Discussion

This review examines the efficacy and effectiveness of tobacco cessation initiatives among active duty military personnel in order to provide evidence-based guidance to develop and implement a significant, cost-effective QI initiative to reduce tobacco use among active duty at a unit level. There are however, gaps noted in the literature and cited in the following discussion. First, there was a limited amount of research using level I and level II evidence, as defined by

Sacket, et al., (2000). Yet, other qualitative and quantitative studies were available to lend sufficient data and guidance to justify future interventions and programs to decrease tobacco use (Sackett, D. L., Straus, S. E., Richardson, W. S., Rosenberg, W., & Haynes, R. B., 2000).

While some of the studies were dated, they still provided useful information. An older study that examined the overall impact of cigarette smoking on the Department of Defense was conducted 20 years ago (Helyer, Brehm et al., 1998). Even so, this large data base provides interesting information related to tobacco use such as, allocation of resources, and impact on military personnel within the Department of Defense military healthcare system.

Also of note, is the variety of studies with small sample sizes, yet valid points. One study, in particular, looked at the cost and consequences associated with a single tobacco cessation program, using nicotine replacement therapy for active-duty service members (Miller, Draugalis et al., 1996). A retrospective review of 126 active-duty health records was conducted between 1993 and 1994. It was noted that abstinence rates while on nicotine replacement therapy were significantly higher at the point of prevalence abstinence (19%) and continuous abstinence point (15%) at six month follow-up respectively. In addition, the longer the therapy, the more participants found tobacco free at six months (Miller, Draugalis et al., 1996).

6. Implications for Practice and Future Research

As evident from the review literature, brief, tailored interventions are more effective in promoting abstinence among current tobacco users (Klesges, DeBon et al., 2006; Severson, Peterson et al., 2009). However, the body of literature reviewed has dealt primarily with tobacco cessation initiatives conducted in large group, versus individual settings. A great opportunity exists to look at utilizing targeted tobacco dependence initiatives in a variety of other settings such as onboard ships, at training facilities, in the field, deployed overseas, and possibly even in

combat. These unique environments provide challenges for healthcare professionals within military healthcare system to reduce tobacco use. Also, tobacco products are frequently used to cope with stress in these environments; however, as noted, it may produce the opposite effect. Therefore, it not only impacts individual health, but may also affect military readiness for that member's particular unit or command (Hourani, Yuan et al., 1999; Stein, Pyle et al., 2008).

7. Conclusion

Tobacco use negatively impacts both military readiness and overall individual health and financial well-being. New, more mobile and brief tobacco cessation strategies may need to be taken to the deck plates (e.g. the worksite) to meet the needs of a patient population who cannot always participate in formal tobacco cessation programs at their local clinic or medical treatment facility. Tobacco cessation efforts that aim to effectively stop tobacco use and promote long-term abstinence should use brief, individually tailored behavioral modification strategies with pharmacotherapy readily available. This holds true for both those who smoke and those who use smokeless tobacco products and may provide guidance for program implementation at the Navy unit level.

Table 1: Best Strength of Evidence by author, sample, design, findings and implications.

Author/Year and Journal	Sample	Design	Findings	Implications
Bushnell, Forbes et al. 1997, Military Medicine	N=512 beneficiaries, 52% active duty, 29% family member, 11% retiree and 8% civilian	RCT	69% of those who attended 75% of the classes were tobacco free. Regression analysis found more intensive program to be twice as effective at the end of program and 3 months follow up. Outcome not continued at 6 months. Vanderbilt University program was more effective than American Cancer Society (85% vs. 60%) in civilian, but not active duty population	Tobacco cessation programs have a significant benefit in reducing tobacco use in all populations; however, more intensive programs do not necessarily have a greater efficacy in the active duty population.
Klesges, DeBon et al. 2006), Journal of Consulting and Clinical Psychology	N=33,215 active duty enrollees in USAF basic military training	RCT	Those assigned the intervention were 1.16-1.30 more times likely to be abstinent at 1 year follow up. Among smokeless tobacco users, abstinence was 1.33 times more likely. In contrast, those who never or experimentally smoked had higher rates of smoking initiation at 1 year follow up	Brief, tailored interventions can be very effective in promoting tobacco abstinence among current users
Pesis-Katz Williams, et al. 2011) The American Journal of Managed Care	N=737; n=526 randomized to treatment group and n=211 randomized to the control group. The ratio for random assignment was used to minimize harm to the control condition, as the intervention was expected to have a greater effect on tobacco abstinence.	RCT	Participants in the intervention group were more likely to attain both self-reported (15.59% vs 4.74%; $\chi 2$ (1) = 16.23, P <.01) and biochemically validated (12.74% vs 3.32%; $\chi 2$ (1) = 14.79, P <.01) measures of 7dPP tobacco abstinence at 6 months. Among those who did not want to stop smoking within 30 days, participants in the intervention group, were more likely to attain self-reported 7dPP tobacco abstinence at 6 months (13.79% vs 4.59%; $\chi 2$ (1) = 6.61, P <.05).	An intervention based on SDT and consistent with the PHS Guideline facilitated tobacco abstinence among insured smokers and was cost-effective compared with other tobacco dependence and medical interventions
Severson, Peterson et al. 2009, Nicotine & Tobacco Research	N=785 active duty personnel recruited from 24 military dental clinics across the U.S.	RCT	Significantly more likely to be abstinent from all tobacco at 3 & 6 month follow up (25%) and significantly more likely to abstain from smokeless tobacco use at 6 months (16.8%) compared to patients receiving typical care at 7.6% and 6.4% respectively	Brief behavioral modification interventions can have a significant impact on tobacco use during a brief outpatient encounter

Key Terms and Symbols: DoD – Department of Defense; NRT – Nicotine Replacement Therapy; RCT – Randomized Control Trial; USAF – U.S. Air Force; HCP – Healthcare Provider; SDT – Self-Determination Theory; PHS – Public Health Service; RR – Risk Ratio; CBT – Cognitive Behavioral Therapy; CI- Confidence Interval

Table 2: Second Tier Evidence by author, sample, design, findings and implications.

Author/Year and Journal	Sample	Design	Findings	Implications
Ebbert, Montori, et al. 2007, Cochrane Library	20 Trials met inclusion criteria	Meta-Analysis of RCT's	Behavioral interventions effective in helping smokeless tobacco users quit. Pharmacotherapy shows no effect on long-term abstinence	Highest success in preventing relapse in smokeless tobacco users hinges on behavior modification intervention strategies
Lancaster & Stead 2005, Cochrane Library	68 trials	Meta-analysis of RCT's	Benefits of self-help materials (regardless of type) in conjunction with NRT were very small. Those self-help strategies tailored to the individual were more beneficial, although the overall benefit to success was small.	Self-help materials (e.g. pamphlets, websites, etc…) are only slightly more efficacious in promoting abstinence from tobacco. Tailored programs are slightly more beneficial
Parsons Shraim et al. 2009 Cochrane Database of Systematic Reviews	N=60 studies; 11 studies for 1st part of review and 49 studies for the 2nd part of the review.	Meta-Analysis of RCT's	Pharmacotherapy aimed at reducing post-cessation weight gain resulted in a significant reduction in weight gain at the end of treatment. With CBT, only weight control advice was associated with no reduction in weight gain and with a possible reduction in abstinence. Individualized programs were associated with reduced weight gain at end of treatment and at 12 months (-2.58kg [-5.11kg to -0.05kg]), and with no effect on abstinence (RR 0.74 [0.39 to 1.43]). Very low calorie diets (-1.30kg (-3.49kg to 0.89kg] at 12 months) and CBT (-5.20kg (-9.28kg to -1.12kg] at 12 months) were both associated with improved abstinence and reduced weight gain at end of treatment and at long-term follow up. Both bupropion (300mg/day) and fluoxetine (30mg and 60mg/day combined) were found to limit post-cessation weight	General advice only were not effective and may reduce abstinence. Individualized interventions, very low calorie diets, and CBT may be effective and not reduce abstinence. Exercise interventions are not associated with reduced weight gain at end of treatment, but may be associated with worthwhile reductions in weight gain in the long term, Bupropion, fluoxetine, nicotine replacement therapy, and probably Varenicline all reduced weight gain while being used. The data was not sufficient to make strong clinical recommendations.
Reda, Kaper et al. 2009, Cochrane Database of Systematic Reviews	9 trials with financial interventions directed at smokers and 2 trials with financial interventions directed at healthcare providers	Meta-Analysis of RCT's	Statistically significant positive effect of full financial interventions directed at smokers on continuous abstinence compared to no interventions with a risk ratio (RR) of 4.38 (95% CI 1.94 to 9.87). There was also a significant positive effect of full financial interventions when compared to no interventions on the number of participants making a quit attempt (RR 1.19; 95% CI 1.07 to 1.32; N = 3). There was also a significant effect of financial interventions directed at health care providers in increasing the utilization of behavioral interventions for smoking cessation (RR 1.33; 95% CI 1.01 to 1.77). Comparison of full benefit with partial or no benefit resulted in costs per additional quitter ranging from $260 to $1453	Full financial interventions directed at smokers when compared to no financial interventions could increase the proportion quitting, quit attempts and utilization of pharmacotherapy by smokers. Although the absolute differences were small the costs per additional quitter were low.
Stead, Bergson, & Lancaster 2009 Cochrane Database of Systematic Reviews	N= 41 trials, conducted between 1972 and 2007, including over 31,000 smokers. The most common setting for delivery of advice was primary care. Other settings included hospital wards and outpatient clinics, and industrial clinics	Meta-Analysis of RCT's	Pooled data from 17 trials of brief advice versus no advice (or usual care) detected a significant increase in the rate of quitting (relative risk (RR) 1.66, 95% confidence interval (CI) 1.42 to 1.94). Amongst 11 trials where the intervention was judged to be more intensive the estimated effect was higher (RR 1.84, 95% CI 1.60 to 2.13) but there was no statistical difference between the intensive and minimal subgroups. Direct comparison of intensive versus minimal advice showed a small advantage of intensive advice (RR 1.37, 95% CI 1.20 to 1.56). Direct comparison also suggested a small benefit of follow-up visits	Simple advice has a small effect on cessation rates. Assuming an unassisted quit rate of 2 to 3%, a brief advice intervention can increase quitting by a further 1to 3%. Additional components appear to have only a small effect, though there is a small additional benefit of more intensive interventions compared to very brief interventions
Stead, Perera et al. 2008 Cochrane Database of Systematic Reviews	N= 132 trials; 111 with over 40,000 participants contributed to the primary comparison between any type of NRT and a placebo or non-NRT control group.	Meta-Analysis of RCT's	The RR of abstinence for any form of NRT relative to control was 1.58 (95% confidence interval [CI]: 1.50 to 1.66). The pooled RR for each type were 1.43 (95% CI: 1.33 to 1.53, 53 trials) for nicotine gum; 1.66 (95% CI: 1.53 to 1.81, 41 trials) for nicotine patch; 1.90 (95% CI: 1.36 to 2.67, 4 trials) for nicotine inhaler; 2.00 (95% CI: 1.63 to 2.45, 6 trials) for oral tablets/lozenges; and 2.02 (95% CI: 1.49 to 3.73, 4 trials) for nicotine nasal spray.	All forms of NRT (gum, transdermal patch, nasal spray, inhaler and sublingual tablets/lozenges) can increase the chances of successfully stopping smoking. NRT cam increase the rate of quitting by 50-70%, regardless of setting. The effectiveness of NRT appears to be largely independent of the intensity of additional support provided to the individual.

