

OBESITY AND U.S. MILITARY SPOUSES:  
AN EXAMINATION OF RISK PERCEPTION AND HEALTH BEHAVIOR

by

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## **Abstract**

Obesity in the U.S. has become a national epidemic. The Military, in particular Military spouses are not exempt from the challenging issue of obesity. Understanding risk perception and health behavior is key to reducing the obesity epidemic, however insufficient research has been conducted among U.S. Military spouses to understand their perceived risk and health behaviors. This quantitative study was conducted among 291 Military spouses using the Extended Parallel Process Model and Social Cognitive Theory as the conceptual frameworks. The results indicated that perceived susceptibility of obesity and obesity related illness among overweight and obese Military spouses while reinforcing both response and self-efficacy is the focal area for communication. Key barriers to weight loss and health goals were identified and the setting of health goals is identified as important. The researcher provides a digital intervention recommendation to address the findings of this study.

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## **Dedication**

I would like to dedicate this thesis to Military spouses across the world. You are the unsung heroes of the Military and I salute you.



## **Chapter 1 - Introduction**

The World has experienced a dramatic increase in obesity over the past 40 years. This has been driven mainly by an increase in processed, affordable and effectively marketed food, leading to passive over-consumption (Hall, 2011). However, sustained obesity prevention efforts in the U.S. have barely got off the ground. Unlike other major causes of preventable death and disability, such as tobacco use, public health measures have been unable to reverse the trend.

The U.S. Military population is not exempt from obesity and its health complications. Approximately 40% of the U.S. Military Health System (MHS) population is overweight and approximately 25% are obese (US Medicine, 2009). Research studies on Military health behaviors have traditionally focused on the Service Member or the family. There is insufficient research focused on understanding how to address the obesity challenge among Military spouses. A small number of pilot communication interventions have been implemented to address negative health behaviors, however these have been short lived and inconsistent. Health communication directed at Military spouses to highlight the risks of obesity is scarce.

This study seeks to understand obesity among U.S. Military spouses and how to reduce the obesity incidence. A quantitative study with U.S. Military spouses was conducted to understand risk perception, health behaviors, and their relationship using the Extended Parallel Process Model (EPPM) and Social Cognitive Theory (SCT) as the conceptual framework. Based on the research results, a recommendation for effective health communication is provided.

### **Background**

The Centers for Disease Control and Prevention (CDC) reported that 33 states had a prevalence of obesity equal to or greater than 25% in 2009 (CDC, 2011a). More than one third of U.S. adults (approx. 72 million) are obese (Let's Move, 2011) and 65 million more obese adults are projected by 2030 (CDC, 2011a; Hall, 2011). Obesity rates for all groups in society, regardless of

age, sex, race, ethnicity, socioeconomic status, education level, or geographic region, have increased markedly (CDC, 2010). Obesity is a critical health issue because there are a number of health consequences linked to obesity. Type 2 diabetes, coronary heart disease, strokes and various forms of cancer are a select example of numerous health complications that are linked to obesity. Furthermore, obesity has psychological and social consequences for both adults and children (CDC, 2010). Hall (2011) predicts that associated treatment costs are estimated to increase by \$48-66 billion per year.

Obesity is a complex health issue for health communicators to address and understand. Behavior, environment, and genetic factors may have an effect in causing people to be overweight and obese (CDC, 2011a). Being overweight and obese results from the imbalance between calorie intake and output through physical activities. Body weight is the result of genes, metabolism, behavior, environment, culture, and socioeconomic status. The CDC have identified that behavior and environment are the greatest areas for prevention and treatment actions (CDC, 2011a).

Healthy nutrition and diet is a particular problem in the United States. Americans are eating 31 percent more calories than they were forty years ago - including 56 percent more fats and oils and 14 percent more sugars and sweeteners (Let's Move, 2011). The average American now eats fifteen more pounds of sugar a year than in 1970 (Let's Move, 2011). Overall obesity levels continue to rise because people are eating too many calories and not getting enough physical activity (CDC, 2011a).

## **Problem**

Obesity is an issue of increasing concern among U.S. Military families. The current estimated cost of obesity to the MHS is approximately \$2 billion per year (US Medicine, 2009), which is a significant cost to the US Department of Defense. The limited studies conducted on Military spouses, risk perception, and health behaviors (Cole & Horacek, 2009; Haas, 2006; The

Uniformed Services University of Health Science, 2010) confirm there is a serious issue. There are a plethora of resources available for Military spouses to maintain a healthy lifestyle, however obesity is at an epidemic level. There are specific barriers that are unique to Military life which affect participation in a healthy lifestyle. For example, deployments of the Military member contribute significantly to the emotional and physical wellbeing of a Military spouse. Education about the need for a healthy lifestyle is essential to encourage improved health behaviors. However Military spouses are generally not prioritizing this or do not see the need for this as there are many life stressors that take priority. Furthermore, there is a lack of information determining if Military spouses are aware of the severity of health issues caused by obesity and their susceptibility to obesity and related illnesses.

The lack of understanding about obesity and Military spouses has led to health communication not being effectively targeted at Military spouses. For example, the U.S. Government's "Let's Move" campaign is focused on Military children but not spouses. Therefore this program fails to address obesity specifically with the spouse. Effective health communication requires a solid understanding of the target, clear identified issues and tailored messaging. Obesity health communication designed specifically for Military spouses does not exist. Overall Military spouses are not prioritizing their own health and communicators are not effectively targeting them.

### **Justification**

No scholarly research on Military spouses and obesity has been formally conducted and this study is the first of its kind. Pilot interventions have been conducted, however these are limited to small sample groups and have been largely ineffective in reducing BMI. As highlighted, obesity is a complex issue and Military spouses often lead complex lives due to being in the Military community. Specific programs developed for Military spouses need to be developed to provide tailored communication and support for this target group. The results of this research can be used to

improve understanding of Military spouses, risk perception and health behavior. Health communicators can use the recommendations provided by this study to develop effective interventions to reduce the obesity incidence among Military spouses. This information and subsequent intervention recommendation can be used by the MHS to reduce of the financial burden caused by obesity and subsequent health issues. This will benefit the individuals targeted, their families, Military member readiness and the Department of Defense (DOD) overall.

### **Organization**

Chapter Two reviews the literature that describes obesity, risk perception and health behaviors applying the theories used for the study. Based on the previous literature and theories, research questions and a hypothesis are presented.

Chapter Three explains the methodology used in this study. It also describes how the respondents were solicited and selected. It details the instruments used in the study and finally describes the variables of interest.

Chapter Four presents the relevant findings related to the research question and notes any other themes that emerged.

Chapter Five discusses the findings of this study in detail and in application to the theory. It provides a detailed analysis of the research results in the context of the research questions, hypothesis and theories used. The researcher concedes the study limitations and concludes the paper with a recommended intervention.

## **Chapter 2 - Literature Review**

This review of literature examines risk perception and health behaviors of U.S. Military spouses within the theoretical framework of the Extended Parallel Process Model (EPPM) and Social Cognitive Theory (SCT). Risk perception, self-efficacy, outcome expectancies and health goals will be specifically assessed in this review. Based on the previous literature and theory, research questions and a hypothesis will be presented.

### **Military Spouses**

Military spouses are commonly referred to as ‘Military dependents’ and are defined as any person in a heterosexual marriage to a Military member. There are five US Military branches: The Army, Air Force, Navy, Marine Corps, and Coast Guard. Military members can be Active Duty or National Guard. There are approximately 1 million U.S. Military spouses (Casey, 2009). Military spouses are diverse in demographics and approximately 95% of U.S. Military spouses are female (Livestrong, 2011). The majority of Military spouses are employed (RAND National Defense Research Institute, 2011), but earn less than comparable civilian spouses. Military spouses are more likely to experience frequent long-distance relocations, and are on average young (under 35 years old) and are more likely to have young children at home (RAND, 2011). Military spouses make personal, employment and academic sacrifices to support their spouse’s career demands (RAND, 2011).

Military spouses face the same challenges as their civilian counterparts in their efforts to achieve a healthy lifestyle; however additional stressors are imposed on the Military spouse. These factors are often cited as ‘mission-related stress’ (Rosen & Durand, 2000, p.57), which includes separation due to field duty, deployments, frequent relocation, long working hours, and the dangers of combat. The increased frequency of deployments post September 11<sup>th</sup> 2001 has significantly impacted Military spouses and their health. Research has shown that since 2004, the percentage of

Army spouses taking care of their own health has decreased (Army Family And Morale & Welfare And Recreation Command (MWR), 2011) and this has become a significant challenge for the MHS.

### **Military Spouses and Body Mass Index (BMI)**

Adults are classified as overweight or obese based on a body mass index (BMI), which is calculated by dividing weight in kilograms by height in centimeters. A BMI greater than 18.5 and less than 25 is classified as “normal. Those ranging from 25 to 29.9 are considered “overweight”, while a BMI greater than 30 is classified as “obese” (American College of Sports Medicine, 2006). BMI is not always the ideal measurement of health, as a person with a high BMI can also be very healthy, a weight lifter for example. However, BMI is the most commonly used classification to determine whether an individual is overweight or obese. The USUHS (2010) identified 59.3% of spouses in their research study (n=112) as overweight or obese. A similar study conducted at Fort Drum (N=91) had a sample mean BMI of 32, with 65% falling in the obese category (Cole & Horacek, 2009). All published research conducted to date has confirmed that obesity is an epidemic for U.S. Military spouses. As obesity is such a complex issue it is important to thoroughly understand why people become and continue to remain obese before developing communication. Theory can provide an excellent framework to help identify the beliefs that are essential to forming persuasive communication (Fishbein & Cappella, 2006).

### **Theoretical Framework**

Most health behavior theories assume that the motivational process to initiate behavior change starts with the belief that one faces a substantial risk of experiencing a threat (Hahn & Lengerke, 1997). The Health Belief Model (Becker, 1974), Theory of Planned Behavior (Ajzen, 1991) and Protection Motivation Theory (Rogers, 1983) are examples. However, evidence regarding the correlation between risk perception and behavior is ambiguous (Rimal & Real, 2003). Understanding obesity and the health behaviors surrounding obesity is multifaceted. Through

examining the relationships between risk perception and health behavior, we can enrich our understanding of health behavior and direct intervention development (Brewer et al., 2007). This study will use the EPPM to understand risk perception and SCT to understand health behavior. The results of the study will be analyzed using both theories to provide recommendations for effective health communication. Overall the two theories selected for the study are complimentary and in application help provide a through understanding of risk perception and health behaviors.

### **Extended Parallel Process Model and Risk Perception**

Over 60 years of research has been conducted on fear appeal theories. There have been numerous fear appeal reviews and theories presented which can be classified into three main groups: drive theories, parallel response models and subjective expected utility models (Witte & Allen, 2000). The Extended Parallel Process Model (EPPM) integrates the main theory groups into one model (Witte & Allen, 2000). The research on fear appeals has identified three key independent variables: fear, perceived threat and perceived efficacy (Witte & Allen, 2000). In fear appeals, perceived threat is conceptualized as risk perception.

The EPPM, advanced by Kim Witte (1992), is the most recent fear appeal theory and 20 years after proposed, the EPPM remains one of the predominant fear appeal theories (Maloney, Lapinski & Witte, 2011). The EPPM explains how and why fear appeals succeed as well as how and why they fail (Witte, 1992a, 1994). Witte, Meyer, and Martell (2001) draw a direct connection between fear appeals and health risk messages: “People are naturally fearful of illness, disease, injuries, and death and want to stay healthy. By definition, most health risk messages are fear appeals” (p. 2). In a 1994 article, Witte argued, “by applying what we know from fear appeal research to risk communication research, we may improve our ability to produce effective risk messages as well as to understand why some risk communications backfire” (p. 231).

The EPPM states that a health risk message will initiate two cognitive appraisals: appraisal of the threat and appraisal of the recommended response. The appraisal will induce one of three responses in individuals: a) no response, b) fear control response, or c) danger control response (Witte, 1995). No response results in people ignoring the risk message and this occurs when there is low perceived susceptibility and/or low perceived severity. A fear control process results in the audience rejecting the message and performing behaviors that are counter to the risk message, for example smoking more cigarettes (Witte, Meyer, & Martell, 2001). Danger control process is when the audience makes the recommended healthy behavior changes (Witte, Meyer, & Martell, 2001).

