EXPLORING THE EFFECTS OF CANCER EDUCATIONAL MESSAGES ON VIETNAM WAR VETERANS

By

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TABLE OF CONTENTS

ACKNOWLEDGMENTS ...................................................................................................................... 4

LIST OF TABLES ............................................................................................................................. 9

LIST OF FIGURES .......................................................................................................................... 10

ABSTRACT ...................................................................................................................................... 11

CHAPTER

1 INTRODUCTION ............................................................................................................................. 13

Bile Duct Cancer ............................................................................................................................. 14
Importance of the Study .................................................................................................................. 16
Aim of the Study .............................................................................................................................. 18

2 LITERATURE REVIEW .................................................................................................................. 20

Bile Duct Cancer ............................................................................................................................. 20
  Bile Duct Cancer Diagnosis ........................................................................................................ 20
  Treatment Plans ............................................................................................................................ 21
  Barriers to Diagnosis and Treatment ......................................................................................... 22
Health Communication ................................................................................................................. 23
  Health Literacy ............................................................................................................................. 23
  Self-efficacy in Health Communication .................................................................................... 25
Channels of Health Information Dissemination ........................................................................... 32
  Media as Health Information Source ........................................................................................ 33
  Health Messages on the Internet ................................................................................................ 33
  Advertisements as a Source of Health Information .................................................................. 35
  Appeals in Health Communication Messages ........................................................................ 38
    Negative appeals in health communication messages ............................................................ 38
    Positive appeals in health communication messages ............................................................. 39
Using Narratives in Health Communication ............................................................................... 42
Source Credibility .......................................................................................................................... 43
Health Influence ............................................................................................................................ 45
Patient-Provider Interaction Satisfaction ................................................................................... 47
Health Research in Vietnam War Veterans ............................................................................... 48
Theoretical Framework .................................................................................................................. 51
  Self-Efficacy Theory ................................................................................................................... 51
  Theorizing Emotional Appeals .................................................................................................. 54

3 METHOD ....................................................................................................................................... 59

Mixed Methods Approach ........................................................................................................... 59
Phase I and Research Questions: In-depth Interviews with Vietnam War Veterans .................. 61
5 DISCUSSION AND CONCLUSION ................................................................................. 141

Phase I—In-depth Interviews .................................................................................. 142
Discussion of Research Questions 1 to 5 ................................................................. 142
Phase II—Message Testing in Focus Groups ............................................................ 151
Discussion of Research Questions 6 to 8 ................................................................. 151
Phase III—Experimental Design .............................................................................. 153
Discussion of Research Questions 9 and 10 ............................................................ 153
Discussion of Hypotheses 1 to 4 .............................................................................. 157
Theoretical Implications ......................................................................................... 162
Limitations .................................................................................................................. 163

APPENDIX

A STUDY MATERIAL ................................................................................................. 166

Interview guide for Veterans Bile Duct Cancer Study ............................................. 166
Veterans’ Health Supplement Survey ...................................................................... 170
Focus Group Guide .................................................................................................. 176
Experiment Design ........................................................................................................184

B HEALTH FLYERS ..................................................................................................200
Veteran Vicarious Flyer.............................................................................................200
Veteran Verbally Persuasive Flyer ..........................................................................201
Doctor Verbally Persuasive Flyer ............................................................................202
Doctor Vicarious Flyer ..............................................................................................203

C NORMAL DISTRIBUTION LINES .......................................................................204

LIST OF REFERENCES ................................................................................................206

BIOGRAPHICAL SKETCH .........................................................................................229
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1</td>
<td>Participant demographics .................................</td>
</tr>
<tr>
<td>4-2</td>
<td>Date and location of focus group ..........................</td>
</tr>
<tr>
<td>4-3</td>
<td>Overall demographics of focus group participants ..........</td>
</tr>
<tr>
<td>4-4</td>
<td>Participant demographics ....................................</td>
</tr>
<tr>
<td>4-5</td>
<td>Cronbach’s alpha values for Phase III variables ........</td>
</tr>
<tr>
<td>4-6</td>
<td>Test for homogeneity of variances ........................</td>
</tr>
<tr>
<td>4-7</td>
<td>Means and standard deviations of emotional response ....</td>
</tr>
<tr>
<td>4-8</td>
<td>Itemized score for source credibility .....................</td>
</tr>
<tr>
<td>4-9</td>
<td>Box’s Test of equality of covariance matrices for Hypotheses 1 and 2</td>
</tr>
<tr>
<td>4-10</td>
<td>Levene’s test of equality of error variances for Hypotheses 1 and 2</td>
</tr>
<tr>
<td>4-11</td>
<td>Doctor’s flyer means score and standard deviations for dependent variables</td>
</tr>
<tr>
<td>4-12</td>
<td>Veteran’s flyer means score and standard deviations for dependent variables</td>
</tr>
<tr>
<td>4-13</td>
<td>Correlation values for Hypotheses 3 and 4 variables ......</td>
</tr>
<tr>
<td>4-14</td>
<td>Test for normality ...........................................</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>Model diagram for Research Questions and Hypotheses</td>
<td>82</td>
</tr>
<tr>
<td>4-1</td>
<td>AdSAM® Perceptual Map for all four groups</td>
<td>133</td>
</tr>
<tr>
<td>4-2</td>
<td>Veteran flyer group</td>
<td>134</td>
</tr>
<tr>
<td>4-3</td>
<td>Doctor flyer group</td>
<td>135</td>
</tr>
<tr>
<td>4-4</td>
<td>Veteran verbal group</td>
<td>136</td>
</tr>
<tr>
<td>4-5</td>
<td>Veteran vicarious group</td>
<td>136</td>
</tr>
<tr>
<td>4-6</td>
<td>Doctor verbal group</td>
<td>137</td>
</tr>
<tr>
<td>4-7</td>
<td>Doctor vicarious group</td>
<td>138</td>
</tr>
<tr>
<td>4-8</td>
<td>Model diagram of Hypothesis results</td>
<td>140</td>
</tr>
</tbody>
</table>
EXPLORING THE EFFECTS OF CANCER EDUCATIONAL MESSAGES ON VIETNAM WAR VETERANS

By

Aqsa Bashir

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As the Vietnam War approaches its 50th anniversary, those who served continue to garner media attention related to politics or healthcare. In addition to the media attention, post-war U.S., veterans have been the center of a number of research studies investigating health-related issues such as post-traumatic stress disorder, drug dependency and addiction, and health complications resulting from exposure to Agent Orange (Bogen, 1979; Lee, Ok & Ellison, 2008). Yet little research has been done to explore how veterans perceive their current health situation, what influences them—if anything—to live a healthy life, and how veterans respond to health messages.

In recent years, Vietnam War veterans have been in the news due to the rising numbers of them developing and dying from bile duct cancer, a disease linked to an East Asian parasite called the liver fluke. The ultimate aim of this study is to inform and educate U.S. Vietnam War veterans about this condition and to encourage them to talk to their doctors about being tested. In order to achieve this overarching aim, the study was divided into three phases. Phase I aimed to understand veterans’ perceptions of their health, and determine their level of awareness about bile duct cancer and its association with the liver fluke through interviews with veterans in the North Florida region (n= 20). Phase II designed different health messages guided by Bandura’s
(1977) self-efficacy theory and knowledge gained from Phase I to inform and educate veterans about bile duct cancer. This phase also tested these messages with a small group of veterans (n=18) before disseminating them to a larger population. Finally Phase III determined the effectiveness of designed messages with a larger veteran population (n=169) throughout the state of Florida. This phase measured veterans’ self-efficacy, their emotional response toward the messages, source credibility, outcome expectation and intent to talk to their doctor.

According to the study results, veterans indicated a strong intention to talk to their doctor irrespective of the type of message to which they were exposed. Veterans also indicated a higher level of trust in fellow veterans informing them of health issues; while doctors were considered more credible given their expertise. Furthermore, although it was theorized that emotional response would influence veterans’ self-efficacy in talking to their doctor; this phenomenon was not observed in the current study.
CHAPTER 1
INTRODUCTION

As the last American troops left Vietnam on March 29, 1973, the world watched the United States lose the war in Vietnam through the eyes of the media. At home, the U.S. was divided over the purpose of a war that lasted for almost two decades, cost more than $200 million, and resulted in the loss of more than 58,220 U.S. troops (CNN Library, 2016). Even after the war ended, it continued to garner media attention primarily on the subject of veteran life and health issues post-war (Valentine, 2013; Boscarino, 2008). In addition to the media attention, post-war veterans have been the center of a number of research studies investigating health-related issues such as post-traumatic stress disorder, drug dependency and addiction, and health complications resulting from exposure to Agent Orange (Bogen, 1979; Rosenheck & Fontana, 1994; Chamie, deVere White, Lee, Ok & Ellison, 2008).

More recently, surviving Vietnam veterans have gained media attention again because of their potential exposure to a parasite they may have ingested during the war by eating local Vietnamese foods such as raw fish and snails. This parasite, known as the liver fluke, is indigenous to and highly prevalent in the East Asian waters and is transmitted from water bodies to humans via uncooked or undercooked fish and snails. The fluke usually resides dormant in infected individuals when ingested in moderate quantities. And can live in the human body—particularly the bile duct—for 20 to 30 years before manifesting itself in the form of gallstones and cancer (Lim, 2011). Clinical symptoms depend on the degree of infection; immediate symptoms of heavy infection include nausea, vomiting, and abdominal discomfort, to name a few and can be successfully treated with a drug called triclabendazole (Ishikawa, Meier-Stephenson, Heitman, 2016; Lim, 2011). While long term symptoms include bile duct obstructions caused by stones and cancer (Lim, 2011). In fact, an increasing number of Vietnam
veterans are developing cholangiocarcinoma—a rare form of bile duct cancer (McDowell & Mason, 2016)—that has been linked to the liver fluke (Kaewpitoon, Kaewpitoon, Pengsaa, & Sripa, 2008; Lim, 2011; Tyson & El-Serag, 2011; Mayo Clinic, 2017).

Furthermore, in memoirs from the Vietnam War, veterans have mentioned eating outside their military camps at local food stalls and homes where hygiene was secondary and local dishes were often served raw or undercooked (Childs, 2012); some even recall fishing in the rivers and cooking their food using make-shift stoves from C-ration containers (Childs, 2012; Bolthouse, 2015). Because many veterans could potentially be exposed to the liver fluke, and as the fluke can live in the body with no symptoms for decades (Lim, 2011), bile duct cancer is an imminent health threat for Vietnam veterans. Moreover, the Western world does not acknowledge this link and often even does not know about the parasitic infection resulting in bile duct cancer (Lim, 2011) as the parasite is not indigenous to the Americas or West European regions (Nakanuma et al., 2000). Thus, this potential health threat is likely unknown to veterans and not something with which their healthcare providers are familiar. Hence, the need for veterans to initiate the conversation with their doctors about this service related condition.

Bile Duct Cancer

The cancer that some Vietnam veterans are being diagnosed with, bile duct cancer, is the second most prevalent hepatic malignancy (Tyson & El-Serag, 2011) occurring in the bile ducts inside the liver (i.e., intra-hepatic) or those outside the liver (i.e., extra-hepatic), the latter of which is most common (Cancer.Net, 2012). The National Institute of Health’s report on Cancer Stat Facts (NIH, n.d.) approximated 40,710 new cases of liver and intrahepatic bile duct cancer in 2017, with approximately 28,920 estimated deaths from the cancer (NIH, n.d.). Globally, bile duct cancer typically is diagnosed among individuals between the ages of 65 to 75 years old and is more frequently observed in men than in women (Ebata et al., 2016; American Cancer Society,
Similarly, in the United States, the average age of individuals diagnosed with bile duct cancer is 70 years for intrahepatic bile duct cancer and 72 years for extrahepatic bile duct cancer, an age group that includes Vietnam veterans (Tyson & El-Serag, 2011; American Cancer Society, n.d.).

As mentioned earlier, a potential cause of bile duct cancer has been linked to Fasciola hepatica, commonly known as the liver fluke (Nakanuma et al., 2000; American Cancer Society, n.d.). Parkin et al. (1991) were the first to establish a strong association between bile duct cancer and liver fluke in a case-control study conducted in Thailand. After observing 103 patients suffering from bile duct cancer, the researchers found elevated amounts of parasitic antibodies in the patients as compared to the control group, thus asserting the association of the parasite with bile duct cancer. A more recent study conducted by Honjo et al. (2005) in the same region confirmed the same findings. According to Smout et al. (2009), the liver fluke causes bile duct cancer by producing a distinct protein called granulin that stimulates an unchecked proliferation of cancerous cells in the area the liver fluke resides in (Smout et al., 2009; Laden, 2009). Additionally, the liver fluke does not immediately cause cancer when ingested; instead, it takes the parasites 30-40 years of irritating and scarring the bile duct for cancer to occur. If caught early, the liver fluke is easy to

Although 35 million individuals have been infected by the parasite all over the world (Liam, 2011), the number of U.S. veterans infected by the parasite is unknown. A report by the Associated Press stated that approximately 700 veterans with bile duct cancer had been seen at the VA hospitals in the last 15 years (Rettner, 2017), and less than half of them submitted claims for service-related benefits. The VA denied 80% of these claims as the VA has yet to acknowledge the association between the liver fluke and bile duct cancer (Porter, 2017).
Furthermore, some veterans may use private insurance that would not report on the incidence of this cancer in veterans, all of which makes it challenging to determine the infection rate in the U.S. Vietnam veteran population.

**Importance of the Study**

Between the diaries and reports of veterans eating off base during the war, the lack of knowledge in the U.S. about the liver fluke, the ability for the fluke to live 40 years undetected and asymptptomatically, and the increase in veterans being seen at the VA for bile duct cancer, this issue is especially important to study for two main reasons. First, bile duct cancer is a rare yet highly fatal form of cancer due to the locally advanced, non-resectable stage at which it is typically diagnosed. Often in patients, bile duct cancer is diagnosed in the end stages when the cancer has progressed, either due to a lack of definitive diagnosis or a misdiagnosis based on its symptoms (Ise, 2004; Fox News, 2016; McDowell & Mason, 2016). The latest cancer statistics, as reported by the Centers for Disease Control and Prevention, American Cancer Society, and the North American Association of Central Cancer Registries, show a promising decline in overall cancer mortality rates by 23% from 2009-2016 (Siegel, Miller & Jemal, 2016). Deaths due to cancers of the hepatobiliary system (e.g., bile duct cancer), however, are on the rise (Siegel, Miller & Jemal, 2016; Jemal et al., 2017). Thus, it is imperative to raise awareness among Vietnam War veterans about bile duct cancer and educate them about their potential risks, methods of early detection, treatment options available, and encourage them to talk to their doctor about screening for the liver fluke and bile duct cancer. Moreover, equipping veterans with adequate health information is essential to empowering them to take better control of their health (Sheng & Simpson, 2013).

The second reason it is important is that Vietnam War veterans have had a challenging time gaining acceptance and compensation from the government and medical providers for their
mental and physical ailments resulting from their deployment (Dean, 1991). It was not until 1980 that the U.S. government classified veteran post-traumatic stress as a disorder that needed psychiatric treatment, five years after the Vietnam War was over (Griffin, 2015). The lack of problem recognition on the part of the government is being observed again, this time in the case of bile duct cancer in veterans. In 2017, the number of claims made for bile duct cancer increased 46% from 2016 (Fox, 2017); the VA denied three out of four of these claims stating there was a lack of definitive research and policy for treating bile duct cancer as a service-related aliment (Fox, 2017). Moreover, to rectify their lack of research on bile duct cancer claims, the VA conducted blood tests on 50 veterans to screen for liver fluke infection in 2017 (Rettner, 2017). Results showed that more than 20% of the veterans tested positive for liver fluke infection. The VA has since issued a statement stating further research is needed to decide on the association of liver fluke infection with bile duct cancer (Fox, 2017). Although the current study does not aim to seek a policy change, it does aim to inform and educate veterans—at an individual level—about this service related cancer and to talk to their doctors about screening tests for liver fluke infection and bile duct cancer.

Besides the importance of the topic to study, this research contributes to multiple, underexplored areas of research within the Vietnam veteran population, including communication with doctors and trust. While much work has been done on patient-provider communication in healthcare research (LaVela, Schectman, Gering, Locatelli & Gawron, 2012), little is known about how Vietnam veterans communicate with their medical providers and their level of trust when talking to their doctors about service-related health conditions. Prior research on patient-provider relationships concludes that trust in providers is central in both disease diagnosis (Bayliss, Edwards, Steiner & Main, 2008) and treatment compliance (Hotta et al.,
Thus, to encourage veterans to talk to their doctors about screening for the liver fluke, this study also explores veterans’ current level of trust and comfort with their providers, which will provide direction to design appropriate health messages to encourage veterans to communicate with their providers.

**Aim of the Study**

Given the purpose of this study, there are three objectives:

1. To determine the level of knowledge Vietnam War veterans have about the liver fluke and the carcinogenic effects of this parasite.

2. To design and disseminate health messages to educate Vietnam War veterans about the liver fluke and its relationship to bile duct cancer, along with the potential outcomes and treatments for bile duct cancer.

3. To prompt veterans to talk to their doctors about the risk of developing bile duct cancer and be tested.

Through these objectives, the study aims to increase Vietnam War veterans’ overall knowledge of bile duct cancer and in doing so, improve rates of early detection by prompting veterans to talk to their doctors about their risk factors and request a test for the presence of liver fluke. Additionally, this study contributes to scientific knowledge of the health profile of veterans and the Baby Boomer population that these veterans represent.

Based on the aims of the study, Chapter 2 begins by outlining diagnosis and treatment of bile duct cancer, as well as barriers to diagnosis and treatment. Furthermore, Chapter 2 will explore literature in the field of health communication, including health literacy and the role of self-efficacy in determining health behavior, channels of health information dissemination, emotional appeals used in health communication, health influencers such as social groups and medical providers as well as health communication in Vietnam War veterans. The section will also discuss self-efficacy theory (Bandura, 1977) as a guiding principle for the study design. Chapter 3 discusses the study’s method, with details using a mixed method approach by using in-
depth interviews, focus groups, and a 2x2 experimental study design to meet the aims of the study. Chapter 4 presents the findings of all three studies, while Chapter 5 presents a concluding discussion of the findings of the studies as well as their relevance in veteran health research.
CHAPTER 2
LITERATURE REVIEW

In order to accomplish the objectives for the current study, it is necessary to review existing research and literature on bile duct cancer and health communication. This section aims to explore bile duct cancer by detailing its diagnosis and treatment. Furthermore, given the communicational context of this study, Chapter 2 will explore previous literature on health communication in terms of health literacy and self-efficacy, health advertisements as health information sources, and health communication with Vietnam War veterans.

Bile Duct Cancer

Bile Duct Cancer Diagnosis

Bile duct cancer is difficult to diagnose, particularly in its early stages. As the cancer occurs deep inside the body, tumors cannot be seen or felt during a routine examination in the preliminary stages of cancer development (American Cancer Society, 2016). Most tumors eventually are seen and felt anatomically have progressed to the late stages. Early detection of bile duct cancer has only been observed in individuals having reason to suspect the cancer or by accidental detection if the patient was being tested for other diseases. Despite symptoms that include persistent fatigue and fevers, abdominal pain, severely itchy skin, loss of appetite and weight loss, clay-colored stools, darkening of the urine, and jaundice (Mayo Clinic, 2017), bile duct cancer is often confused with gallstones, jaundice, and hepatitis C, making its diagnosis even more challenging (Beers, 2008; American Cancer Society, 2016).

When bile duct cancer is suspected, doctors check the liver and bile duct function and levels of bilirubin in the blood. Elevated levels of bilirubin in the blood are a strong indicator there may be problems with liver and bile duct function; however, factors other than cancer may also cause such elevated levels. Blood tests, such as tumor markers, may further indicate the
presence of cancer (American Cancer Society, 2016). Specifically, elevated levels of two tumor markers—carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA 19-9)—in the blood are distinctive of gastrointestinal cancer; however, these markers result from cancer being present anywhere in the gastrointestinal track and are not just specific to cancer occurring in the bile ducts (American Cancer Society, 2016).