Key Terms and Symbols: DoD – Department of Defense; NRT – Nicotine Replacement Therapy; RCT – Randomized Control Trial; USAF – U.S. Air Force; HCP – Healthcare Provider; SDT – Self-Determination Theory; PHS – Public Health Service; RR – Risk Ratio; CBT – Cognitive Behavioral Therapy; CI- Confidence Interval

Table 3: Third Tier Evidence by author, sample, design, findings and implications.

Author/Year and Journal	Sample	Design	Findings	Implications
Green, Hunter et al. 2008, Nicotine & Tobacco Research	USAF junior enlisted technical training students using a 120-item questionnaire. N=4505 with a 65% response rate of N=2962.	Cross-sectional study using baseline prospective cohort study data	Military role models who use tobacco, peer smoking behavior, and perceived smoking norms increase the likelihood of smoking initiation among newly enlisted military personnel who have recently undergone a period of forced abstinence.	Peer pressure and military culture can impede cessation and abstinence efforts.
Russ, Fonseca et al. 2001, American Journal of Health Promotion	N=252 enrollees to a tobacco cessation program in 1999	Cross-sectional Cohort Study	Active duty military status was associated with an elevated level of concern about weight gain, as well as a higher anticipated relapse. Occupational weight standards or expectations may pose an additional barrier for tobacco cessation candidates and may hinder efforts to decrease smoking prevalence in certain groups.	Weight plays a significant role in military member's careers as the hallmark indicator of fitness and good military bearing. Concern about weight gain may negatively impact tobacco cessation efforts in the military community
Saul, Lien et al 2011, International Journal of Environmental Research and Public Health	Divided into 3 separate cohorts receiving NRT. An eight week single-shipment cohort (n = 247) and a split-shipment cohort (n = 160) receiving five weeks of NRT (n = 94), followed by an additional three weeks of NRT if callers continued with counseling (n = 66).	Observational Cohort Study	8 weeks of NRT, whether in one or two shipments, reported that the helpline was ―very helpfull (77.2% of the single-shipment group; 81.1% of the two-shipment group) than those receiving five weeks of NRT (57.8% of the one-shipment group) ($p = 0.004$). Callers in the eight week two-shipment group completed significantly more calls (3.0) than callers in the five week one-shipment group (2.4) or eight week single-shipment group (1.7) ($p < 0.001$). There were no significant differences in 30-day point prevalence abstinence at seven months among the three protocol groups. The mean cost per caller was greater for the single-shipment phase than the split-shipment phase ($350 vs. $326) due to the savings associated with not sending a second shipment to some participants. Cost-per-quit was lowest for the five week one-shipment group ($1,155), and lower for the combined split-shipment cohort ($1,242) than for the single-shipment cohort ($1,350	Results of this evaluation indicate that while satisfaction rates increase among those receiving more counseling and NRT, quit rates do not, even when controlling for demographic and tobacco use characteristics

Key Terms and Symbols: DoD – Department of Defense; NRT – Nicotine Replacement Therapy; RCT – Randomized Control Trial; USAF – U.S. Air Force; HCP – Healthcare Provider; SDT – Self-Determination Theory; PHS – Public Health Service; RR – Risk Ratio; CBT – Cognitive Behavioral Therapy; CI- Confidence Interval

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Changing to a Tobacco Free Military:

Seeking a Policy Paradigm Shift in a High Use, Pro-Tobacco Subculture

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Abstract

To date, members of the U.S. military as a group are one of the highest users of tobacco products when compared to the civilian population. This holds true particularly among the majority of service members in the 18-25 year age group. As early as the 1980's, some military leaders began working to decrease tobacco use as it was thought to be contrary to maintaining a healthy, effective fighting force. However, there are many aspects of Military culture that continue to promote tobacco use. During the past decade of war, the observed decline in tobacco use is now slowly starting to rise. Contributing factors such as socio-economic status, peer pressure, stress, anxiety and depression associated with deployments play a role. However, even more troubling are the influence by outside sources such as tobacco companies and the U.S. Congress on military tobacco policy. This article explores the history of military tobacco use, its impact, and policy efforts by the Department of Defense to go tobacco-free. The overall purpose of this analysis is to propose more effective strategies to achieve the goal of a tobacco-free military.

Promoting a Tobacco Free Military: Seeking a Policy Paradigm Change in a High Use, Pro-Tobacco Subculture

Statement of the Problem

Tobacco use rates within the United States military remain inordinately high when compared to the civilian population. Not only does tobacco use affect the individual's health but it also negatively impacts mission readiness and increases unnecessary health care costs for the Department of Defense (DoD). As early as the 1980's, several leaders within the military recognized tobacco use as contrary to maintaining a vital fighting force. These individuals attempted various efforts to achieve the goal of making the Military tobacco-free. However, several unexpected barriers confounded those efforts. While significant progress has been made in reducing tobacco use among the services within DoD, they have been unable and are unwilling to achieve a tobacco-free status.

Background

The U.S. military is comprised of approximately1.3 million active duty personnel. Military members are a prime market for the tobacco industry, as the majority of tobacco users are junior enlisted personnel (ages 18-25) who are more likely to use tobacco. As of 2005, the smoking prevalence among service members was approximately 32.2% (Smith and Malone, 2009). Smoking impacts military member's financial well-being as each year of smoking is related to a 4% decrease in overall net worth (Pyle, Haddock et al., 2007).

The tobacco industry has had a long relationship with the military. This symbiotic relationship has been ongoing throughout the 20th century, and continues well into the 21st century. In the past, cigarette distributors have sponsored events for military personnel. This is only one barrier that continues to impede military tobacco reduction efforts. As recently as 1975,

military personnel were issued cigarettes with troop rations, which may explain in part the higher rates of tobacco use in the military as compared to the general public. To quote a famous General, John J. Pershing, the importance of tobacco for military leaders is evidenced by his statement "You ask me what we need to win the war? I answer tobacco as much as bullets" (Nelson and Pederson, 2008). While this attitude has changed significantly within military leadership circles, many challenges still remain (Nelson and Pederson, 2008).

If only for fiscal reasons, tobacco use should not be tolerated by the military establishment in the work setting. A 1995 study found that among active duty personnel, costs associated with smoke breaks and smoking related hospitalizations were estimated at $346 million (Helyer, Brehm et al., 1998). In 2006, the Department of Defense spent an estimated $2.1 billion per year for medical costs associated with tobacco use, excess weight and obesity, and excess alcohol consumption combined. Nonmedical costs, such as potential productivity losses due to high rates of absenteeism, lower than normal work productivity, and first-year attrition for military service, related to the same three factors (e.g. looking at only the active duty population) were in excess of $965 million per year (Dall, Zhang et al., 2007).

At the individual level, average expenditures related to tobacco use for junior enlisted personnel can amount to as much as 10% of their annual base pay, or essentially an entire month's pay. For those in the military at the rank of E1 (lowest enlisted rank), smoking a half a pack a day to two packs per day consumes as much as 4.8% to 19.3% of their annual income; for those at the E2 rank, 4.3% to 17.2% of their annual income is spent on tobacco products; and for those at the E3 level, 3.6% to 14.5% of their annual income is spent on tobacco use (Pyle, Haddock et al., 2007).

Although zero-tolerance policies exist with regards to using tobacco products while on duty, military personnel can smoke on their own time. Factors that contribute to smoking among the military include, but are not limited to, stress due to combat, separation from family, and financial hardship. Although many military commanders and active-duty members perceive that tobacco use helps to manage stress, the opposite is true. The physiological and psychological changes induced by nicotine addiction serve to increase the stress response. Those who repeatedly try to quit become more anxious and agitated. Stein, et. al (2008) studied individuals using multiple tobacco products and discovered a relationship between use of multiple tobacco products and stressful coworker relationships. Among multi-product users, 90% were more likely to report stressful coworker relationships with current smokers 55% more likely to do so. Additionally, as compared to those who never used tobacco, those who used tobacco of all forms were less likely to employ positive coping strategies in dealing with stress (Stein, Pyle et al., 2008). Because it is increasingly apparent that tobacco use does not mitigate stress, there is some evidence to suggest that smokers may have more stressful relationships with their coworkers (Stein, Pyle, et al., 2008).

Basic military training provides the opportunity to enhance tobacco cessation through forced abstinence. However, without behavioral intervention sustained tobacco cessation rates do not materialize. Rates of recidivism in both male and female recruits after basic military training are as high as 68% to 84% (Nelson and Pederson, (2008). These recruits returned to tobacco use within the first month after basic military training was completed. Additionally, according to Nelson and Pederson (2008), smokeless tobacco is becoming a common place substitute among military recruits and other regular active-duty members. It is generally seen as a safer alternative

to smoking and is often perceived to be less harmful to overall health status of a service member as compared to smoking (Nelson and Pederson, 2008).

Other Factors Associated with Continued Use

Tobacco use costs both the military organization, in terms of mission readiness and its personnel in regards to their overall well-being. While several services within the Department of Defense (DoD) have made great strides in developing policies to deal with tobacco use, there is still a great deal more to accomplish if a tobacco-free policy within the DoD and its military services is to be achieved. Military services realize there is a need for more effective tobacco policies, yet must deal with existing barriers which preclude a tobacco-free military culture.

The Current Situation and Underway Efforts

The military has attempted to diminish tobacco use by developing policies that include: a) banning tobacco use by military healthcare providers while on duty, b) prohibiting cigarette promotions aimed at military members, c) banning tobacco use in all services during basic training, d) providing free tobacco dependence treatment and e) increasing the price of tobacco products to within 5% of civilian sector prices (Poston, et al., 2010). However, when one examines tobacco control perspectives among various service policy leaders and tobacco control managers (Table 4), there is a different story to be told. Currently, those involved with developing and implementing tobacco control policies within DoD believe that military leaders view tobacco control issues as a very low priority with little to no impact on meeting their respective missions or ‘bottom lines’. Even more perplexing is the lack of consistent enforcement of current tobacco control policies within the various services under DoD (Poston, et al., 2010).

Conceptual Framework

Kingdon (2011) provides a conceptual framework that can be used to examine efforts to affect tobacco use policy change with the military. The framework is comprised of three key policy processes that include the ***problem, policy and political "streams"***. The ***"Problem Stream"*** examines those processes in government that facilitate government official's attention to potential policy problems or issues. Some of these processes include indicator measures (e.g. mortality rates, disease rates, etc…) that are routinely collected and might indicate a need for a policy change. Many studies exist, within the military community, which effectively demonstrate the rates of tobacco use and the overall financial impact associated with tobacco use – both on individual health and costs to the organization (Department of Defense). A major sticking point, however, is convincing military leadership to enact policies and contribute resources as it relates to tobacco policy, improving their unit's ability to fulfill their mission and save money on healthcare costs. According to Kingdon (2011), a problem exists when "… people must be convinced that something should be done to change it. People in and around government make that translation by evaluating conditions in the light of their values, by comparisons between people or between the United States and other countries, and by classifying conditions into one category or another" (Kingdon, 2011).