According to the EPPM, the goal of the risk message is to initiate the danger control response (Witte, Meyer & Martell, 2001), as this is where a person is engaging in the recommended healthy behavior. Therefore, if a person's perception of risk and self-efficacy toward a health threat can be determined, then the EPPM can be used to predict which one of the three responses they will engage in. Furthermore, determining a person's risk and efficacy perceptions will aid the understanding of which perceptions need to be increased or decreased to promote the danger control response (Witte, Meyer & Martell, 2001). An extensive literature review and correspondence with Witte (August 2011) has confirmed that the EPPM has not been applied to either the topic of obesity or the population group of Military spouses.

According to the EPPM (Witte, 1992), risk perception is measured by perceived severity and perceived susceptibility. Perceived severity is defined as a person's belief about the significance or magnitude of a threat. Perceived susceptibility is a person's belief about their risk of experiencing the threat. Perceived likelihood is sometimes included in studies as a component of risk perception. Perceived likelihood can be understood as the probability that one will be harmed by the hazard. In particular Brewer and colleagues (2007) argue that risk perception has been poorly measured and all three variables (perceived severity, perceived susceptibility and perceived likelihood) should be used to measure risk perception.



The EPPM states that that perceived risk motivates action. The stronger the perceived risk, the greater the fear aroused and the higher an individual's motivation. In the EPPM perceived efficacy determines the nature of the response and perceived threat determines the extent of the response. However, the EPPM states that if perceived threat exceeds perceived efficacy then an individual will pass the critical point and move to fear control process. The objective of the EPPM is for individuals to move into the danger control process and not fear control.

### **Social Cognitive Theory**

SCT was developed in the 1970s when a paradigm shift took place from a focus on behavior to a focus on cognitions. Bandura published Social Learning Theory and his article on self-efficacy in 1977. However in 1986, Bandura fully developed his Social Cognitive Theory of human functioning. SCT theory states that human motivation and action are regulated by forethought (Luszczynska & Schwarzer, 2005). The theory outlines a number of variables that influence behavior: knowledge of health risks, perceived self-efficacy, outcome expectancies, goals, socio-structural factors and behavior change process. Bandura's (1977) SCT assumes that behavior is the outcome of interaction between an individual's cognitive process and environmental events. Studies have shown that understanding these constructs can help predict behaviors (Sharma, Wagner, & Wilkerson, 2006). Furthermore, Bandura (2004) states that, "social cognitive theory offers both predictors and principles on how to inform, enable, guide, and motivate people to adapt habits that promote health and reduce those that impair it" (p.146). SCT has been employed to develop health interventions to change behaviors (Luszczynska & Schwarzer, 2005).

The main focus of SCT is perceived self-efficacy and is defined as what you believe about your ability to perform a certain action. According to Bandura (2004), "Self efficacy is a focal determinant because it affects health behavior both directly and by its influence on the other determinants" (p.145). Outcome expectancies are also an important construct of SCT and are either

positive or negative. Positive outcome expectancies are similar to response efficacy in the EPPM and apply to an individual's belief that a certain behavior leads to a certain behavior. According to Bandura (1977), only when efficacy expectations are high can people perform certain behaviors (Witte, Meyer & Martell, 2001). In summary, both SCT and EPPM have been selected for this study as they provide a complimentary framework to understand how to address obesity and Military spouses.

### **Risk Perception**

Bandura (2004) states "knowledge of health risks...creates the precondition for change" (p.144). SCT has been used to understand human motivation and understanding an individual's risk perception is a key aspect of motivation. The EPPM postulates that when risk perception is low, individuals are not motivated to enact self-protective behaviors (Rimal & Real, 2003). Therefore if risk perception is low, efficacy beliefs should exercise little impact. Understanding risk perception is crucial in understanding how to address the obesity incidence among Military spouses.

Both the SCT and EPPM agree that it is important to combine risk perception with self-efficacy. Bandura (1997) states that when developing interventions for risk awareness they have to be combined with methods for self-efficacy. People need to be motivated for active learning and skills training, but on the other hand people need to be self-efficacious for opening up to unpleasant information. The EPPM maintains that in appraising the threat a person will question whether the threat is relevant for them (perceived susceptibility) and whether the threat is significant (perceived severity). If a person has high-perceived susceptibility and/or high perceived severity they will be motivated to appraise the efficacy of the recommended response. The EPPM explains that the perceived threat determines the extent of the response and the perceived efficacy determines the nature of the response (Witte, 1995). If the communication target's perceived efficacy is greater

than their perceived threat, the result will be danger control process. If the perceived threat is greater than perceived efficacy the result will be fear control process (Witte, 1992 & Witte, 1995).

There is limited information available specifically regarding an individual's knowledge on health risks and obesity (Kan & Tsai, 2004). Academic literature has focused on exploring the role of economic factors when exploring the determinants of individual obesity (Kan & Tsai, 2004), but not the individual's response to risk or risk perception. Skilbeck (1977) examined fear and compliance with dietary instructions among overweight women. The study concluded that: a) one exposure to a fear arousal message improved compliance with a healthy diet more effectively than multiple exposures and b) medium fear arousal messages achieved significantly better weight losses than the low or high fear arousal messages (Skilbeck, 1977).

Despite the lack of information on nutrition and risk perception it is evident that understanding risk perception is key to addressing behavior change. Williams and Noyes (2007) analyses of risk identified a "reliable relationship between risk perception and decision-making" (p.3). In a meta-analysis conducted (Brewer et al., 2007) on risk perception, health behavior and vaccinations, it was shown that there was a strong association between risk perception and behavior. Brewer et al. (2007) also concluded that risk perception is and should be a core concept in health behavior theory.

There is extremely limited information on Military spouses and obesity risk perception. In an unpublished study conducted by Dong and Tenconi in 2011, half of the respondents in the study did not consider themselves at risk of becoming overweight. Participants who had a higher risk perception of obesity indicated a lower desire for a healthy diet and lower intention to change their diet for the healthier. To understand risk perception among Military spouses the following research question will be examined:

RQ1. Do Military spouses consider themselves at risk of obesity and subsequent health issues?

## **Self-Efficacy**

The core focus of SCT is self-efficacy. Self-efficacy is defined as “people’s beliefs that they can exert control over their motivation and behavior and their social environment” (Bandura, 1989, p.128). For example, if a person has high confidence in their ability to resist eating chocolate, then the likeliness of that person not consuming chocolate is increased. The EPPM separates perceived efficacy into self-efficacy and response efficacy. Similarly to SCT, perceived self-efficacy refers to “beliefs about one’s ability to perform the recommended response to avert the threat” (Maloney, Lapinski & Witte, 2011, p.208). Perceived response efficacy is “beliefs about the effectiveness of the recommended response in deterring the threat” (Maloney, Lapinski & Witte, 2011, p.208). In the context of this review, response efficacy will be examined in the assessment of outcome expectancies.

Bandura (1977) views self efficacy as the driving force of human behavior: “Efficacy expectations are a major determinant of people’s choice of activities, how much effort they will expend, and of how long they will sustain effort in dealing with stressful situations” (p.194). A number of sources can affect self-efficacy. Bandura (1977) described four sources of efficacy development or information: 1) personal experience, 2) vicarious experience, 3) verbal persuasion and, 4) one’s physiological and emotional state. Self-efficacy is particularly important as both SCT and the EPPM convey that if an individual does not have high self-efficacy then they will not be motivated to change behaviors.

Studies have shown that there is a significant relationship between risk perception and self-efficacy. Rimal and Real (2003) conducted a longitudinal analysis of health campaigns and found that perceived self-efficacy governs whether individuals are motivated by risk perception to search for health information and whether they translate this information into behavior change. Both SCT and the EPPM state that the effect of perceived risks on an individual’s motivations and behaviors will be moderated by their efficacy beliefs. According to SCT, those with high-perceived self-

efficacy are likely to see risks as challenges to overcome, whereas those lacking in efficacy typically accept their vulnerability and are not motivated to change behavior (Rimal & Real, 2003).

There are a number of research studies that have proven there is a direct relationship between self-efficacy and behavior. Bandura and Locke (2003) assessed nine meta-analyses and concluded that efficacy beliefs contribute significantly to an individual's motivation and performance. Studies on weight-control behavior have shown that subjects with relatively high self-efficacy have lower dropout and higher weight loss rates than subjects with lower self-efficacy (AbuSabha & Achterberg, 1997). In a childhood nutritional pilot study conducted by Parcel and colleagues, self-efficacy was found to be strongly associated with the children's (n=1127) food choices (AbuSabha & Achterberg, 1997). DeWolfe and Shannon (1993) used SCT to predict eating behavior in 89 college students. The study found that students, who increased their self-efficacy during the study were the same students who reported decreasing fat intake in their diet.

There is a lack of information regarding self-efficacy and Military spouses, however studies conducted (Cole & Horacek, 2009; Haas, 2006; MWR, 2011; USUHS, 2010) do provide some information on self-efficacy, exercise, and the nutrition of Military spouses. In the assessment of Military spouse participation in exercise programs it is evident that there are a range of exercise facilities and programs available on all U.S. Military Installations, and data indicates that the majority of spouses are engaging in regular exercise (Rosen & Durand, 2000). The 2010 Survey of Army Families confirmed that 66.5% of spouses used installation recreation programs (MWR, 2011). However, it is unclear how frequently they are attending recreational programs and how capable they are at exercising at an effective level to prevent obesity and related diseases.

Evidence suggests that Military spouses do not have the necessary self-efficacy to overcome barriers in their environment to follow a healthy diet. Diet and nutrition are central to the levels of obese and overweight Military spouses. Dr. Jack Smith, one of the chief physicians in the Department of Defense, has noted that most Active Duty Army families are "too busy" and this

leads them to “indulge in fast food” and not make the “healthiest choices” (US Medicine, 2009, p.1). In an unpublished research project by Dong and Tenconi in 2011, it was identified that lack of time (44%), not wanting to cook for themselves (21.3%) and fast food being more convenient (21.3%) were the three key reasons cited for Military spouses not eating more healthy food.

Stress is a central barrier in the studies conducted on health behavior and Military spouses. According to The Uniformed Services University of Health Science (2010), it is evident that perceived stress is predictive of several health behaviors, most prominently exercise and diet. They USUHS (2010) assessed dietary behavior and the results indicate Military spouses of deployed Soldiers were not actively limiting fat or sugar intake. Lack of adherence to proper nutrition was most prominent during their spouse’s deployment. Furthermore, as the length of the deployment increased, the healthy dietary behavior decreased (USUHS, 2010). Haas (2006) conducted a study with postpartum Military spouses, concluding that stress caused by deployment had a physical impact on a Military spouse’s diet and in turn on their newborn child. The spouses in Haas’s study changed their eating habits for the worse while their spouses were deployed. The study also identified the physical impact of poor nutrition, as the researcher found that pregnant women with deployed spouses gave birth to larger babies (Haas, 2006).

Emotional and marital issues have also increased among Military families, which are a result of ‘mission-related stress’. From 2004 to 2010 there has been an increase from 15.3% to 19.2% of U.S. Military families facing emotional issues (MWR, 2011). Cole and Horacek (2009) identified that emotional eating was a significant behavior in U.S. Army spouses. Emotional eating is defined as eating in response to a ‘feeling’ instead of physical hunger. Emotional eating is not necessarily caused by depression as it can be caused by both positive and negative emotions - anger, sadness, stress, depression, and happiness (Kidd, 2011).

In summary, self-efficacy is important in understanding health behaviors. A Military spouse faces a number of emotional and physical barriers that can affect self-efficacy. It is also evident that

diet and nutrition is a focal area for reducing the obesity incidence among Military spouses.

Therefore, this study will examine the self-efficacy of Military spouses with the following research question:

RQ2. Do Military spouses believe they are capable of following a healthy diet?

### **Outcome Expectancies**

Outcome expectancies are an important part of SCT and can be either positive or negative. They referred to as response efficacy in the EPPM and refer to an individual's belief that certain actions will result in a certain outcome (Bandura, 2004). The positive outcome expectancies generally refer to the benefits that result from adopting a behavior or completing a task. Incentives, deterrents, conflicts, costs, and resources are all factors that a person will take into account when assessing whether to take on a task or behavior (AbuSabha & Achterberg, 1997). An individual will take into account these factors and evaluate their perceived outcome expectancies. For example, price and taste could override nutritional goals when making food choices.

There are three dimensions to outcome expectancies: a) physical, b) social and c) self-evaluative. Physical outcome expectancies refer to what will be experienced after behavior change takes place. For example, a person reducing their fat and sugar in their daily diet may experience a smaller physical appearance. Social outcome expectancies refer to the anticipated social responses after behavior change. For example, an individual may expect their friends or family to congratulate them for adopting a healthy diet. Self-evaluative outcome expectancies refer to the anticipation of experiences, such as being satisfied or ashamed.