In addition to liver function tests and tumor markers, physicians perform radiological imaging since it is more sensitive for detecting cancers that lie deep in the body. Imaging may include X-rays, ultrasounds, CT scans, and MRIs. While all of these options have shown success in diagnosing cancers deep in the body, a multiphase CT scan is most effective at detecting bile duct cancer. A CT scan, unlike a standard x-ray, takes multiple x-ray pictures of the desired area and then outputs them in the form of pictorial slices of the body part that are being studied, thus showing the tumor and its spread (P. Sharma, personal communication, November 1, 2017; American Cancer Society, 2016). Once the diagnosis is made, the oncologist can then proceed with treatment and cancer management plans.

**Treatment Plans**

Cancer’s stage and survival rates are essential in understanding disease severity and are necessary for medical providers to discuss and devise treatment plans. Treatment plans typically depend on the size and location of the tumor. Treatment plans begin by determining what stage—stage I (initial) to stage V (highly progressed)—the cancer is. Staging is determined by the location of the cancer, the organs it is affecting, and how far cancer has spread. This is further broken down by three criteria: the size of tumor itself, the spread to local and regional lymph nodes, and whether there is distant metastatic disease (i.e., how far the tumor has spread). This three-stage process is most commonly referred to as TNM staging: T—tumor, N—nodes, M—metastasis (The Cholangiocarcinoma Foundation, n.d.). For extra-hepatic
cholangiocarcinoma, the 5-year survival rate for individuals with an early-stage diagnosis is 30%, while the survival rate for intra-hepatic cholangiocarcinoma is 15% (American Society of Clinical Oncology, 2016). The 5-year survival rate for both intra-hepatic and extra-hepatic bile duct cancer is much lower at approximately 6% when the cancer has spread to the regional lymph nodes and 2% if it has spread to distant parts of the body (Cancer.Net, 2016; American Cancer Society, 2016).

Once the medical providers have determined what stage the cancer is, a treatment plan may comprise of radiation therapy, palliative therapy, liver transplant, chemotherapy, interventional radiology, or a combination of these, depending on the stage and type of cancer (Banales et al., 2016; Wedro, nd). In the case of bile duct cancer, surgically removing the cancer is possible if it is still localized to the liver and bile duct region. However, given that bile duct cancers typically occur in older adults, many of whom are at a higher risk of post-surgical complications, surgical removal is often discouraged (Wedro, n.d.).

**Barriers to Diagnosis and Treatment**

One of the most significant challenges in the outcome of a disease remains early detection and patients’ compliance with treatment plans (Thomas, 2006). It is essential for the patient to understand the disease process to adhere to the treatment plan (Burgess, Morris & Pettingale, 1998; Lin & Bauer-Wu, 2003). However, all this begins with educating and raising awareness among the “at risk” population (Thomas, 2006). Therefore, for the current study, it is necessary to inform and educate veterans about the potential harms of the liver fluke and its relation to bile duct cancer. By raising veteran awareness of bile duct cancer, this study aims to increase veterans’ self-efficacy and potentiate informed decision-making. Informed decision-making significantly decreases stress and uncertainty when it comes to problems involving medical uncertainty such as cancer (Glanz, Rimer & Viswanath, 2008). Information
dissemination aimed at increasing knowledge about health issues and initiating healthy behaviors in a population can be done through health communication.

**Health Communication**

According to Healthy People 2010 guidelines (US Department of Health and Human Services, 2010), health communication encompasses the study and use of communication strategies to inform, educate and influence individuals’ behaviors to encourage a healthy lifestyle (Thomas, 2006 p. 1). Health communication aims to increase the audiences’ knowledge about a condition, suggest and demonstrate practices to avoid unhealthy behaviors and adopt healthy behaviors, as well as clear misconceptions about a particular health issue (Thomas, 2006; Thompson, Parrott & Nussbaum, 2011). Indeed, prior research suggests that increasing individuals’ health literacy via communication methods leads to a better understanding of the issue and, consequently, boosts individuals’ self-efficacy (Benoit & Benoit, 2008; Gray, Clarke, Kwong, Alzougoool, Hines, Tidhar & Frukhtman, 2014).

**Health Literacy**

According to the U.S. Department of Health and Human Services (2000), health literacy is defined as the ability of an individual to acquire, process, and comprehend basic health information. Increased health literacy leads to a higher awareness of the health condition and enables individuals to improve their lifestyle and to seek and optimally utilize health care services (Gray et al., 2014; Schwarzer, Schüz, Ziegelmann, Lippke, Luszczynska & Scholz, 2007). On the other hand, poor health literacy is associated with chronic health conditions and an increased likelihood of engaging in harmful health behaviors due to a lack of awareness about the condition (Stewart et al., 2013).

Furthermore, health literacy is increasingly being recognized as an elemental factor affecting the communication process in cancer treatment (Davis et al., 2002). Cancer care
agencies are actively focusing on promoting individuals’ health literacy in order to enhance cancer prevention, detection, and treatment (Davis et al., 2002). For example, a recent content analysis of lung cancer tweets on Twitter revealed that a majority of organizations were focusing their cancer communication around prevention efforts (Sedrak et al., 2016). The study further found that organizations were actively engaging in dialogue with the public about therapeutic trials and preventive techniques (Sedrak et al., 2016), thereby increasing the public’s overall health literacy.

In another study looking at health literacy (i.e., health knowledge), Shah, Scogin, Pierpaoli, and Shah (2017) conducted a study with 140 individuals over the age of 55 to assess their attitude toward and the impact of a depression-screening pamphlet that increased their health literacy on depression and their screening compliance. The researchers recruited individuals at two medical facilities and randomly assigned them to a treatment or control group. The treatment group was administered a pretest and then received pamphlets on depression that included an overview of the disease, methods of screening, and treatment. Results revealed that the treatment group showed a significant increase in their knowledge about depression and its treatment and were more likely to comply with screening based on this knowledge. The researchers suggested that older adults seemed to be more receptive toward screening if they were knowledgeable about the condition, its screening process, and benefits for being screened (Shah, Scogin, Pierpaoli & Shah, 2017).

Similarly, Mottus, Johnson, Murray, Wolf, Starr and Deary (2012) conducted a study with 730 seniors to understand the association between seniors’ health literacy and their physical health. The researchers assessed seniors’ health literacy as their ability to comprehend and follow instructions on prescription dosage as well as their ability to understand a nutrition label.
Additionally, the researchers also measured participants’ general physical health, body mass index, and time taken to walk six meters. Results revealed that seniors who scored higher on the health literacy assessment also had better overall physical health, a healthy body mass index and were more likely to walk the test distance than seniors with lower health literacy (Mottus et al., 2012). Mottus and colleagues (Mottus et al., 2012) explained that cognitive ability to comprehend health messages was a key factor affecting individuals’ health literacy, which in turn lead to better adherence to healthy behaviors and good overall health. The researchers suggested healthcare workers develop educational material and campaigns that were easy to read and understand by the masses to increase health literacy on the subject (Mottus et al., 2012).

While understanding the extent to which knowledge on a condition affects an individual’s behavior, some researchers have explored the links among health literacy, behavior, and self-efficacy. For example, Osborn, Paasche-Orlow, Bailey, and Wolf (2011) proposed a model that predicted the pathway from health literacy to health behavior change and adherence with variables such as knowledge and self-efficacy mediating the process. Data was collected from 330 primary care clinic patients and analyzed to test the proposed model. Osborn and colleagues (Osborn, Paasche-Orlow, Bailey & Wolf, 2011) concluded that higher health literacy was associated with greater knowledge and higher levels of knowledge on the health-related subject. Higher knowledge levels, then, lead to greater self-efficacy on the subject, and increased self-efficacy, in turn, was associated with more self-care and positive health behavior change and adherence (Osborn, Paasche-Orlow, Bailey & Wolf, 2011).

**Self-efficacy in Health Communication**

While health literacy is necessary for cancer treatment and prevention, individual self-efficacy plays a significant role in determining how individuals utilize health information. Self-efficacy is defined as individuals’ beliefs in their ability to succeed in understanding and
implementing health information, thus encompassing action intention and the action itself (Bandura, 1989; Bandura, 1997; Marks, Allegrante & Lorig, 2005). Researchers have looked at self-efficacy’s influence on emotions, behavior, and coping.

For example, Burgess, Morris, and Pettingale (1988) determined that an increase in self-efficacy in newly diagnosed breast cancer patients was associated with a more effective coping mechanism, rapid treatment adoption, and less depression and anxiety. Thus, the more confident patients were in their ability to comprehend their condition and its treatment, the more successful they were in managing their disease.

Studies have looked at self-efficacy and health information in terms of peer support. For example, Namkoong et al. (2011) conducted a study on how well patients received breast cancer treatment information based on their level of self-efficacy. The researchers examined the exchange of treatment information in an online breast cancer support group with 177 breast cancer patients. The study concluded online support groups that discussed cancer treatment negatively affected patients with low self-efficacy, resulting in higher anxiety and depression levels, whereas patients with higher self-efficacy benefited from treatment discussions (Namkoong et al., 2011).

Similarly, research has also explored social support in the form of one-on-one peer support using vicarious experiences. Bandura (1977) described vicarious experiences as learning from observing others model a behavior or following instructions on performing a behavior. For example, Weber et al. (2007) conducted an experiment to determine how dyadic support partners for—prostate cancer survivors—could be useful in decreasing depression and enhancing self-efficacy in older men suffering from prostate cancer. In their experimental group, Weber et al. (2007) trained prostate cancer survivors to serve as support partners for current prostate cancer
patients, thereby using vicarious experiences of former patients to influence current patients. The support partners were trained to recognize signs of depression and help patients manage their condition by sharing their personal experiences of going through surgery and chemotherapy. A control group was also set up with participants given all the standard healthcare and social support except the dyadic support partner. Seventy-two prostate cancer patients, 45 years and older were randomly assigned to one of the two groups. Self-efficacy and depression scores for both groups were recorded at the baseline and after eight weeks. Results revealed that the experimental intervention—vicarious experience from one-on-one peer interaction—was significantly effective in boosting self-efficacy and lowering depression in current patients, as compared to the control group where no peer support was provided. The researchers concluded that the use of vicarious experiences in boosting self-efficacy was indeed effective as compared to no form of support (Weber et al., 2007).

Similarly, Zhang, Chan, You, Wen, Peng, Liu, and Zheng (2014) used all four sources in various stages of a self-efficacy-enhancing intervention to determine its effectiveness in middle-aged colorectal cancer patients. The researchers conducted a nurse-led six-month intervention aimed at increasing patient efficacy in managing health issues during chemotherapy, such as anxiety, depression, and physical weakness. The interventions comprised of teaching and social support sessions on managing health during chemotherapy. Researchers randomly assigned participants to the experiment group or control group. The experiment group first met with an oncology nurse for an educational session focused on life after chemotherapy and symptom management using vicarious experience and verbal persuasive techniques. Participants were also given a handbook containing the information and were encouraged to refer to the guide during their recovery period. During the next six months, patients received four coaching sessions from
an oncology nurse via telephone calls. The aim of these sessions was to strength patients’ self-efficacy by reinforcing information delivered during the first face-to-face session and encouraging management adherence. Researchers used performance accomplishment strategies to enhance patients’ behavior, as well as recorded patients’ emotional arousal during the phone sessions. Participants in the experimental group also received routine care and follow-up appointments from their providers. The control group only received routine care and follow-up appointments. Analysis of the data revealed the interventions were more successful in reducing symptoms of anxiety and depression in the intervention group when compared to the control group, who did not receive any of the experimental information material or coaching. Moreover, participants also indicated more confidence in looking for information related to their symptoms, compared to individuals who were not exposed to the intervention (Zhang et al., 2014). The researchers concluded that utilizing the four efficacy sources at various points in a healthcare intervention was an effective way of boosting an individual’s self-efficacy.

Furthermore, Maibach and Flora (1993) conducted a study to determine the role of vicarious experience and verbal persuasion in increasing individuals’ self-efficacy for AIDS prevention. The researchers defined vicarious experience as symbolic modeling of successfully performing the intended behavior and verbal persuasion as encouraging and urging individuals that they could perform the recommended behavior (Maibach & Flora, 1993). Researchers conducted a study with 138 individuals who were randomly assigned to one of three video conditions. The vicarious experience video featured necessary information on AIDS—the history of AIDS, how it is transmitted, and how it can be prevented. The video also included preventative modeling behavior—insist on wearing a condom or refuse intimate contact—and cognitive rehearsal—repetition of the modeled behavior. The verbal persuasion video featured all
of the information on AIDS included in the first video but only encouraged preventative behavior. The control video only featured basic information on AIDS. Participants’ self-efficacy was measured before being exposed to the videos, immediately after exposure, and one month later. Results showed that participants who were exposed to the vicarious experience video experienced the highest increase in AIDS preventative self-efficacy immediately after exposure to the video as well as at the 1-month follow-up (Maibach & Flora, 1993). The researchers concluded that modeled behavior in addition to cognitive rehearsal at the time of exposure was most effective in enhancing self-efficacy and increasing the likelihood for behavior adherence (Maibach & Flora, 1993) rather than simply encouraging preventative behavior or no call to action.

Additionally, Anderson (2000) conducted an experiment with 147 females to determine their self-efficacy, response outcome expectations, and behavior intentions when exposed to videos encouraging self-breast examinations for breast cancer awareness. The researcher used videos produced by the American Cancer Society that followed the vicarious experience and verbal persuasion methods of information dissemination on self-breast examinations. The study concluded that vicarious experience was the most effective in increasing self-efficacy among women and that both vicarious experience and verbal persuasion methods were effective in boosting efficacy expectations as compared to when neither of these sources was used (Anderson, 2000).

Similarly, Graham, Prapavessis, and Cameron (2006) aimed to determine if the threat of colon cancer was a motivational factor in promoting exercise in at-risk populations by using video modeling of exercise behaviors—vicarious experience. Thus, the experimental video modeled the behaviors, while a control video featured a nutritionist discussing the linkages of
diet and colon cancer. The intervention aimed to manipulate participants’ self-efficacy of coping appraisal (i.e., increase their self-confidence in their ability to perform the recommended exercises, which in turn affected their intention to exercise) (Graham, Prapavessis & Cameron, 2006). Respondents were administered a questionnaire immediately after exposure to the health videos, one week after, and one month after exposure. Results showed that even a month after exposure to the stimulus, participants showed a more significant change in coping appraisal as well as an overall increase in their confidence to perform the recommended exercises as compared to the control group (Graham, Prapavessis & Cameron, 2006). Respondents in the experiment group not only showed a stronger intention to perform the exercise but also were more likely to adhere to the recommended exercises. The researchers concluded that increasing individuals’ self-efficacy by recommending and modeling specific healthy behaviors was effective in stimulating behavior and consequently, behavior adherence. The researchers also found that a one-time exposure to health media messages was effective in influencing individuals’ attitudes and beliefs and stimulating initial behaviors (Graham, Prapavessis & Cameron, 2006).

Additionally, Lee, Arthur, and Avis (2007) explored the role of self-efficacy in developing and maintaining an exercise habit to lower blood pressure in seniors. The researchers organized a community intervention to encourage senior citizens to walk regularly and for a length of time. Participants were chosen based on their age—60 years and older—and had to be mild to moderately hypertensive. Participants were randomly assigned to a treatment group—those who participated in a six-month walking intervention led by a nurse—in addition to their usual primary care. The intervention was heavily focused on verbal persuasion and periodic advice from the nurse. The control group, on the other hand, only received their usual primary care.
care. Participants’ self-efficacy for exercising and hypertension was measured both at the time of recruitment and the end of the 6 months. Results revealed that the experimental group showed a significant increase in self-efficacy, greater adherence to regular walking, and improved blood pressure as compared to the control group. Participants in the treatment group attributed verbal persuasion and encouragement by the nurse and their significant others as motivating factors to continue their walking exercise (Lee, Arthur & Avis, 2007). Thus, periodic verbal persuasion was effective in increasing self-efficacy and maintaining the recommended behavior.

Finally, Feeley, Cooper, Foels, and Mahoney (2009) qualitatively explored self-efficacy in regards to colorectal cancer screening. The researchers conducted focus groups with 103 senior patients (average age 63 years) and 56 primary care providers and found that patients experienced low self-efficacy when it came to screening techniques such as colonoscopies as well as heightened fears of screening outcomes, which led to low screening compliance. When asked what could help them overcome such barriers, patients suggested verbal persuasion by their providers as most effective, followed by verbal persuasion from their families (Feeley, Cooper, Foels & Mahoney, 2009). Patients also suggested sharing experiences of former patients as sources of increasing current patients’ confidence in their abilities to comply with screening methods. Providers suggested acting as sources of vicarious experiences or verbal persuasion to facilitate patients’ self-efficacy as well as implement educational programs and messages aimed at increasing knowledge about colorectal cancer, its screening and treatment processes (Feeley, Cooper, Foels & Mahoney, 2009).

Based on the literature, then, self-efficacy is an important variable to explore when it comes to personal effort in adopting a behavior (Tucker et al, 2009). Moreover, the literature (Anderson, 2000; Weber et al., 2007; Feeley, Cooper, Foels & Mahoney, 2009) tends to focus on
and support two methods of increasing self-efficacy—vicarious experience and verbal persuasion. Thus, this study on Vietnam veterans will test these two sources of increasing self-efficacy.

Mass media have a significant role in promoting a healthy lifestyle at both a community and national level (Maibach & Flora, 1993). While mass media as a whole consists of several sources, these sources can be grouped into three broad areas that are most effective in disseminating health messages: TV, advertising, and the Internet (Gottfried & Shearer, 2016; Kamenova, Reshef, & Caulfield, 2014). As the current study focuses on disseminating health messages to a niche population—Vietnam War veterans—this section will discuss the Internet as a source of proliferating health messages within the veteran community. The Internet is increasingly and widely being used as a medium for disseminating and gaining health information and increasing health literacy within the Baby Boomer population (National Research Council, 2000; Rainie, 2010; Hilt & Lipschultz, 2016 p. 95). This section will also explore advertisements as an effective source of informing and educating target audiences about health issues and consequently promoting screening, and treatment options (Mintez et al., 2003). Health advertisements in the form of direct-to-consumer advertising and public service announcements are effective ways of targeting a broader audience to provide them with the information they need to get proactive about their health (Bloomcreative, n.d.).

**Channels of Health Information Dissemination**

Besides looking at elements of health communication that positively influence behavior like health literacy and self-efficacy, it is necessary to explore channels that are most effective for disseminating health information based on the type of message and the target population. The health care industry has utilized a variety of channels to inform and educate individuals on health issues, to disseminate health campaigns, and to boost individuals’ confidence in their abilities to
perform healthy activities (Holden, 1992; Walsh-Childers, 2017). The most popular channels are mass media and health care providers (Walsh-Childers, 2017).

**Media as Health Information Source**

Mass media have a significant role in promoting a healthy lifestyle at both a community and national level (Maibach & Flora, 1993). While mass media as a whole consists of several sources, these sources can be grouped into three broad areas that are most effective in disseminating health messages: TV, advertising, and the Internet (Gottfried & Shearer, 2016; Kamenova, Reshef, & Caulfield, 2014). As the current study focuses on disseminating health messages to a niche population—Vietnam War veterans—this section will discuss the Internet as a source of proliferating health messages within the veteran community. The Internet is increasingly and widely being used as a medium for disseminating and gaining health information and increasing health literacy within the Baby Boomer population (National Research Council, 2000; Rainie, 2010; Hilt & Lipschultz, 2016 p. 95). This section will also explore advertisements as an effective source of informing and educating target audiences about health issues and consequently promoting screening, and treatment options (Mintez et al., 2003). Health advertisements in the form of direct-to-consumer advertising and public service announcements are effective ways of targeting a broader audience to provide them with the information they need to get proactive about their health (Bloomcreative, n.d.).