The ***"Policy Stream"*** entails development, debate, revision and consideration of policy proposals. This process, according to Kingdon (2011), takes place typically within specialty communities (e.g. healthcare). Typically more cohesive in its functionality, the Healthcare Community is capable of avoiding fragmented policy development when compared to other specialty areas that do not effectively network with their related groups and agencies that pertain to the issue of concern. For proposals to survive, they must be able to be implemented,

acceptable to the values of the majority to whom the issue pertains, and be able to be modified to meet any potential budgetary constraints. As an example the Department of Defense's use of 'top down' approach of policy implementation, in the form of DoD Instruction 1010.15 in 1994, made it the largest employer within the U.S. that prohibited smoking in its facilities. This ban encompassed all DoD workspaces both in the United States and Overseas. However, tobacco use was still allowed in other government owned areas, to include base housing (barracks and family housing), clubs and restaurants (Jahnke, et al., 2011). With regards to this particular DoD policy, Kingdon (2011) effectively points out that the ***"Policy Stream"*** produces a "short list that … is an agreement that a few proposals are prominent. Having a viable alternative available for adoption facilitates the high placement of a subject on a governmental agenda, and dramatically increases the chances for placement on a decision agenda" (Kingdon, 2011). Thus in this instance, this policy gave military leadership the opportunity to implement tobacco control policies, yet with enough 'wiggle' room so as to not be so restrictive as to be struck down (Kingdon, 2011).

The third policy process, the ***"Political Stream",*** has a very strong influence on policy agendas by promoting some agendas and effectively shutting down others. Factors such as public opinion (e.g. national mood), influence of interest groups, and results of elections to include ideology (e.g. liberal v. conservative) of congressional majorities as well as presidential administrations all influence this process. In essence, any change is facilitated by the support that exists for or against it at the time; and political turnover from the 'top down' has strong influence on policy agendas as whole (Kingdon, 2011).

Members of the military are part of a powerful institution whose mission requires them to be 'on their game' and at the highest state of physical and mental readiness. Congress is

ultimately responsible for military oversight but may negatively interfere due to the influence of outside interests. In the "***Political Stream***" active duty military leaders and personnel are unable to effectively lobby due to various structural controls. Thus, the internal ability of the military to respond to outside agencies or undue congressional interference is severely curtailed (Offen, et al., 2011).

Landscape and Stake Holders

The evidence of the deleterious effects of tobacco use upon the military mission and the health of military members is quite evident. However, for any efforts to improve upon tobacco control policy within the military to be successful; one must take into consideration the primary stakeholders, powerbrokers, and political landscape. The stakeholders and powerbrokers include the military services, military personnel, the Tobacco Institute (the tobacco industry lobbying organization), the tobacco companies, congress, and civilian unions (Arvey & Malone, 2008).

Efforts to control tobacco use can be impeded both within and without the military establishment. Individual branches of service are authorized to implement their own tobacco control programs with the goal of reaching tobacco use rates lower than the civilian population. Interestingly, both the Navy and Air Force set goals to become tobacco free by 1998 and 2000 respectively. To date, those goals have not been achieved. On the one hand the Department of Defense instructs the military services to discourage tobacco use, but on the other hand continues to sell tobacco products tax-free in military commissaries and exchanges (Arvey & Malone, 2008).

The impact that key stakeholders and political powerbrokers can have over tobacco control policy within the military environment is clearly demonstrated when one looks at early tobacco control efforts in the military (Table 1). As early as 1986, response to the Department of

Defense Directive 1010.10; the Army instituted a tobacco control policy with three goals: 1) establishing cessation programs, 2) promoting educational awareness regarding the risks associated with tobacco use, and 3) deglamorization of tobacco use. The Army aimed to reduce tobacco use rates from 52% to 25% by 1990 (Arvey & Malone, 2008).

As policy efforts were implemented by the Army; the tobacco lobby and tobacco companies (Philip Morris) worked to have this policy discontinued. Independent consultants were hired (to include one congressman and retired Navy officer as well as a retired Department of Defense insider). They, in turn, waged a public relations campaign by gathering signatures for a letter that was then sent to Department of Defense Secretary Weinberger denouncing this new policy. Position papers against the policy were also written and published within the military journals. Additionally, the tobacco lobby and industry coordinated behind-the-scenes with several tobacco friendly congressmen and senators, typically from tobacco producing states to include Virginia and North Carolina. In the end, the Army failed to fully implement its tobacco control policy (Arvey and Malone, 2008).

Other efforts within the military to implement tobacco control policy from 1987 to 1991 (Table 1) failed. Major opposition to tobacco control polices came from both the tobacco companies and United States Congress. In most cases the remaining policies (Table 1) were either rescinded entirely or severely curtailed to protect smoker's rights (Arvey & Malone, 2008).

Political, Social, Economic and Practical Considerations

It seems that in most instances where the military services try to go tobacco free, the political and policy streams collide (Kingdon, 2011). Hoffman et al. (2011) provide an overview of military tobacco control policies (Table 2a & 2b). More than 75% of these policies address the adverse health effects of tobacco use, environmental tobacco smoke, designation of smoking areas, tobacco dependence treatment/programs, and smokeless tobacco use. Few policies defined smoking or tobacco use as incompatible with military service or impacting military readiness (Hoffman, et al., 2011).

The power of the tobacco industry to influence Congress is impressive. This influence unduly impedes military efforts to promote a healthier force. As a result of tobacco industry power over congress, the military is prevented from raising prices of tobacco products in all the military commissaries and exchanges or prohibiting in-store promotions of tobacco products. Additionally, Congress has applied pressure to military tobacco control advocates, publicly derided their efforts, and even passed laws impeding the ability to establish effective tobacco control policies. One has to look no further to see the power of the tobacco lobby and its collusion with congressional members than when the aircraft carrier USS Theodore Roosevelt tried to go smoke-free (Offen, et al, 2011).

The commanding officer of the USS Roosevelt began this effort in 1993. As part of his new tobacco free policy, it was announced that he would end cigarette sales aboard ship. He was motivated by the literature and news reports regarding the cancer-causing effects of secondhand smoke. Initially, his efforts were supported by then Navy Surgeon General Hagen and Chief of Naval Operations Adm. Frank B. Kelso (Offen, et al, 2011). In a subsequent interview by Offen et al., (2011), of the USS Roosevelt senior enlisted leader it was found that the commanding

officer's new tobacco free policy was opposed by a relatively small number of individuals aboard ship. According to the commanding officer, the reaction amongst his crew was split among non-smokers and smokers. During a forum with the commanding officer, a crew member asked by what right the commanding officer could take away his right to smoke. The crewmember was informed "… that the military regulates the length of hair and fingernails, how one dresses, and other such matters; that many things, such as conjugal privileges and alcohol consumption, are prohibited on ship; and that smoking cigarettes, like drinking alcohol and smoking marijuana, affected the health and welfare the rest of the crew" (Offen et al., 2011).

One month after becoming smoke-free, the efforts of the USS Roosevelt were opposed by the tobacco lobby and industry, and the matter was quickly addressed by the Morale Welfare and Recreation panel of the House Armed Services Committee. The Rear Admiral in charge of the Navy Exchange Command was informed that this new policy was discriminatory, denied freedom of choice, and denied privileges and rights earned by service to the country. The Navy's smoking restrictions were even linked to the efforts of prohibition earlier in the nation's history. Additionally revenues for morale, welfare and recreation activities could be curtailed by eliminating tobacco product sales. One only has to examine the effects of the political and policy streams during this particular tobacco control effort (Table 3) to get an idea of how one-sided the battle to become tobacco free in the Navy had become (Offen, et al., 2011).

Several members of the Morale Welfare and Recreation (MWR) panel of the House of Representatives Armed Services Committee at that time received substantial monetary contributions (Table 3) from the tobacco industry. The largest recipients were from the tobacco producing states. Globally, panel members were paid more campaign contributions than other

house members on average by 16.9% in 1990, 13.5% in 1992, and as high as 93.2% more in 1994 (Offen, et al., 2011).

Then Secretary of the Navy Dalton later issued a press release characterizing revised Navy policy on tobacco control as protecting people from involuntary exposure to environmental tobacco smoke rather than stating the reality which was that smoking areas on ships would be reinstated. This led the media to characterize the secretary of the Navy's new policy on tobacco as becoming hard on smokers versus the actual fact of submitting to the will of the members of the House Armed Services Committee MWR panel. The Navy was reported to have conceded that their goal to become tobacco free was impractical. It instead established a tobacco use reduction goal of 35% equivalent to their civilian counterparts at the time (Offen et al., 2011).

Policy Options

Between 1988 and 1994, the tobacco industry has had the upper hand in tobacco control efforts by the Navy. According to Offen et al (2011), nearly 70% of congressional membership receives tobacco industry money. While Congress has the ultimate responsibility for maintaining the military fighting force, in their capacity of maintaining civilian oversight, it often leaves the military policy regarding tobacco use vulnerable to other special interests (Offen, 2011). The wrong message is sent when the military continues to sell tobacco products in its exchanges and commissaries. In order for the military to achieve a tobacco free status, tobacco cessation advocates will need to become very adept at approaching policy change through the lens of Kingdon's (2011) Policy Streams Model (Offen et al, 2011; Kingdon, 2011).

Where We Go From Here

Several opportunities exist to improve the efficacy of tobacco control efforts in the future. Military readiness, of course, would seem to be the largest selling point to both military and congressional leadership. Tobacco control advocates need to be astute in their ability to counter the argument of the tobacco industry - that use of tobacco products is an individual right. The military already imposes restrictions on activities or personal actions that may interfere with fitness for duty or reflect poorly upon the military service. An example is that of weight/body composition. Excess body weight has been determined to be contrary to fitness for duty and reflects poorly upon the military service. Members who cannot comply with body composition standards are frequently separated from the military. Requiring that an individual not use tobacco products for the same reasons is analogous to what is already being done with maintaining physical fitness qualifications (e.g. body weight).

In keeping with the Problem Stream of Kingdon's Model (2011), public attention needs to be directed to tobacco control efforts within the military. Previous congressional interference has largely taken place behind closed doors. Unfortunately, tobacco advocates within the military are precluded from being very effective with regards to public disclosure of their interactions with Congress. The empirical evidence surrounding the deleterious effects of tobacco use is clear and widely available. This information needs to be continually reinforced to members of Congress, as newer members are most likely not aware of the long-term effects to the health of Navy personnel, as a result of the politically expedient actions taken for the tobacco lobby by their predecessors, to impede tobacco control efforts (Offen, et al, 2011).

Within the Political Stream, we must also encourage public health organizations within the civilian sector to take a larger role in tobacco control efforts within the military. As

previously mentioned, active duty military personnel are constrained by structural controls with regards to their lobbying ability. Ability of military members to respond to attacks by both the tobacco industry congressional members is very limited. Hence, there needs to be a collaborative effort among outside government agencies. Such agencies would include veteran's advocacy groups, public health agencies, and tobacco control advocacy groups, among others, to effect significant change in policy within the Department of Defense. Veteran's groups and their political lobbying agencies can be extremely effective in helping facilitate policy change by bringing to light the effects of tobacco use on their members who currently/formerly used tobacco as a result of being part of a tobacco friendly organization such as the military. By working together, these groups can effectively help further the cause of tobacco free policy implementation within the military service by holding congressional members accountable in the public arena (Offen, et al, 2011).