Outcome expectancies have been identified as an important determinant of nutrition and health related behavior (AbuSabha & Achterberg, 1997). Conn (2010) indicates that research on the perceived benefits of dietary behavior provides evidence that outcome expectancy may be important for dietary behavior. Perceived benefits of particular dietary patterns have been shown to

predict both behavior and motivation to perform certain dietary behaviors (Brownell & Cohen, 1995; Kelly et al., 1991; Kristal et al., 1995). In smoking studies, strong outcome expectancies have increased the rate of quitting (Luszczynska & Schwarzer, 2005).

According to SCT, self-efficacy is connected to outcome expectancies. Resnicow et al. (2000) conducted a nutrition study that concluded that self-efficacy to eat more fruit and vegetables, as well as outcome expectancies in terms of fruit and vegetable intake, predicted a 24-hour recall of actual fruit and vegetable intake. The relationship between self-efficacy and outcome expectancies is apparent in a range of health topics. For example, self-efficacy beliefs and positive outcome expectancies are identified as closely linked in the examination of prostate cancer screening (Luszczynska & Schwarzer, 2005). Self-efficacy and outcome expectations are key constructs in the development of health interventions. For example, Luszczynska and Schwarzer (2005) cite 238 nutrition interventions where self-efficacy and/or outcome expectancies were used.

In summary, understanding outcome expectancies among Military spouses is important for understanding and predicting health behaviors. This study will examine the outcome expectancies of Military spouses with the following research question:

RQ3. What are Military spouses outcome expectancies of following a healthy diet?

### **Health Goals**

SCT states that in adopting a desired behavior, individuals' first form a goal and then attempt to execute the action (Luszczynska & Schwarzer, 2005). There is a distinction between distal goals and proximal goals in SCT. For example a distal goal would be, "I will adopt a healthy diet in the next year". A proximal goal would be, "In the next week I intend to adopt a healthy diet". According to Bandura (2003), individuals who adopt challenging goals and are confident (have high self-efficacy) about performing a desired behavior attain their goals more effectively as compared with individuals with little confidence in their ability to perform the desired behavior.



Outcome expectancies are also important in the formation of an individual's health goals, as an individual would not set goals for themselves if they thought the pursuit of such goals had more disadvantages than advantages (Luszczynska & Schwarzer, 2005). Therefore, an individual requires high self-efficacy and positive outcome expectancies to set health goals.

Nutrition and weight control studies using components of SCT confirm that goal setting is an important aspect of behavior change. Schnoll and Zimmerman (2001) conducted a study on fiber intake, using a nutrition class as their sample and their results concluded that goal setting had a significant effect on dietary fiber self-efficacy and on dietary fiber consumption. Subjects who set goals scored 15% higher on the dietary fiber self-efficacy scale and consumed 91% more fiber than subjects that did not set goals (Schnoll & Zimmerman, 2001). Anderson, Winett and Wojcik (2007) support Schnoll and Zimmerman's study and state that goal setting has been associated with healthier eating. Their 2007 study (Anderson, Winett & Wojcik) also concluded that women exhibited better use of goal setting and self-regulation strategies.

Goal setting depends on the perceived socio structural factors. In SCT socio structural factors refer to barriers or opportunities that reside in living conditions, health systems, political, economic, or environmental systems (Bandura, 1977). The rising number of conflicts that the U.S. is currently engaged in and the subsequent increase in the number of deployments a Military member participates in during their career is a socio structural factor that provides additional challenges and increased stress for Military spouses. While the Service Member is deployed, the spouse (who is typically female) becomes the head of the household and effectively becomes a single parent. A significant reason cited by Military spouses for insufficient exercise is a lack of available childcare (Cole & Horacek, 2009). A Fort Drum study (Cole & Horacek, 2009) on a weight management pilot program for Military spouses found that childcare services were limited and this impacted the success of the program. Many U.S. Military installations have reduced childcare services offered to spouses due to budget cuts. For example in 2010, at Fort Riley, KS,

Army spouses of deployed Soldiers were provided with 20 free hours of childcare per month per child. In 2011, they were provided with 16 free hours per child. Furthermore, there is a lack of consistency of childcare provided at the recreational facilities on Military installations. For example, at Fort Benning, GA, childcare is provided at all gyms, whereas at Fort Riley, KS, childcare is not available at gyms.

There is a lack of information available specifically regarding Military spouses and health goals. However, in an unpublished study conducted by Dong and Tenconi in 2011, a significant number of Army spouses (72.9%) desired a healthier diet, with half of the respondents having stated that they were looking to revise their diet in the next week or month.

### **Summary**

In summary, it is important to understand the risk perception and health behaviors of Military spouses to address the obesity epidemic. In review the research questions presented are:

RQ1. Do Military spouses consider themselves at risk of obesity and subsequent health issues?

RQ2. Do Military spouses believe they are capable of following a healthy diet?

RQ3. What are Military spouses outcome expectancies of following a healthy diet?

The literature review has also shown that there is a relationship between perceived risk, self-efficacy, outcome expectancies and goal setting. This study will also test the following hypotheses:

H1: Military spouses with high-perceived risk, high self-efficacy and high response efficacy will be motivated to set health goals.

SCT and EPPM provide a useful framework for analyzing obesity among Military spouses and these theories will be applied as the conceptual framework for the quantitative study.

Chapter Three explains the methodology used in the study to answer the research questions and hypothesis. It also explains how the respondents were recruited and selected, and expounds on the instrument used and variables of interest.

## **Chapter 3 - Methodology**

This chapter explains the methodology used in this study, including how the respondents were solicited and selected. Variables of interest are defined and details of the instrument used are explained. Finally, data reduction techniques are addressed.

This study explored Military spouses' risk perception and health behavior. The data was collected using an online survey utilizing the conceptual frameworks of SCT and the EPPM. A consent statement was provided at the beginning of the survey and participants had the option to enter their details for a \$100 gift card prize draw as an incentive. All information provided was anonymous and confidential. Protocol met requirements of the Kansas State University Institutional Review Board (#5975). Data was collected from the 1<sup>st</sup> -10<sup>th</sup> October 2011 and analyzed using SPSS software.

### **Recruitment of Participants**

In addition to meeting the requirements for the Kansas State University Institutional Review Board the researcher obtained permission for contacting Military spouses. There are no official regulations regarding contacting Military spouses, however the researcher utilized the Family Readiness Network's (FRG) email distribution list and this required approval from Commanding Officers. A convenience sample of Military spouses was solicited via e-mails sent through the 266th MCT (Fort Riley, KS) FRG distribution list, 1<sup>st</sup> Infantry Division Headquarters Battalion (Fort Riley, KS) FRG distribution list, the 221st Military Police Detachment (Fort Eustis, VA) FRG distribution list, the 39<sup>th</sup> Transportation Battalion (Kaiserslautern, Germany) FRG distribution list and the researcher's Military spouse acquaintances and word-of-mouth referrals. Furthermore the survey linked was posted to the Facebook page of "Army Wives Network", a support and information site for Army Wives.

The researcher emailed the 1<sup>st</sup> Infantry Division Family Support Coordinator, Mrs. Stacie Dumas, with the research link and asked to forward it on to the 1<sup>st</sup> Infantry Division Headquarters Battalion FRGs. This reached approximately 200 Military spouses. The researcher emailed the 266<sup>th</sup> Movement Control Team FRG with the research link reaching 20 Military spouses. U.S. Army Captain Philip Todd Turner (266<sup>th</sup> MCT, 1STB) provided consent to email the FRG network. The researcher emailed the 221st Military Police Detachment FRG with the research link reaching 80 Military spouses. U.S. Army Captain Samuel Arnett (221st MPs) provided consent to email the FRG network. Mrs. Betrena Christian, 39<sup>th</sup> Transportation Battalion Family Readiness Support Technician emailed the survey link to the FRG distribution list that reached 50 spouses. Mrs. Tara Crooks, founder of the “Army Wife Network” provided permission to post the link to the survey on their Facebook page which had approximately 32,000 fans at time of posting. Lastly, the researcher emailed 30 Military spouse friends and asked them to forward the link to fellow Military spouses. All 30 friends contacted forwarded the link to approximately 5 people each.

All branches of the U.S. Military were encouraged to participate. The sample was not restricted to females to ensure a representative sample of spouses, as men do represent a small percentage of U.S. Army spouses (3.3%) (MWR, 2011). Geographical location was not restricted as there is a high degree of geographical movement in the military and numerous posting assignments. Pregnant respondents were excluded from the study.

The objective of the study was to achieve a 95% confidence level. Witte, Meyer and Martell (2001) recommend a minimum of 150 respondents when conducting a quantitative study using the EPPM. Witte et al. (2001) state that 150 respondents provide sufficient ‘power’ to detect significant relationships between variables, if the significant relationships exist. A snowball sample of female U.S. Army spouses was recruited to conduct an on-line survey. To reduce sampling error, the researcher ensured the initial sample population’s husbands had a wide variety of ranks. This ensured that the sample was not purely Officer spouses or Enlisted spouses, as previous studies

have shown distinct differences between the two groups. The total sample achieved was 291 Military spouses (N=291).

### **Variables of Interest**

The operational definition of obesity in the study follows the CDC BMI guidelines (2011b): a BMI less than 18.5 is classified as underweight, 18.5-24.9 is a normal weight range, 25 – 29.9 is overweight and those with a BMI in excess of 30 are classified as obese. As per CDC guidelines (2011b), BMI was calculated using the following formula:  $[\text{weight in pounds} \div (\text{Height in inches})^2] \times 703$ . BMI was the dependent variable in the study and the following 2 items were asked to calculate BMI:

1. What is your height (in inches) ( $M = 65.11$ ,  $SD = 3.15$ )?
2. What is your weight (in pounds) ( $M = 161.93$ ,  $SD = 39.54$ )?

The independent variables examined in the study were perceived severity, perceived susceptibility, perceived likelihood, perceived self-efficacy, perceived response efficacy, negative outcome expectancies and health goals. The operationalizations of the variables were:

Perceived severity is defined as a person's belief about the significance or magnitude of a threat. Items to measure perceived severity were assessed on a 5 point scale of 1) strongly agree to 5) strongly disagree. All statement were reverse coded to have a consistent scale in the study from 1) strongly disagree to 5) strongly agree:

1. Obesity is a serious medical condition and can cause diabetes ( $M = 4.45$ ,  $SD = 0.90$ ).
2. Obesity is a serious medical condition and can cause cardiovascular disease ( $M = 4.38$ ,  $SD = 0.92$ ).
3. Obesity is a serious medical condition and can cause some forms of cancer ( $M = 3.83$ ,  $SD = 0.99$ ).
4. Obesity is more harmful than most people realize ( $M = 4.39$ ,  $SD = 0.88$ ).

5. Obesity is a severe threat that can shorten my life expectancy ( $M = 4.33$ ,  $SD = .92$ ).

Perceived susceptibility measured a person's belief about their risk of experiencing the threat. Items to measure perceived susceptibility were assessed on a 5 point scale of 1) strongly agree to 5) strongly disagree. Statements 3-5 were reverse coded to have a consistent scale in the study from 1) strongly disagree to 5) strongly agree:

1. The likelihood of me becoming obese is low ( $M = 2.24$ ,  $SD = 1.12$ ).
2. Compared to most people my age I understand my risk of becoming obese is low ( $M = 2.42$ ,  $SD = 1.09$ ).
3. I am at risk for obesity because I do not eat enough vegetables and fruit ( $M = 2.43$ ,  $SD = 1.12$ ).
4. I am at risk for obesity because I do not limit my fat and sugar intake ( $M = 2.61$ ,  $SD = 1.21$ ).
5. I am at risk for obesity because my family or a family member is obese ( $M = 2.75$ ,  $SD = 1.30$ ).

Perceived likelihood can be understood as the probability that one will be harmed by the hazard. Items to measure perceived likelihood were assessed on a 5 point scale of 1) highly unlikely to 5) highly likely:

1. What is the likelihood that you will become obese in the next year ( $M = 1.96$ ,  $SD = 1.11$ )?
2. What is the likelihood that you will become obese in the next year compared to other women/men of your age ( $M = 2.04$ ,  $SD = 1.11$ )?

Perceived self-efficacy measured the participants' belief that they are capable and confident to follow a healthy diet. Items to measure perceived self-efficacy were assessed on a 5 point scale of 1) strongly disagree to 5) strongly agree:

1. I can follow a healthy diet ( $M = 3.91$ ,  $SD = .86$ ).

2. I believe I have the ability to follow a healthy diet ( $M = 4.20, SD = .73$ ).
3. For me it would be easy to follow a healthy diet ( $M = 3.45, SD = 1.01$ ).
4. I am able to prepare healthy meals at home ( $M = 4.13, SD = .81$ ).