**Health Messages on the Internet**

While in-person social interactions—peer-to-peer or patient-provider—are a common way of gaining and disseminating health information, the Internet holds great potential for providing health information as well as support for informed decision making for self-care (Miller & Bell, 2011). The number of adult Internet users in the U.S. has grown exponentially from 52% in 2000 to 89% in 2018, and approximately 87% of the Baby Boomer population is
now on the Internet (Pew Research Center, 2018). Furthermore, in an American Trends Panel survey conducted in 2014, 44% of the online Baby Boomer population indicated that they were most interested in health-and medicine-related information on the Internet (Kennedy & Funk 2015). Thus, not only has the Internet become a popular source of health information among the younger populations, but it has also become a source for older populations to gain health-related information (Rainie, 2010; Bloomcreative, n.d.).

For example, Tennant et al. (2015) studied e-health literacy levels in the Baby Boomer population and their overall Internet information-seeking behavior (Tennant et al., 2015). The study concluded that approximately 90% of the Baby Boomer population utilized Internet websites—especially social networking websites like Facebook—to share their health information, and medical websites to search for health information. Factors such as education and higher use of electronic devices were also positively associated with greater e-Health literacy among this population (Tennant et al., 2015). The study further revealed Baby Boomers displayed a high level of comfort associated with using the Internet to seek and gain health-related information. However, respondents showed a lack of confidence in their ability to trust health messages on the Internet (Tennant et al., 2015). These latter findings corroborate Manafo and Wong (2012) who found older adults were not adept in distinguishing between high-level and low-level health information presented to them on the Internet, thus indicating the importance of source credibility when it comes to influencing health attitudes and beliefs.

Additionally, Baby Boomers spend on average 19 hours a week online (Nanji, 2013) searching for various topics related to health, news, and online deals. More recently, Hilt and Lipschultz (2016) conducted a case study analysis on how Baby Boomers used the Internet to look for information. The case participants referred to the Internet as a convenient replacement
for newspaper and books when it came to gaining knowledge or looking for information (Reisenwitz, & Iyer, 2007; Hilt & Lipschultz, 2016). In terms of looking for health information, participants mentioned visiting medical websites they trusted, such as those of the reputable institutions like the Mayo Clinic or an organization they were a part of (Hilt & Lipschultz, 2016) such as the military. The authors suggested partnering with organizations that ranked high on Baby Boomers’ trust when trying to educate the population on important health issues (Hilt & Lipschultz, 2016).

Additionally, email was also a popular source of information used by this population. Baby Boomers sent and received emails every day as an active way of keeping up with their social circle (Fox, 2006), in addition to exchanging important health information and research within their social circles (Fox, 2011). Given the Vietnam veteran population falls into the Baby Boomer generation, and based on the study by Hilt and Lipschutz (2016) and Ninji’s (2013) report, emails are a promising channel to inform and educate veterans about their potential threat of developing bile duct cancer and encouraging them to talk to their doctor about being tested.

Advertisements as a Source of Health Information

Besides the Internet being a top source for disseminating and receiving health information for the Boomer population (Hilt & Lipschultz, 2016), health messages are increasingly being conveyed to a wider audience using advertising in the form of direct-to-consumer (DTC) advertisements such as pharmaceutical ads, and public service announcements (PSA) such as anti-smoking ads.

**Direct-to-consumer advertising.** DTC advertising is an excellent way to satisfy the growing demand for health information and promote treatment options (Holmer, 1999). Multiple DTC advertising studies have explored the influence of DTC ads on patients’ interaction with their providers (Weissman, Blumenthal, Silk & Zaper, 2003; Schwartz & Woloshin, 2016). For
example, Weissman, Blumenthal, Silk and Zapert (2003) explored the effects of DTC ads on patient-provider interaction. Researchers analyzed data from 3,000 phone surveys of a national sample collected between 2001 and 2002. Of the 35% who indicated they had visited a physician during that time frame, 25% reported they had talked to their doctor about an advertised medication (Weissman, Blumenthal, Silk & Zapert, 2003). While 75% of those respondents were prescribed a drug, approximately 43% of the respondents had been prescribed the advertised drug (Weissman et al., 2003), thus indicating that DTC advertisements do affect the target audience and their conversation with doctors (Mintzes, 2003).

Others have looked at how DTC ads influence the senior population. For example, Park (2016) explored the effects of Alzheimer’s treatment drugs’ DTC advertising on the older population. The researcher aimed to determine whether exposure to a disease-specific ad would contribute to an increase in knowledge and awareness of the disease and the drug itself. A self-administered online survey conducted with 626 seniors asked questions related to their understanding of the disease and the frequency of viewing a DTC ad for Alzheimer’s drugs or treatment. Results indicated that exposure to Alzheimer’s drugs DTCs was positively correlated with subjective knowledge about the disease. However, DTC healthcare advertising is not without its critics, particularly DTC ads related to cancer treatments. In a recent study analyzing the DTC cancer advertisements, Schwartz and Woloshin (2016) pointed out that cancer advertisements often mislead viewers by overstating success stories from cancer survivors. This overstatement, in turn, led to false hope among patients and their families who expected the same results as shown in the commercial (Schwartz & Woloshin, 2016).

Public Service Announcement. Although DTC ads have been extensively used by the pharmaceutical industry to promote their drugs and bring attention to the drug’s corresponding
condition, this study’s goal is informing and educating Vietnam War veterans and encouraging them to talk to their doctors about their potential risk of developing bile duct cancer. Therefore, this study’s type of message objective strategy falls under the category of public service announcement (PSA). While PSAs are considered a communication form similar to advertisements, these are focused on informing and educating a community about an issue, thereby increasing the quality of life in the society (Nan, 2008) through the act of helping one’s self (Bagozzi & Moor, 1994). While there is some research available on the effectiveness of PSAs, most studies have focused on safe sex practices and anti-narcotic use among the younger populations, particularly college students (Perse, Nathanson & McLeod, 2009; Dillard & Peck, 2000). The following sections will review the effects of PSAs in seniors and populations at risk of developing cancers. The sections will also review research on PSAs regarding the type of emotional appeals, narrative strategy, and source credibility that were used.

In terms of raising awareness about a particular disease in the senior population, Cram and colleagues (Cram, Fendrick, Inadomi, Cowen, Carpenter & Vijan, 2003) analyzed the effectiveness of Katie Couric’s 2000 colorectal cancer campaign that aired on the “Today Show.” Using the Clinical Outcomes Research Initiative (CORI) database from 1998 to 2000, the authors compared the rates of colonoscopy utilization before and after Couric's weeklong series promoting colorectal cancer awareness. Results showed a significant increase in the number of procedures in the adult population (45 years and older) immediately after the campaign (14.6 colonoscopies per physician every month prior to the campaign and 18.6 procedures per physician post-campaign). Moreover, the rate of procedures remained high nearly a year after the campaign (Cram et al., 2003). The number of colonoscopies in women increased from 43% to 47%, indicating that the message content was highly relatable with audiences and
provided guidance to them on the issue of colorectal cancer (Cram et al., 2003). Hence, it can be concluded that a PSA dedicated to a disease that outlines preventive and/or treatment measures for the disease has higher chances of encouraging the desired behavior in the target population.

**Appeals in Health Communication Messages**

While it is important to choose the appropriate message format (i.e. DTC advertising or PSAs) to deliver the message content, it is also necessary to use a suitable persuasive appeal to encourage the desired behavior (Hale & Dillard, 1995). Although researchers have explored rational appeals (Golden & Johnson, 1983), many suggest that emotional appeals are more effective in advertising communication messages (Liu & Stout, 1987; Morris Woo, Geason & Kim, 2002). Liu & Stout (1987) suggested emotional appeals were more effective than cognitive appeals when it came to persuading viewers, as emotional appeals tend to create a more visceral impression on individuals’ memory; resulting in a stronger message recall and adoption/adherence to the recommended behavior (Miller, 2016). Indeed, a number of researchers have explored emotional appeals for the promotion of health messages (Flora & Maibach, 1990) and concluded that emotions are the primary motivational system responsible for human behavior (Nabi, 2014) that have a greater effect on individual’s attitudes and intentions as compared to rational appeals (Zhang, Sun, Lui & Knight, 2014).

**Negative appeals in health communication messages**

Moreover, emotional appeals in health messages can be categorized into two main types: negative appeals such as fear and threat and positive appeals such as motivation and hopefulness (Peters, Ruiter & Kok, 2012; Ruiter, Kessels, Peters & Kok, 2014). Negative appeals have widely been used in persuasive campaigns and behavior change interventions (Ruiter, Kessels, Peters & Kok, 2014). There is great support for using negative appeals in discouraging harmful behavior, especially fear appeals. Fear, being the most basic human emotion, has been studied
extensively in terms of encouraging an appropriate behavior or discouraging a harmful behavior (Basil & Witte, 2014 p. 498). Researchers advocating the use of fear appeals believe message acceptance is a direct function of induced fear (Boster & Mongeau, 1984; Dillard, Plotnick, Godbold, Freimuth & Edgar, 1996). For example, Dillard et al. (1996) conducted a study to determine the effectiveness of fear appeal PSAs (Freimuth, Hammond, Edgar & Monahan, 1990). The researchers recruited 188 individuals and exposed them to PSAs comprising of fear appeals regarding AIDS. They then assessed the effectiveness of the PSAs by asking the respondents how persuasive and frightening the messages were. Results revealed that a majority of the PSAs (61% of N=31) induced fear in the viewers and consequently were regarded as more persuasive. The researchers concluded that utilizing fear appeals in PSAs was an effective technique for promoting message acceptance.

Additionally, Witte and Allen (2001) came to the same conclusion by conducting an extensive meta-analysis of 93 studies. The researchers only included studies that manipulated fear appeals in their experimental design and included attitude or behavior-dependent measures. The results of the meta-analysis revealed that the stronger the fear aroused by the fear appeal, the greater the persuasiveness of the message and consequently the greater the behavior intention, acceptance and adherence. Analysis also revealed that fear appeals were most effective when the perceived severity and proximity of threat was high in the target population (Wittie & Allen, 2001).

**Positive appeals in health communication messages**

In contrast, some researchers have indicated that when individuals are exposed to information delivered in a fearful manner with few or no suggestions of how to reduce this fear-inducing risk, individuals manage their fear by avoiding the message altogether (Witte, 1992; Dunwoody & Griffin, 2014). Because high stress in the individual leads to impaired judgment,
slower information processing, and lesser information elaboration that results in poor comprehension of the message (Carrera, 2014 p. 396). Instead, researchers encourage the use of positive appeals in health messages to gain and retain the target audiences’ attention (Nan, 2008). Positive appeals are intended to foster a sense of comfort and ease in the viewers, making them comfortable with the issue being addressed as well as its proposed solution (Maibach & Parrott, 1995). Using positive appeals such as incentives and benefits to recommend the desired behavior in health campaigns has also shown to be effective with the audiences (Neuberger, 2014 p. 699) such that individuals focused on the gains rather than shifting into self-protecting mode. Furthermore, positive messages—showing encouragement, empathy, and compassion—elicit similar emotions and behaviors in viewers (Monahan & Collins-Jarvis, 1992; Puhl, Peterson & Luedicke, 2012).

Additionally, using positive health messages can also serve as a useful strategy in helping the target audience reconsider issue salience and relevance (Maibach & Parrott, 1995). For example, Monahan and Collins-Jarvis (1992) conducted a study to determine individuals’ attitudes toward HIV/AIDS PSAs and their issue relevance. The researchers wanted to test the effectiveness of PSAs that cued a positive message, specifically PSAs showing empathy and compassion toward disease victims. After participants were exposed to the HIV/AIDS PSAs, they were asked to report their emotional response and attitude toward the message as well as issue salience. Results indicated that individuals experienced a higher level of empathy toward the issue and victims after viewing PSAs that cued empathy as compared to PSAs that did not cue empathy for the victims and the disease. Additionally, respondents felt encouraged to further discuss the message within their social circle (Monahan & Collins-Jarvis, 1992) after viewing ads that cued positive emotions toward HIV/AIDS. The researchers concluded that positive
emotional messages prompted a greater thought process and intention to adhere to the suggested behavior.

Furthermore, researchers have indicated that positive message recall is higher in older adults as compared to negative messages (Shamaskin, Mikels, & Reed, 2010). Shamaskin, Mikels, and Reed (2010) conducted a study to determine which type of message appeal resulted in better recall in seniors. Participants read four pamphlets on health care issues such as skin cancer and cholesterol. The flyers contained general information about the condition as well as four positively or negatively framed statements regarding behavior adaptation. Participants were then administered a survey asking about their attitudes toward the message. Following which, they were administered a surprise recognition task where participants had to identify statements that they had just read in the pamphlets. Results revealed that participants regarded the health issues shown to them as severe and indicated they were likely to practice the preventative behaviors suggested in the flyers. While there was no significant difference in behavior intention between those who viewed either positive or negative framed pamphlets, there was a significant difference observed in informativeness and message recall. Participants who viewed the positive appeal messages rated the messages as more informative as well had a higher message recall as compared to the negative messages (Shamaskin, Mikels, & Reed, 2010). The researchers concluded that older adults tend to remember information presented in a positive valence fashion and display a better message recall when it comes to illnesses that they reported as serious conditions such as cancer. Given the aims of the current study and based on the suggestions from Shamaskin, Mikels, and Reed (2010), the current study will use positive messages in informing and educating the veteran population.
Using Narratives in Health Communication

Along with using positive appeals in messages targeted at the veterans, this study also used narratives as a means of delivering the health messages since research has shown narratives to be an effective means of delivering cancer-related information to target populations (Green, 2006). According to Green and Brock (2002), narratives reduce the likelihood of counterarguments and help overcome personal barriers such as an individual’s belief they cannot perform a task (i.e., self-efficacy). Additionally, researchers have found the perceived similarity of the narrator with the target audience helps with message acceptance, source credibility, and trustworthiness; hence, similarity of the narrative character to the target is essential (Kreuter et al., 2007; Slater, Buller, Waters, Archibeque, LeBlanc, 2003; Polyorat, Alden & Kim, 2007).

For example, Grow and Christopher (2008) conducted focus groups with 21 Baby Boomer men—18 of who suffered from Hepatitis C—to determine their perceptions of Hepatitis C based on the style of PSAs they were exposed to (narrative style or commentary), as well as what type of appeal—positive or negative, resonated best with the group. Two PSAs were selected for the study. Dart Thrower had a commentary style and overall negative tone saying Hepatitis C was a sufferer’s fault. Freddy Fender had a narrative style and an overall positive tone. It was the story of a musician with Hepatitis C who encouraged Boomers to get tested. Analysis of the interviews revealed that Dart Thrower was not well received by the participants as it stigmatized Hepatitis C and blamed the sufferer for their condition. Freddy Fender, on the other hand, was well liked by the participants as they could identify with the protagonist (i.e., narrator) and his story and did not feel blamed for their condition. Participants strongly suggested that fear tactics used in the Dart Thrower ad were ineffective. They also voiced a need for more information about the disease and its treatment options for better-informed decision-making (Grow & Christopher, 2008). The study concluded that using positive appeals in PSAs
aiming to boost screening behavior were a more effective message strategy than using fear appeals. The researchers also concluded that messages were more effective if the audiences felt connected to the characters portrayed (Grow & Christopher, 2008).

Similarly, Brown and Basil (1995) explored the effectiveness of basketball legend “Magic” Johnson’s AIDS disclosure on increasing AIDS prevention awareness. Johnson’s PSA not only came with a disclosure of the disease but also promoted preventative techniques in a narrative form. Brown and Basil (1995) administered a questionnaire to 225 individuals to measure their media exposure, their attitude toward Johnson’s narrative and their perceptions of AIDS risk and preventative techniques. Results indicated that individuals held a positive perception toward the announcement and sympathized with Johnson. There was also a favorable attitude toward the AIDS prevention techniques narrated by Johnson (Brown & Basil, 1995). The researchers concluded that not only was the use of narration effective in prompting a positive attitude toward the issue but using a source that was liked and favored by the audience also played a considerable role in the effectiveness of the objective (Brown & Basil, 1995).

**Source Credibility**

Patient narratives not only offer a way of sharing in another’s experience but also facilitate the creation of a mutual world that enables individuals to feel comfortable with and follow techniques to manage their conditions (Carlick & Biley, 2004). Apart from a narrative form of message delivery, another concept that holds great significance in individuals’ information believability and action intention is the credibility of the information source (Goldsmith, Lafferty & Newell, 2002). Studies have found higher perceived source credibility is related to a greater likelihood to not only accept the message, but also a greater intention to act upon it and follow through with a call to action (Mizerski, Golden & Kernan, 1979; Kareklas, Muehling & Weber, 2015). Because the sources used to communicate health message and the
sources from which the information comes impact the persuasiveness of a message’s content (Brown & Basil, 1995), it is important to include source credibility within the present study with Vietnam veterans.

Source credibility can be defined as a receiver’s perception that a source is believable and trustworthy (Goldsmith, Lafferty & Newell, 2002). Making up this concept of credibility are the constructs of source expertise and trust in the source. Expertise is derived from relevant knowledge of the subject, while trust refers to the perceived honesty with which the source would convey a message (McGinnes and Ward, 1980).

One of the major factors that impacts source credibility is the association of the source with an organization (Berry & Shields, 2013). For example, Berry and Shields (2013) conducted an experiment to determine how individuals rated a source’s credibility if the source was associated with a for-profit organization or non-profit organization. Participants watched videos of individuals promoting exercise for health-related reasons or appearance-related reasons with the sources representing a for-profit organization or a non-profit organization. Results indicated sources that represented for-profit organizations ranked lower on the perceived source credibility regardless of the reason for exercise promotion, thus indicating that the association of the source with an organization impacts source credibility.

In another example, Kareklas, Muehling and Weber (2015) conducted a study to determine the effectiveness of types of sources on message acceptance. Researchers exposed online participants to pro- and anti-vaccination PSAs that also featured comments from four fictitious individuals. Participants were made to believe that the PSAs were sponsored by the Centers for Disease Control and Prevention or the National Vaccine Information Center. Results revealed that participants found the PSAs to be credible. However, the credibility of the fictitious
commenters was moderated by the amount of information on the commenters. Thus, if 
individuals could not ascertain the credibility of the commenter/quoted source, their trust in the 
message was low and vice versa (Kareklas, Muehling & Weber, 2015).

As the current study explored the health messages that are directed toward veterans, study 
Phase III also explored the credibility of two types of information sources: government-run 
organizations such as the VA and non-profit veteran organizations such as the VVA and VFW.

Health Influence

Along with source credibility and trustworthiness, another vital factor that influences 
individuals’ health behaviors are their social circles. Health communication is most effective 
when it is relevant to individuals’ personal and social contexts (Neuhauser et al., 2009). In terms 
of Vietnam veterans, their experience as a Vietnam veteran and their relationship with other 
veterans who served in the same war is a significant part of veterans’ self-identity (Smith, 1980). 
Braithwaite (1997) noted that Vietnam veteran’s marginalization in society after their return 
drove them into an even tighter-knit group that enhanced their sense of community and 
togetherness, influencing their lives in terms of their personal, social, and career choices. Thus, 
this study aims to design health messages for veterans by capitalizing on social ties with veteran 
groups like the VVA and VFW.

Researchers have explored social ties and observed group influence on health behaviors 
in terms of social identity and health behaviors such as eating and exercise habits (Oyserman, 
Fryberg & Yoder, 2007; Estabrooks & Carron, 1999). For example, Estabrooks and Carron 
(1999) examined the relationship of group unity and attitude toward exercise in older adults. The 
researchers administered a questionnaire to 179 Canadian seniors who were members of 14 
different exercise classes such as power walking, strength training, and cardiovascular training.
Results revealed that social bonding was related to attitude toward exercise; thus, if seniors liked their group and felt a sense of social belonging toward it, they held a positive attitude toward the exercise and were more intent on maintaining the behavior (Estabrooks & Carron, 1999).