Conclusion

Unfortunately, the fight to go tobacco free within the Department of Defense continues. A recent article from the Navy Times, in November of 2012, reveals that "the smoking lamp will stay lit" at least for now, and within the Navy and Marine Corps. According to the assistant Secretary of the Navy for Manpower and Reserve Affairs Juan Garcia, "There are no plans to turn out the smoking lamp across the fleet… We want to reduce tobacco consumption and ultimately work toward a tobacco free Navy but in a voluntary manner" (Stewart, 2012).

It seems, at least for now, the political will to make the military tobacco free is not present at the senior levels due to lack of support from civilian political leaders. However, all hope is not lost; as the strategies to affect change are present. One has only to wait, as Kingdon (2011) suggests; eventually, opportunities may arise as political representatives and

administrations change. In that light, the message of the detrimental effects of tobacco use upon the military service, the health of its members, and negative impact on the ability to maintain mission readiness need to be put forth in the public arena and to political leadership on a consistent, regular basis (Kingdon, 2011).

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TABLE I. Selected Military Tobacco Control Initiatives, 1986–1993

Policy	Issued	Modified	Opposition to Policy				
			Tobacco Institute	Tobacco Companies	Congress	Military Personnel	Civilian Union
ATCP *Policy*: D1010.10 plus further restrictions on smoking and punishment for violations. *Action*: Cut back to minimum DoD requirements. Included references to "right to smoke." Full policy never implemented.	April 1986	July 1986	√	√	√		
Air Force SAC Unit *Policy*: SAC tobacco-free by April 1988. Smoking prevalence to be tracked by position. *Action*: Tracking data modified to "protect" smoker identities.	October 1987	October 1988		√	√	√	
Army–Fort Dix Policy Memo 43 *Policy*: Ban all use of tobacco products indoors and in military vehicles and aircraft. *Action*: Rescinded entirely.	September 1988	October 1988			√		√
AAFES Policy MB 90-127 *Policy*: Eliminate most tobacco promotions in exchanges. *Action*: Rescinded entirely before implementation.	October 1990	April 1991		√	√		√

Table 1: (Arvey & Malone, 2008)

Table 2: Military tobacco policy rating form data for department of defense, service-level, and MAJCOM-level policies

Item	*Organization*					
	Department of Defense	*Army*	*Navy*	*Air Force*	*Marines*	*Total*
1. Is the tobacco industry mentioned anywhere in the policy (% yes)	0 (0.0%)	0 (0.0%)	1 (8.3%)	0 (0.0%)	7 (70.0%)	8 (8.2%)
2. Are prevalence rates mentioned anywhere in the policy (% yes)	1 (25.0%)	0 (0.0%)	0 (0.0%)	1 (1.7%)	0 (0.0%)	2 (2.1%)
3. Are the health effects of tobacco mentioned anywhere in this policy (% yes)	3 (75.0%)	11 (91.7%)	12 (100.0%)	51 (86.4%)	10 (100.0%)	87 (89.7%)
4. Is environmental tobacco smoke mentioned anywhere (direct or indirect references) (% yes)	4 (100.0%)	10 (83.3%)	12 (100.0%)	53 (89.8%)	10 (100.0%)	89 (91.8%)
5. Is environmental tobacco smoke directly stated in the policy (% yes)	3 (75.0%)	9 (75.0%)	11 (91.7%)	46 (78.0%)	9 (90.0%)	78 (80.4%)
6. Are designated smoking areas mentioned anywhere in the policy (% yes)	4 (100.0%)	10 (83.3%)	11 (91.7%)	56 (94.9%)	10 (100.0%)	91 (93.8%)
7. Is tobacco advertising mentioned (% yes)	0 (0.0%)	0 (0.0%)	7 (58.3%)	42 (71.2%)	7 (70.0%)	56 (57.7%)
8. Is it mentioned anywhere that smoking is non-normative or incompatible with military service (% yes)	0 (0.0%)	0 (0.0%)	2 (16.7%)	2 (3.4%)	2 (20.0%)	6 (6.2%)
9. Is it mentioned anywhere that tobacco in any way affects military readiness or are there any references to readiness (% yes)	0 (0.0%)	11 (91.7%)	9 (75.0%)	2 (3.4%)	10 (100.0%)	32 (33.0%)

Table 2a: (Hoffman et al., 2011)

10. Is the sale of tobacco products addressed anywhere in the policy (% yes)	0 (0.0%)	1 (8.3%)	7 (58.3%)	42 (71.2%)	7 (70.0%	57 (58.8%)
11. Is the cost or price of tobacco sales specifically mentioned in the policy (directly stated as cost, dollar, or percentage) (% yes)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
12. Is the cost of the result of tobacco use mentioned anywhere in the policy (for example, the cost to readiness, cost to health, and so on) (% yes)	2 (50.0%)	10 (83.3%)	7 (58.3%)	1 (1.7%)	7 (70.0%)	27 (27.8%)
13. Are tobacco prevention or cessation programs mentioned anywhere in the policy (% yes)	3 (75.0%)	12 (100.0%)	11 (91.7%)	56 (94.9%)	10 (100.0%)	92 (94.8%)
14. Is smokeless tobacco addressed in the policy as different from smoking (and no less harmful) (% yes)	0 (0.0%)	9 (75.0%)	8 (66.7%)	49 (83.1%	8 (80.0%)	74 (76.3%)
15. Is this an established policy (% yes)	4 (100.0%)	12 (100.0%)	12 (100.0%)	59 (100.0%)	10 (100.0%)	97 (100.0%)

Table 2b: (Hoffman, et al., 2011)

TABLE 1—Campaign Contributions From the Tobacco Industry to Members of the Morale, Welfare and Recreational (MWR) Panel of the House of Representatives' Committee on Armed Services

	Contributions in Dollars			
	1990[a]	1992[b]	1994[c]	Career
MWR Panel recipient				
Neil Abercrombie (D, HI)	0	500	1500	9500
Herbert H. Bateman (R, VA)	8100	8450	5260	41548
Earl Hutto (D, FL)	0	0	0	0
John R. Kasich (R, OH)	500	500	1500	9500
H. Martin Lancaster (D, NC)	18200	22198	44720	85118
Donald K. Machtley (R, RI)	1750	0	0	1750
Solomon P. Ortiz (D, TX)	1000	500	6000	33000
Owen B. Pickett (D, VA)	2850	2000	6500	25750
Bob Stump (R, AZ)	2000	3500	2500	15250
John S. Tanner (D, TN)	5700	4700	5500	157700
Robert A. Underwood (D, GU)	0	0	0	0
Total contributions received	40100	42348	73480	379116
Average donation received by all MWR Panel members	3645	3850	6680	
Average donation received by all House members	3118	3393	3458	

[a]MWR Panel members received on average 16.9% more than all House members.
[b]MWR Panel members received on average 13.5% more than all House members.
[c]MWR Panel members received on average 93.2% more than all House members.

Table 3: (Offen, et al., 2011)

TABLE I. PLs' and TCMs' Ratings of the Potential for Services Leaders' Support for Policy Implementation

Policy	Very Unlikely	Unlikely	Likely	Very Likely	Don't Know or N/A
Ban Smoking in Military Uniform					
PL	*N* = 1 (6%)	*N* = 5 (31%)	*N* = 8 (50%)	*N* = 1 (6%)	*N* = 1 (6%)
TCM	*N* = 4 (11%)	*N* = 13 (35%)	*N* = 9 (24%)	*N* = 5 (14%)	*N* = 6 (16%)
Ban Smoking in Military Housing					
PL	*N* = 4 (25%)	*N* = 7 (44%)	*N* = 3 (19%)	*N* = 2 (13%)	*N* = 0 (0%)
TCM	*N* = 9 (24%)	*N* = 11 (30%)	*N* = 3 (8%)	*N* = 6 (16%)	*N* = 8 (22%)
Ban Smoking Entirely on Installation					
PL	*N* = 5 (31%)	*N* = 9 (56%)	*N* = 2 (13%)	*N* = 0 (0%)	*N* = 0 (0%)
TCM	*N* = 12 (32%)	*N* = 11 (30%)	*N* = 5 (14%)	*N* = 3 (8%)	*N* = 6 (16%)
Significantly Restrict Cigarette Sales					
PL	*N* = 6 (38%)	*N* = 7 (44%)	*N* = 3 (19%)	*N* = 0 (0%)	*N* = 0 (0%)
TCM	*N* = 7 (19%)	*N* = 14 (38%)	*N* = 9 (24%)	*N* = 1 (3%)	*N* = 6 (16%)
Increase the Price of Tobacco Products					
PL	*N* = 3 (19%)	*N* = 3 (19%)	*N* = 7 (44%)	*N* = 1 (6%)	*N* = 2 (13%)
TCM	*N* = 3 (8%)	*N* = 9 (24%)	*N* = 18 (49%)	*N* = 2 (5%)	*N* = 5 (14%)
Reduce Visibility of Tobacco Products in Commissary					
PL	*N* = 1 (6%)	*N* = 4 (25%)	*N* = 7 (44%)	*N* = 3 (19%)	*N* = 1 (6%)
TCM	*N* = 1 (3%)	*N* = 7 (19%)	*N* = 18 (49%)	*N* = 5 (14%)	*N* = 6 (16%)
Reduce the No. of Designated Smoking Areas					
PL	*N* = 1 (6%)	*N* = 5 (31%)	*N* = 5 (31%)	*N* = 3 (19%)	*N* = 2 (13%)
TCM	*N* = 2 (5%)	*N* = 7 (19%)	*N* = 17 (46%)	*N* = 5 (14%)	*N* = 6 (16%)
Reduce the Comfort of Designated Smoking Areas					
PL	*N* = 0 (0%)	*N* = 3 (19%)	*N* = 7 (44%)	*N* = 4 (25%)	*N* = 2 (13%)
TCM	*N* = 4 (11%)	*N* = 8 (22%)	*N* = 17 (46%)	*N* = 2 (5%)	*N* = 6 (16%)
Limit All Military Members to 2 Smoke Breaks During the Duty Day					
PL	*N* = 1 (6%)	*N* = 4 (25%)	*N* = 11 (69%)	*N* = 0 (0%)	*N* = 0 (0%)
TCM	*N* = 1 (3%)	*N* = 11 (30%)	*N* = 13 (35%)	*N* = 6 (16%)	*N* = 6 (16%)
Make Smoking Status Part of Fitness Evaluation Score					
PL	*N* = 4 (25%)	*N* = 7 (44%)	*N* = 4 (25%)	*N* = 1 (6%)	*N* = 0 (0%)
TCM	*N* = 8 (22%)	*N* = 17 (46%)	*N* = 2 (5%)	*N* = 2 (5%)	*N* = 8 (22%)
Include Smoking Status on Performance Reports					
PL	*N* = 6 (38%)	*N* = 7 (44%)	*N* = 1 (6%)	*N* = 0 (0%)	*N* = 2 (13%)
TCM	*N* = 11 (30%)	*N* = 16 (43%)	*N* = 2 (5%)	*N* = 0 (0%)	*N* = 8 (22%)

PL, policy leader; TCM, tobacco control manager.