Perceived response efficacy is defined as an individual's belief that certain actions will result in a certain outcome. This is also characterized as positive outcome expectancies in SCT. Items to measure perceived response efficacy were assessed on a 5 point scale of 1) strongly disagree to 5) strongly agree. Statements 3-5 were reverse coded to have a consistent scale in the study. Questions 1-8 assess response efficacy and diet, questions 9-10 assess response efficacy and obesity:

1. If I lose weight I will have more energy ( $M = 4.37, SD = .66$ ).
2. If I eat a healthy diet I will feel healthier and happier ( $M = 4.36, SD = .67$ ).
3. If I eat a healthy diet I will lose weight ( $M = 4.05, SD = .85$ ).
4. If I eat a healthy diet I will live longer ( $M = 4.12, SD = .75$ ).
5. If I eat a healthy diet I will feel better in my clothes ( $M = 4.29, SD = .68$ ).
6. If I eat a healthy diet my health will improve ( $M = 4.34, SD = .66$ ).
7. If I eat a healthy diet I will have better skin, hair or teeth ( $M = 4.27, SD = .71$ ).
8. If I eat a healthy diet I am less likely to suffer obesity related health issues ( $M = 4.26, SD = .83$ ).
9. Eating a healthy diet does not prevent obesity ( $M = 3.75, SD = 1.14$ ).
10. Eating a healthy diet does not prevent obesity related health issues ( $M = 3.89, SD = .71$ ).

Negative outcome expectancies are an individual's belief that certain actions will result in a negative outcome and are barriers to behavior change. Items to measure negative outcome expectancies were assessed on a 5 point scale of 1) strongly disagree to 5) strongly agree:



1. Buying fast food for meals is much easier than preparing healthy meals ( $M = 3.23$ ,  $SD = 1.18$ ).
2. If I eat healthy food, the food will not taste as good ( $M = 1.90$ ,  $SD = .95$ ).
3. If I eat a healthy diet, I will need time to plan my meals a long time in advance ( $M = 2.92$ ,  $SD = 1.08$ ).
4. If I cook healthy food for my family, they will think it is boring ( $M = 2.17$ ,  $SD = .91$ ).
5. If I follow a healthy diet shopping will be a lot of hard work for me ( $M = 2.34$ ,  $SD = .99$ ).
6. If I follow a healthy diet I will need to go food shopping more frequently ( $M = 3.46$ ,  $SD = 1.15$ ).
7. If I follow a healthy diet it will be more expensive for me ( $M = 3.52$ ,  $SD = 1.16$ ).
8. I do not have time to prepare meals that are healthy ( $M = 2.27$ ,  $SD = .91$ ).
9. I do not want to cook for myself when my spouse is deployed or away with work ( $M = 3.38$ ,  $SD = 1.25$ ).
10. I do not like cooking ( $M = 2.13$ ,  $SD = 1.24$ ).
11. It will be difficult to get my family to follow a healthy diet ( $M = 2.43$ ,  $SD = 1.14$ ).
12. ( $M = 2.10$ ,  $SD = .97$ ).

Health goals are defined as the personal goals that an individual sets him or herself to achieve the desired health behavior. Proximal goals provide self-incentives for behavior change and distal goals set the course for long-term personal change. Item 1 measured the proximal goal, item 2 measured the distal goal and items 3-6 measured health goals. Barriers to achieving health goals were measured by items 7-9. All items were assessed on a 5 point scale of 1) strongly disagree to 5) strongly agree:

1. Starting tomorrow, I intend to change my eating habits ( $M = 2.81$ ,  $SD = .95$ ).
2. I intend to change my eating habits in the near future ( $M = 3.39$ ,  $SD = 1.08$ ).

3. I intend to start a diet (regulating your calorie intake to achieve or maintain a controlled weight) ( $M = 3.25$ ,  $SD = 1.13$ ).
4. I intend to change my eating habits by reducing the number of calories I eat per day ( $M = 3.24$ ,  $SD = 1.10$ ).
5. I intend to change my eating habits by consuming less fat and sugar ( $M = 3.55$ ,  $SD = 1.20$ ).
6. I intend to change my eating habits by consuming more portions of fruits and vegetables ( $M = 3.66$ ,  $SD = .97$ ).
7. When I don't lose weight every week (regularly) on a diet, my ability to stick to a diet becomes very hard ( $M = 3.32$ ,  $SD = 1.20$ ).
8. When I eat out I have a hard time getting back to my diet ( $M = 2.93$ ,  $SD = 1.14$ ).
9. When my spouse is deployed it is hard to stick to a diet ( $M = 2.88$ ,  $SD = 1.33$ ).

Demographics were assessed using the following questions:

1. What branch of the Military is your spouse in?
2. Is your spouse Enlisted or an Officer? (Enlisted = 1, Officer = 2)
3. Is your spouse deployed? (Yes = 1, No = 2)
4. Are you male or female? (Male = 1, female = 2)
5. What is your year of birth?
6. What is your highest level of education?: (1=less than high school, 2=high school GED, 3=some college, 4=2 year college degree, 5=4 year college degree, 6=Masters degree and 7=beyond Masters)
7. How many children do you have?
8. If you have one or more children, how many are under the age of 16 and living with you?

## **Pilot Study**

The researcher conducted a pilot study of the questionnaire in September 2011 with 5 Military spouses. The online pilot survey was provided to the participants to complete on their personal computer unobserved. After survey completion, the researcher interviewed the participants by telephone. The findings of the pilot were that some of the questions were double-barreled and therefore the questions were reworded to ensure only one question was being asked per statement. Second, the pilot questionnaire had the risk perception questions at the beginning of the survey and respondents did not appreciate this. Therefore the risk perception (severity, susceptibility and likelihood) questions were moved to the end of the survey so the respondents were able to ‘warm up’ to the survey before answering. Lastly, the questions on weight and height were at the beginning of the survey in the pilot, but were moved to the end to ensure the respondents were comfortable with the survey to answer the questions honestly.

## **Data Collection Procedure**

The researcher used the tool Survey Monkey website to administer the study. The survey was self-administered, confidential and examined the risk behavior diagnosis scale of the participant. Participants were able to access the link to the on-line survey and the survey was only accessible once via the link provided. A consent statement was also provided at the beginning of the questionnaire (see Appendix B for survey cover page). Participants were given the opportunity to be incentivized for completing the survey in order to improve response rates. The incentive was a prize draw for a \$100 Amazon voucher, and Survey Monkey administered the selection and distribution of the voucher. All information provided for the questionnaire and prize draw was confidential and respondents were not obliged to enter into the prize draw. The researcher was made aware of the name of the winner of the prize draw.

## **Data Analysis**

Data was analyzed using SPSS software. A factor analysis was conducted and an interpretable 10-factor solution was identified (See Table 1). Loadings less than 0.40 were omitted from the factor analysis. The Bartlett's test of sphericity was significant and yielded an approximate Chi-Square of 5379.01 (df: 1035;  $p < 0.001$ ) A significant Bartlett's test indicates that the variables are correlated highly enough to provide a reasonable basis for factor analysis. The Kaiser-Meyer-Olkin (KMO), the measure of sampling adequacy was .80. A KMO greater than .70 indicates an absence of multicollinearity among the variables.

A linear regression with BMI as the dependent variable against all 10 variables was conducted to assess the three research questions. Correlations and cross-tabulations were also calculated using BMI as the dependent variable. To test the hypothesis, two linear regressions were conducted with health goals (Q1-6) and health goal barriers (Q7-9) as the dependent variables. Self-efficacy, susceptibility, severity, response efficacy in relation to diet (Q1-8) and response efficacy in relation to obesity (Q9-10) were the independent variables.

Table 1

*Factor Loadings for the Rotated Factors*

Items	Factor Loading										Community	
	1	2	3	4	5	6	7	8	9	10		
Self Eff. Q1					.79							.73
Self Eff. Q2					.76							.66
Resp. Eff. Q1	.78											.66
Self Eff. Q3					.75							.75
Resp. Eff. Q2	.78											.69
Self Eff. Q4					.66							.61
Resp. Eff. Q3	.70											.54
Suscept. Q1						.59						.68
Resp. Eff. Q4	.69											.60
Suscept. Q2						.52						.62
Resp. Eff. Q5	.74											.60
Suscept. Q3						.73						.67
Resp. Eff. Q6	.78											.71
Suscept. Q4						.69						.63
Resp. Eff. Q7	.71											.63
Suscept. Q5						.80						.66
Resp. Eff. Q8	.52											.55
Neg. exp. Q.3							.52					.55
Goal Q1		.73										.58
Neg. exp. Q.6							.77					.67
Goal Q2		.79										.73
Neg. exp. Q.7							.76					.65
Goal Q3		.85										.77
Resp. Eff. Q9								.86				.81
Goal Q4		.84										.76
Resp. Eff. Q10								.85				.79
Goal Q5		.87										.80
Goal Q7									.63			.64
Goal Q6		.79										.66
Goal Q8									.69			.61
Severity Q1			.90									.85
Goal Q9									.69			.59
Severity Q2			.91									.87
Neg. exp. .Q.8											.56	.53
Severity Q3			.59									.61
Neg. exp. Q.9											.72	.61
Severity Q4			.86									.79
Neg. exp. Q.10											.75	.59
Severity Q5			.68									.55
Eigenvalues	8.00	5.53	3.32	2.54	2.17	1.76	1.68	1.54	1.40	1.10		
Neg. exp. Q.2				.57								.55
% of variance	17.38	12.02	7.22	5.52	4.72	3.83	3.64	3.35	3.03	2.40		
Neg. exp. Q.4				.71								.62
Neg. exp. Q.11				.74								.70
Neg. exp. Q.12				.79								.74

## **Summary**

Chapter Three addressed participant recruitment, variables of interest, measurement of variables, the pilot study and data collection procedures. Chapter Four outlines the research results and presents the survey findings in relation to the research questions and hypothesis.

## **Chapter 4 - Findings**

This chapter outlines the findings of the study. Descriptive statistics of the sample and the 10 variables are presented. Next, results relevant to each research question are addressed. Regression analysis will illuminate the relationship between BMI and the 10 independent variables. Last, the hypothesis is assessed through a regression analysis using health goals as the dependent variable and susceptibility, severity, self-efficacy and response efficacy as the independent variables.

### **Descriptive Statistics**

Among the sample 98.7% were female and 1.3% were male. The mean age was 31 and the mean BMI of the sample was 26.8. The sample consisted of 96.6% Army spouses, 2.4% Airforce, 0.7% Navy and 0.3% Marines. The sample consisted of 71% Enlisted spouses and 29% Officer spouses. Spouses whose spouse was currently deployed in combat represented 40.1% . The education levels of the sample were: 1% less than high school, 11% high school educated, 33.1% had some college courses completed, 15.2% had received their 2 year college degree, 28.3% had a 4 year college degree and 11.4% had a Master's degree or PhD. The average number of children in the sample group was 1.54 and the average number of children living with them was 1.27. The sample consisted of 26.5% not having children and in total 35.1% of the sample did not have children living with them. In regards to BMI, 30.6% of the sample had a BMI that classified them as overweight and 24.4% of respondents were obese.

Means and standard deviations of each variable are presented in Table 2. Each variable, excluding BMI, was assessed on a scale of 1-5 (low to high).

Table 2  
*Descriptive Statistics*

Variables	N	Minimum	Maximum	Mean	Std. Deviation
BMI	286	16.43	47.55	26.79	6.01
Self Efficacy	291	1.75	5.00	3.92	.69
Susceptibility	291	1.00	4.20	2.49	.85
Severity	291	1.00	5.00	4.27	.75
Response Efficacy and Diet	291	1.13	5.00	4.26	.55
Response Efficacy and Obesity	290	1.00	5.00	3.82	1.04
Barrier 1: Cooking	291	1.00	5.00	2.60	.84
Barrier 2: Family	291	1.00	4.25	2.15	.77
Barrier 3: Resources	291	1.00	5.00	3.29	.88
Health goals	290	1.00	5.00	3.32	.86
Barriers to Health goals	290	1.00	5.00	3.04	.94

### Research Question Results

Research question one was; do Military spouses consider themselves at risk of obesity and subsequent health issues? Analyzing BMI along with perceived severity, perceived susceptibility and perceived likelihood assessed the research question. Perceived severity of obesity and related illnesses was high,  $M=4.27$ ,  $SD=.75$ . In the correlation analysis of severity and BMI, there was not a significant relationship ( $r = -.06$ ,  $p<.29$ ). Perceived susceptibility of obesity and related illnesses was low,  $M=2.49$ ,  $SD=.85$ . In the correlation analysis of susceptibility and BMI, the two variables were positively correlated and the results were significant  $r = .46$   $p<.001$ . A Crosstabulation with BMI is presented in Tables 3 and 4. Severity and susceptibility were measured on a scale of 1-5. Low < 2.50, medium <3.75 and high <5.00. The crosstabulation results identify that regardless of BMI, Military spouses see obesity as a severe problem. However, in the crosstabulation of BMI and susceptibility, as a persons BMI increases, a person is more inclined to believe he/she is susceptible to obesity and related illnesses.