Additionally, individuals' appraisal of their health behaviors is influenced by their salient social identification (St Claire & He, 2009). For example, St Claire and He (2009) surveyed 53 people over the age of 50 to find out how identifying with a particular group influenced older adults who were suffering from hearing loss to ask their provider for a hearing aid. The study found that participants who identified as seniors were more accepting of their hearing loss and thereby more receptive to asking for a hearing aid. The researchers concluded that highlighting group identity—such as senior adults or individuals with hearing impairments—in health promotion would be effective when informing a target group about conditions that affected them (St Claire & He, 2009). Based on prior research on group identity and salience (Ellemers, Kortekaas & Ouwerkerk, 1999), it will be essential to determine whether Vietnam War veterans identify themselves in the veteran category, so this self-identification can be used in developing messages aimed at this population.

Another important source influencing individuals’ health behavior is their medical provider. There is a dearth of literature available on patient-provider communication and trust in the provider, and how those two variables influence patient’s health behavior (e.g., Lasser, Ayanian, Fletcher & Good, 2008; Eheman et al., 2009; Walsh et al., 2010). Walsh et al. (2010) surveyed 539 prostate, colorectal, breast, and lung cancer patients to determine what information sources patients used and what influenced their treatment decision-making the most. Seventy-one percent reported their treatment options were a shared decision-making process between their
medical provider and themselves (Walsh et al., 2010). Furthermore, participants indicated that ease of communication with their providers enabled them to better understand their cancer as well as the treatment options, which in turn, enabled them to feel confident during the shared decision-making process of selecting their cancer treatment plans.

Similar results were observed in a study conducted by Eheman et al. (2009). The researchers reported that cancer patients sought information from and were positively influenced by their medical providers regarding their conditions irrespective of whether they were active information seekers or passive information seekers (Eheman, 2009).

**Patient-Provider Interaction Satisfaction**

As the ultimate goal of this study is to prompt veterans to talk to their doctors and request a screening for the liver fluke and bile duct cancer, it is essential to understand how veterans perceive communicating with their providers and whether they feel satisfied with their relationship. Patient satisfaction with their medical providers is essential in determining healthy behavior and treatment adherence (Roter, Hall & Aoki, 2002). Successful patient-provider communication is key to patient satisfaction and occurs when the appointment or consultation is centered on the patient’s needs and desires (Rees & Williams, 2009).

Moreover, patient-provider communication is a major factor to be considered when exploring constructs, such as trust in provider and provider influence. For example, Roter, Hall, and Aoki (2002) examined successful patient-provider interaction that comprised of effective communication and overall patient satisfaction. The analysis revealed that providers who facilitated an open and equal exchange of information ranked higher on the patients’ satisfaction. Roter, Hall, and Aoki (2002) found that patients displayed a higher satisfaction with their female
providers as female providers spent more time with the patient and provided more information to them as compared to male providers. The analysis also revealed that clear conversations free of medical jargons in addition to provider responsiveness to emotional cues—concerns and fears—influenced patient’s perceptions of a successful interaction, their satisfaction and consequently the success of patients adhering to the recommended health behaviors (Roter, Hall & Aoki, 2002).

Furthermore, research has shown that patient-centeredness in diagnosis initiation and determining treatment plans have been effective in treatment reception and adherence (Rees & Williams, 2009). Rees and Williams’ (2009) systematic review revealed that when patients were allowed to share their health concerns with a provider who was willing to listen and did not display a negative response to the concern, patients held a more favorable attitude toward the practice as well as increased the likelihood of treatment adherence. Moreover, this resulted in a favorable attitude toward the provider and hence also influenced self-management of the disease (Nazareth et al., 2008). In conclusion, it is essential that patient experience successful interactions with their providers and feel comfortable communicating with their providers in order to take the first step in diagnosis and treatment. If an individual does not trust the medical provider or feel they cannot share their health concerns with their medical practitioners, this may hinder the process of disease diagnosis (Roter, Hall & Aoki, 2002).

**Health Research in Vietnam War Veterans**

In addition to understanding effective health communication in older adults through mass media, types of appeals and delivery formats, regarding this study it is essential to understand what is known about health communication with Vietnam War veterans specifically. Most research involving Vietnam War veterans has been related to PTSD (Hunter, 1978; Whealin,
Jenchura, Wong & Zulman, 2016). For example, Whealin, Jenchura, Wong, and Zulman (2016) designed a study to identify the types of e-Health tools veterans used to manage their PTSD and health needs. The researchers aimed to identify new resources that would enable veterans to feel empowered and consequently manage their health. Whealin, Jenchura, Wong, and Zulman (2016) conducted a survey with 119 veterans with an average age of 64 years, 72% of who were male. A majority of veterans (79%) indicated they used the Internet to search health-related information, while 71% reported they regularly used the communication tools (e.g., online health charts, emails, short message service SMS) to communicate with their health care providers.

Whealin, Jenchura, Wong, and Zulman (2016) also conducted follow-up focus groups with the respondents of the survey to gauge more in-depth information related to their technology usage and comfort level with using the resources for various tasks such as searching medical information, communicating with social circle and provider, tracking and ordering medication etc. Analysis of the focus groups revealed that veterans used the VA website to look up their health conditions as well as any online resource their doctor pointed out. Additionally, health information and management resources received from peers were deemed useful and trustworthy. Veterans also described the effectiveness of using technology (texting and social media) to facilitate mutual social support for those veterans who felt uncomfortable with face-to-face interaction. Regarding their medical provider, veterans appreciated the convenience of engaging with their provider via email and secure messaging, rather than having to wait for an appointment to discuss non-emergency medical questions. Whealin, Jenchura, Wong, and Zulman’s (2016) study concluded that veterans were actively searching for health information online and utilizing technology resources to facilitate their health management behavior. The
study identified social interactions, access to providers, and information as necessary tools to empower veterans for effective disease management.

Similarly, Schneiderman, Lincoln, Curbow, and Kang (2004) conducted a cross-sectional study with Vietnam, Persian, and Bosnia-Kosovo era veterans. Schneiderman (2004) and colleagues wanted to determine what type of health information sources were most helpful for veterans who were conscious about their health status. The researchers conducted a survey with 1,432 veterans—seventy percent of who were Vietnam era veterans—and asked them to rate the helpfulness of sources such as “own doctor,” “VA doctor,” “newsletters and brochures from the VA,” “newsletters from veteran organizations,” and “the internet” when it came to gaining knowledge about a particular condition. Results revealed that veterans most favored their “own doctor” and had a negative attitude toward the helpfulness of the “VA doctors” when it came to obtaining health information. Furthermore, veterans indicated that newsletters from the VA and veteran organizations were most helpful in informing them about health conditions.

In terms of veterans’ level of health information and consequent behavior, Fisher, Lee, McGrath, and Krejci-Manwaring (2015) aimed at determining veterans’ knowledge and attitude toward skin cancer and whether veterans were aware of their heightened risk of developing skin cancer due to their exposure to Agent Orange. Researchers examined veterans’ awareness of their risk factors for skin cancer and the importance of certain preventative behaviors. A telephone survey was conducted with 100 veterans (average age 67) diagnosed with skin cancer. Participants indicated exposure to the sun’s rays as the number one cause of skin cancer (94%) followed by chemical exposure (12%), exposure to Agent Orange (5%), and genetic causes (4%). When asked about their perceived risk of developing skin cancer, veterans responded saying they
thought they were at minimal risk and, therefore, had not heeded the warning. Thus, there was a lack of awareness in the veteran population about their heightened risk of developing skin cancer because of Agent Orange exposure from their time in Vietnam. Additionally, when asked about the best communication methods to inform other veterans about skin cancer, they suggested providers talk to their patients about preventative techniques and screening options. Veterans also suggested educating others through PSAs and military programs for current service members (Fisher, Lee, McGrath & Krejci-Manwaring, 2015).

**Theoretical Framework**

**Self-Efficacy Theory**

This study has adopted a theory-based approach to educating Vietnam War veterans on the potential harms of the liver fluke and its connection with bile duct cancer. By increasing their self-efficacy on the issue, this study aims to boost veterans’ confidence in their ability to talk to their doctors about being tested for the parasites. Given the purpose of this study, Bandura’s (1977) self-efficacy theory will be used as its theoretical framework. Bandura (1977) defined self-efficacy as an individual’s confidence in his/her ability to succeed in understanding and utilizing the information he/she was exposed to, thus encompassing action intention and the action itself. According to the theory, efficacy expectations determine whether a behavior will be performed, the amount of effort expended, and the duration of adherence to the behavior. Not surprisingly, individuals with low self-efficacy would perceive tasks to be harder than they actually were, while individuals with high self-efficacy perceived tasks to be more manageable (Bandura, 1977).

Bandura (1977) theorized self-efficacy is influenced by four principle sources of information: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal. First, performance accomplishments are related to an individual’s personal
experience of their performance capabilities and success in executing the task. Performance accomplishments have been regarded as the most effective sources in enhancing self-efficacy, as an individual has first-hand experience in learning and performing the behavior (Bandura, 1986).

However, actual performance accomplishment is not the only way to positively influence self-efficacy. Vicarious experience, verbal persuasion, and emotional arousal too can affect self-efficacy. Vicarious experience relies on observing others successfully model the intended behavior either visually or verbally; that is, watch an individual perform a behavior or follow verbal instructions on performing the behavior. While vicarious experience is not as effective as performance accomplishment, watching others model a behavior or following instructions and succeeding instills a sense of self-belief in individual’s ability to perform the behavior (Chu, Huber, Mastel-Smith & Cesario, 2009).

Verbal persuasion, on the other hand, uses encouragement and positive appraisal to convince individuals they can perform the recommended behavior. Verbal persuasion is a weaker source of influencing self-efficacy when compared to performance accomplishments and symbolic modeling; however, verbal persuasion plays a significant role in individuals’ self-belief (Bandura, 1977). Furthermore, verbal persuasion, in contexts of social encouragement and verbal motivation, can encourage individuals to pursue a behavior they are unfamiliar with or uncomfortable with performing (Chu, Huber, Mastel-Smith & Cesario, 2009).

Finally, emotional arousal enables individuals to recognize their level of anxiety and discomfort when faced with a threatening situation (Bandura, 1977; Anderson, 2000). Individuals rely on their level of emotional arousal in examining their anxiety levels and susceptibility to a stressful situation (Bandura, 1977). Bandura’s explication of emotional arousal focuses solely on two discrete emotions: anxiety and stress (Hackett & Betz, 1981). Researchers
observing the effects of emotional arousal on self-efficacy found that the higher the anxiety and stress experienced by the individual resulting from exposure to the message/instruction, the lower was their perceived self-efficacy (Biaggio & Nielsen, 1976). Similarly, researchers exploring the effects of positive arousal such as joy, pride, and excitement toward individual self-efficacy found that experiencing positive emotions led to an increase in individuals’ confidence in their ability to perform the recommended tasks (Fredrickson & Joiner, 2002). Alessandri, Vecchione and Caprara (2015) argue this discrepancy between effectiveness of positive and negative emotional arousal such that change in self-efficacy (high or low) after exposure to messages was heavily dependent on a combination of the message content, the recommended belief or behavior being advocated and the type of appeal being used in the message. For example, Graham, Huang, Clark, and Helgeson (2008) found that expressing negative emotions such as indignation over unjust practices would result in a positive increase in individuals’ self-efficacy toward the issue and vice versa. Thus, the type of emotional arousal needs to be appropriated in regards to the message content and the desired behavior.

In summary, several studies have applied the self-efficacy theory to a wide domain of health research topics including cancer screening, management, and prevention (Zhang, Chan, You, Wen, Peng, Liu & Zheng, 2014; Merluzzi, Nairn, Hegde, Martinez Sanchez & Dunn, 2001). While researchers have found performance accomplishment to be the best influence on individual self-efficacy (Bandura, 1986), others have deemed vicarious experiences as more effective in comparison to verbal persuasion (Feltz & Riessinger, 1990). Additionally, research on emotional arousal, although limited, does suggest emotions to be effective in influencing individual self-efficacy (Graham, Huang, Clark & Helgeson, 2008). Furthermore, prior research on health management also suggests an increase in self-efficacy to be a strong mediating factor
between intervention and behavior performance as well as behavior adherence (Zhang et al., 2014).

In light of the research aims and the reviewed literature, this study proposed to apply and test the effectiveness of two of the four sources of efficacy influence: vicarious experience and verbal persuasion, on veterans’ self-efficacy to discuss the association of the liver fluke with bile duct cancer with their doctors and to request a screening test. Performance accomplishments cannot be manipulated in the current situation, as veterans may not have any prior personal experience of being tested for the liver fluke and examined for bile duct cancer.

Additionally, emotional arousal was not manipulated in this study instead explored as a response to the health material. In review of the literature, it is assumed that emotional response will occur when veterans are informed of their potential health hazard such as bile duct cancer. Furthermore, emotional arousal has some dependency on a person’s personality and the health topic making emotions challenging to manipulate, as humans will emotionally respond according to how they feel (Plutchik, 1980) rather than what the research intends them to feel. Self-efficacy and behavior performance have typically been studied as cognitive processes (O’Leary, 1985), with very few studies focusing on emotional arousal as a significant source of self-efficacy (Lee, Hwang, Hawkins, & Pingree, 2008). Thus, instead of manipulating emotional arousal, this study measured emotional arousal using three dimensions of emotional response: appeal, engagement, and empowerment (Jang, Chun, Ko, & Morris, 2014) as detailed in the following section. Thus, exploring the correlation between emotional arousal and self-efficacy in promoting behavior performance in the male Baby Boomer population was the focus.

**Theorizing Emotional Appeals**

Although Bandura conceptualized self-efficacy in terms of self-referent judgments arrived at through cognitive processing of information (Bandura, 1986), the theory does
acknowledge emotional arousal as a source of efficacy influence. However, most researchers have only explored emotional arousal in terms of single, specific, distinct emotions such as anxiety or stress (Bandura, 1982; Chu, Huber, Mastel-Smith & Cesario, 2009) and fail to address the full range of emotional response. In fact, researchers have found emotional response is not a single reaction to a stimulus, but numerous emotional responses to a single stimulus (Dillard & Nabi, 2006). For example, Pinto and Priest (1991) found that guilt-based messages evoked both emotions of guilt and anger, while Nabi (2002) found that messages advocating social issues such as domestic terrorism, although designed to evoke anger, also evoked feelings of disgust. Thus, a single health message will likely elicit multiple emotional responses, so self-efficacy theory’s conceptualization and operationalization of emotion may well miss some important emotional responses that influence self-efficacy research as a whole.

In fact, Mehrabian and Russell (1974) have found emotional response is not just one discrete positive or negative emotion; rather, it is a range of emotions that can be conceptualized and measured along three dimensions—pleasure, arousal, and dominance (PAD) (Mehrabian & Russell, 1974). The rest of this section explains the three dimensions of emotion and how they will be incorporated into the present study.

Mehrabian and Russell (1974) defined the first dimension, pleasure/displeasure, as emotions ranging from extreme happiness to extreme unhappiness. Arousal/non-arousal, the second dimension, constituted emotions on some physical level ranging from frenzied excitement and extreme mental alertness to mental inattentiveness, sleepiness, and inactivity at the non-aroused end of the continuum. The final dimension of dominance/submissiveness, ranged from feelings of power, influence, and control with feelings of hopelessness and
powerlessness at the other end of the continuum (Mehrabian & Russell, 1974; Mehrabian & de Wetter, 1987; Morris, Woo, Geason, and Kim, 2002; Bashir, Wen, Kim & Morris, 2018).

While the PAD dimensions of emotion have been popularly used in psychology, advertising, and consumer behavior, the PAD dimensions have been renamed as AEE (i.e., appeal, engagement, empowerment) to better reflect their meaning and their use in communication studies (Jang, Chun, Ko & Morris, 2014). As this study looks at communicating health information in the form of a public service announcement, the PAD will be explored as AEE. According to Jang, Chun, Ko and Morris (2014), appeal is defined as a measure of positive or negative reaction to a particular stimulus; engagement is defined as the level of involvement individuals have with that particular stimulus and empowerment is defined as individuals’ feelings of being in control of their situation when exposed to the same stimulus (Bashir, Wen, Kim & Morris, 2018; Jang, Chun, Ko & Morris, 2014). The combination of these three emotional dimensions constitutes a full spectrum of human emotion (e.g., Ju, Jun, Dodoo & Morris, 2015).

Although AEE has been used in communication studies to determine how individuals feel toward a particular message, it has been used most commonly in advertising/marketing messages (Ju, Jun, Dodoo & Morris, 2015; Bashir, Wen, Kim & Morris, 2018). For example, Ju, Jun, Dodoo, and Morris (2015) explored the emotional effects of nostalgic advertisements influenced by life satisfaction. The researchers conducted an experiment with 313 adults online and exposed them to two types of nostalgic advertisement to measure their AEE response to the ads. Results revealed that individuals with higher life satisfaction experienced a greater positive AEE response when exposed to the nostalgic advertisement (Ju, Jun, Dodoo & Morris, 2015); thus, the
more satisfied an individual was in their life, the more positive was their emotional response to nostalgic advertisements.

While AEE has been extensively used in advertising research studies, researchers have not utilized the three dimensions in analyzing the effectiveness of health messages. Instead, researchers have looked at discrete emotional response—such as empowerment, fear, anger, guilt, and anxiety (Dillard et al., 1996; Nabi, 2016)—to determine the effectiveness of health messages. However, Dillard and Nabi (2006) much like Mehrabian and Russell (1974), argued that emotional response to a message is not a discrete response but messages have the ability to evoke multiple responses. Supporting this belief, Dillard and Nabi (2007) found that after exposure to the Victor Crawford's cancer PSA (Dillard & Nabi, 2006; Dillard, Shen & Vail, 2007), participants showed a significant spike in five emotions—surprise, fear, anger, sadness, and contentment—all at the same time. Seeing a tobacco lobbyist, Victor Crawford, advocating against tobacco use, heightened the element of surprise among the respondents. While listening to the consequence of smoking in the PSA heightened fear, and thinking of a wasted life heightened the emotion of sadness. Furthermore, anger was seen as a reaction to tobacco companies’ indifference toward their consumers’ health and observing Victor Crawford’s demise heightened contentment.

1 The words “The Truth” appear in white text on a black screen. The ad continues in black and white to show images of an old man, Victor Crawford. He begins by telling viewers that the tobacco company is targeting young children because “they don’t know better.” “They might get your sister or your brother.” He then admits that he was a tobacco lobbyist for 20 years and knows how the tobacco industry works. Finally, he apologizes by saying, “I lied and I’m sorry.” The ad concludes with four individually presented black screens containing the following text: “Victor Crawford died. He died of lung cancer. Tobacco is addictive. Don’t smoke.” (Dillard & Nabi, 2006)
While exploring discrete emotions in health messages has enabled researchers to understand the effectiveness of the message, it is necessary to go beyond discrete emotions and measure emotional response on a three-dimensional spectrum. By measuring discrete emotions research assumes individuals experience and distinguish only one emotion at a time; however, measuring emotions using a three-dimensional approach is more robust as it holds more pertinent information about the range of emotions experienced by individuals when exposed to a message or event (Morris, 2012). Therefore, this study attempts to understand the degree of veterans’ emotional response to health messages as measured on the dimensions of appeal, engagement, and empowerment. This would not only expand the literature on emotional response to health messages, especially in an underexplored population such as the Vietnam veterans, but also help understand how individuals’ emotion effect their self-efficacy and consequently their behavior intention; thereby providing an explanation for the role of emotional response in enhancing self-efficacy when exposed to a health message.
CHAPTER 3
METHOD

This research aimed to determine the level of knowledge Vietnam War veterans have about the liver fluke and bile duct cancer and to inform and educate veterans about the parasite and its connection to the cancer. Thus, encouraging veterans to talk to their doctor about being tested for the parasite. To accomplish these aims, a mixed methods approach was adopted with three phases. The first phase comprised of semi-structured interviews to explore the knowledge levels of Vietnam War veterans in regards to the liver fluke and bile duct cancer. The second phase designed and tested health messages related to the liver fluke and bile duct cancer through focus groups with Vietnam veterans. This was done to see if the designed messages resonated with the target audience or not. Finally, the last phase explored the health messages on a large scale through an experimental design to test whether the messages prompted veterans to talk to their doctor. The following section details the rationale behind adopting a mixed method approach as well as proposed methods for each of the three phases.