Table 4: (Poston, et al., 2010)

Tobacco Dependence Treatment and its Relationship to Abstinence and Weight Gain:

A Pilot Study

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Abstract

Background: Military readiness, employer productivity and individual health are all significantly impacted by high rates of tobacco use. Current research, to date, suggests that use of brief, individually tailored behavioral modification strategies through group therapy may be most effective in smoking cessation. The objective of this pilot study was to explore tobacco use within a civilian population and determine the relationship between type of treatment, smoking abstinence, and maintenance of body weight (e.g. avoid weight gain) among those seeking tobacco use cessation. The findings of this study can provide guidance on enhancing current tobacco cessation efforts to enable long-term tobacco use abstinence while maintaining body weight among U.S. Navy personnel.

Methods: A convenience sample of all participants attending a local community Tobacco Cessation program (e.g. group tobacco dependence treatment) or tobacco cessation counseling in a primary care setting (e.g. one-on-one counseling by the Primary Care Provider or Tobacco Cessation Specialist) was collected for one month. An observational cohort study with 2 nonequivalent groups, using a Control Group Post-Test Only Design with repeated measures was implemented for this study. This study examined tobacco treatment in two unequal cohorts: 1) tobacco dependence treatment received on an individual basis (e.g. Primary Care Provider or Tobacco Cessation Specialist) or 2) group tobacco dependence treatment. As all participants were referred to the group program – this was the standard (or the control group). The Fagerstrom Test for Nicotine Dependence was administered at baseline and at Post Test after treatment (individual or group) for those who continued to smoke. Repeated measures of weight and abstinence status were measured at 1 and 3 months during clinic follow up.

Results: Ten-percent (4/40) of participants achieved cessation at 30 days and 15% (6/40) were abstinent at 90 days follow-up. There were no statistically significant relationships between the types of tobacco dependence treatment received, ability to maintain body weight and abstinence rates. Abstinence rates at 90 days among those receiving treatment in primary care were only slightly better than national statistics on abstinence rates among patients attempting cessation with no help at all. Also, as the majority of the sample data were from the primary care cohort (n=38) no significant inferences could be made from the remaining 2 cohorts – those who received individual counseling and those who attended group treatment. However, a majority of patients attempting tobacco cessation had decreases in their nicotine dependence scores and were able to either maintain or lose weight at 30 and 90 days during their cessation attempt(s).

Conclusions: The results of this pilot study suggest the need for more rigorous research of tobacco treatment in primary care and community settings. Statistical trends of weight maintenance (or loss) and decreased nicotine dependence by study participants, coinciding with longer post treatment follow up, indicate that a study of longer duration, utilizing a randomized approach to control for adequate participation in each treatment intervention, would potentially provide greater insight. Additionally, the experiences and lessons learned, by the investigator, while conducting this pilot will prove invaluable in conducting future research in a similar unique patient population.

Tobacco Dependence Treatment and its Relationship to Abstinence and Weight Gain: A Pilot Study

Introduction

Among health risk behaviors, tobacco use remains the leading cause of preventable illness and death within the United States. Several thousand deaths from cardiovascular disease, respiratory disease and/or malignancy are associated with tobacco use each year (Centers for Disease Control, 2011). As recently as 2010, 19.3% of adults in the U.S. smoked. However, the highest prevalence was seen in the Midwest and Southern regions with smoking rates as high as 21.8% and 21.0% respectively. Annually, there are approximately 443,000 tobacco-related deaths with a national financial burden of $96 billion in direct medical expenses and $97 billion in lost productivity (Centers for Disease Control, 2011). Hence, addressing tobacco use cessation is an issue of clinical relevance.

Within the civilian population of the United States, smoking prevalence has decreased from a high of 42% in the 1960s to about 20% currently. In recent years however, this rate has remained relatively consistent. Studies have shown that higher prevalence rates are noted in populations with lower incomes, mental health disorders, and lower educational socioeconomic status. Tobacco use is also quite prevalent in the U.S. military. As recently as 2005, a Department of Defense (DoD) Health Related Behavior survey revealed that 32.2% of service members smoke with 42.8% of military personnel 20 years or younger and 41% of those 21 to 25 years of age currently smoking (Smith & Malone, 2009).These two age groups comprise the bulk of tobacco users among military members (Green, Hunter et al., 2008). Tobacco use is substantially higher in military than civilian populations by as much as 13.1% with the highest

rates of usage being in the 18-35 year age groups (Centers for Disease Control, 2011; Smith & Malone, 2009).

The potential physical and financial costs associated with this health risk behavior are well documented, and can impact both the individual and their command. As an example, a 1995 study found that among active duty personnel, costs associated with smoke breaks and smoking related hospitalizations were estimated at $346 million (Helyer, Brehm et al., 1998). Additionally, a retrospective review of 4.3 million participants, under the age of 65, enrolled in the TRICARE Prime program in 2006 found that the DoD spent an estimated $2.1 billion per year for medical costs associated with tobacco use, excess weight and obesity, and excess alcohol consumption combined. Nonmedical costs, such as potential productivity losses due to high rates of absenteeism, lower than normal work productivity, and first-year attrition from military service, related to the same three factors were in excess of $965 million per year (Dall, Zhang et al., 2007). These facts, along with the significant prevalence of tobacco use among the younger members of the military, indicate a strong need for improved tobacco cessation efforts (Helyer, Brehm et al., 1998) (Dall, Zhang et al., 2007).

Tobacco cessation programs in the military also face many obstacles. Potential barriers can include individual willingness to change, as well as types and availability of support systems and tobacco cessation programs, among others (Green, Hunter et al., 2008). Several studies have demonstrated that individuals attempting smoking cessation are likely to encounter the problem of weight gain (Chiolero, Faeh, Paccaud, & Cornuz, 2008). While there are still many questions regarding the relationship between smoking and obesity, smoking cessation is typically followed by weight gain. As an appetite suppressant, nicotine from tobacco use may contribute to smokers having a lower body weight than non-smokers (Chiolero, Faeh, Paccaud, & Cornuz, 2008).

However, other studies show that heavy smokers often times have a greater body weight than lighter smokers and that there is a compilation of other contributing factors such as having a lower socioeconomic status, being less than 55 years of age, and being African-American (Schlam & Baker, 2013).

Weight gain is a significant concern to military members as body weight indicates fitness for duty and continued service. Some members are therefore hesitant to engage in cessation since up to 80% of smokers who stop tobacco use gain weight with average weight gain as high as 13 pounds within one year of abstinence (Russ, Fonseca et al., 2001). In addition, nicotine dependence serves as a strong predictor of smoking cessation outcomes as well. The higher the nicotine dependence the more problematic achieving smoking cessation goals (Japuntich, et al., 2011). These impediments include difficulty in achieving initial abstinence, higher rates of lapse and relapse (Japuntich, et al., 2008). Nicotine dependence data for the military population is not readily available as it is not a component typically reported to responsible monitoring entities. However, the higher known tobacco usage rates among military personnel (Smith & Malone, 2009; Green, Hunter et al., 2008) may correspond to higher rates of nicotine dependence and give credence to further research in this area.

As military members must negotiate often very rigorous work schedules to attend group sessions and office appointments, an alternative to scheduled classes and office visits for tobacco dependence treatment might improve cessation efforts. Primary care settings remain the best opportunity to assess readiness for smoking cessation and introduce smoking cessation interventions (Fiore & Baker, 2011). Tobacco interventions in such settings can be delivered through individualized counseling by the primary care provider or more intensive individualized counseling by a tobacco cessation specialist. Additionally, group counseling and referral to

phone advice services such as tobacco quit lines are more options available in the cessation arsenal (Fiore & Baker, 2011). Indeed, research has demonstrated that when compared to brief advice or usual care in the primary care setting, more intensive interventions such as motivational interviewing, can potentially increase six-month cessation rates to as high as 30% (Fiore & Baker, 2011).

Due to several barriers encountered while attempting to implement such research in a DoD facility, the primary investigator chose to examine the tobacco cessation program for the Community Health and Family Medicine component of the University of Florida (UF) Health System. An evaluation of smoking cessation outcomes in a civilian equivalent tobacco treatment effort, in the form of a pilot project, may be an appropriate starting point to gain a further grasp of the need non-traditional programs within the Military (Russ, Fonseca et al., 2001; Klesges, DeBon et al., 2006). Hence, the purpose of this study was to examine the relationship between tobacco dependence treatment, ability to maintain body weight and smoking abstinence in a community setting.

Methods

An Observational Cohort Study with 2 nonequivalent groups, using a Control Group Post-Test Only Design with repeated measures was utilized for the purposes of this study. This study looks at 2 unequal cohorts: Tobacco Dependence treatment received on an individual basis (e.g. with a Primary Care Provider or Tobacco Cessation Specialist); or group Tobacco Dependence Treatment (Group program through Northeast Florida AHEC). As all participants were referred to the group program – this is the standard (or the control group). The Fagerstrom Test for Nicotine Dependence was administered at baseline (currently not done as part of UF tobacco cessation) and as a Post Test (also not currently part of the UF tobacco dependence

treatment effort) after treatment (individual or group) for those who continued to smoke. Repeated measures of weight and abstinence status were obtained at 1 and 3 months during clinic follow up. Medical Institutional Review Board approval was obtained from both the University of Kentucky Office of Research Integrity and UF Health Shands Jacksonville Institutional Review Board prior to beginning this study.

Setting

The University of Florida Shands Jacksonville Medical Center (formerly UF&Shands) is the urban campus of the University of Florida Health Science Center and is located in the urban core of Duval County, Florida. UF Health Shands Jacksonville operates a 695-bed statutory teaching hospital and 33 primary care and specialty medical practices that serve Northeast Florida. This health system has highly regarded clinical services that are major centers for the care of adults with cardiovascular disease and stroke, cancer, diabetes, epilepsy depression and other major programs through which flow a large and constant stream of patients burdened by health disparities. As a publicly supported, not-for-profit, university health care system, UF Health Shands Jacksonville provides care for very low-income, medically indigent individuals funded through a contract with the City of Jacksonville. Over 13% of the Medical Center's patients are covered by the city contract, while 30% of patients are covered by Medicaid, 30% Medicare, and 4% are self-pay. Given its location and patient population, the UF Health System in Jacksonville is a natural starting point for research to address health and health care disparities (personal communication, Dr. Eric B. Stewart, October 1st, 2013).

UF Health Shands Jacksonville primarily serves an inner-city area which is predominantly African American, with high rates of unemployment and low rates of health

insurance, low education levels, high rates of poverty, and strained family and other support systems. In many respects, this is very similar to the junior military population who comprise the vast majority of tobacco users for that population. They too are of low income and for married couples family and support systems are also strained for financial and job-related reasons. Rates of obesity, diabetes, and other chronic diseases are higher in Duval County than the Florida state averages. While the latter health issues are not as prevalent in the military community, tobacco use can be counted on as one of these more highly prevalent comorbidities in both communities (Green, Hunter et al., 2008; personal communication, Dr. Eric B. Stewart, October 1st, 2013). The most recent tobacco use statistics for the population of interest are from 2010. Overall tobacco use in Duval County is at 18.6%. Of this total, men comprised 21.3% of smokers. Women comprise 16.1%. African-American males topped the list for tobacco use at a rate of 27.7%. They are followed closely behind by white non-Hispanic men at 20%. Those between the ages of 45 years and 64years are the largest group of smokers at 24.7%. Socioeconomic data reveals that the majority of smokers in Duval County also have only a high school degree or GED (26.8%) and make less than $25,000 annually (29.2%). In each of these demographics, Duval County surpasses the same measures for the entire state of Florida (Yu, Ren & Huang, 2010).