Table 3

*BMI and Severity Crosstabulation*

			Severity			
			Low	Medium	High	Total
BMI	Underweight	Count	0	1	8	9
		% within BMI	.0%	11.1%	88.9%	100.0%
	Normal	Count	7	8	102	117
		% within BMI	6.0%	6.8%	87.2%	100.0%
	Overweight	Count	4	5	80	89
		% within BMI	4.5%	5.6%	89.9%	100.0%
	Obese	Count	5	3	63	71
		% within BMI	7.0%	4.2%	88.7%	100.0%
Total		Count	16	17	253	286
		% within BMI	5.6%	5.9%	88.5%	100.0%

Table 4

*BMI and Susceptibility Crosstabulation*

			Susceptibility			
			Low	Medium	High	Total
BMI	Underweight	Count	8	1	0	9
		% within BMI	88.9%	11.1%	.0%	100.0%
	Normal	Count	77	38	2	117
		% within BMI	65.8%	32.5%	1.7%	100.0%
	Overweight	Count	35	49	5	89
		% within BMI	39.3%	55.1%	5.6%	100.0%
	Obese	Count	15	45	11	71
		% within BMI	21.1%	63.4%	15.5%	100.0%
Total		Count	135	133	18	286
		% within BMI	47.2%	46.5%	6.3%	100.0%

The perceived likelihood of becoming obese was assessed by two questions (M=1.96, SD=1.11 and M=2.04, SD=1.11). The results indicate a low perceived likelihood of becoming obese.

Research question two was; do Military spouses believe they are capable of following a healthy diet? It was assessed through analyzing BMI and perceived self-efficacy. The overall

perceived efficacy of the respondents was relatively high,  $M=3.92$ ,  $SD=.69$ . In the correlation analysis of perceived self-efficacy and BMI, the two variables were negatively correlated and significant  $r = -.28$   $p<.001$ . A Crosstabulation with BMI is presented in Table 5. Perceived self-efficacy was measured on a scale of 1-5. Low perceived self-efficacy  $< 2.50$ , medium  $<3.75$  and high  $<5.00$ . The cross tabulation results indicate a negative relationship; perceived self-efficacy decreases with BMI.

Table 5  
*BMI and Self Efficacy Crosstabulation*

			Self Efficacy			
			Low	Medium	High	Total
BMI	Underweight	Count	0	2	7	9
		% within BMI	.0%	22.2%	77.8%	100.0%
	Normal	Count	3	30	84	117
		% within BMI	2.6%	25.6%	71.8%	100.0%
	Overweight	Count	4	30	55	89
		% within BMI	4.5%	33.7%	61.8%	100.0%
	Obese	Count	8	36	27	71
		% within BMI	11.3%	50.7%	38.0%	100.0%
Total		Count	15	98	173	286
		% within BMI	5.2%	34.3%	60.5%	100.0%

Research question three was; what are Military spouses outcome expectancies of following a healthy diet? It was assessed through analyzing BMI along with response efficacy and barriers. Outcome expectancies were measured as either positive or negative. Positive outcome expectancies were labeled response efficacy and negative outcome expectancies were classified as barriers. Response efficacy in relation to diet and response efficacy in relation to obesity were segmented as two variables in accordance to the factor analysis. Both response efficacy results indicated high perceived response efficacy (diet:  $M=4.26$ ,  $SD.55$  and obesity:  $M=3.82$ ,  $SD=1.04$ ) In the correlation analysis of perceived response efficacy in relation to diet and BMI and perceived response efficacy in relation to obesity, both were negatively correlated but there was not a significant relationship

(diet:  $r = -.10, p < .12$  and obesity:  $r = -.13, p < .02$  ). A Crosstabulation with BMI is presented in Tables 6 and 7. Perceived efficacy was measured on a scale of 1-5. Low perceived response efficacy  $< 2.50$ , medium  $< 3.75$  and high  $< 5.00$ . The crosstabulation results of perceived response efficacy in relation to diet indicate that all BMI ranges have high-perceived response efficacy. The crosstabulation results of perceived response efficacy in relation to obesity all BMI ranges have high-perceived response efficacy, however there are less people with high perceived response efficacy in Table 7 in comparison to Table 6.

Table 6

*BMI and Response Efficacy (Diet) Crosstabulation*

			Response Efficacy Q1-8			
			Low	Medium	High	Total
BMI	Underweight	Count	1	1	7	9
		% within BMI	11.1%	11.1%	77.8%	100.0%
	Normal	Count	0	16	101	117
		% within BMI	.0%	13.7%	86.3%	100.0%
	Overweight	Count	0	17	72	89
		% within BMI	.0%	19.1%	80.9%	100.0%
	Obese	Count	1	16	54	71
		% within BMI	1.4%	22.5%	76.1%	100.0%
Total		Count	2	50	234	286
		% within BMI	.7%	17.5%	81.8%	100.0%

Table 7

*BMI and Response Efficacy (Obesity) Crosstabulation*

			Response efficacy Q9-10			
			Low	Medium	High	Total
BMI	Underweight	Count	0	1	8	9
		% within BMI	.0%	11.1%	88.9%	100.0%
	Normal	Count	21	20	76	117
		% within BMI	17.9%	17.1%	65.0%	100.0%
	Overweight	Count	17	15	56	88
		% within BMI	19.3%	17.0%	63.6%	100.0%
	Obese	Count	12	18	41	71
		% within BMI	16.9%	25.4%	57.7%	100.0%
Total		Count	50	54	181	285
		% within BMI	17.5%	18.9%	63.5%	100.0%

The factor analysis (Table 1) identified three key negative outcome expectancies that are labeled “Barriers”. Barrier 1 is concerned with the preparation of home cooked meals (I do not have time to prepare meals that are healthy; I do not want to cook for myself when my spouse is deployed or away with work; and I do not like cooking). There was no significant relationship identified in the correlation analysis between BMI and Barrier 1 ( $r = -.03, p < .63$ ). Barrier 2 is classified as the family’s role as a barrier (If I eat healthy food, the food will not taste as good; If I cook healthy food for my family, they will think it is boring; It will be difficult to get my family to

follow a healthy diet; and it will be impossible to get my family to follow a healthy diet). There was no significant relationship identified in the correlation analysis between BMI and Barrier 2 ( $r = .10$ ,  $p < .10$ ). Barrier 3 is the resource required to follow a healthy diet (If I eat a healthy diet I will need time to plan my meals a long time in advance; If I follow a healthy diet I will need to go food shopping more frequently; and If I follow a healthy diet it will be more expensive for me). In the correlation analysis Barrier 3 and BMI were positively correlated and the results were significant  $r = .18$ ,  $p < .002$ .

A linear regression was conducted to analyze the relationship between BMI and the independent variables (Table 8). The regression analysis indicated a strong positive linear relationship. The variance in BMI accounted for by the 10 independent variables is 31% ( $R^2 = .31$ ). The regression analysis was statistically significant, (Table 9)  $F(10, 273) = 12.44$ ,  $p < .001$ .

Table 8  
*Regression Analysis Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.559 <sup>a</sup>	.313	.288	5.052870

a. Predictors: (Constant), Severity, Barrier 1, Health goals, Response Efficacy 9-10, Barrier 3, Self-efficacy, Response Efficacy 1-8, Health goals barriers, Barrier 2, Susceptibility.

Table 9  
*ANOVA<sup>b</sup>*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3176.043	10	317.604	12.440	.000 <sup>a</sup>
	Residual	6970.099	273	25.531		
	Total	10146.141	283			

a. Predictors: (Constant), SEVN, BAR1 Barrier 1, HGN1 Health goals, POSN2 Response Efficacy 9-10, BAR3 Barrier 3, SEN, POSN1 Response Efficacy 1-8, HGN2 Health goals barriers, BAR2 Barrier 2, SUSN

b. Dependent Variable: BMI

The coefficients related to the regression analysis are shown in Table 10 and the standardized coefficients were used for analysis. The coefficients for susceptibility (0.32) and health goals (0.22) are significantly significant ( $p<.001$ ). The coefficient for self-efficacy (-0.17) was marginally significant ( $p<.006$ ). The regression analysis identified that for every unit increase in susceptibility we expect a .32 increase in BMI. For every unit increase in severity we expect a .04 increase in BMI. For every unit increase in health goals we expect a .19 increase in BMI. For every unit increase in self-efficacy we expect a .17 decrease in BMI.

Table 10  
*Regression*

Independent Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	25.82	4.09		6.31	.000
Self-Efficacy	-1.44	.52	-.17	-2.77	.006
Susceptibility	2.20	.43	.31	5.15	.000
Severity	.31	.43	.04	.74	.463
Response Efficacy and Diet	-.42	.62	-.038	-.67	.504
Response Efficacy and Obesity	-.58	.31	-.10	-1.88	.061
Health goals	1.31	.38	.19	3.42	.001
Barrier 1: Cooking	-1.04	.40	-.15	-2.64	.009
Barrier 2: Family	-.80	.46	-.10	-1.73	.085
Barrier 3: Resources	.36	.39	.05	.93	.355
Health goals barriers	.88	.38	.14	2.30	.022

a. Dependent Variable: BMI

To assess the significant variables relationship with BMI, individual regressions analysis was conducted. The regression analysis with BMI and susceptibility as the independent variable indicating a positive linear relationship,  $R^2=.21$ . The results were statistically significant,  $F(1,284)=75.16, p<.001$ . The standardized coefficient for susceptibility (0.46) was statistically significant ( $p<.001$ ) and indicated that for every unit increase in susceptibility there is a corresponding increase in BMI of .46.

A regression analysis was conducted with BMI and health goals as the independent variable indicating a positive linear relationship,  $R^2=.10$ . The results were statistically significant,  $F(1,283)=29.90, p<.001$ . The standardized coefficient for susceptibility (0.31) was statistically significant ( $p<.001$ ) and indicated that for every unit increase in health goals there is a corresponding increase in BMI of .31.

### Hypothesis Results

The hypothesis that Military spouses with high-perceived risk, high perceived self-efficacy and high perceived response efficacy will be motivated to set health goals was analyzed by conducting a linear regression analysis. The dependent variable was health goals and the independent variables were perceived self-efficacy, susceptibility, severity and perceived response efficacy. The regression analysis indicated a positive linear relationship. The variance in health goals accounted for by the independent variables is 15% ( $R^2=.15$ ). The regression analysis was statistically significant,  $F(5,283)=9.87, p<.001$ . The coefficients (Table 11) for susceptibility (.33) and response efficacy in relation to diet (.25) were statistically significantly ( $p<.001$ ).

Table 11  
*Linear Regression*

Independent Variables	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Error Std.	Beta	t	
(Constant)	.72	.54		1.35	.179
Self Efficacy	-.01	.07	-.00	-.07	.945
Susceptibility	.33	.06	.33	5.52	.000
Severity	.09	.07	.08	1.42	.158
Response Efficacy Diet	.39	.10	.25	4.13	.000
Response Efficacy Obesity	-.07	.05	-.09	-1.56	.120

a. Dependent Variable: Health Goals

Table 12 is a second linear regression with health goal barriers as the dependent variable. The regression analysis indicated a positive linear relationship. The variance in health goal barriers accounted for by the independent variables is 26% ( $R^2=.26$ ). The regression analysis was statistically significant,  $F(5,283)=13.16$   $p<.001$ . The coefficients (Table 11) for susceptibility (.36) and self efficacy (-.27) were statistically significantly ( $p<.001$ ).

Table 12  
Linear Regression

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.793	.552		5.061	.000
Self -Efficacy	-.362	.076	-.267	-4.745	.000
Susceptibility	.399	.062	.358	6.430	.000
Severity	-.046	.068	-.037	-.683	.495
POSN1 Response Efficacy Diet	.196	.097	.114	2.013	.045
POSN2 Response Efficacy Obesity	.011	.049	.012	.226	.821

a. Dependent Variable: Health Goal Barriers

In the correlation analysis (Table 13) susceptibility and health goals were positively correlated and significant ( $r = .28, p<.00$ ). Response efficacy in relation to diet and health goals were also positively correlated and significant ( $r = .20, p<.00$ ).