Mixed Methods Approach

Creswell (2014) defines mixed methods research as a combination of both qualitative and quantitative methods to answer the research questions and validate assumptions. This approach of combining qualitative and quantitative methods emerged from social science research; it has gained popularity in healthcare research (Wisdom & Creswell, 2013) given its adaptive nature to answer a variety of research questions and assess complex interventions (Creswell & Plano Clark, 2011).

Another reason for using a mixed methods approach is to allow the researcher to decrease methodological biases and limitations and achieve more complete findings, thereby gaining a better understanding of the subject (Greene, 2007; Maxwell, 2013; Babbie, 2010). Johnson and
Christensen (2004) refer to the concept of mixed method as a principle of complementarity, such that a researcher can amplify the strengths from one approach to overcome or minimize the weaknesses of another approach. Moreover, complementing rich qualitative data from interviews and focus groups with numerical data from quantitative surveys—or vice versa—allows for a deeper comprehension of the subject, that would benefit both theoretical understanding as well as practical implications (Johnson & Christensen, 2004).

Furthermore, Wisdom and Creswell (2013) discuss several approaches in a mixed method design being used in healthcare research, two of which are developing survey instruments and involving community-based stakeholders. Developing survey instruments involves an exploratory sequential design, beginning with qualitative exploratory data followed by a quantitative instrument built on the findings of the first stage (Wisdom & Creswell, 2013). Involving community-based stakeholders engages community members in many quantitative and qualitative phases of research to test and bring about the desired change. This is a standard method used by the health care industry to bring about a health behavior change in society, such as promoting exercise and proper nutrition education (Wisdom & Creswell, 2013).

Given the exploratory nature of the current study and the research aims, this study followed Wisdom and Creswell (2013) approach of developing survey instruments (i.e., moving from a qualitative to quantitative approach), and involving veterans as community members in developing health messages for the broader veteran population. For this reason, the study was divided into three phases. The first phase of the study was to qualitatively determine the knowledge level about bile duct cancer among Vietnam War veterans using semi-structured interviews. According to Creswell (2014), semi-structured in-depth interviews are the best way to explore subjects that have limited prior information available.
The second phase aimed to design health messages that would inform and educate veterans about the liver fluke and its relationship to bile duct cancer. Additionally, these messages intended to encourage veterans to talk to their doctors about being tested for liver fluke. The messages, in flyer format, were designed in InDesign and tested through focus groups. Focus groups are most widely used to test concepts in advertisements as they provide rich insight into how viewers perceive the messages they were exposed to (Armstrong, Adam, Denize & Kotler, 2014).

The final aim of the study was to test the messages with the Vietnam War veterans in order to measure their emotional response to the messages, their self-efficacy in communicating this issue with their doctors and finally to determine their behavior intention of talking to their doctor. Therefore, the study could deduce the effectiveness of the messages. This phase was tested using an experimental design. Veterans were then randomly exposed to one of the designed messages, and the post-test gauged veterans’ attitude toward the message, their self-efficacy scores, emotional response to messages, and their likelihood of talking to their doctor. The following section details the method and instruments proposed for the three phases.

**Phase I and Research Questions: In-depth Interviews with Vietnam War Veterans**

**Aims of Phase I**

The first phase of the study adopted an exploratory approach to:

1. Explore the veteran’s living conditions during the war.
2. Discuss their attitudes toward health communication material provided by Veterans Affairs and any other veteran organizations.
3. Determine the best media channel for dissemination of health-related information to veterans.
4. Gauge veterans’ general health beliefs and more specifically, their knowledge about bile duct cancer and the liver fluke.
To achieve the aims of Phase I, a qualitative method using semi-structured in-depth interviews was applied. Qualitative research involves answering questions and providing meaning (Crouch & McKenzie, 2006; Creswell, 2014). Additionally, in-depth interviews provide a rich source of information concerning events when individuals cannot be observed in the desired event (Creswell, 2014), such as the Vietnam War.

**Rationale for In-depth Interviews**

In-depth interviews were chosen for several reasons. They are advantageous to conduct, especially when limited knowledge is available on the subject. Additionally, one-on-one interviews also prevent influence from peers or group members—such as in a focus group, which can effect a participant’s beliefs about the subject being discussed. Thus, more privacy allows for participants to share their views without hesitation of being judged (Babbie 2013).

Moreover, semi-structured interviews were chosen over structured interviews for several reasons. Although in both formats interview questions are preplanned, structured interviews have strict guides that are fixed and have to be followed as designed. Instead, semi-structured interviews allow for more fluidity during the interview, such that questions can be moved around and reordered (Cohen & Crabtree, 2006). This was beneficial in the current phase as exploring veterans’ knowledge and attitude toward the liver fluke and bile duct cancer had not been studied before; thus, the interviewer had the flexibility to rearrange questions according to the veterans’ responses and maintain a fluid conversation. Furthermore, conducting semi-structured interviews allowed for additional follow-up questions to clarify veterans’ responses and request more information on the issues brought up (Biagi, 1992; Berger, 1998; Bernard & Ryan, 2010; Krueger, 1988). Finally, semi-structured interviews permitted a degree of leniency to deviate from the topic, allowing the veterans to share their thoughts and experiences as they would
during a natural conversation, this was intended on making respondents feel more at ease with the interviewer (Segal, Coolidge, O’Riley & Heinz, 2006).

**Interview Guide**

The semi-structured interview guide was designed based on the three aims of this study phase and was divided into four sections (see Appendix A for interview guide). The goal of the first section was to determine the living conditions of Vietnam veterans during the war. As the objective of the current study was to inform and educate Vietnam War veterans about the possible harms of the liver fluke and the connection with bile duct cancer, the interview guide began with determining veterans’ dietary and living conditions to establish the risk of their exposure to the parasite. The following research question is proposed:

**RQ1:** What dietary and sanitary conditions did the veterans have during the Vietnam War?

The second section determined veterans’ attitude toward any healthcare correspondence and health messages that were sent out by the Department of Veterans Affairs (VA) and other veteran organizations such as the Vietnam Veterans of America (VVA). Upon review of the literature, there is an overall paucity of research in regards to healthcare messages delivered by the VA and other veteran organizations. This phase enabled the study to understand veterans’ attitude toward messages from the VA and other veteran organizations. This helped determine the level of trust veterans had toward these organizations and aided in developing health messages in study Phase II.

Prior research on veterans’ healthcare has shown a lack of consensus in regards to veterans’ trust of health messages delivered by these entities. High levels of trust, or a lack thereof, would likely affect the way veterans perceive health materials from such sources as previous studies have shown trust is a key factor in individuals’ message acceptance and adherence (Kareklas, Muehling & Weber, 2015). A Pew Research Center poll surveyed 1,853
veterans (33% of who were seriously injured in the Vietnam War and 26% in the post-Vietnam - pre 9/11 era), 52% of who indicated that the government had not helped them enough with their health conditions. Respondents also reflected a lack of trust in governmental veteran entities and consequently messages that were sponsored by the entities (Morin, 2011). In contrast, a 2013 independent study released by the Department of Veterans Affairs Office of Public and Intergovernmental Affairs (2014) reported 93% of veterans held a highly favorable attitude toward the VA and more than 90% of these respondents were satisfied with the VA healthcare services. These respondents also indicated they would use the VA’s healthcare services again. Thus indicating a level of trust and positive attitude toward the correspondence that came from the entity.

Given these discrepancies in reported veteran attitudes toward the VA healthcare services, and the lack of research available on attitude toward health messages produced by the VA and other veteran organizations, the following research questions are proposed:

**RQ2a:** What are Vietnam War veterans’ attitudes toward health messages disseminated by the VA who reside in the state of Florida?

**RQ2b:** What are Vietnam War veterans attitude toward health messages disseminated by other veteran organizations such as the Vietnam Veterans of America who reside in the state of Florida?

The third section of the interview guide explored veterans’ health media consumption. In a study on veterans’ media consumption, Houston et al. (2013) concluded that more than half of the veterans in the study accessed the Internet for health-related information; however, the study did not state what portion of the participant pool was Vietnam era veterans. Although a Pew Research Center (2018) report indicated 87% of Baby Boomers regularly use the Internet and approximately 44% of the online Baby Boomers use the Internet to search for health-related
topics (Kennedy & Funk, 2015), these statistics cannot validate an assumption on Vietnam veterans’ health media consumption. Therefore, understanding how best to target the Vietnam veteran population for disseminating health messages is necessary; hence, the following research question is proposed:

**RQ3**: What media channels do Vietnam War veterans in the state of Florida go to for health-related information?

The final section of the interview guide was designed to assess the current health beliefs and behaviors of the Vietnam War veterans, their health influencers, and their knowledge of bile duct cancer and liver flukes. This section questioned veterans about their current health status, how cognizant they were about their health, and how proactive they were in taking care of their health. Additionally, this section asked veterans about their health influencers and sources of health information. This section was adapted from Jackson, Steptoe, and Wardle’s (2015) study on health influencers. The study found that individuals would change their behavior (i.e., quit smoking, eat health, etc.) if someone in their close circle of influence—family, doctor, and friends—would encourage them or change the behavior. Although the current study did not attempt to change veteran’s behavior, it did aim to encourage veterans to talk to their doctors about their risk of developing bile duct cancer and be tested for liver fluke infection. This section of the interview guide aimed to determine which individual—family, doctor, friend, etc.—in the veterans’ social circle influenced their health beliefs the most and would be a credible source that would encourage the veterans to talk to their doctors. This laid a foundation for the second phase of the study (i.e., designing health messages with a voice of influence that resonated best with the veterans).

Furthermore, this section also explored Vietnam veterans’ current level of knowledge of bile duct cancer. A baseline knowledge level amongst the veterans in regards to the liver fluke
and its connection to bile duct cancer was necessary to design health messages for Phase II of the study. Based on their knowledge levels and awareness of the condition, Phase II incorporated information on exposure, life cycle, symptoms, screening, and treatment information in the flyers. The current lack of research on bile duct cancer in the Vietnam War veteran population provided an opportunity to add to research literature in this area; thus, the following research questions are proposed:

**RQ4a:** How do veterans perceive their current health?

**RQ4b:** What sources in the veterans’ social circle greatly influence their health behavior?

**RQ4c:** How aware are Vietnam War veterans of the causes and threats of the liver fluke and bile duct cancer?

**Recruitment**

The first step in conducting qualitative research such as in-depth interviews was to identify and recruit individuals who had the necessary information about the research topic and would likely be able to provide answers to the research questions in the study. For this phase of the study, the researcher identified organizations that were involved with or worked with Vietnam War veterans in the North Florida region such as the Veterans of Foreign Wars in The Villages, FL, and the Vietnam Veterans of America (VVA) Chapter 1092 located in Gainesville, FL. The researcher contacted the heads of these organizations who agreed to set up interviews with the residents of the Villages and members of the VVA #1092 who had served in the East Asian region during the Vietnam War. A total of 40 individuals were identified as possible recruits for the interviews. After Institutional Review Board approval was obtained, the researcher conducted interviews with 20 veterans as thematic saturation was achieved (Creswell, 2014; Charmaz, 2006). Thematic saturation occurs when the researcher observes no new themes and topics (Glaser & Strauss, 1967; Guest, Bunce & Johnson, 2006).
Procedure

The researcher contacted veterans via phone and email and requested them to participate in an interview. The researcher informed veterans that the interview would explore their health behaviors and attitudes toward veteran organizations. Veterans were also informed that the interview would be audio recorded for data analysis. After informing veterans of the broad research aim, the researcher asked veterans for a convenient time, date, and location to conduct the interviews. These semi-structured interviews were conducted at the veteran’s location of choice. Each interview lasted between 30-60 minutes.

The first step in the interview process was to administer the informed consent to the participants, explaining the aim of the interview as well as requesting them to consent to an audio recording of the interview. All participants consented to audio recording, and the researcher proceeded to record the interaction until the interview was over and the researcher thanked the veterans for their time and participation.

Analysis

Interviews were transcribed using the REV transcription service software. The researchers and a fellow graduate student coded interviews using the constant comparison method (Glaser, 1965) for emerging themes based on the four research questions. A semi-structured guidebook (see Appendix A) was created based on the research questions that guided the researcher and graduate student to look out for specific themes in addition to the emergent themes (Burnard, 1991). The researcher and graduate student coded two interviews and met to discuss the findings. Themes were compared to determine that transcripts needed to be reviewed again and analysis needed adjustment regarding observed themes (Creswell, 2014; Burnard, 1991). The researcher and graduate student coded two more interviews and met again to discuss observed themes in the analysis. Both coders found similar themes the second time. The
researcher then proceeded with coding the remainder 60% (n=10) of the interviews, while the graduate student coded the remaining interviews.

**Phase II and Research Questions: Focus Group Study Design for Bile Duct Cancer Message Targeted at Vietnam War Veterans.**

**Aims of Phase II**

Using data collected from the in-depth interviews in study Phase I, study Phase II aimed to design and test health messages with a sample of veterans. Phase II focused on the educational health campaign design, which included:

1. Message design (InDesign)
2. Message testing (5 focus groups were conducted with veterans from the North Florida region)

**Message Design**

The researcher proposed to use a single page flyer format to disseminate the health message. A flyer, most typically, is a single page that allows the reader access to all the information on one page (Fawcett, Francisco, Schultz, Berkowitz, Wolff & Nagy, 2000). This format was chosen because PSAs distributed by the VA and VVA use flyers or brochures so that respondents would be familiar with the message format. Flyers also are easy to view both online and in print. For the message testing in focus groups, participants were shown messages in print form because it was easier to set up in a focus group and participants weren’t distracted by computers. However, veterans were also exposed to the health messages electronically for the actual experiment in Phase III, so flyers are a good choice given they work well in both formats.

Concerning message design, a professional graphic designer from UF Online’s marketing department designed the message using InDesign. Because health messages are likely to be read non-linearly, lists and headings were used in the messages design to help participants understand what the section informed them about and enabled them to find necessary information with ease.
when reading (National Cancer Institute, 2003; Wright, 2003). Furthermore, as members of the target population are classified as seniors, the copy was presented using an easy-to-read, sans serif typeface at 12 to 14-point (Goodman, Theis & Shenkman, 2017). The written content was presented with images, light-colored space, and vivid colors for ease of reading (Bitterman & Shalev, 2004; Given, Ruecker, Simpson, Sadler & Ruskin, 2007; Shafer, Cates, Diehl, Hartmann, 2011).

While prior research has confirmed that type size, colors, and layout contribute to ease of message comprehension, images used also affect message believability and acceptance (Bitterman & Shalev, 2004; Shafer, Cates, Diehl & Hartmann, 2011). For example, Shafer, Cates, Diehl, and Hartmann (2011) conducted a study to determine the impact of HPV vaccination messages on mothers whose adolescent daughters had not been vaccinated. The researchers used images of women and girls about the same age as the respondents and their daughters. Respondents reflected that in-group identity, such as being a mother or being of the same race as shown in the message helped them identify with the models in the message. Hence, images used in Phase II of this study were chosen to reflect personal context and group identity for the veterans by using an image of a Vietnam veteran, colors from the VVA logo—yellow, blue, and green—as well as images of veteran emblems such as the golden eagle, and the American flag.

As reviewed in Chapter 2, this study aimed to test which efficacy source—vicarious experience or verbal persuasion—was more effective in prompting behavior intention. Additionally, this study aimed to determine which message source—expert (i.e., doctor) or social group member (i.e., fellow veteran) was more likely to prompt behavior change. Thus, this phase proposed to design two health messages based on the self-efficacy sources—vicarious
experience and verbal persuasion—with each message further having two versions featuring either a doctor or a fellow veteran. Hence, a total of four versions were designed—(1) vicarious experience narrated by a doctor, (2) vicarious experience narrated by fellow veteran, (3) verbal persuasion narrated by a doctor, and (4) verbal persuasion narrated by a fellow veteran. The message content—amount of information on the liver fluke, and its association with bile duct cancer—was based on results from the interviews conducted in Phase I.

**Message Content**

**Verbal persuasive message.** The single page flyer featured an image of a doctor narrating how one of his Vietnam veteran patients asked to be tested for the liver fluke. The doctor informed the reader of the liver fluke, its prevalence in East Asia and its connection with bile duct cancer. The narrative also informed readers about a recent study conducted by the VA that showed 1 in 4 veterans tested positive for the parasite. The doctor urged all veterans who had been stationed in the East Asia region during the Vietnam War to get tested for the parasite. The second flyer presented the same message except it featured a veteran narrating the message. The second flyer featured the same model, but this time in a Vietnam veteran ensemble—wearing a t-shirt with VVA logo.

**Vicarious experience message.** Vicarious experience messages (i.e., message 3 and 4) featured the same model (doctor and veteran) and background information as in the verbal persuasive flyers. However, in this set of flyers, the model was vicariously delivering the message by including a narrative script that guided veterans to discuss testing with their doctors. This script emerged from the interviews in Phase I and included information such as veterans telling their doctors about their deployment in Vietnam and whether they consumed untreated water from rivers and streams or raw/undercooked fish and snails. Veterans were also asked to
mention the VA study conducted in 2017 to their doctors. Finally, the script informed veterans to request a test for the liver fluke and ask to be regularly monitored for bile duct cancer if needed.

Additionally, the researcher aimed to keep written text at or below a sixth-grade reading level in agreement with the Institute of Medicine’s concerns that individuals who have difficulty reading above eighth-grade levels may find health messages challenging to read, comprehend and consequently act upon (Makoul, Krupat & Chang, 2007). For this purpose, the copy of the message was subjected to a Lexile readability analysis. Lexile scores are calculated using sentence length and word frequency; hence, a sentence or paragraph’s Lexile value of 855L to 1165L indicates a 6th-grade reading level (Lexile.com).

Furthermore, the message design was also guided by the emergent theme of optimistic bias in Phase I. The message featured a narrative about how Brad the veteran and the doctor’s patient asked to be tested for the condition. This narrative was meant to address optimistic bias in the veterans who presumed they were never exposed to the risk factors. The narrative stated that the veteran was curious about hearing of the condition in the news and asked his doctor to be tested. Through this, the research also intended to minimize the level of explicit threat, as that was not the intention of this study.

Additionally, as this stage explored veteran’s understanding of and attention to the message content, the researcher selected five additional images of doctors and veterans to test as alternative images with the respondents. The researcher selected alternative images and reviewed by advertising research experts. These images were selected from stock image websites including iStock® (www.istockphoto.com) and Shutterstock® (www.shutterstock.com). Due to a lack of research in veterans’ attitude toward health messages, alternative images were selected,
as the researcher and advertising experts were not definitive about which model the veterans
would identify with most.

**Rationale for Message Testing Through Focus Groups**

These messages were tested in focus groups before being tested in the larger population
in Phase III. Message testing complements the idea of patient-centered approach by involving the
target audience in message design (National Cancer Institute, 2003). Moreover, message testing
is done to test message concepts—type of appeal, source likability, message comprehension, and
action intention clarity—so that the messages are understood by the target audience as intended
by the makers of the messages (National Cancer Institute, 2003; Armstrong, Adam, Denize &
Kotler, 2014 p.245). Based on the aims of study Phase II, the following research questions are
proposed:

**RQ6:** Could veterans differentiate between vicarious experience and verbal persuasive
messages?

**RQ7:** Did veterans find the written information easy to comprehend?

**RQ8:** What was veterans’ attitude toward the message creative—images, colors, layout and
font?

**Recruitment**

After Institutional Review Board approval was obtained, the researcher conducted 5
focus groups with 3-4 participants per focus group session, until thematic saturation was
achieved (Krueger & Casey, 2014; Morgan, 1997). Only three of the original interviewees
participated in the focus groups. Focus groups were conducted from November 14th, 2018, to
November 30th, 2018. A total of 60 Vietnam veterans were identified through the VVA chapter
1092, VFW Post 2811, and the Veterans Village, Fort McCoy. These veterans were contacted via
email and phone to participate in the focus groups. Potential participants were informed that the
sessions would be audiotaped, prospect participants who refused to be audio recorded were
thanked for their time and exclude from the subject pool. Veterans who agreed to be audio
recorded were informed of designated times when the focus groups were to be conducted and
were requested to sign up for a two-hour time slot. Focus groups lasted between one to two hours
and were held at the Veterans of Foreign Wars Post 2811, Gainesville, Florida, and the Veterans
Village, Ocala, Florida (Table 4-2 for focus group participation, dates, locations, and duration).