Currently, UF Health Community Health Family Medicine tobacco cessation efforts are primarily comprised of individual one-on-one counseling by the primary care provider or referred to a tobacco cessation specialist who currently works in the UF Pain Management Clinic on the Shands Jacksonville main campus. Those who desire group tobacco dependence treatment intervention are referred by the Tobacco Cessation Specialist to the Northeast Florida Area Health Education Center (AHEC) “Quit Smoking Now” program in Jacksonville. The

group program is composed of a traditional 4-5 week (or short as a one-day session) psychoeducational program held in a classroom setting. In both instances (individual and group treatment), weight management is addressed to varying degrees.

Participants

A convenience sample of all participants attending a local community Tobacco Cessation program (e.g. group tobacco dependence treatment) or tobacco cessation counseling in a primary care setting (e.g. one-on-one by PCP or Tobacco Cessation Specialist) was assessed for one month period. The project setting was located at UF Health Commonwealth Family Medicine and Pediatric Center and included its associated primary care sites: UF Health Murray Hill Family Medicine, UF Health Soutel Plaza Family Medicine, UF Health Elizabeth Means Community Care and UF Health Brentwood Family Medicine, under the auspices of the UF Health Shands Jacksonville Healthcare System located in Jacksonville, Florida. These combined outpatient facilities provide primary care and preventative services to over 34,000 outpatient visits annually. Forty patients elected to participate in the study at the conclusion of a 30 day enrollment period.

Intervention

The Tobacco Cessation Program consisted of a one day (minimum) group program held by Northeast Florida AHEC Community Health 40-50 times per year that incorporated clinical practice guidelines and treatment strategies from the American Cancer Society's Fresh Start Program® and the Mayo Clinic Tobacco Cessation guidelines, among others. Sessions were held at various locations within Duval, Nassau, Clay and Volusia counties. Each session was held in a

classroom setting and contained both didactic presentations and group counseling. Didactic information included such topics as tobacco use history, stress management, nutrition and weight loss. Group counseling focused on motivational interviewing, nicotine withdrawal management and relapse prevention. Participants who elect to attend are able to support one another in their efforts at smoking cessation by talking about their progress. In addition participants are recommended to also receive pharmacotherapy agents from their primary care providers which may include use of agents such as Nicotine replacement (NRT). This medication comes in the standard 21/14/7mg patches and may be augmented with use of the Nicotine Replacement Lozenge. Treatment recommendations are dose dependent upon patient's nicotine consumption history (based on Mayo Clinic guidelines). Bupropion may also be used, with or without NRT. Additionally, Chantix is also made available and consists of up to 12 weeks of treatment. Instead of the traditional tobacco dependence treatment program, individuals may choose to obtain more individualized counseling with a primary care provider, who may do the counseling themselves or refer to a tobacco dependence specialist. Pharmacotherapy was not a measurement criterion for this study.

The skill mix of Primary Care Providers within the UF Community Health Family Medicine is typically comprised of Family Physicians (MD/DO) and 2-3 Physicians' Assistants and/or Family Nurse Practitioners. This provider skill mix was also made available, to varying degrees, at five primary care sites to include UF Health Commonwealth, UF Health Murray Hill, UF Health Soutel Plaza, UF Health Elizabeth Means and UF Health Brentwood Clinics. Tobacco Dependence Treatment training for these providers is based primarily on that received during their respective core specialty programs. Additional continuing education is not

mandatory, but readily available through local and out-of-state offerings, as well as online through a variety of educational outlets.

The Tobacco Dependence Specialist for UF Commonwealth Clinics is Dr. Joseph Cammilleri, Pharmacist, UF Pain Management Clinic, located at the Main Campus of UF Shands Jacksonville. Dr. Cammilleri provides nicotine dependence and pharmacologic counseling to patients who are referred to him. Dr. Cammilleri's notes are made available in the Allscripts electronic medical record; but do not provide any of the data points required for this study. Each of his patients are referred to Group Tobacco Dependence treatment through AHEC in Jacksonville. However, patients may or may not attend the group session – regardless of having the referral. As AHEC does not separately track UF Health patients; there is no accurate way to assess attendance other than at primary care follow up appointments. Additionally, AHEC collects no data on abstinence or weight measures that can be shared with the primary investigator.

Measures

The electronic medical record (Allscripts and Epic) were used to obtain information on the type of tobacco cessation program participation, weight measurements, and tobacco abstinence rates at 1 and 3 months. A retrospective record audit was conducted to collate all data points for all participants (e.g. individual and group) as weight and tobacco use status are assessed at each patient clinic visit. No additional data points such as medications used or biomarker confirmation of cessation status were collected. A further description of the types of data measures collected includes the following:

Demographic Data

Demographic data was measured by age (in years) and gender (male vs. female).

Nicotine Dependence

Nicotine dependence was measured using the Navy's Modified Fagerstrom Test for Nicotine Dependence (Appendix I) which is an 8 item questionnaire measured on a scale of 0-15 with scores 7 and higher indicating higher nicotine dependence (Navy and Marine Corps Public Health Center, 2010). The Fagerstrom and/or the Navy's Modified Fagerstrom is a standardized, validated and nationally used instrument to assess nicotine dependence as part of tobacco dependence treatment efforts. It is not currently utilized as part of UF Health's Tobacco dependence treatment efforts. The Fagerstrom tool is widely recognized nationally and utilized in most established tobacco cessation program arsenals (Heatherton, et al., 1991). The Navy's Modified Fagerstrom Test for Nicotine Dependence was administered in the primary care venue prior to beginning treatment (traditional program vs. primary care) and at month 1 and 3 of the study if the participant was still smoking.

Primary Outcome Variables

The variables of interest to be measured were body composition and abstinence rates at end of the program (i.e. at 1 month and 3 months).

Weights were measured in pounds and obtained using a calibrated, digital scale prior to tobacco dependence treatment and obtained at subsequent follow up visits at months 1 and 3 post treatment. These measurements were obtained from the patient's electronic medical records at the time of enrollment, 30 days and 90 days follow up respectively.

Abstinence Rates were defined as continuous cessation from tobacco for 30 days (at 1 month follow up) and 90 days (at 3 month follow up). Abstinence measures were obtained in the

form of ‘yes’ or ‘no’ responses from participants either in person or by telephone and/or e-mail follow-up.

Data analysis

Frequencies and means (M) with standard deviations (SD) were used to describe the characteristics of the sample for this pilot study. Frequencies were also used to describe the numbers of participants who attained tobacco cessation and maintained (or lost) body weight at 30 day and 90 day follow up periods. Nicotine dependence scores were further described utilizing means and standard deviations as well. Following conventions of an intent-to-treat analysis, individuals who were lost to follow-up or did not provide data for the follow-up time points (n= 2) were considered to not have maintained their abstinence or their weight goals.

Fisher’s exact chi-square tests were performed to evaluate gender differences in smoking abstinence and ability to maintain weight at 30 days and 90 days. In addition, the association between age of participant, smoking abstinence (at 30 days and 90 days), and ability to maintain weight (at 30 days and 90 days) were determined using spearman correlations.

A Wilcoxon Signed Rank Test was also performed to determine changes in weight and Fagerstrom nicotine dependence scores between baseline and follow-up time periods. For all analyses, an alpha level of $p<.05$ was used to indicate significant results. All analyses were performed using SPSS version 21.

Results

Sample Description:

Descriptive data for the sample utilized in this pilot study are outlined in Table 1. The majority of participants were female 67.5% (n=27) with an average age of 45.3 years (Range= 23 to 71 years). Weight measurement at baseline ranged from 93 lbs. to 364 lbs. (M=175.8

lbs.SD=56.1). The average baseline nicotine dependence score (M=8.38, SD=2.8) was fairly high for the entire sample. The majority (95%) of patients self- selected tobacco cessation intervention at the primary care level (N=38). Only two (5%) patients self-selected to attend individualized tobacco cessation counseling (N=2). No patients in the study elected group intervention.

Smoking Abstinence Outcomes:

Abstinence at 30 days was 10% (4/40) and 15% (6/40) at 90 days follow-up (see Figure 1). A greater proportion of females achieved smoking abstinence than males (albeit not significant) at 30 days (14.8% vs. 0.0%, Chi-square= 2.14, p = .284), but not at 90 days (14.8% vs. 15.4%, chi-square = .00, p = 1.00). Age of participant was not associated with achieving abstinence at 30 days (Spearman Rho = .054, p = .740) or 90 days (Spearman Rho = .13, p = .411)

Weight Maintenance Outcomes:

The changes in average weight of participants during treatment is presented in Table 2. An approximate 2 pound mean weight loss amongst sample participants was found from baseline to 90 days. Average weight measurements declined at 30 days (M=175.64) and at 90 days (M=173.64) follow up. Weight maintenance/loss at 30 days was 47.5% (19/40) and increased to 57.5% (23/40) at 90 days (see figure 2). There was no significant difference between the proportions of females and males who achieved their weight maintenance goals at 30 days (48.1% vs. 46.2%, Chi-square = .01, p = 1.00), and at 90 days (48.1% vs. 76.9%, Chi-square = 2.97, p = .103). Neither was weight maintenance associated with age of participant at 30 days (Spearman Rho = -.12, p = .447) or 90 days (Spearman Rho = .04, p = .830).

Changes in Nicotine Dependence Scores:

Changes in nicotine dependence scores between baseline and at 30 and 90 days are presented in Table 2. Average nicotine dependence scores (only of those who provided baseline, 30 days, and 90 days Fagerstrom scores, n=20) decreased from M=8.38 at baseline to M=7.80 at 90 days follow up. However, no statistically significant change in scores were noted either at baseline to one month (Z=-1.00, p= .317) or baseline to 90 days follow-up (Z=-1.08, p=.282).

Discussion

The overall purpose of this pilot project was to assess the feasibility of implementing a more rigorous study to assess the relationship between the types of tobacco dependence treatment received and the associated impact on tobacco abstinence rates and ability to maintain body weight. Despite inherent limitations to the design and the process of carrying out this pilot project, the findings are clinically relevant and merit further research.

For patients who receive as little as 1 to 3 minutes of counseling cessation rates can reach as high as 14% (Fiore & Baker, 2011). This increases to 19% for 4 to 30 minutes of counseling and 27% for 31 the 90 minutes of counseling (Fiore & Baker, 2011). Cessation rates for patients who receive no counseling average 11% (American Cancer Society, 2013). Pharmacotherapy also contributes to the success rates when utilized (Fiore & Baker, 2011) (American Cancer Society, 2013). While counseling duration (and pharmacotherapy) was not monitored in this pilot study, the smoking abstinence rates may suggest that participants could have received 1 to 3 minutes of brief counseling per visit. Interestingly, cessation rates increased between 30 days to 90 days follow up, although this increase was not statistically significant. Also, due to the small sample size (N=40) and uneven cohort distribution, no meaningful analysis could be performed

to examine the association between the type of tobacco dependence treatment received and tobacco abstinence.

For this pilot study, participants' average weight did not significantly decrease from baseline to 90 day follow-up. However, an approximate 2 pound mean weight loss amongst sample participants from baseline to 90 days is clinically significant (Chiolero, Faeh, Paccaud, & Cornuz, 2008; Schlam & Baker, 2013). Demonstrated ability to maintain and potentially lose weight during the cessation attempt could prove meaningful to those who are contemplating quitting tobacco use. This especially holds true for those concerned about weight gain and the impact on their careers, as in the military population (Chiolero, Faeh, Paccaud, & Cornuz, 2008; Schlam & Baker, 2013).