Table 13  
Correlations

		Health Goals
Health goals	Pearson Correlation	1
	Sig. (2-tailed)	
	N	290
Response Efficacy Diet	Pearson Correlation	.195**
	Sig. (2-tailed)	.001
	N	290
Response Efficacy Obesity	Pearson Correlation	-.018
	Sig. (2-tailed)	.766
	N	289
Self-Efficacy	Pearson Correlation	-.052
	Sig. (2-tailed)	.379
	N	290
Susceptibility	Pearson Correlation	.278**
	Sig. (2-tailed)	.000
	N	290
Severity	Pearson Correlation	.067
	Sig. (2-tailed)	.253
	N	290

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

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

Chapter 5 discusses the results in the context of the research questions, hypothesis, EPPM and SCT. The limitations of the study are addressed and a recommendation for communication is presented.

## **Chapter 5 - Summary, Conclusions and Recommendations**

The purpose of this study was to understand risk perception and health behaviors of Military spouses in regards to obesity and obesity related issues. This was conducted through the application of the EPPM and SCT. This chapter analyzes the results of the study in relation to the research questions, the hypothesis and within the context of the EPPM and SCT. A recommendation for an intervention is also provided.

### **Research Questions and Hypothesis**

The results of research question one indicate that Military spouses believe that obesity and related illnesses are severe, but do not necessarily consider themselves susceptible to obesity or related illnesses. The sample also responded that it was unlikely that they would become obese or suffer obesity related illness in the distal or proximal future. Therefore the risk perception of Military spouses was relatively low. Interestingly, perceived susceptibility and BMI had a positive relationship, those with a higher BMI felt more susceptible. However 50 Military spouses that were overweight or obese had low perceived susceptibility and 94 had medium perceived susceptibility, indicating perceived susceptibility is a key issue to address.

Military spouses did consider themselves capable of following a healthy diet, as perceived self-efficacy was relatively high. Therefore research question two was clearly answered within the study. Interestingly BMI and perceived self-efficacy had a negative correlation, indicating that as perceived self-efficacy increases, BMI reduces. Therefore, the obese target group is where the problem is and should be the focal target for communication.

Research question three identified that perceived response efficacy among Military spouses was also high. Interestingly, BMI did not affect perceived response efficacy. There was a small variation when assessing response efficacy in relation to obesity, however this was not significant. The research identified one clear barrier for Military spouses, which were resources. The cost of

healthy food, the time it takes to shop for healthy food and the planning time required for healthy meals were all factors which were significant and provide a clear focal area for a communicator to address.

The hypothesis of the study was partially supported by the study. Susceptibility and response efficacy in relation to diet were significant and contributed to health goal setting. However, severity and perceived self-efficacy were not as significant. Both response efficacy in relation to diet and susceptibility were positively correlated, indicating as these two variables increase, so does the setting of health goals.

### **EPPM**

The EPPM is a useful theoretical model for developing messages about health risks as it explains how people process messages about health risks (Witte, 1992; 1994). This means that a health risk message which includes all four message variables will be more likely to elicit the corresponding perceptual variables and result in positive behavior change. The study results can be used to calculate the discriminating value:

$$\text{Perceived Efficacy} = M=3.92+(M=4.26+M=3.82/2) = 7.96$$

$$\text{- Perceived Threat} = M=2.49 + M=4.27 = 6.76$$

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$$\text{Discriminating Value} = 1.2$$

The positive discriminating value score indicates that Military spouses are in danger response, which according to the EPPM indicates that they will have higher levels of attitude, intention and behavior change than those with negative discriminative values (Witte, 1995). In the analysis for the discriminating value, it is evident that perceived threat can be increased to ensure individuals are remaining in the danger control process. Witte (1995) states that when people have high efficacy they will engage in danger control even under situations of high threat. However, to

ensure that the discriminating value remains positive, the EPPM indicates that there is also scope to improve efficacy among Military spouses. Therefore according to the EPPM, the study has indicated that a message promoting higher susceptibility while reinforcing efficacy would be the optimal message to improve the health behaviors of Military spouses. Witte and colleagues impress that it is important not to solely focus on fear appeals, as efficacy levels need to remain high to ensure individuals remain in danger control response (Witte, Meyer & Martell, 2001).

To increase perceived susceptibility towards a threat, Witte and colleagues recommend that “messages need to emphasize or illustrate how the health threat occurs in people who are demographically, psychologically, and in anyway other way possible, identical to your intended audiences” (Witte, Meyer & Martell, 2001, p.74). However, Witte firmly states that when increasing susceptibility it is important to support fear messages with high efficacy messages to ensure motivation to act (Witte, 1995).

## **SCT**

SCT perspective on health behavior change is that “individual behavior change can be facilitated by modifying people’s personal factors and by altering environmental factors to encourage healthful behavior” (Maibach & Cotton, 1995). Bandura states that risk knowledge is a pre-condition to behavior change. The study results confirm that risk perception, in particular susceptibility, is a key factor in behavior change. Self-efficacy is the key component of SCT and in the study the respondent’s perceived self-efficacy was reasonably high. The regressions conducted did not identify self-efficacy as a key predictor of BMI or health goals which in contrary to SCT. However the significance level for self-efficacy and BMI was 0.006 that is close to the target of 0.005. Therefore self-efficacy was important, but not a key contributor to BMI or to the setting of health goals. The key finding on self-efficacy in the study was that as BMI increases self-efficacy

decreases. Therefore it would be important for a health communicator to focus on increasing self-efficacy among those in the overweight and obese categories to help reduce BMI.

Bandura (1986) outline that people are motivated to perform behaviors that they believe will produce outcomes they desire. SCT labels these outcome expectancies, which are either positive or negative. The study identified that positive outcome expectancies (response efficacy) were high among the respondents. Response efficacy in relation to diet was particularly important in setting health goals and this finding supports SCT. Negative outcome expectancies are labeled as barriers in the study and there was one barrier that was identified as important to address. Overall the barriers identified were relatively low and therefore did not have a specific affect on BMI or goal setting. This finding supports SCT. Lastly, health goals are an important part of SCT as they represent action. SCT states that risk, self-efficacy and outcome expectancies affect health goals. However, the study's findings can only partially support SCT as susceptibility and response efficacy were the key variables that affected health goals. In fact self-efficacy had the least effect on health goals.

Overall SCT was an excellent complimentary theory to the EPPM to help understand risk perception and health behaviors. The EPPM provides a communicator with a solid direction on how to develop a communication message, whilst SCT has provided insights into contributing factors like barriers and health goals.

### **Communication Recommendation**

The results of this study indicate that an intervention among Military spouses needs to increase susceptibility perceptions of obesity and obesity related illnesses. However, there is also the need to address self- efficacy, response efficacy in relation to diet, the key barrier of planning and preparing for healthy meals and health goals in order to provide an effective campaign. Perceived severity is already at a high level. The study has indicated that the core target of an

intervention should be Military spouses in the overweight and obese categories. An intervention needs to educate spouses on the risks of obesity and related illness, whilst providing tools to help them overcome the key barriers. It is important that the target also set achievable health goals to help reinforce efficacy. Social support can provide motivation, particularly when the Service Member is deployed, to stay focused on keeping to the goals to help achieve a healthy BMI.

Witte and colleagues (2001) recommend the use of a spokesperson that can relate to the target to aid increased susceptibility perceptions. For example, a fellow Military spouse that has developed obesity related illnesses. This would be effective as they would be credible and authentic. An expert nutritionist could be utilized in conjunction with the spokesperson to provide tips and information on how to plan healthy meals and purchase healthy foods in a convenient and budget friendly way. Both the spokesperson and nutritionist could help Military spouses to set achievable goals as goals are particularly important for sources of behavior change and motivation.

Due to the transient nature of Military life, interactive tools like a website and social media could be used as the communication mediums. A digital platform could offer a social support section where spouses could encourage one-another. Education modules could be created and communicated in writing, by video or through podcasts that could be downloadable. It is recommended that any intervention be tested and piloted with the target audience first to ensure maximum effectiveness.

### **Limitations**

The sample population of the study is a limitation of the research. The initial sample contacted was a convenience sample and this restricted the sample to predominantly Army spouses. Ideally the sample population would represent all branches of Military to provide greater external validity. The current obesity rate in the US is 33% (CDC, 2011a) and the study obesity rate is 24.8%. The difference in the study population and US population can be considered a limitation of

the study as this primarily due to the fact that a convenience sample was used to recruit spouses. The number of Officer spouses in the sample was 29% and this is not representative of the Military community as the current percentage of Officers in the US Military is 14.6% (About.com, 2011). A random sample for future research would help alleviate these limitations.

The study did not address the ethnic background of the respondent and this was a limitation to the study. It would have been of interest to understand the racial and cultural influences of risk perception and health behavior. Race and gender have been identified to affect risk perception. This has been labeled the “white male effect” as studies have shown that women and minorities have higher risk perception than white males (Finucane, Slovic, Mertz, Flynn & Satterfield, 2000). Furthermore, geographical location of the respondents was not assessed which would be useful for targeting the intervention to particular Military installations or Regions. Lastly, it would have been of interest to understand the role of social support. Whilst the barriers to health goals did provide some insight into social support, a more meaningful analysis would have been beneficial to the intervention recommendation.

## **Conclusion**

Obesity is a concerning global issue and a problem within the US Military community. Military spouses in the overweight and obese categories are important to the Department of Defense, as their health affects Military readiness and resources. The EPPM and SCT were effectively utilized in this study with 291 Military spouses to conduct quantitative research on risk perception and health behavior. Research identified that perceived susceptibility of obesity and obesity related illness amongst Military spouses is the primary focus to be increased, while also reinforcing efficacy. Providing Military spouses with education on how to overcome barriers and set achievable health goals can enforce efficacy. The EPPM was particularly useful in analyzing the research results and determining the focus for an intervention recommendation. SCT provided

complimentary information to the EPPM in the form of negative outcome expectancies and health goals. However, the role of self-efficacy was not found as prominent an issue as stated by Bandura. In summary, the study identified a strong relationship between risk perception and health behavior among Military spouses. These findings should be utilized for intervention purposes to better ensure the readiness of the U.S. Military and health of U.S. Military families.



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# Appendix A - IRB Form

## Human Subjects Research Protocol Application Form

The KSU IRB is required by law to ensure that all research involving human subjects is adequately reviewed for specific information and is approved prior to inception of any proposed activity. Consequently, it is important that you answer all questions accurately. If you need help or have questions about how to complete this application, please call the Research Compliance Office at 532-3224, or e-mail us at [comply@ksu.edu](mailto:comply@ksu.edu).

Please provide the requested information in the shaded text boxes. The shaded text boxes are designed to accommodate responses within the body of the application. As you type your answers, the text boxes will expand as needed. After completion, print the form and send the original and one photocopy to the Institutional Review Board, Room 203, Fairchild Hall.

Principal Investigator:	Dr. Joye Gordon
Project Title:	Obesity and U.S. Military Spouses: An Examination of Risk Perception and Health Behavior
Date:	September, 12 2011

### MODIFICATION

Is this a modification of an approved protocol?  Yes  No If yes, please comply with the following:

If you are requesting a modification or a change to an IRB approved protocol, please provide a concise description of all of the changes that you are proposing in the following block. Additionally, please highlight or bold the proposed changes in the body of the protocol where appropriate, so that it is clearly discernable to the IRB reviewers what and where the proposed changes are. This will greatly help the committee and facilitate the review.

### NON-TECHNICAL SYNOPSIS (brief narrative description of proposal easily understood by nonscientists):

This study seeks to understand obesity among U.S. Military spouses and how to reduce the obesity incidence. A quantitative study with U.S. Military spouses will be conducted to understand risk perception, health behaviors, and the relationship between the two using Social Cognitive Theory (SCT) and the Extended Parallel Process Model (EPPM) as the conceptual framework. Based on the research results, a recommendation for effective health communication will be provided.

### I. BACKGROUND (concise narrative review of the literature and basis for the study):

The global obesity epidemic has been increasing for forty years, driven mainly by an increase in processed, affordable and effectively marketed food, leading to passive over-consumption (Nicholas Hall, 2011). However, sustained obesity prevention efforts in the U.S. have barely got off the ground. Unlike other major causes of preventable death and disability, such as tobacco use, public health measures have been unable to reverse the trend.