Procedure

As the main aim of study Phase II was to test the developed messages with veterans and
to determine if the messages resonated with the target population, the focus group script included
questions about veterans’ attitude toward the messages content, source, and general like or
dislike for the messages. In general, the focus groups were semi-structured; this prompted an
organic discussion in the group. The focus group guide (see Appendix A) was divided into three
main sections: the introduction included a welcome note, the informed consent, an icebreaker
question, and introduction questions. The second part included reviewing all four health
messages and a discussion on the content, creative, comprehension, likability of the messages,
and suggested changes. The third part included reviewing and discussing additional images of
doctors and veterans, and a closing thank you note.

Before each session, the researcher set up a table with 4-6 chairs facing each other such
as in a group setting, according to the number of participants for that session. An audio recorder
with two extended microphones was placed in the center of the table to clearly record
participants’ speech even if they were further away from the recorder. Once all participants
arrived, the researcher—who served as a moderator for the sessions—welcomed the participants
and reviewed the informed consent with them. Participants were also reminded that the session
would be audio recorded. Once the participants reviewed the consent, the moderator began the audio recording. The moderator began the session with a brief introductory statement about the topic that gave the participants a general idea about the purpose and direction of the conversation (Morgan, 1997). The introduction also included a brief summary of the rules and expectations of proper group etiquettes and respect for difference in opinion. Participants were also informed that there were no correct or incorrect answers, the study’s only interest was to explore their opinions and feelings about the health messages.

After the introduction, the moderator began the session with an icebreaker question (Morgan, 1997) that allowed participants to briefly introduce themselves by stating their rank, division, year of deployment in Vietnam, and their current occupation. The next section introduced a short description of the liver fluke and its connection to bile duct cancer. Veterans were then asked to talk about their feelings if they had to talk to their doctors about this condition. After this, the moderator asked participants to view the first set of messages and encouraged them to make notes and write their thoughts on the sheet of paper provided to each participant. The order in which each group was shown the health messages was randomized; however, participants were shown messages in a pair (i.e., vicarious experience narrated by doctor and veteran, and verbal persuasion narrated by doctor and veteran). The order in which the doctor and veteran messages were presented to the veterans was also randomized to reduce order bias that may occur when viewing messages. The researcher used a random number generator online to pick the order in which the messages were shown. The moderator also asked participants to talk about their attitude toward the messages shown—more specifically, their attitude toward the message content, and spokesperson likability and credibility. After each set of messages was discussed, the participants were asked if they would change anything in the
messages shown. Additionally, after each section, the moderator summarized the discussion for the group before moving on to the next session.

After the participants viewed and commented on both sets of messages, they were shown alternative photos of doctors and veterans. Participants were asked to pick out any alternative photo they found more appealing. Participants were given a few minutes to look over the photos and encouraged to compare them with the original doctor/veteran images in the messages. Participants were then asked to talk the group through their selection. Once the discussion was over, participants were thanked for their time and participation and dismissed.

**Analysis**

The focus groups were recorded and transcribed by the researcher using the transcription software REV. An initial codebook was created for *a priori* deductive coding (see Appendix A) of themes specific to the aims of study Phase II and was expanded as new themes emerge during analysis. The researcher also transcribed and reviewed each focus group before conducting the next focus group, which allowed for new lines of inquiry that could be addressed in the next set of focus groups.

After initial open coding was done, the researcher applied axial coding to the process to categorize the most relevant and recurrent themes (Corbin & Strauss, 2015). According to Creswell (2014), axial coding refers to breaking up individual codes initially and then connecting them to one another. The researcher enlisted the assistance of a graduate student trained in qualitative data analysis who served as a second coder on the study. Using Glaser’s (1965) constant comparative method, the researcher and graduate student both coded the first focus group transcript and met to discuss the themes based on the established codebook in addition to the new themes observed. Multiple themes were agreed upon and collapsed into umbrella themes. Due to the inductive scope of this research, intercoder reliability was not calculated for
the study (Walsh-Childers & Braddock, 2014), rather themes were explored as recommended given little to no prior information was available on the topic (Van Gorp, 2010). After discussing and resolving differences in themes and codes, the researcher and co-coder coded the second focus group and met to discuss the findings. Both coders observed similar findings the second time, the researcher then analyzed half of the remaining transcripts, and the second coder analyzed the other half.

**Phase III, Hypothesis and Research Questions: Experimental Design**

**Aim of Phase III**

The third phase of the study aimed to determine the effectiveness of the designed flyers in motivating veterans to talk to their doctor about being tested. For this purpose, flyers were tested with a larger Vietnam veteran population throughout the State of Florida. This stage of the study adopted a quantitative approach—experimental design—to test the effectiveness of the health messages and the efficacy sources in prompting veterans to talk to their doctors about being tested. A 2(efficacy source) x 2(spokesperson) posttest-only experiment was designed for this purpose. Kirk (2012) describes an experiment as an investigative procedure in which subjects are randomly assigned to one or more manipulated independent variables to observe the effects on one or more dependent variables. Additionally, manipulation of independent variables and the random assignment of subjects to one of the manipulations distinguish experiments from other research methods (Kirk, 2012).

**Rationale for Experimental Design**

To test the proposed hypotheses, a between-subjects 2 (source efficacy [i.e., vicarious or verbal persuasion]) x 2(spokesperson [i.e., doctor or veteran]) posttest-only experimental design was pursued. Babbie (2013) describes a posttest-only design as a true experiment where none of the groups are exposed to a pretest and the experiment begins with the respondents being
exposed to the stimulus. A pretest measuring respondents’ self-efficacy in talking to their doctors about bile duct cancer and liver fluke testing was not measured, as it would sensitize respondents to the experiment. The present study used an experimental method because experiments are the primary tool for exploring a causal relationship between variables. Experiments can isolate the independent variable and establish time order and correlation, which are criteria for causation (Babbie, 2014). Moreover, experiments have been used to study a wide variety of topics in advertising and health care research; from gauging participants’ attitude to advertising (e.g. MacKenzie & Lutz, 1989), to determining what messages work best in promoting cancer screening (e.g. Anderson, 2000; Schapira & VanRuiswyk, 2000).

More recently, experiments have been conducted online to overcome geographical restrictions imposed by traditional in-lab experiments (Reips, 1998). Using the Internet to conduct experiments allows reaching a target population that previously may not have been targeted. This can lead to an increased number of responses and thus, a higher statistical power resulting from the greater response size (Reips, 2000). Moreover, online experiments diminish several threats to external validity\(^2\) such as the Hawthorne effect (Reips, 1998), which results in modification of behavior in response to being watched (McCarney, Warner, Iliffe, Van Haselen, Griffin & Fisher, 2007). Furthermore, true random assignment of respondents online diminishes volunteer bias\(^3\) that may result from respondents choosing to participate in one experimental group versus another. While volunteer bias cannot be completely removed, given participating

\(^{2}\) The extent to which responses from a sample can be generalized into the population (Heffner, 2004)

\(^{3}\) Volunteer bias occurs when respondents choose a study or treatment group based on their characteristics and affinity for the study (Jordan et al., 2013)
respondents expressed interest in the study to begin with (Jordan et al., 2013), random
assignment of participants helps diminish this bias.

Additionally, online experiments also lower the effects of demand characteristics\(^4\) (Repis, 2000) that will influence participants to respond favorably to or be in agreement with the experimenters’ research objective (Heffner, 2004). In online experiments, respondents would not be directly exposed to the researchers; thus, the demand characteristics would not be as pronounced (Repis, 2000). Moreover, conducting experiments online enables easier recruitment of a niche target population on a large scale without being restricted to a physical location (Reips, 2000). In the case of Vietnam veterans, there are not large enough clusters of them in locations such as Gainesville, Florida, so the needed number of subjects would have been harder to achieve in a laboratory experiment and require multiple locations across the state. In addition to ease of recruiting, online experiments facilitate ease of participation as well, since respondents do not have to schedule appointments and travel to the experiment location. Given that some of these subjects were disabled due to their service, transportation was potentially more of an issue. Finally, conducting the proposed experiment online more closely mimicked exposure to an actual health message, as respondents viewed these messages on their computers at work or in their home. These are likely environments in which they would otherwise be exposed to such targeted informatory messages (Ha, 2008).

As Phase III aimed to test health messages that were guided by Bandura’s self-efficacy theory (1977), the following section proposes research questions and hypotheses in the order of

\(^4\) Demand characteristics are subtle cues given off by experimenters that change or reinforce participants’ responses during an experiment (Reips, 2000)
Bandura’s (1977) sources of self-efficacy—vicarious experience, verbal persuasion, and emotional response.

**Hypothesis and Research Questions**

**Vicarious Experience and Verbal Persuasion**

In regards to vicarious experience and verbal persuasion, Phase III aimed to explore vicarious experience as the most effective efficacy source in enhancing individual’s self-efficacy and forming a positive attitude toward the message that would lead to positive outcome expectation and consequently prompt behavior intention (Anderson, 2000; Weber et al., 2007).

To test the effectiveness of these two sources, the following hypothesis are proposed:

**H1:** Veterans exposed to the health message featuring a doctor vicariously guiding readers to talk to their providers about being tested for the liver fluke will have a

1. more positive attitude toward the message
2. more positive outcome expectation
3. higher efficacy score
4. greater likelihood of talking to their own doctors

as compared to veterans who were exposed to the message featuring a doctor verbally persuading them.

**H2:** Veterans exposed to the health message featuring a fellow veteran vicariously guiding readers to talk to their providers about being tested for the liver fluke will have a

1. more positive attitude toward the message
2. more positive outcome expectation
3. higher efficacy score
4. greater likelihood of talking to their own doctors

as compared to veterans who viewed a message featuring a veteran verbally persuading them.

**Emotional Response**

Furthermore, as proposed in the Chapter 2, this phase aimed to measure emotional response to the messages rather than manipulate it as an efficacy source. Emotional response is characterized by the extent to which veterans found the health messages appealing, how engaged
they were with the messages, and how empowered they felt after viewing the messages. Prior research has explored the effects of emotional response on efficacy in regards to workplace satisfaction (Billingsley, Carlson & Klein, 2004), and task performance attrition (Ruble, Usher & McGrew, 2011). Research has also explored changes in self-efficacy in response to a single emotion such as fear (Anderson, 2000). However, researchers have not explored the three dimensions of emotion in regards to self-efficacy. Emotional response is important to explore and understand as it is closely related to attitude toward messages and behavior intention. This study is also a first in determining emotional response to service-related health messages in Vietnam veterans. Hence, due to the exploratory nature of this source of efficacy, the following research question is proposed. Additionally, based on existing literature, the following research question and hypotheses are proposed:

**RQ9:** Which health message (1-4) prompted the greatest positive response in veterans?

**H3:** Veterans experiencing the greatest positive appeal, engagement, empowerment after exposure to the messages, will display a higher self-efficacy score.

**H4:** Veterans experiencing the greatest positive appeal, engagement, empowerment after exposure to the messages, will be more likely to talk to their doctors about being tested.

Furthermore, this phase also explored veterans’ perceptions of the doctor and fellow veteran who were featured in the health messages. Specifically, this phase measured the
credibility of the two sources, which has not been explored in the Vietnam veterans’ population before. Source credibility in this phase was operationalized as the extent to which veterans found the two sources to be experts on the issue and provided accurate information that the veterans found believable. Prior research in the area of source credibility supports both characters (i.e., experts—doctors, and in-group members—fellows from a social group) as being credible sources of information (Grow & Christopher, 2008; Kang & Sundar, 2016). For this purpose, the following research question is proposed:

**RQ10:** Which message source (doctor or veteran) was perceived most credible by veterans?

Figure 3-1 represents a modeled diagram of the research questions and hypotheses posed in Phase III of this study.
Figure 3-1. Model diagram for Research Questions and Hypotheses
Independent Variables

The first aim of this phase was to examine which of the two sources (verbal persuasion or vicarious experience) of self-efficacy was most effective in enhancing veterans’ efficacy in talking to their doctor, as well as prompting veterans’ behavior intention to request a screening test by their providers. Hence, the first independent variable in this phase of the study was efficacy source that was manipulated on two levels—vicarious experience and verbal persuasion. Bandura (1977) defined vicarious experience as learning from observing others model the behavior. Hence, in regards to the current study, vicarious experience is operationalized as veterans learning—from the vicarious messages featuring a checklist—to talk to their doctors about being screened for the liver fluke. The second efficacy source of verbal persuasion can be defined as verbally encouraging individuals to perform a behavior (Bandura, 1977). In regards to the health messages in this study, verbal persuasion was operationalized as simply encouraging veterans to talk to their doctors. The effectiveness of the vicarious experience versus verbal persuasion has been studied extensively in health care research in terms of stimulating a healthy or preventative behavior, screening for cancer or managing treatment behaviors with cancer patients (Weber et al., 2007; Miabach & Flora, 1993; Anderson, 2000). However, the effectiveness of either source has not been explored in the Vietnam veteran population.

The second independent variable in this phase was the source of information. The spokesperson was manipulated on two levels: 1) doctor and 2) fellow veteran who narrated the health messages. These two sources were chosen based on prior literature that states a source is credible based on the relevant experience and knowledge they have on the topic under study and whether they can be trusted (Brown & Basil, 1995; Hovland, Janis & Kelly, 1953).
Dependent Variables

This phase of the study evaluated six dependent variables:

1. Behavior intention
2. Communication self-efficacy
3. Attitude toward health messages
4. Source credibility
5. Emotional response to health messages
6. Outcome expectation

As discussed in the Chapter 2, prior research shows that either—or all—of the four efficacy sources are meant to increase individual self-efficacy on the topic and consequently prompt the desired behavior (Anderson, 2000; Weber et al., 2007; Zhang et al., 2014; Graham, Prapavessis & Cameron, 2006; Lee, Arthur & Avis 2007). Additionally, advertising literature reviewed indicates that messages stimulate a range of emotional response, rather than a single discrete emotion (Ju, Jun, Dodoo & Morris, 2015), which in turn leads to behavior intention and behavior performance (Dillard & Nabi, 2007). The following section will review the dependent variables in Phase III of the study.

Behavior intention

Behavior intention is defined as the perceived likelihood that an individual will perform the task or behavior being promoted (Lutz, MacKenzie & Belch, 1983). Behavior intention in this phase of the study was veterans’ intentions to talk to their doctors about being tested for the liver fluke. Veterans’ intention was measured using four behavior intention statements on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7), adapted from Schifter and Ajzen (1985) study on weight loss intention. The original scale obtained an $\alpha=.88$ and featured statements such as “I intend to reduce weight over the next six weeks” and “I will try to reduce weight over the next six weeks” and “I am determined to lose weight over the next six weeks,” these were adapted to read: I intend on talking to my doctor about being screened for the
liver fluke at my next appointment, I will talk to my doctor about being screened for the liver fluke at my next appointment, I have decided to talk to my doctor about being screened for the liver fluke at my next appointment, and I am determined to talk to my doctor about being screened for the liver fluke at my next appointment. Each statement was also subjected to a readability test using the Lexile readability analysis. Statements scored between 100L (1st grade reading level) to 900L (8th grade reading level) with an overall score of 800L-900L indicating 6th-8th grade reading levels.

**Communication self-efficacy**

The second dependent variable in this phase was veterans’ communication self-efficacy. Bandura (1977) defined self-efficacy as an individual’s confidence in their ability to perform a certain task. Phase III operationalized, veterans’ communication self-efficacy as their confidence in their ability to successfully talk to their doctor about the liver fluke and its association with bile duct cancer and to request a screening test. While self-efficacy is a key determinant of behavior intention, these two constructs are conceptually different and are empirically measured separately (Bandura, 2005). Therefore, veterans’ communication self-efficacy was measured using an adapted version of Axboe, Christensen, Kof od and Ammentorp’s (2016) 10-item communication efficacy scale with an internal consistency of \( \alpha=.95 \). The items were measured on an 11-point scale ranging from *not at all certain* (0) to *highly certain* (10). The scale was originally developed for and tested with physicians to explore their efficacy in communicating with their patients. The scale items were adapted from the original statement of “*How certain are you that you are able to successfully make an agenda/plan for conversation with the patient*” and “*How certain are you that you are able to successfully clarify what the patients knows in order to communicate the right amount of information*” to “*How certain are you that you can successfully make a plan to talk to your doctor about liver fluke screening*” and “*How certain are you that
you can successfully double-check information you have about the liver fluke before talking to your doctor about screening tests." The researcher followed Bandura’s (2005) guidelines in adapting the scale by using the word ‘can’ as can implies an individual’s judgment of capability (Bandura, 2005, p.308). Each statement was also subjected to a readability test using the Lexile readability analysis. Statements scored between 100L (1st grade reading level) to 900L (8th grade reading level) with an overall score of 800L-900L indicating 6th-8th grade reading levels.

**Attitude toward health messages**

The fourth dependent variable in this phase of the study was attitude toward the health message. In regards to the current study, attitude toward message is defined as individuals’ response to that specific health message in a favorable or unfavorable manner (MacKenzie & Lutz, 1989). Researchers have noted that likability is the main underlying characteristic of individuals’ attitude toward messages (MacKenzie & Lutz, 1989; Bergkvist & Rossiter, 2009). Hence, if individuals have an overall favorable attitude toward the message, they would be more accepting toward the message content, as well as more likely to adhere to the call to action in the message (Bergkvist & Rossiter, 2009). For this purpose, veterans’ overall attitude toward the message was measured as a dependent variable using MacKenzie and Lutz’s (1989) 3-items (interesting/boring, favorable/unfavorable, and irritating/not irritating) measured on a 5-point bipolar scale with an original internal reliability of α=. 89 (MacKenzie & Lutz, 1989). Veterans’ overall attitude toward the health message provided an indication of their message favorability and action intention.

**Source credibility**

While source of information served as the independent variable that was manipulated on two levels, veterans’ perception of the sources’ credibility was measured to determine the effectiveness of the sources (Kareklas, Muehling & Weber, 2015). Prior research suggests source
credibility comprises of two main constructs: trust and expertise (McGinnes and Ward, 1980). Trust in a source refers to how much an individual believes the source delivering a message to be truthful, while expertise refers to the experience and knowledge that the source holds on the topic (McGinnes and Ward, 1980). Prior research has indicated that the more credible a source is perceived as, the greater is the message’s believability, action intention, and behavior adherence (Mizerski, Golden & Kernan, 1979; Brown & Basil, 1995; Goldsmith, Lafferty & Newell, 2002). Thus, if audiences believe the source delivering the message is credible and an expert in what he/she is saying, the message seems more authentic, plausible, and convincing. For this reason, source credibility in this phase of the study is operationalized as veterans’ perception that the source—doctor or fellow veteran—is believable, trustworthy and considered an expert on the topic of liver fluke and cancer screening (Goldsmith, Lafferty & Newell, 2002). In this phase, source credibility was gauged using Harmon and Coney’s (1982) 6 statements measured on a seven-point bipolar scale with an internal reliability of \( \alpha = 0.88 \). Items included on the bipolar scale were not trustworthy- trustworthy, not expert-expert, not experienced- experienced, and bad- good.