Moreover, obtaining follow up data on nicotine dependence during this study was also problematic. In addition to small sample size, the return rate of nicotine dependence assessment questionnaires (Appendix I) were only 50% (N=20/40) at one month and three month follow-up periods. No statistically significant changes could be found when looking at the differences between nicotine dependence scores at baseline to one month and one month to three months. As a caveat, however, mean nicotine dependence stores seem to be clinically significant as they decreased the longer the cessation attempt (Japuntich, et al., 2011). This decrease in nicotine dependence over time warrants further exploration to determine what program attributes may have contributed to this downward trend. Areas of focus for additional study in this area should include treatment strategies that prevent relapse (e.g. cognitive behavioral therapy, counseling or pharmacotherapy). Findings could help improve cessation efforts, leading to future quit attempts and improved chances for total cessation (Japuntich, et al., 2011).

Study Limitations

Several limitations were noted during this study. These limitations are important to keep in mind when reviewing the study's findings. First, the small sample size (N=40) and skewed distribution of cohort assignment hindered appropriate examinations of the relationship between tobacco dependence treatment type, abstinence, and maintaining body weight. Second, participants' use of pharmacotherapy modalities were not assessed. As medication use is demonstrated to improve cessation efforts, this may have affected overall cessation rates at the one and three month follow-up point. Third, no objective measure of abstinence was used (such as cotinine or expired breath Carbon Monoxide). Measuring cotinine levels at the appropriate follow-up intervals would have provided a more objective analysis of abstinence. Fourth, obtaining complete follow-up data was also problematic, specifically with regards to reevaluating nicotine dependence, utilizing the Fagerstrom tool, for those still smoking at 30 and 90 day follow up points. Return rate of assessment tools was initially very poor at 30 and 90 day follow up points. Hence, significant effort on the part of the investigator in the form of phone follow up attempts was required. Three attempts were made for each study participant. The result was still only a 50% return rate (e.g. N=20/20) at 30 and 90 days.

Implications for Future Research

Upon completion of this pilot study, subsequent process evaluation revealed several areas that could be improved to facilitate future research utilizing this study design. While patient contact information were to be updated at every encounter by clinic staff; it was apparent this was not done consistently as up to three attempts were made to contact each patient who did not return or complete their Fagerstrom tool during the follow up visit. Even though the investigator had clearly placed alerts in the patient's electronic health record to have the Fagerstrom tool

completed, high turnover of more experienced medical assistants familiar with the process at the beginning of the study compromised data collection efforts as these medical assistants comprise the frontline personnel responsible for this task. Thus, new staff not familiar with the study frequently omitted ensuring patients completed the Fagerstrom as required. As tobacco use screening was a more ingrained process at patient check-in, this was fairly reliably obtained except in cases where patients failed to show for follow-up. A proposed solution in this instance would be the assignment of a floating medical assistant who would serve as team leader and be responsible for reviewing patient appointments for the day and screening them for study participants, flagging, making data collection tools to be given to patients prior to discharge from the clinic and providing reminders to clinic staff about collecting the completed data forms and returning them appropriately.

Each study participant was automatically referred to the tobacco cessation program at the time of study enrollment. This afforded patients an opportunity to self-select either into more individualized tobacco cessation counseling and/or group treatment intervention. Initially, 30 patients were assigned to the primary care treatment option and 10 patients self-selected to attend the more individualized tobacco cessation counseling as part of the tobacco cessation program. However, by the end of the follow-up periods, only two patients actually attended the individualized counseling. No patients self-selected to attend group treatment. As both the more intensive individualized counseling (e.g. Tobacco Cessation Specialist) and group treatment options (e.g. AHEC) were located ‘off-site’; the lack of immediate availability of services at the time of appointment itself posed problems for compliance study participation.

Additionally, the vast majority of patients in study sample were of low socioeconomic status and low educational level and also typically had several comorbidities and other substance

dependence issues. Many were chronic pain patients and required monthly follow up visits to obtain their controlled substance refills. Unfortunately, the confounding variables of socioeconomic status, education level, comorbidities, substance dependence and chronic pain were not measured as part of the pilot. Looking at the data globally inferences can be made as to the importance placed on follow up in primary care for chronic illness and pain needs versus incurring the extra expenditure associated with fuel and transportation costs (e.g. cab fare, bus fare, private auto fuel costs). The combination of each of the confounding variables with lack of immediate availability of all tobacco dependence treatment options may have adversely affected study participation and outcomes. Thus having onsite staff available at each clinic trained in tobacco cessation counseling might increase compliance with more intensive individualized counseling or group treatment. Patients could more effectively coordinate 'one-stop-shopping' visits to the clinical site for tobacco dependence treatment intervention.

As previously indicated, the relatively small sample size and lack of participation, in sufficient numbers, for each of the cohorts under study may have limited the power to detect statistically significant findings regarding the association between the type of tobacco dependence treatment received and the effect on abstinence rates and weight maintenance. However, mean values and skewness statistics for both weight and nicotine dependence show a decrease in measurements and clinically relevant, although not statistically significant change from baseline to 90 day follow-up.

Some additional preemptive changes could contribute to better sampling of the data and clinical picture as it pertains to tobacco dependence treatment strategies in this or similar populations. First, due to time constraints a 90 day study window may have been insufficient (and possibly ambitious) in meeting the aim of this pilot study. A study of longer duration (e.g.,

one year or longer) using a randomized control design may capture more accurate clinical data. This is especially true when taking into account the amount of time for the pilot, from the time the tobacco cessation program referral was placed until the patient was practically able to receive the desire intervention (e.g. Tobacco Cessation Specialist counseling or Group treatment option).

Second, while significant effort was made to obtain 'buy-in' for study participation by local and remote clinic leadership and ancillary staff, the majority of study participants (with the exception of one subject) were all from the investigator's clinical practice site and not from any of the remote clinics who agreed to participate in the study. While it is possible these other clinics had no patients ready to engage in tobacco use cessation or participate in this pilot study, it is highly unlikely. Reasons given by office management, at other clinic sites, for lack of participation (post study) ranged from staffing shortage issues (e.g. high turnover resulting in lack of familiarity with study procedures) to failure of mid-level management to ensure staff participation in study requirements. Assignment of a responsible 'front line' person at each clinical sight to ensure staff compliance with study deliverables is seen as the first, best option to overcome the difficulties in this particular area. Additional efforts may include more time to network with all clinic staff to help cement 'buy-in' from clinic leadership and obtain cooperation from frontline personnel who would have the primary responsibilities of tobacco use screening, attaining biometric data, and administering questionnaires.

A military population is the desired focus for future study. The results of this pilot are easily transferable to that subculture. The majority of tobacco users within the military consist of junior enlisted personnel who are typically in the younger age range from 18 to 25 years (Pyle, et. al, 2007; Green, et. al, 2008). Similar to the population of the study, these younger military members experience many of the same confounding variables found in the civilian population

that was the case in this study (such as low socioeconomic and educational status). Also, those military members who are married are often one car family's and, in addition to their low income, experience many of the same transportation and affordability issues that pertain to tobacco cessation program participation in the civilian setting. Treatment options are identical in that they are offered in primary care, individual counseling, and group formats. Data collection would not be as problematic as contact information is more readily available and accurate. Additionally compliance rates would be expected to be higher as typically there are no other confounding issues such as multiple comorbidities or substance abuse problems. Duration of treatment is individualized to the patient just as it is in the civilian setting. However, the feasibility of conducting follow-up for greater than a one year period is most likely not practical as the tobacco cessation program coordinator's ability to track their participant's changes with duty assignment(s) (permanent or temporary) which relocate them outside of the catchment area (Pyle, et. al, 2007; Green, et. al, 2008).

Conclusion

While an analysis examining the association between treatment type, smoking abstinence or weight maintenance could not be performed, descriptive analysis provide some clinically relevant findings that may support the need for more rigorous research in this area. A more rigorous clinical study approach and longer study duration would also afford a more accurate clinical picture of the association between tobacco dependence treatment, abstinence and weight management in the three cohorts of interest (primary care, tailored, individualized counseling, and group treatment). With some additional minor preemptive modifications, the preliminary study design of this pilot study can further the research into more effective tobacco dependence treatments strategies in both civilian and similar military populations.

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Table 1. Sample Characteristics

	Total (N = 40)	
	n	%
Gender		
Male	13	32.5
Female	27	67.5
Treatment Type		
Primary Care	38	95
Individual Counseling	2	5
Group Treatment	0	0
	Mean	SD
Age (years)	45.0	13.6
Baseline Weight (in pounds)	175.8	56.1
Baseline Fagerstrom Score	8.4	2.8

Table 2. Changes in Body Weight and Nicotine Dependence at 30-days and 90days follow up

	30 days		90 days		Differences** Baseline to 30 days			Differences** Baseline to 90 days		
	Mean	SD	Mean	SD	Mean change	Z score	P	Mean change	Z score	P
Body weight (pounds)	175.6	55.6	173.6	54.0	-0.2	-.19	.850	-2.2	-.22	.826
Fagerstrom Scores[a]	8.6	2.5	7.8	2.4	-0.2	-1.0	.317	-0.6	-1.1	.282

**Differences between baseline, 30 days, and 90 days were determined using Wilcoxon Signed Rank Test

a. Differences in Fagerstrom scores are measured for 20 individuals who completed baseline, 30 days and 90days follow-up.

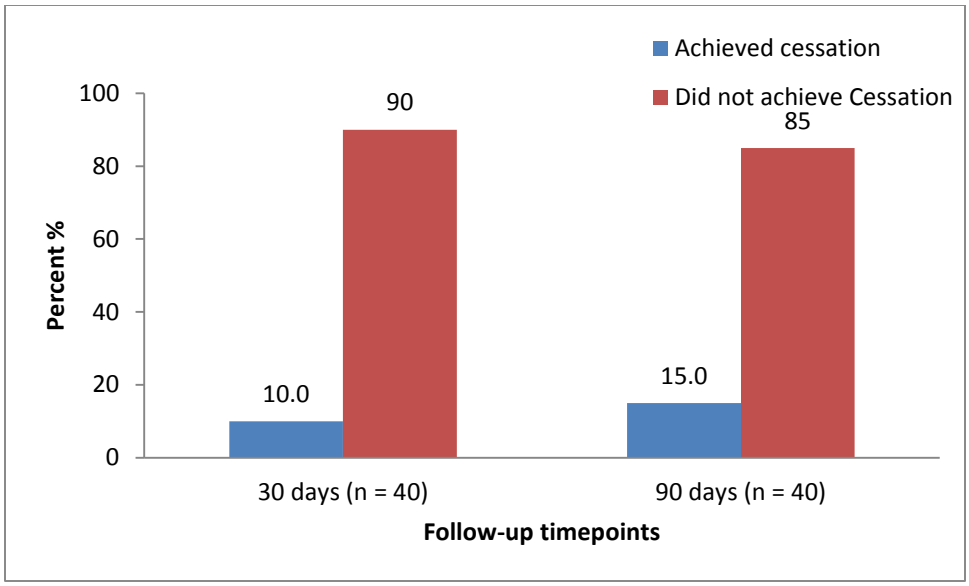


Figure 1. Tobacco Use Status at 30 days and 90 days follow-up.