The U.S. Military population is not exempt from obesity and its health complications. Approximately 40% of the U.S. Military Health System (MHS) population is overweight and approximately 25% are obese (US Medicine, 2009). Research studies on Military health behaviors have traditionally focused on the Service Member or the family. There is insufficient research focused on understanding how to address the obesity challenge among Military spouses. A small number of pilot communication studies have been implemented to address negative health behaviors, however these have been short lived and inconsistent. Health communication directed at Military spouses to highlight the risks of obesity is scarce.

Obesity is an issue of increasing concern among U.S. Military families. The current estimated cost of obesity to the MHS is approximately \$2 billion per year (US Medicine, 2009), which is a significant cost to the US Department of Defense. Military spouses face the same challenges as their civilian counterparts in their efforts to achieve a healthy lifestyle; however additional stressors are imposed

on the Military spouse. These factors are often cited as ‘mission-related stress’ (Rosen & Durand, 2000, p.57), which includes separation due to field duty, deployments, frequent relocation, long working hours, and the dangers of combat. The increased frequency of deployments post September 11th 2001 has significantly impacted Military spouses and their health. Research has shown that since 2004, the percentage of Army spouses taking care of their own health has decreased (Army Family And Morale & Welfare And Recreation Command (MWR), 2011) and this has become a significant challenge for the MHS.

The limited studies conducted on Military spouses, risk perception, and health behaviors (Haas, 2006; Cole & Horacek, 2009 and The Uniformed Services University of Health Science, 2010) confirm there is a serious issue. The USUHS identified 59.3% of spouses in their research study as overweight or obese (USUHS, 2010). A similar study conducted at Fort Drum had a sample mean BMI of 32, with 65% falling in the obese category (Cole & Horacek, 2009). Although the sample sizes were relatively low, 112 and 91 respectfully, all published research conducted to date has confirmed that obesity is an epidemic for U.S. Military spouses.

#### **Problem and Justification**

No scholarly research on Military spouses and obesity has been formally conducted, this study will be the first of its kind. As a result there is a lack of understanding about obesity among Military spouses. As highlighted, obesity is a complex issue and Military spouses often lead complex lives due to being in the Military. The results of this formative research can be used to improve understanding of Military spouses, risk perception and health behavior. This information can be used by the MHS to reduce of the financial burden caused by obesity and subsequent health issues. Furthermore, health communicators can use the recommendations provided by this study to develop effective interventions to reduce the obesity incidence among Military spouses. This will benefit the individuals targeted, their families, Military member readiness and the Department of Defense (DOD) overall.

#### **Theoretical Framework**

Most health behavior theories assume that the motivational process to initiate behavior change starts with the belief that one faces a substantial risk of experiencing a threat (Hahn & Lengerke, 1997). The Health Belief Model (Becker, 1974), Theory of Planned Behavior (Ajzen, 1991) and Protection Motivation Theory (Rogers, 1983) are examples. However, evidence regarding the correlation between risk perception and behavior is ambiguous (Rimal & Real, 2003). Nevertheless, understanding the relationships between risk perception and health behavior can enrich our understanding of health behavior and direct intervention development (Brewer et al., 2007). Therefore this study has selected the EPPM and SCT as the conceptual framework for research. The EPPM will be used to examine risk perception and the SCT will be applied to understand health behavior.

Advanced by Kim Witte (1992), the EPPM states that a health risk message will initiate two cognitive appraisals: appraisal of the threat and appraisal of the recommended response. The appraisal will induce one of three responses in individuals: a) no response, b) fear control response, or c) danger control response. According to the EPPM, the goal of the risk message is to initiate the danger control response (Witte, Meyer & Martell, 2001), as this is where a person is engaging in the recommended healthy behavior. Therefore, if a person’s perception of risk and self-efficacy toward a health threat can be determined, then the EPPM can be used to predict which one of the three responses they will engage in. Furthermore, determining a person’s risk and efficacy perceptions will aid the understanding of which perceptions need to be increased or decreased to promote the danger control response (Witte, Meyer & Martell, 2001). The EPPM has been applied to a plethora of health threats and population targets, but has never been used in research on obesity and Military spouses.

Bandura’s SCT theory states that human motivation and action are regulated by forethought (Luszczynska & Schwarzer, 2005). The theory outlines a number of variables that influence behavior:

perceived self-efficacy, outcome expectancies, goals, socio-structural factors and behavior change process. Similarly to the EPPM, a main focus of the theory is perceived self-efficacy. As in the EPPM, perceived self-efficacy is defined as what you believe about your ability to perform a certain action. According to Bandura, “Self efficacy is a focal determinant because it affects health behavior both directly and by its influence on the other determinants” (Bandura, 2004). Outcome expectancies are also an important construct of SCT. Outcome expectancies are somewhat similar to response efficacy in the EPPM and apply to an individual’s belief that a certain behavior leads to a certain behavior. According to Bandura (1977), only when efficacy expectations are high can people perform certain behaviors (Witte, Meyer & Martell, 2001).

Overall the two theories selected for the study are complimentary and in application will provide an understanding of risk perception as a pre-condition for change and enrich our knowledge of Military spouse health behaviors. The combination of this information will be analyzed to provide recommendations for effective health communication.

**Research Questions:**

**RQ1. Do Military spouses consider themselves at risk of obesity and subsequent health issues?**

**RQ2. Do Military spouses believe they are capable of following a healthy diet?**

**RQ3. What are a Military spouses outcome expectancies of following a healthy diet?**

**Hypotheses:**

**H1: Military spouses with high perceived risk, high self efficacy and positive outcome expectancies will be motivated to engage in setting health goals.**

**Additionally, other factors and demographics identified will be explored.**

**II. PROJECT/STUDY DESCRIPTION** (please provide a concise narrative description of the proposed activity in terms that will allow the IRB or other interested parties to clearly understand what it is that you propose to do that involves human subjects. This description must be in enough detail so that IRB members can make an informed decision about proposal).

This study will involve collecting quantitative data from military spouses. The sample will be recruited via the method of snowball sampling. We aim to recruit approximately 150 military spouses. A convenience sample of twenty military spouses will be emailed directly with a link to the on-line survey. The study will be conducted via a on-line survey and the researchers will use the Survey Monkey website to administer this. The participants will be able to access the link, as their email addresses would have been inputted into the on-line survey database. The participants can only answer the survey once, this will avoid duplication. Each participant will be asked to suggest a friend to complete the survey via email and if the friend accepts via email, they will be sent the appropriate link. The on-line survey results will be password protected, therefore no one other than the administrators will be able to access the results.

All initial participants have given verbal permission to complete the survey, as they are friends of the student conducting the research. All military spouses initially recruited will be married to Active Duty US Army personnel. All participants will voluntarily participate in the study. The survey will begin with an assurance of confidentiality and an explanation of how the research data will be used. The survey will be self-administered to examine risk perception and health behaviors of military spouses.

An opportunity to enter a prize draw for a \$100 Amazon gift voucher will be administered via Survey Monkey. Entry is optional and all information will be confidential.



**III. OBJECTIVE** (briefly state the objective of the research – what you hope to learn from the study):

**This study seeks to understand obesity among U.S. Military spouses and how to reduce the obesity incidence through recommendations for effective health communication.**

**IV. DESIGN AND PROCEDURES** (succinctly outline formal plan for study):

A. Location of study:	<b>On-line survey</b>
B. Variables to be studied:	<b>Risk perception (severity and susceptability), self-efficacy, outcome expectancies, health goals and demographics</b>
C. Data collection methods: (surveys, instruments, etc – <b>PLEASE ATTACH</b> )	<b>On-line survey (see attached survey)</b>
D. List any factors that might lead to a subject dropping out or withdrawing from a study. These might include, but are not limited to emotional or physical stress, pain, inconvenience, etc.:	<b>Nothing is likely to make a subject drop out or withdraw from this study.</b>
E. List all biological samples taken: (if any)	<b>n/a</b>
F. Debriefing procedures for participants:	<b>n/a</b>

**V. RESEARCH SUBJECTS:**

A. Source:	<b>Female Military spouses</b>
B. Number:	<b>150 minimum</b>
C. Characteristics: (list any unique qualifiers desirable for research subject participation)	<b>Must be married to a person serving as a US Military Member.</b>
D. Recruitment procedures: (Explain how do you plan to recruit your subjects? Attach any fliers, posters, etc. used in recruitment. If you plan to use any inducements, ie. cash, gifts, prizes, etc., please list them here.)	<p><b>The study will utilize the snowball recruitment method. The initial study participants will be convenience sample, who will be requested to send the study information to a friend via email. Each participant will be asked to suggest a friend to complete the survey via email and if the friend accepts via email, they will be sent the appropriate link.</b></p> <p><b>An opportunity to enter a prize draw for a \$100 Amazon gift voucher will be administered via Survey Monkey as an incentive to complete the survey. Entry is optional and all information will be confidential.</b></p>

**VI. RISK – PROTECTION – BENEFITS:** The answers for the three questions below are central to human subjects research.

You must demonstrate a reasonable balance between anticipated risks to research participants, protection strategies, and anticipated benefits to participants or others.

- A. **Risks for Subjects:** (Identify any reasonably foreseeable physical, psychological, or social risks for participants. State that there are “no known risks” if appropriate.)  
**There are no known risks associated with conducting this research.**
- B. **Minimizing Risk:** (Describe specific measures used to minimize or protect subjects from anticipated risks.)  
**The text in our survey has been written to avoid any offence to participants.**

C. **Benefits:** (Describe any reasonably expected benefits for research participants, a class of participants, or to society as a whole.)

**The benefit of this research is for health communicators to understand how to effectively target Military spouses to help reduce obesity.**

In your opinion, does the research involve **more than minimal risk** to subjects? (“Minimal risk” means that “the risks of harm anticipated in the proposed research are not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.”)

Yes       No

**VII. CONFIDENTIALITY:** Confidentiality is the formal treatment of information that an individual has disclosed to you in a relationship of trust and with the expectation that it will not be divulged to others without permission in ways that are inconsistent with the understanding of the original disclosure. Consequently, it is your responsibility to protect information that you gather from human research subjects in a way that is consistent with your agreement with the volunteer and with their expectations. If possible, it is best if research subjects’ identity and linkage to information or data remains unknown.

Explain how you are going to protect confidentiality of research subjects and/or data or records. Include plans for maintaining records after completion.

**A participant's identity and linkage to data will remain unknown. Anonymity will be preserved for all .**

**VIII. INFORMED CONSENT:** Informed consent is a critical component of human subjects research – it is your responsibility to make sure that any potential subject knows exactly what the project that you are planning is about, and what his/her potential role is. (There may be projects where some forms of “deception” of the subject is necessary for the execution of the study, but it must be carefully justified to and approved by the IRB). A schematic for determining when a waiver or alteration of informed consent may be considered by the IRB is found at

<http://www.hhs.gov/ohrp/policy/consentckls.html>

Even if your proposed activity does qualify for a waiver of informed consent, you must still provide potential participants with basic information that informs them of their rights as subjects, i.e. explanation that the project is research and the purpose of the research, length of study, study procedures, debriefing issues to include anticipated benefits, study and administrative contact information, confidentiality strategy, and the fact that participation is entirely voluntary and can be terminated at any time without penalty, etc. Even if your potential subjects are completely anonymous, you are obliged to provide them (and the IRB) with basic information about your project. See informed consent example on the URCO website. It is a federal requirement to maintain informed consent forms for 3 years after the study completion.

**Yes    No    Answer the following questions about the informed consent procedures.**

A. Are you using a written informed consent form? If “yes,” include a copy with this application. If “no” see b.

B. In accordance with guidance in 45 CFR 46, I am requesting a waiver or alteration of informed consent elements (See Section VII above). If “yes,” provide a basis and/or justification for your request.

This study involves no known risks to the participants, who will be told that their information will be kept strictly confidential and does not adversely affect their rights and welfare.

C. Are you using the online Consent Form Template provided by the URCO? If “no,” does your Informed Consent document has all the minimum required elements of informed consent found in the Consent Form Template? (Please explain)

**Not applicable as consent statement incorporated into survey**

D. Are your research subjects anonymous? If they are anonymous, you will not have access to any information that will allow you to determine the identity of the research subjects in your study, or to link research data to a specific individual in any way. Anonymity is a

powerful protection for potential research subjects. (An anonymous subject is one whose identity is unknown even to the researcher, or the data or information collected cannot be linked in any way to a specific person).

Each participant will have an individualized link to the survey and no names or other identifying information will be sent back to the researchers

- E. Are subjects debriefed about the purposes, consequences, and benefits of the research? Debriefing refers to a mechanism for informing the research subjects of the results or conclusions, after the data is collected and analyzed, and the study is over. (If “no” explain why.) Attach copy of debriefing statement to be utilized.