**Emotional response**

The next dependent variable in this study was respondents’ emotional response toward the health message. According to Morris, Woo, and Chi (2003), emotional response is a significant precursor of behavior intention and attitude toward the message. Additionally, measuring emotional response depicts a more robust analysis of the effectiveness of the message (Morris, Woo, Geason & Kim, 2002; Haley & Baldinger, 1991). In regards to the current study, emotional response is operationalized as the extent to which veterans find the messages appealing, and the degree to which they feel engaged with and empowered by the message. Emotional response to the messages was measured using the Attitude Self-Assessment Manikin
(AdSAM®). AdSAM® is a self-administered graphical scale featuring three rows of manikins (on a 9-point scale) and was adapted by Morris (1995) from Lang’s (1980) Self-Assessment Manikin (SAM). Each row of manikins represents one dimension of AEE. For example, the first row of manikins measuring the appeal dimension on a 9-point scale range from a wide grinning manikin, to a happy face manikin to a neutral face manikin, to a frowning face manikin followed by a sad face manikin. The second row of manikins measuring the engagement dimension of emotion feature manikins ranging from extremely excited and activated to a calm face with closed eyes. The third row measuring the empowerment dimension feature different sizes of the manikins ranging from a small manikin representing little to no empowerment to a large manikin bust representing a highly empowered state (see appendix for scale).

AdSAM® has been used in advertising and consumer behavior research to measure the three dimensions of AEE in response to advertising messages (Morris, 1995; Jang et al, 2014; Bashir, Wen, Kim & Morris, 2018) and has been deemed as a reliable and accurate measure of human emotion (McMullem & Morris, 2004). This study utilized AdSAM®, instead of the SAM scales, as its database comprises of an additional 165 emotional adjectives that were scored using the same technique as SAM (Morris, 1995). Additionally, the graphical presentation of AdSAM® facilitated the respondents’ focus on specific feelings about the message without exposing them to the verbal/ written adjectives (Morris, 1995; Ju, Jun, Dodoo & Morris, 2015) that may have different associated meanings for different respondents.

**Outcome expectations**

The final dependent variable in this phase of the study was outcome expectations. An outcome expectation is defined as an individual’s perception that a given behavior would result in certain outcomes. According to Bandura (2005), outcome expectations are important to consider, as these are individuals’ perceived effects that can result from performing the behavior.
Outcome expectations may strengthen or weaken an individual’s intention to perform the behavior based on whether they perceive an outcome to be positive or negative. In regards to the current study, the outcome expectation—finding out the risk of infection (i.e., higher chances of developing cancer) could hinder veteran’s intention of talking to their doctor about being screened. Outcome expectation was measured using Anderson’s (2000) response-outcome expectation scale with an internal reliability of $\alpha=.98$. Veterans were asked to rate their expectations of talking to their doctor about live fluke testing on a three-item, 11-point Likert scale ranging from not at all (0) to extremely (10) using statements such as I believe talking to my doctor about testing for liver fluke is worthwhile, I believe testing for the liver fluke is an effective technique for detecting liver fluke infection, and I believe testing for the liver fluke is an effective first step in monitoring for bile duct cancer. The items were subject to the Lexile readability analysis. The first two statements scored a 100L (1st grade reading level) while the third statement scored a 1000L (9th grade reading level). Combined, all three items scored 1000L-1100L indicating an 8th-9th grade reading level.

**Confounding Variable**

In addition to these six dependent variables in Phase III—intention to talk to the doctor, communication self-efficacy, attitude toward health messages, source credibility, emotional response to health messages, and outcome expectations—it is likely that other factors may influence veterans’ intention to talk to their doctor. In particular perceived risk of disease has the potential to confound the findings. Therefore, perceived risk was also measured in this phase of the study.

**Perceived Risk**

Existing literature supports claims that perceptions of disease risk significantly affect health behaviors. Perceived risk refers to individuals’ subjective perception of the risk of
contracting a disease or developing a health condition (Gore & Bracken, 2005). Erblich, Bovbjerg, Norman, Valdimarsdottir, and Montgomery (2000) determined low perceptions of disease risk resulted in unhealthy behaviors, late diagnosis and poor treatment compliance. Researchers exploring the effects of risk perception of disease with behavior compliance observed similar findings (McCaul et al., 1996; Ma, Fang, Shive, Toubbeh, Tan & Siu, 2007; Tessaro, Mangone, Parkar & Pawar, 2006). For example, Tessaro, Mangone, Parkar, and Pawar (2006) conducted a study with 821 individuals 50 years and older, to determine the main barriers to colorectal cancer screening. Results from the survey and follow-up focus groups revealed that in addition to knowledge of the screening and higher relationship satisfaction with their providers, individuals were more likely to comply with screening if their perceived risk of the cancer was high.

Thus for the current study, veterans’ perceived risk of developing bile duct cancer from liver fluke infection was considered as a confounding variable. This was measured using an adapted version of the perceived risk scale used in Gore and Bracken’s (2005) meningitis study. The scale consisted of 3-items measured on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7) with an internal reliability of $\alpha= 0.85$. Original items reading “I am at risk for meningitis” and “It is possible that I will get meningitis” were reworded to “I am at risk for developing bile duct cancer from liver fluke infection” and “It is possible I may develop bile duct cancer from liver fluke infection.” Each of the three items was subjected to the Lexile readability analysis. All three statements scored a 100L (1st grade reading level). Combined, all three items scored 900L-1000L, indicating an 8th grade reading level.

**Recruitment and Procedure**

The experiment was distributed to Vietnam War veterans via email listservs through the Veterans of Foreign War and Vietnam Veterans of America throughout Florida. In total, Florida
hosts 30 VFW and VVA chapters from Tallahassee in the north of Florida, to Marathon in the Florida Keys. The researcher selected 10 chapters from counties that had high numbers of bile duct cancer incidences as tabulated by the State Cancer Profiles (n.d). These counties included: Miami-Dade County, Broward County, Palm Beach County, Hillsborough County, Pinellas County, Orange County, Duval County, and Alachua County.

According to the Florida Department of Veterans’ Affairs (FDVA), there are 519,843 Vietnam era veterans in Florida (Florida Department of Veterans’ Affairs, 2017). However, this number may vary as not all veterans are registered with the FDVA or are members of VVA organizations in Florida. Additionally, this number has not been updated in the past three years and does not account for veterans who served in the East Asia region, which was the target demographic of this study. Furthermore, the FDVA groups female medical practitioners as Vietnam era veterans as well. To determine the N for the study, the researcher requested the presidents of the 30 VVA chapters to indicate their total membership; however, not all organizations responded and thus the total number of veterans invited to participate could not be conclusively determined.

After receiving approval was from the Institutional Review Board, the researcher emailed presidents of the 10 chapters informing them of the research. Presidents were asked to forward the experimental link to Vietnam veterans in their listserv. The experiment was conducted from January to March 2019. Initially, the researcher emailed presidents and officers of 30 VVA chapters in the state of Florida to request VVA members’ participation in the online experiment. However, because of low participation response, the researcher then traveled to VVA meetings in the North-Central Florida region including St. Augustine, Jacksonville, Ocala, Fort McCoy, and Tampa to conduct the experiment using printed copies of the experimental questionnaire. A
total of 233 respondents accessed the questionnaire on Qualtrics ($n=117$) and in person ($n=52$). Of the 233 veterans, 12 declined to participate, and 29 did not complete the survey so they were eliminated from the pool. Furthermore, 23 participants indicated they were Vietnam era veterans but did not serve in the East Asia region. These respondents were thanked for their time and provided with a debrief on the study.

Veterans who were interested in participating were presented with two screening questions. The first asked if they had been deployed in East Asia during the war. If respondents selected no, they were taken to the end of the questionnaire and thanked for their time. If respondents selected yes, they were presented with a second screening question asking if they had been tested for the liver fluke. If respondents selected yes, they were taken to the end of the questionnaire and thanked for their time. If respondents selected no they were asked to review the informed consent. These questions were used to screen veterans who were not exposed to the liver fluke—as they were not stationed in the East Asia region and those who already been tested for the liver fluke and thus had met the aim of this study.

Veterans who met the criteria (i.e., served in East Asia during the Vietnam War and had not been tested for the liver fluke) and viewed the informed consent were notified about the general aim of the study, their rights as participants, as well as any risks and benefits associated with their participation. The informed consent also listed the contact information of the researcher, supervisor, and the Institutional Review Board if the participants had any further questions and concerns about the research. Once respondents provided consent to participate in the study, they started the experiment.

The experiment was divided into three parts. The first part comprised of questions about veterans’ knowledge about the liver fluke and bile duct cancer. In the second section, veterans
were randomly assigned to one of the four health flyers and were asked to share their thoughts and feelings related to the message. Each respondent only viewed one of the health flyers (using Qualtrics® random assign feature) followed by measuring their emotional response to the message using the AdSAM® scale. This section also measured respondents’ overall attitude toward the message, self-efficacy in talking to their doctor, behavior intention, source credibility, outcome expectation, and perceived risk. The third section presented respondents with general demographic questions about their age, race, level of education completed, current occupation status, and their total household income.

**Statistical Analysis**

The current study aimed to first explore veterans’ current knowledge about the liver fluke and bile duct cancer. Second, design and test health messages that would encourage veterans to talk to their doctors about being tested for the liver fluke. And third, to test the health messages in a larger veteran population to determine their effectiveness. While Phases I and II were exploratory in nature, qualitative data analysis using thematic coding was used to answer the research questions.

In Phase III, the 2x2 experiment was conducted to determine the effect of the two independent variables—efficacy sources and spokespersons, on the six dependent variables—behavior intent, communication self-efficacy, attitude toward health messages, source credibility, emotional response, and outcome expectation. In order to test the proposed hypotheses, multivariate analysis of covariance (MANCOVA) (H1 and H2), and a multiple regression were performed (H3 and H4). To answer the research questions, a between-subjects ANOVA (RQ9) and an independent samples t-test (RQ10) was performed.
For Hypotheses 1 and 2, multivariate analysis of covariance (MANCOVA) were performed. A MANCOVA tests the influence of two or more independent variables on multiple dependent variables as well as compares means of different groups. The advantage of conducting a MANCOVA over a regression analysis or an ANCOVA is that it tests the main and interaction effects between the independent and dependent variables while controlling for the effect of the confounding variables. Additionally, a MANCOVA allows for analysis of multiple dependent variables that an ANCOVA does not permit.

For Hypotheses 3 and 4, multiple linear regressions were carried out to test the relationship between AEE and self-efficacy (H3), and AEE and behavior intention (H4). A multiple linear regression was carried out for these two hypotheses instead of a simple linear regression as the former allows for analysis of the effect of two or more independent variables on one dependent variable that was being tested here.

Furthermore, for Research Question 9, an ANOVA was performed as an ANOVA compares the mean scores between groups. For Research Question 10, an independent samples t-test was performed. An independent samples t-test is used when two sets of independent groups are being compared; it determines if there is a significant difference between the mean scores of two groups.

The statistical analysis was be performed using SPSS® V23.
CHAPTER 4
RESULTS

The current study adopted a mixed-methods approach first to determine the level of knowledge veterans held about liver fluke and its association with bile duct cancer. The aim was also to design health messages to inform veterans about this cancer and to test the effectiveness of these messages among a larger veteran population. Thus, Chapter 4 is divided into three sections. The first section reports the results of in-depth interviews conducted in Phase I of the study. Next, the second section details the focus group results that tested the designed health messages in Phase II. Finally, the third section presents findings from the experiment in Phase III.

Phase I - In-depth Interviews

The first phase of the study adopted an exploratory approach to understand the veterans’ living conditions during combat situations during the Vietnam War and discuss their attitudes toward health communication material provided by Veterans Affairs and other veteran organizations. Most importantly, this phase gauged veterans’ general health beliefs and more specifically, their knowledge about bile duct cancer and its connection with liver fluke. After conducting interviews, the researcher then transcribed the recordings and analyzed the transcripts to answer the research questions. The following section details the descriptive data on the interview participants, followed by an analysis based on the research questions.

Interview Participants

Twenty veterans participated in the first phase of the study. All participants were Caucasian with the youngest being 69 years old and the oldest participant being 84 years of age. Participants had served in the Marine Corps, Air Force, Army, or Navy, each with one to three tours in Vietnam lasting between six to 12 months (Table 4-1).
Table 4-1. Participant Demographics

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**Research Question 1—Dietary and Sanitary Conditions During the Vietnam War**

RQ1 explored the living conditions of veterans during the war to better ascertain the likelihood of their exposure to liver fluke. First, participants were asked where they resided. Eighteen of the veterans stated they had been deployed in the field for some part of their service and recalled living in dugout trenches or “hooches” that were simple huts or temporary structures. Although sanitary conditions at military bases were satisfactory, veterans indicated sanitary conditions in the field were not a priority in a war zone. For example, Participant 6 mentioned:
In the field you had to go when you had to go, you know what I mean. We didn't have facilities like at the base to use or clean up.

Similarly, Participant 13 said:

When you’re out there, you’re out there. Washing your hands is not what we’re thinking of. On base, it was normal. The outhouse was good. Water was flowing in taps, stuff like that.

In terms of food and diet, most veterans mentioned they ate food flown in from the United States while on base, C-rations when in the field, and at local restaurants or homes when they went into the villages or towns. Of these three types of food, C-rations generated the most commentary, and it was largely negative. For example:

We had canned turkey loaf, canned peaches, canned peas, Spam. The biscuits were good to shoot at for moving target practice. It was “food.” (Participant 2)

C-rations were an acquired taste. And you had to acquire it. (Participant 6)

Some veterans indicated that their C-rations had been issued in the 1940s and questioned the nutritional value of the rationed meals for men fighting in the forests of Vietnam. For example, Participant 13 said, “It tasted like crap, what else would it taste like. It was issued in the 1940s.”

A few participants also mentioned instances when their supplies were not replenished causing them to either trade food with each other or with the locals, or to look for food elsewhere such as fishing in the river. For example, Participant 3 mentioned:

In the field, you were out there, and you got C-rations. They’d supply us, and we’d eat the heavy stuff first and then you loaded. Everybody got a case of C-rations that lasted you for three days. You didn’t always get resupplied, but you always tried to keep rucksacks as light as you could. You know, sometimes you’d

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1 C-rations were military issued canned meals for soldiers deployed in the field
go weeks without getting resupplied. You had to improvise then. Your socks were wet. Your shoes were wet. Your clothes were wet. We were miserable, you know.

Similarly, Participant 2 said:

I used to trade [with] this little Vietnamese boy. I traded him one Salem cigarette, one menthol cigarette for two hard-boiled eggs every day.

When asked if they had ever fished in a river, most veterans did not recall doing so. However, one participant said:

Fishing? The Vietnamese will sit for hours with a homemade fishing pole fishing. We just threw a fragmentation hand grenade in the pond, which is usually a bomb crater, then all of the fish came to the surface of the water dead.

The veteran who shared this information had been a member of the Marine Corps and was mostly stationed in the field. He indicated that the group would collect the dead fish and cook them atop their makeshift stoves. However, while most veterans remembered going to restaurants and locals’ homes, most did not recall eating any undercooked or raw fish and snails, which carry liver fluke. For example, Participant 5, who was stationed in Thailand said:

A houseboy invited me to a wedding, and I attended the wedding, and when I was there, I did eat some shellfish. Let me think of what they were, and they were not clams, snails perhaps or mussels…it was out of the Thai river. That was my highest risk that I remember taking was attending the Thai wedding because I had tried many different things [foods].

Furthermore, Participant 20 said:

When you got hungry out there, you’d eat and drink anything. I ate stuff I didn't even know what it was. And I’d eat fish any opportunity I got.

Veterans were also asked if they recalled drinking from rivers and streams while in the field. While veterans’ immediate response was that they did not do so, it later became apparent in most interviews that they did when veterans mentioned filling up their canteens from a stream or river and using purification tablets. For example, Participant 12 said:

Well. Did I? I probably had. I probably filled my canteen. I don't recall. I probably could have since we were just out there.
Participant 1 stated that while he did not fill his canteen from the streams, he did go swimming:

We did go swimming sometime in the creeks and rivers, but I don't remember ever drinking. You may get a mouthful (of water) sometimes.

Only one participant vividly recalled drinking water directly from the streams:

Oh yeah. All the time. We drank water that looked like milk. I was so thirsty I carried 8 quarts of water, and I was always running out of water because you know you go up in the mountains and they’d be no streams and you go down you get down into the streams and nobody use those tablets. They [the tablets] just ruined the taste of water. We’d drink water right out of the river sometimes. When you found water you just drank because you never knew where the Vietcong was.

In summary, veterans indicated satisfactory living conditions on base but described conditions in the field as emotionally and physically taxing. Participants did not immediately recall their eating and drinking behaviors; however, as the interview progressed, they did recall certain risk behaviors that could have exposed them to the liver fluke.

**Research Question 2a—Veterans' Attitude Toward Health Messages Disseminated by the VA**

The second Research Question explored veterans’ attitudes toward Veterans Affairs’ health information materials. Some veterans only recalled seeing brochures and flyers while at the VA hospital. For example, Participant 2 stated:

Yeah, you only see that in the waiting rooms at the VA. You take that home with you, at least I do. Once they find out you have a condition, they will even mail it to you.

Similarly Participant 2 said:

No, I don’t get any information from them. Other than when you are in the waiting area. They got pamphlets and all there, but I don’t get any in the mail.

Although a majority of veterans did recall receiving health information from the VA, they said they did not pay attention to it. For example, Participant 10 stated:

I get regular health care from the VA, and I get regular updates from the VA electronically. Telling me what I need to do is for the doctors. But yeah, I yeah, I'd probably get materials, but I don't pay attention to it.
While Participant 6 said:

Well, there are things telling me about Agent Orange for instance the various cancers and Hepatitis C. There's a bunch of them, but I don't pay much attention to.

When asked why they did not pay attention to material from the VA, some veterans indicated they found the material repetitious. For example, Participant 7 stated, “There’s nothing that they are forwarding me that I don’t already know.” Participants also indicated some of the material was outdated. For example, Participant 15 stated:

[It’s helpful] to some extent. But it can be dated. All right. And the biggest problem I find is that some of the material that’s out there has been there a couple of years, which is not relevant anymore. They just don't update their material they hand out to veterans.

Others indicated a lack of trust in VA research and information. For example, Participant 20 stated:

They’ve spent millions of dollars on research, but they don't give you a solution. I’m still suffering from Agent Orange.

Some veterans also indicated they did not use the VA for their medical needs, as they had insurance that covered other medical providers. Hence, they did not access information from the VA, nor did they signup for correspondence. For example, a participant mentioned he was covered by private insurance at the University of Florida Hospital system and relied on them for treatment of geriatric and service-related conditions. The participant also stated his lack of trust in the VA system due to prior incidents with his friends dying of Agent Orange-related complications, which in turn led to a lack of trust in health information from the VA.

In conclusions, veterans had mixed feelings about the VA health information they received. A few of them thought the VA information was beneficial to them, while others thought it outdated or something they already knew.
Research Question 2b—Veterans’ Attitude Toward Health Messages Disseminated by Veteran Organizations Such as the Vietnam Veterans of America

With the exception of three veterans, all participants (n=17) were members of a veteran’s organization in their area such as the VVA or the VFW. Most veterans had a positive attitude toward health information disseminated by these independent organizations. Veterans stated that the monthly newsletter sent by the VVA was particularly beneficial as it not only held news stories about fellow Vietnam veterans but also addressed any health or life issues the veterans face.

I get newsletters from them [VVA], so they would give us updates about what was going on mostly focused with Vietnam… But the big issues were health, readjustment, getting a job, getting a good education such concerns and that's what the newsletters focus on (Participant 17).

When asked their opinion on health communication from these organizations, some veterans said they trusted the information and found it relevant. For example, Participant 11 said, “I mean, yeah, I trust it. It seems to be helpful. It’s relevant information to me.” Participant 1 stated that the material was direct and concise and said he also liked when such channels told him the specifics of a condition, so he could talk to his doctor about it.

Veterans from different VVA chapters also indicated their local chapters regularly invited researchers, social workers, and health workers to talk to the veterans about health issues or new developments in health care that might positively affect them. As Participant 6 said, “We have speakers that come in and tell us about this and that. Do I pay attention to it? Hell yeah.” While another veteran said:

Yes, we get speakers. They tell us new stuff they found or where I can get my benefits from. Like this one guy would devote every Monday from 9am-6pm helping us file our claims. He would come to our meetings and tell us when he’d be at the post, so all the guys would get with him.
In conclusion, veterans had positive thoughts and opinions about health information disseminated by veteran organizations.