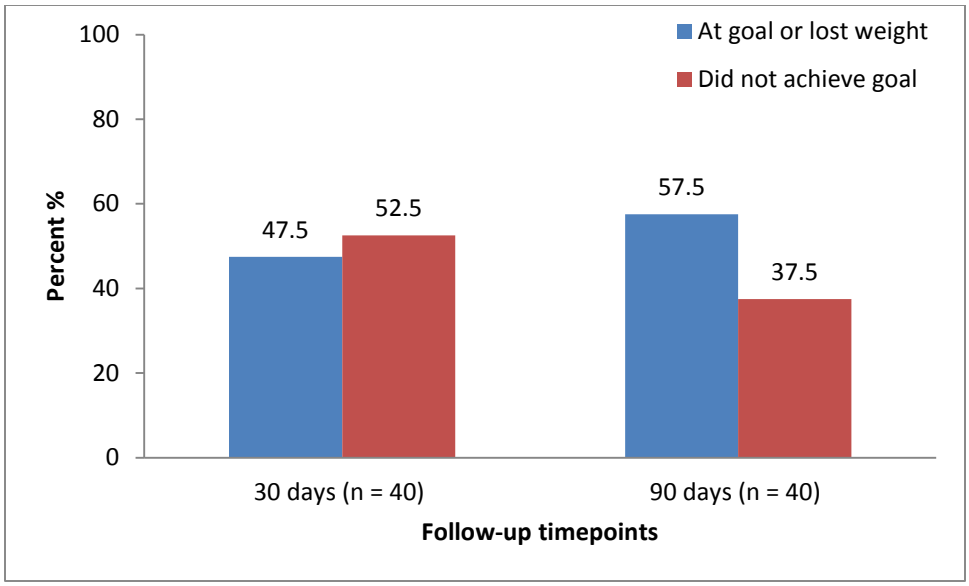


Figure 2. Weight maintenance outcomes at 30 days and 90 days follow-up.

APPENDIX 1

Nicotine Dependence Questionnaire
(Modified Fagerstrom Tolerance Questionnaire)

Please check one answer for each question.

1. How many cigarettes a day do you usually smoke?

[ ] 1 - 10	0 points
[ ] 11 – 20	1 points
[ ] 21 – 30	2 points
[ ] 31 or more	3 points

2. What type do you smoke? 0 points

[ ] Low nicotine (0.9 mg or less)	1 point
[ ] Medium nicotine (1.0 – 1.2 mg)	2 points
[ ] High nicotine (1.3 mg or more)	3 points

3. How often do you inhale the smoke from your cigarette?

[ ] Never	0 points
[ ] Sometimes	1 points
[ ] Always	2 points

4. How soon after you wake up do you smoke your first cigarette?

[ ] Within less than 5 minutes	3 points
[ ] Within 6-30 minutes	2 points
[ ] Within 31-60 minutes	1 points

5. Do you smoke more during the first two hours of the day than during the rest of the day?

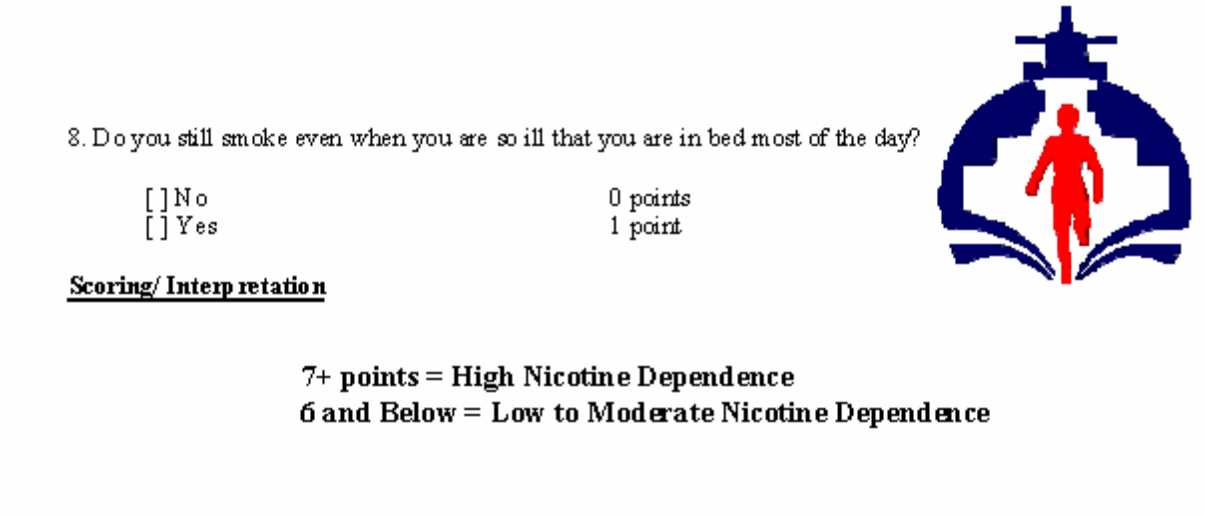
[ ] No	0 points
[ ] Yes	1 points

6. Which cigarette would you most hate to give up?

[ ] The first cigarette in the morning	1 point
[ ] Any cigarette other than the first one	0 points

7. Do you find it difficult to refrain from smoking in places where it is forbidden, such as public buildings, on airplanes or at work?

[ ] No	0 points
[ ] Yes	1 point



8. Do you still smoke even when you are so ill that you are in bed most of the day?

[ ] No 0 points
[ ] Yes 1 point

Scoring/ Interpretation

7+ points = High Nicotine Dependence
6 and Below = Low to Moderate Nicotine Dependence

Source: (Navy and Marine Corps Public Health Center, 2010).

Conclusion

Tobacco cessation programs in the military continue to face many obstacles. Potential barriers can include individual willingness to change, as well as types and availability of support systems and tobacco cessation programs, among others. Weight gain alone is a significant concern to military members as body weight indicates fitness for duty and continued service. Some members are therefore hesitant to quit when studies show that up to 80% of smokers who quit tobacco gain weight, with the average weight gain reaching as high as 10 pounds after stopping tobacco use. Additionally, the average weight gain within one year of abstinence has been reported to be as high as 13 pounds (Russ, Fonseca et al. 2001).

As military members must negotiate often very rigorous work schedules to attend group sessions and office appointments, an alternative to scheduled classes and office visits for tobacco dependence treatment might improve cessation efforts. As risk for weight gain and the type of smoking cessation program may effect abstinence rates, individually targeted worksite tobacco cessation program might enhance or improve abstinence among Navy personnel who smoke (Russ, Fonseca et al., 2001) (Klesges, DeBon et al., 2006) .

The three deliverables (articles) for publication that comprise this capstone project provide a comprehensive analysis and approach to optimizing tobacco dependence treatment programs in the military subculture. The first article "Targeted Tobacco Dependence Intervention to Reduce Tobacco Use at the Military Unit Level: A Brief Review of the Literature" provides a sound foundation for implementing changes based on scientific research. As evident from its literature review; brief, tailored interventions are more effective in promoting abstinence among current the tobacco users in the military (Klesges, DeBon et al., 2006; Severson, Peterson et al., 2009). However, the body of literature reviewed to date has dealt

primarily with tobacco cessation initiatives conducted in larger group, versus individual settings. A great opportunity still exists in examining targeted tobacco dependence initiatives in a variety of other settings such as onboard ships, at training facilities, in the field, deployed overseas, and possibly even in combat. These unique environments provide challenges for healthcare professionals within military healthcare system to reduce tobacco use. Also, tobacco products are frequently used to cope with stress in these environments. Tobacco use not only impacts individual health, but also military readiness for that member's particular unit or command (Hourani, Yuan et al., 1999; Stein, Pyle et al., 2008).

Affecting policy change is key in being able to implement and maintain effective tobacco dependence treatment strategies and programs. The second article "Changing to a Tobacco Free Military: Seeking a Policy Paradigm Shift in a High Use, Pro-Tobacco Subculture" looks at doing this utilizing Kingdon's (2011) conceptual framework. In keeping with the Problem Stream of this model, public attention needs to be directed to tobacco control efforts within the military. Previously, congressional interference has largely taken place behind closed doors. Unfortunately, tobacco advocates within the military are precluded from being very effective with regards to public disclosure of their interactions with Congress. The empirical evidence surrounding the deleterious effects of tobacco use is clear and widely available. This information needs to be continually reinforced to members of Congress, as newer members are most likely not aware of the long-term effects to the health of military personnel, as a result of the politically expedient actions taken for the tobacco lobby by their predecessors, to impede tobacco control efforts (Kingdon, 2011) (Offen, et al, 2011).

Within the Political Stream, we must also encourage public health organizations in the civilian sector to take a larger role in tobacco control efforts within the military. As active duty

military personnel are constrained by structural controls with regards to their lobbying ability. Ability of military members to respond to attacks by both the tobacco industry congressional members is very limited. Hence, there needs to be a collaborative effort among outside government agencies. Such agencies would include veteran's advocacy groups, public health agencies, and tobacco control advocacy groups, among others, to effect significant change in policy within the Department of Defense. Veteran's groups and their political lobbying agencies can be extremely effective in helping facilitate policy change by bringing to light the effects of tobacco use on their members who currently/formerly used tobacco as a result of being part of a tobacco friendly organization such as the military. By working together, these groups will be less impeded by the military tobacco control advocates, and can more effectively help further the cause of tobacco free policy implementation within the military service by holding congressional members accountable in the public arena (Offen, et al, 2011).

The third component of this capstone project "Tobacco Dependence Treatment and its Relationship to Abstinence and Weight Gain: A Pilot Study" examines the feasibility of conducting more rigorous research as it pertains to tobacco dependence treatment type and its relationship to the ability of patients to abstain from tobacco use while maintaining their body weight. Significant barriers were encountered during the attempt to conduct research within a Department of Defense medical facility. While some of these barriers were expected, others made any attempt at conducting research within the investigator's desire population not practical for the purposes of this project. Therefore, a study within an accessible civilian population could potentially provide transferable knowledge to the Military population. No statistically significant relationship could be established from this pilot with regards to tobacco dependence treatment type and its effect on abstinence rates and weight maintenance. However statistical trends among

study participants demonstrated weight maintenance and/or loss as well as a decrease in nicotine dependence over a 90 day cessation effort suggest the feasibility of performing more rigorous research in this area is warranted.

Tobacco dependence treatment efforts can significantly impact the leading cause of preventable death in the United States and thus lead to a decrease in comorbidities and associated healthcare costs. While there is certainly no one-size-fits-all treatment methodology for patients who use tobacco products, evidenced-based literature demonstrates that an "all hands on deck" approach needs to be taken in the battle against tobacco use. In that regard, "outside of the box" thinking must be utilized when developing tobacco dependence treatment strategies as individually tailored programs, be they in the form of individual or group treatment, are more effective than standardized or cookie-cutter type programs. Additionally, tobacco cessation advocates must ensure that organizational policy changes are implemented and remain consistent in order to have effective treatment programs as well. Nicotine dependence and the ability to attain abstinence as well as maintain body weight are areas that need further research. Current research demonstrating best practices in tobacco cessation is imperative in order for tobacco dependence program facilitators to afford their patients the greatest opportunity for success in their cessation efforts.

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