The consent statement at the beginning of the survey also acts as a de-briefing statement.

**\*It is a requirement that you maintain all signed copies of informed consent documents for at least 3 years following the completion of your study. These documents must be available for examination and review by federal compliance officials.**

**IX. PROJECT INFORMATION:** (If you answer yes to any of the questions below, you should explain them in one of the paragraphs above)

- | Yes                                 | No                                  | Does the project involve any of the following?   |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | a. Deception of subjects   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | b. Shock or other forms of punishment  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | c. Sexually explicit materials or questions about sexual orientation, sexual experience or sexual abuse            |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | d. Handling of money or other valuable commodities   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | e. Extraction or use of blood, other bodily fluids, or tissues   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | f. Questions about any kind of illegal or illicit activity   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | g. Purposeful creation of anxiety  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | h. Any procedure that might be viewed as invasion of privacy   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | i. Physical exercise or stress   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | j. Administration of substances (food, drugs, etc.) to subjects  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | k. Any procedure that might place subjects at risk   |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | l. Any form of potential abuse; i.e., psychological, physical, sexual  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | m. Is there potential for the data from this project to be published in a journal, presented at a conference, etc? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | n. Use of surveys or questionnaires for data collection  |
- IF YES, PLEASE ATTACH!!**

**X. SUBJECT INFORMATION:** (If you answer yes to any of the questions below, you should explain them in one of the paragraphs above)

- | Yes                      | No                                  | Does the research involve subjects from any of the following categories?  |
|--------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. Under 18 years of age (these subjects require parental or guardian consent)  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | b. Over 65 years of age   |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | c. Physically or mentally disabled  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | d. Economically or educationally disadvantaged  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | e. Unable to provide their own legal informed consent   |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | f. Pregnant females as target population  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | g. Victims  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | h. Subjects in institutions (e.g., prisons, nursing homes, halfway houses)  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | i. Are research subjects in this activity students recruited from university classes or volunteer pools? If so, do you have a reasonable alternative(s) to participation as a research subject in your project, i.e., another activity such as writing or reading that would serve to protect students from unfair pressure or coercion to participate in this project? If you answered this question “Yes,” explain any <u>alternatives options</u> for class credit for potential human |

subject volunteers in your study. (It is also important to remember that: Students must be free to choose **not** to participate in research that they have signed up for **at any time** without penalty. Communication of their decision can be conveyed in any manner, to include **simply not showing up** for the research.)

- j. Are research subjects **audio** taped? If yes, how do you plan to protect the recorded information and mitigate any additional risks?
- k. Are research subjects' images being recorded (video taped, photographed)? If yes, how do you plan to protect the recorded information and mitigate any additional risks?

XI. **CONFLICT OF INTEREST:** Concerns have been growing that financial interests in research may threaten the safety and rights of human research subjects. Financial interests are not in them selves prohibited and may well be appropriate and legitimate. Not all financial interests cause Conflict of Interest (COI) or harm to human subjects. However, to the extent that financial interests may affect the welfare of human subjects in research, IRB's, institutions, and investigators must consider what actions regarding financial interests may be necessary to protect human subjects. Please answer the following questions:

- |                          |                                     |   |
|--------------------------|-------------------------------------|---|
| <b>Yes</b>               | <b>No</b>                           |   |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. Do you or the institution have any proprietary interest in a potential product of this research, including patents, trademarks, copyrights, or licensing agreements? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | b. Do you have an equity interest in the research sponsor (publicly held or a non-publicly held company)?   |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | c. Do you receive significant payments of other sorts, eg., grants, equipment, retainers for consultation and/or honoraria from the sponsor of this research?           |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | d. Do you receive payment per participant or incentive payments?  |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | e. If you answered yes on any of the above questions, please provide adequate explanatory information so the IRB can assess any potential COI indicated above.          |

**XII. PROJECT COLLABORATORS:**

A. **KSU Collaborators – list anyone affiliated with KSU who is collecting or analyzing data:** (list all collaborators on the project, including co-principal investigators, undergraduate and graduate students)

Name:	Department:	Campus Phone:	Campus Email:
Danielle Tenconi	Journalism and Mass Communication	7853237069	dtenconi@k-state.edu
Dr. Nancy Muturi	Journalism and Mass Communication	785-532-3890	nmuturi@ksu.edu
Dr. Bill Schenck-Hamlin	Communication Studies	785-532-6861	billsh@k-state.edu

B. **Non-KSU Collaborators:** (List all collaborators on your human subjects research project not affiliated with KSU in the spaces below. KSU has negotiated an Assurance with the Office for Human Research Protections (OHRP), the

federal office responsible for oversight of research involving human subjects. When research involving human subjects includes collaborators who are not employees or agents of KSU the activities of those unaffiliated individuals may be covered under the KSU Assurance only in accordance with a formal, written agreement of commitment to relevant human subject protection policies and IRB oversight. The Unaffiliated Investigators Agreement can be found and downloaded at <http://www.k-state.edu/research/comply/irb/forms/Unaffiliated%20Investigator%20Agreement.doc>

C.

The URCO must have a copy of the Unaffiliated Investigator Agreement on file for each non-KSU collaborator who is not covered by their own IRB and assurance with OHRP. Consequently, it is critical that you identify non-KSU collaborators, and initiate any coordination and/or approval process early, to minimize delays caused by administrative requirements.)

Name:	Organization:	Phone:	Institutional Email:

**Does your non-KSU collaborator’s organization have an Assurance with OHRP?** (for Federalwide Assurance and Multiple Project Assurance (MPA) listings of other institutions, please reference the OHRP website under Assurance Information at: <http://ohrp.cit.nih.gov/search>).

No  
 Yes If yes, Collaborator’s FWA or MPA # \_\_\_\_\_

**Is your non-KSU collaborator’s IRB reviewing this proposal?**

No  
 Yes If yes, IRB approval # \_\_\_\_\_

C. **Exempt Projects:** 45 CFR 46 identifies six categories of research involving human subjects that may be exempt from IRB review. The categories for exemption are listed here: <http://www.hhs.gov/ohrp/policy/checklists/decisioncharts.html>. If you believe that your project qualifies for exemption, please indicate which exemption category applies (1-6). Please remember that only the IRB can make the final determination whether a project is exempt from IRB review, or not.

**Exemption Category:** (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects’ responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects’ financial standing, employability, or reputation.

XIII. CLINICAL TRIAL Yes No  
 (If so, please give product.)

**Export Controls Training:**

-The Provost has mandated that all KSU faculty/staff with a full-time appointment participate in the Export Control Program.  
 -If you are not in our database as having completed the Export Control training, this proposal will not be approved until your participation is verified.

Last revised on January 2011

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## **Appendix B - Survey Cover Page and Questionnaire**

Thank you for taking time to answer questions in this survey. This survey is about the health behaviors of Military spouses. Completely this survey is important, as the information you provide will help design health communication messages for Military spouses. Upon completion of the survey you will have the opportunity to be included into a prize draw for a \$100 Amazon voucher! Your anonymous responses will be used only for statistical purposes and will be confidential.

This survey will take you approximately 20 minutes to complete. Please complete the survey to the best of your ability describing what you think and feel. You may stop participating at any time without explanation, penalty, or loss.

The information you provide for the prize draw is confidential and only the researcher will be made aware of the winner's name. The questionnaire information and prize draw information will not be linked and both will remain separate and confidential.

This is an academic research study conducted by a student at the School of Journalism and Mass Communications at Kansas State University. If you have any questions regarding the questionnaire, please contact Danielle Tenconi at [danielle.tenconi@gmail.com](mailto:danielle.tenconi@gmail.com) or Dr. Joye Gordon at [gordon@ksu.edu](mailto:gordon@ksu.edu). If you have any further questions regarding the questions about the method or the research procedure, please contact the KSU Research Compliance Office at 203 Fairchild Hall, Manhattan KS, 66502 or phone at 785-532-3224 or fax at 785-532-3278 or E-mail at [comply@ksu.edu](mailto:comply@ksu.edu).

**1. What branch of the Military is your spouse in?**

- Army
- Airforce
- Navy
- Marines
- Coast Guard

**2. Is your spouse Enlisted or an Officer?**

- 1. Enlisted
- 2. Officer

**3. Is your spouse deployed?**

- Yes
- No

A healthy diet is defined as limiting your intake of fat and sugar, eats 5 servings of fruit and vegetables per day and limit fast food and convenience foods.

**4. Please rate the following statements from 1) Strongly disagree to 5) Strongly agree**

	1. Strongly disagree	2. Disagree	3. Neither disagree nor agree	4. Agree	5. Strongly agree
I can follow a healthy diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe I have the ability to follow a healthy diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For me it would be easy to follow a healthy diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to prepare healthy meals at home.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. Please rate the following statements from 1) Strongly disagree to 5) Strongly agree**

	1. Strongly disagree	2. Disagree	3. Neither disagree nor agree	4. Agree	5. Strongly agree
If I eat a healthy diet I will lose weight.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not want to cook for myself when my spouse is deployed or away with work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet, I will need to plan my meals a long time in advance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat healthy food, the food will not taste as good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not like cooking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buying fast food for meals is much easier than preparing healthy meals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It will be impossible to get my family to follow a healthy diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet I will feel healthier and happier.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I follow a healthy diet, it will be more expensive for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating a healthy diet does not prevent obesity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet I am less likely to suffer obesity related health issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet I will feel better in my clothes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating a healthy diet does not prevent obesity related health issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet my health will improve.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It will be difficult to get my family to follow a healthy diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet I will have better skin, hair, or teeth.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I cook healthy food for my family, they will think it is boring.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I eat a healthy diet I will live longer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not have the time to prepare meals that are healthy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



If I eat a healthy diet I will have more energy.

If I follow a healthy diet shopping will be a lot of hard work for me.

If I follow a healthy diet I will need to go food shopping more frequently.

**6. What is the likelihood that you will become obese in the next year?**

- 1. Highly unlikely
- 2. Unlikely
- 3. Not sure
- 4. Likely
- 5. Highly likely

**7. What is the likelihood that you will become obese in the next year compared to other women/men of your age?**

- 1. Highly unlikely
- 2. Unlikely
- 3. Not sure
- 4. Likely
- 5. Highly likely

**8. Please rate the following statements from 1) Strongly agree to 5) Strongly disagree**

	1. Strongly agree	2. Agree	3. Neither disagree nor agree	4. Disagree	5. Strongly disagree
Obesity is a serious medical condition and can cause cardiovascular disease.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The likelihood of me becoming obese is low.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obesity is a serious medical condition and can cause some forms of cancer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obesity is more harmful than most people realize.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compared to most people my age I understand my risk of becoming obese is low.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obesity is a serious medical condition and can cause Diabetes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am at risk for obesity because I do not limit my fat and sugar intake.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obesity is a severe threat that can shorten my life expectancy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am at risk for obesity because my family or a family member is obese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am at risk for obesity because I do not eat enough vegetables and fruit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**9. How serious an issue on a scale from 1 (not serious at all) to 10 (extremely serious) would it be for you if you became obese in the next year?**

**10. Please rate the following statements from 1) Strongly disagree to 5) Strongly agree**

	1. Strongly disagree	2. Disagree	3. Neither disagree nor agree	4. Agree	5. Strongly agree
Starting tomorrow, I intend to change my eating habits.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to change my eating habits in the near future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to start a diet (regulating your calorie intake to achieve or maintain a controlled weight).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to change my eating habits by reducing the number of calories I eat per day.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to change my eating habits by consuming less fat and sugar.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to change my eating habits by consuming more portions of vegetables and fruit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I don't loose weight every week (regularly) on a diet, my ability to stick to a diet becomes very hard.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I eat out I have a hard time getting back to my diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When my spouse is deployed it is hard to stick to a diet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**11. Are you male or female?**

- Male
- Female

**12. What is your year of birth?**

**13. What is your highest level of education?**

- Less than high school
- High/school (GED)
- Some college
- 2 Year College degree/Associates
- 4 Year college degree (BA/BS)
- Masters Degree
- Beyond Masters Degree

**14. How many children do you have?**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

**15. If you have 1 or more children, how many are under the age of 16 and living with you?**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

**16. What is your weight (in pounds)?**

**17. What is your height (in feet and inches)?**

- 4 feet
- 5 feet
- 6 feet
- 1 inch
- 2 inches
- 3 inches
- 4 inches
- 5 inches
- 6 inches
- 7 inches
- 8 inches
- 9 inches
- 10 inches
- 11 inches