**Research Question 3—Frequently Visited Media Channels for Health-Related Information.**

Veterans were provided a list of multiple media sources that included TV programs such as soap operas and talk shows, news channels and websites such as CNN and Fox News, emails from organizations such as the VA or VVA, social media such as Facebook and Twitter, and medical websites such as WebMD and the Mayo Clinic. They were then asked to indicate which sources they used most frequently for health-related information. A majority (n=16) of veterans indicated that they received geriatric and Vietnam-related health information from organizational newsletters and emails, which they further investigated on medical websites. Veterans also indicated they looked up information online and would discuss it with their physicians if needed. When asked to elaborate on their preferred organizational newsletter or medical website, Participant 1 said:

> I’m a part of the VVA and the VFW. They are great at sending out stuff for like eye care or arthritis care, issues that our generation is beginning to have…. Most recently, they had something about Agent Orange again. You don't know if somebody tells you something if it's a rumor, is it trustworthy or not, so you follow up on it. I go to the medical website, look it up, and then follow up on it [with my primary care at the VA]

Similarly, Participant 13 said:

> The VVA drops stuff [health information] like that in the newsletter on a regular basis. I do trust that information, but for my own curiosity, I go to either WebMD or the Mayo Clinic’s page and see if they got something on it, too.

Furthermore, Participant 14 said:

> If I have questions about health-related information, I'll go to WebMD or Mayo Clinic you know and search for information about whatever topic I'm curious about. So then if I do have a question you know and once a year when I go for my physical I sort of save up some questions if I want more detail about it and then that's when I'll discuss it with him [physician].
Veterans indicated they were actively receiving and searching for health-related information, although not on social media in any significant fashion. Only three of the 20 participants interviewed indicated they were active on Facebook. They only used that platform to stay connected with their families and not for exchanging or obtaining health information. Additionally, none of the participants indicated they received health information from news sources or TV programs. Hence, veterans were consistent in their behavior when it comes to seeking health information. They used newsletters from organizations to which they belong and medical websites for verification of the information they read, which they later discussed with their providers if needed.

**Research Question 4a—Veterans’ Perceptions of Their Current Health**

When veterans were asked how they felt about their current state of health, all but one veteran indicated that they were in good to excellent health. Most veterans stated they exercised regularly (between three to five days a week). Some mentioned walking between four and seven miles a week, while others said they worked regularly on their farm or gardened. As Participant 7 said:

> Well, I'm 75 years old. I drive a tractor trailer, and I deliver plants. I offload plants anywhere from 3,000 plants by hand in a week. Maybe anywhere from five to nine or 10 stops on tractor trailer in Florida. That keeps you in shape.

Participants also said staying physically fit contributed to their mental health. While some veterans openly indicated they experienced PTSD, others indicated that regular exercise was their way of maintaining a balance with their mental health. As Participant 10 said: “I have PTSD. They’ve [VA] been treating me for it. I like to keep fit because that's just a part of it too.” Similarly, Participant 20 said:

> I like to exercise. I walk a mile or two miles every day. It helps clear the head you know. Blow off steam like that.
Furthermore, veterans were asked about their level of confidence in taking care of their health. Most veterans indicated they were very confident in their ability to take care of themselves and monitor their health and well-being. Some participants also indicated if they felt unwell they immediately reached out to their medical provider through the VA’s myhealthyvet.com messages system and sought advice without having to go into the VA.

Veterans also credited being proactive about their physical health.

I’m on top of things. If I have a problem, I have a right to the V.A. I don’t mess with my health (Participant 3).

Similarly, participants brought up the concept of prevention rather than treatment. Veterans felt their age made it important to regularly monitor their health and practice a healthy lifestyle to maintain it:

I believe that as you get older like I'm getting 71 next year, you have to stay on top. You know preventive health care is better to deal with ahead of time, waiting for something to happen is not what I like to do. I like to go in there, and if I have an issue, I get it taken care of (Participant 14).

Some veterans also indicated that they closely followed their doctors’ advice about their health.

For example, Participant 13 said:

Sure, I know what my medical conditions are. I normally do what the doctor says. I guess it comes with old age, but I want to keep healthy because of my lifestyle.

In summary, veterans indicated they were in good health and were strong proponents of preventive care; hence, they maintained a healthy and active lifestyle.

Research Question 4b—Greatest Health Influencers

Most veterans indicated the women in their lives such as wives, significant others, or their daughters were the most influential in terms of their day-to-day health, while their physicians were influential on their overall health. A majority of the veterans interviewed were married and stated their wives were the greatest influence on their
health behavior. For example, a veteran who was married for 34 years said, “My wife knows me. She knows what’s good for my health, and she makes sure I do it, especially if the doc said it.”

Talking about their healthy habits, veterans mentioned how their loved ones had influenced them to quit or adopt healthy habits.

I picked up smoking marijuana in Vietnam. One of the things about my marriage is that my wife made me quit as a condition of our marriage and so I quit marijuana (Participant 16).

Similarly, Participant 14 said he and his wife actively discussed and maintained a healthy diet and exercised everyday:

And so, we mutually discuss you know what is good food for us, what is healthy food, what's a healthy lifestyle, exercising, and for example, we have Fitbits, a watch that counts my step, so we make sure we get our steps in.”

Finally, Participant 7 said:

If left to my own devices, I probably would not do a lot of the stuff that is healthy. OK guy I'm not very good about doing it on my own and for my own sake. But having the motivation that I have, it makes a huge difference and I motivate my wife as well.

Veterans also indicated they adhered to their wives’ or girlfriends’ suggestions for maintaining a healthy life.

I do stuff on my own, you know. Get on my mower, rake the leaves, and stuff. She has a flowerbed that she makes me take care of. Well, she makes me do it all. And you have to listen to her. (Participant 3)

Furthermore, some veterans mentioned their significant others had been in the medical profession and trusted their level of expertise.

You have to listen to her. My wife’s a retired nurse from Shands. She knows what she’s doing. You just have to listen to her (Participant 19).
Similarly, Participant 6 said:

She's extremely knowledgeable. My wife has been a nurse now for 25 years and in different fields, and she keeps up on stuff.

Some veterans also said their daughters were very cognizant of their health needs and did the research for their parents, even accompanying them to doctors’ appointments.

My daughter researches everything. She is like a bulldog. She doesn’t let anything go until she knows and is sure of what is good. And I have to follow her instructions you know. She’s my decision maker (Participant 9).

Similarly, Participant 20 said:

My daughter wants me to stick around for a long time. She makes sure I do what the doctor said. She don't want Dad to go anywhere anytime soon.

However, one veteran indicated his brother—who also served in the military and experienced the same health issues as the participant—had the greatest influence on his health.

I was having some ibuprofen for my hip pain, and he [brother] said to me he said don't take the ibuprofen. That's not good for your heart. It was prescribed by my doctors at the VA in Orlando. I told my brother that I was prescribed, and he said that's absurd. He [doctor] doesn't know what he's doing. So I stopped doing it.

In addition to their loved ones influencing their day-to-day health behavior, veterans indicated that their doctors had influence on their overall health. Veterans attributed positive relationships with their doctors as a key factor.

I think that she listens. I think that's the biggest thing. We'll sit and talk. She'll ask questions. You know I've had the same doctor now for probably six years, and she knows me. I know her (Participant 11).

Additionally, Participant 3 said:

It puts me at ease you know if I have an issue and she explained it to me. I understand it better. It puts me at ease.

Similarly, some participants attributed their doctors’ vigilance and experience as factors that influenced their overall healthy behavior. For example, Participant 13 said:
He's very knowledgeable, and he makes sure the tests are done properly in the proper time and keeps an eye on issues that happened in the past. And he's up-to-date, and he knows my case. So when he tells me to do something, I follow.

Veterans also indicated their doctors were very direct with them.

He's straightforward with you and doesn’t gloss over anything. I like that. If something is wrong with the test results, he’s direct you know and tells me straight what to do or not to. Yeah, I listen to him (Participant 5).

In summary, the veterans mentioned the women in their lives and their physicians as the two major influencers on their health. Vietnam veterans indicated a high level of trust in their own physicians, while their wives and daughters were highly influential in their day-to-day health decisions.

Research Question 4c—Level of Awareness About the Causes and Threats of the Liver Fluke and its Connection with Bile Duct Cancer

Only two of the 20 veterans interviewed (n=18, N=20) knew about the connection between liver fluke and bile duct cancer. One of the participants was aware of the connection because a fellow Vietnam veteran—who died of bile duct cancer—had suggested he get tested. This participant then conveyed that information to his doctor, external to the VA, who immediately tested him for liver fluke. However, when he tried to reach out to his doctor at the VA, he received a negative reaction.

Like I said, I didn't get that warm and fuzzy feeling. And I said to him [VA doctor] look I have some information about this parasite. Can I come by you know next week and give it to you? He said no.

This participant also reached out to the head of the VA in The Villages, FL who said:

And he [VA head] looked it up in his computer and said yes there is some information here. We don't know exactly what the VA is going to do with it.
The second participant who was aware of the connection learned of it from the news media. He said, “Yeah, it’s got to do with your liver. Yeah, I just heard that on TV. Yeah, they said that they tested 700 veterans.”

Besides the two who were knowledgeable, some veterans indicated that they had a vague awareness of the liver fluke. However, when asked, they only knew it to be a parasite or a worm and did not know any specific method of transmission or symptoms of the infection.

No. I mean I’ve heard about it but have no real knowledge on it. It’s like a little parasitic worm (Participant 6).

Overall, veterans had very little knowledge about bile duct cancer and its connection with liver fluke. Even the two veterans who were aware of the association lacked specific knowledge about the parasite, its life cycle, how the disease is transmitted, treated and monitored.

Research Question 5—Emergent Themes in Study Phase I.

The next Research Question addressed the emergent themes from the interviews. Three dominant themes emerged from the in-depth interviews with Vietnam War veterans: optimistic bias, health motivation, and an I-feel-fine-but effect.

Optimistic Bias

One of the most prevalent themes, when veterans were informed about bile duct cancer and its connection with the liver fluke, was their optimistic bias. Optimistic bias is commonly defined as a human tendency to be positive and hopeful rather than realistic. It is akin to the individual’s mistaken belief that their chances of encountering a misfortunate event are lesser—or encountering a positive event are greater—as compared to their peers (Klein & Helweg-Larsen, 2002; Weinstein, 1987). The veterans interviewed in this study displayed optimistic bias to the degree that they believed they were not at risk for developing the cancer, as they did not think they had consumed raw or undercooked fish or snails nor recalled drinking contaminated
water. However, although most veterans did not immediately recall eating and drinking contaminated food and water, they did voice uncertainty as the interview progressed. For example, Participant 20 said after denying personal consumption of contaminated food and drink:

Like I said, we were at war. You have other things on your mind than what if my food and water is it clean. I don't know. I may have had water. I may have had snails at that gathering. I don't know.

Similarly, Participant 13 who was a part of the Infantry said this about Dave, his fellow veteran who recently passed away from complications of liver cancer:

I know Dave probably ate a lot of native food in restaurants, and he drank water there too. But I didn't. I know of a lot of the Infantry would get it, out there in the field when we were out in the field for a long time. And then leeches were common because of the water, but I never knew anything about the fluke. Yeah but I don't recall eating at the natives’ places.

Similar to the current study with Vietnam veterans, optimistic bias has been observed in individuals at risk for colorectal cancer (Blalock-DeVellis, Afifi & Sandler, 1990), lung cancer (Weinstein, Marcus & Moser, 2005), and breast cancer (Katapodi, Lee, Facione & Dodd, 2004). These individuals did not show signs of active concern for their risk and displayed a sense of a lower perceived risk.

Several researchers have also concluded that individuals’ optimistic bias interfered with the adoption of precautionary behaviors (Helweg-Larsen & Shepperd, 2001; Larwood, 1978). For example, in a study to explore middle-aged males’ likelihood of undergoing a prostate cancer exam, the researchers found that participants considered themselves less likely than their peers to develop prostate cancer. The study found no significant relationship between optimistic bias and intention to undergo prostate cancer screening, thus indicating that men with higher optimistic bias were less likely to undergo screening behavior. Similarly, I found that some
veterans who showed optimistic bias were hesitant to undergo testing for liver fluke infection.

For example, Participant 4, who had no knowledge about the liver fluke or bile duct cancer said:

Can it be detected in blood work? The VA does extreme amount of blood work on me. I’ve had them draw up eleven vials of blood. Checked for everything okay. If I had it, they’d tell me okay.

Furthermore, Participant 17 said:

Yeah, you want to ask them [Vietnam veterans], or tell them have you ever consumer water from a stream or other than in your mess hall? I went to South America [in the 1980s] and picked up a parasite, and I had dysentery while I was down there. When I came back here, the VA gave me a medicine that killed anything I could have ever possibly picked up. So I have suffered from that but nothing I got from Vietnam. Like I said, ask them.

Just as was the case for Participant 1, most participants would talk about other digestive track issues from which they had suffered. However, they displayed optimistic bias when it came to the possibility that they might have contracted the parasite or developed the cancer. They clearly felt that the VA would have already told them they had it or would have tested them for it given how much blood work they had undergone with the VA overtime.

Health Motivation

Another predominant theme was health motivation, which was further divided into two sub-themes: personal incentives and family/social motivation. Health motivation was triggered by internal and external agents that motivated veterans to take care of their health, follow a healthy lifestyle, and be cognizant of it (Moorman & Matulich, 1993; Phillips, Schneider & Mercer, 2004). The theme of health motivation was most commonly observed when veterans were asked about the quality of their health in response to a research question. Most veterans responded with “myself” when asked what motivated them to take care of their health. Their internal motivation was attributed to incentives such as living a long life after serving in a war as well as their active lifestyle as military men and athletes. For example, Participant 16 said, “I like
to be active and alive as long as I can,” while Participant 8 said, “I’m an athlete, and that’s how my lifestyle is.” While Participant 4 said:

I want to live long and party long. I enjoy life. Okay. You only get one, and I think I got a second chance at it.

Additionally, Participant 13 who had been a victim of bullying in school and not accepted back in his social circle due to his service in Vietnam said:

I feel living as long as I can is the best revenge for all those who wronged me when I was young. I went back this year for my high school reunion, and I asked about all those guys and guess what? They died. I’m still here. And I love life.

Furthermore, veterans referred to their independent lifestyle as a strong motivator in their need to take care of their health. Veterans also mentioned not wanting to go live in a retirement facility or having to move to living situations where their families could care for them.

I want to live healthy and as long as I can in my house. My daughter thinks dad is old and needs help. But I’m 77 and going strong (Participant 20).

My sisters are both in retirement facilities and boy do I never want to do that. They take your independence from you (Participant 12).

The other motivating incentives were external, mainly family. A number of veterans—as previously stated—attributed their motivation to their spouse and significant other.

I have a family full of people that are looking out for me and motivating me. That’s the thing about me; if I were left to my own devices I probably would not do a lot of the stuff that is healthy (Participant 6).

Okay I’m a guy, and I’m not very good about doing it on my own and for my own sake. But having motivation that I have. It makes a huge difference, and I motivate my wife and she motivates me (Participant 19).

Grandchildren were another external factor. A number of veterans stated the highlight of their year/week was the time they spend with their grandchildren.
Well I want to be around my grandkids. She’s coming to college here and I want to spend as much time with her as I can you know. Can’t do that if you’re sick. Kids don’t like that. (Participant 3)

She’s [daughter] an RN. She has two sons, they are 3 and 5. And her husband is a teacher in South Carolina. They aren’t able to come down because of their work and also the two boys. So, we go up there, and we either drive or fly. Now if I’m sick, chances are my daughter will have to take off from work and probably not bring both the boys. So, I want to make this easy for them and for us (Participant 15).

Additionally, veterans were motivated to stay healthy for their animals. For example, Participant 5 who was 88 years old said:

I have a little dog, my daughter’s dog, and he's Jack Russell terrier. He demands that I walk, so I walk Jaz twice a day morning and afternoon and I do about eight-tenths of a mile every morning. He keeps me motivated.

Similarly, participant 20 said:

I have horses and a small farm. I like taking care of the animals, in a way they take care of me too.

Furthermore, veterans indicated that they did not want to experience health problems like their peers and relatives. Most veterans mentioned individuals in their social circles who were either incognizant or chose to ignore their health issues. This resulted in long periods of ill health and suffering before death. For example, Participant 12 said:

My two sisters, one is one year older than me, one is two years older, and they have a lot of health issues. So maybe that's the motivation for me also because I see what they are going through, I don't want to be them.

Similarly, Participant 20 said:

I don't smoke or drink anymore. My buddy did and he ended up real bad with lung cancer and all sorts of stuff. It was hard to see him go like that. I want to live as long as I can and just drop dead one day hopefully without having cancer or something like that.

Additionally, Participant 11 who lived in a retirement community stated:
When you go to dinner and you hear conversations that work around health issues which we, my wife and I, just get tired of hearing, so I think we really get motivated. I think we do not want to be like them. I don't want to be like them. And so I think that motivates us to try to take care of our bodies and make you live in a longer life.

Hence, veterans are motivated when they observe members of their social circle suffer from health conditions.

The I-feel-great-but Effect

A consistent theme that was observed in a majority of interviews was that while veterans indicated their health ranged from good to excellent, veterans indicated they suffered from a number of service-related or geriatric issues as the researcher delved deeper into questioning their health status. Thus, the I-feel-great-but effect is defined in this study as individuals who suffer from health conditions but overall perceive their health to be good. For example, Participant 6 indicated his health overall was good. However, he was exposed to heavy showers of Agent Orange during his service in Vietnam. He said he did not experience any of the health side effects of the defoliant chemical, yet he stated he suffered from back pain triggered from a helicopter jump in Vietnam that progressed to sciatica in recent years. Participant 6 said, “I have never felt pain like that. Finally, I had my back surgery, so I’m free of that pain. But that was just the back pain. I’m fine overall.”

Similarly, Participant 14 who recently experienced macular degeneration in addition to hypertension and high cholesterol said:

I’m doing fine. I feel blessed about that. I have had cataract surgery just within the last couple of months. My vision, I’m starting to get macular degeneration in my left eye, and it’s been a problem with my vision. I also have hypertension or blood pressure and cholesterol, so they have put me on a couple of medications. Other than that I feel great.
Additionally, Participant 2 who was waiting on the VA to schedule him for hip surgery and was dependent on his walker to get around said he was much better than the people around him:

I feel great. I look around a lot at people my age can’t do even half of what I do, and I’m in this thing [walker]. If only the docs would schedule my surgery soon, I’d be back to my full use.

Thus, all of these examples show that the veterans saw these conditions (e.g., sciatica) affecting an isolated area of their body and not their overall health. Even when they had multiple conditions such as hypertension and high cholesterol, they still overall saw themselves as healthy showing how they compartmentalize conditions rather seeing them as systemic.

In summary, the three main themes that emerged were optimistic bias, health motivation, and the I-feel-fine-but effect. The challenge is to find ways to help veterans understand their feelings and still take the necessary steps to stay healthy and live as healthy a lifestyle as possible.

Phase II—Focus Group Message Testing for Bile Duct Cancer Flyers Targeted at Vietnam War Veterans

After completing Phase I, the researcher designed four health flyers to test with Vietnam veterans. These flyers were guided by two of Bandura’s (1977) sources of self-efficacy: vicarious learning and verbal persuasion and contained information that veterans in Phase I indicated they would like to see incorporated in the flyers. Furthermore, the message design was guided by the emergent theme of optimistic bias from Phase I. After conducting the focus groups, the researcher analyzed the transcripts to answer research questions posed in Phase II of the study. Descriptive data on the focus groups is presented below followed by exploration of the research questions.
Focus Group Participants

A total of 18 veterans participated in five focus groups (Tables 4-2-4-3). A majority of the veterans (94%, n=17) identified as Caucasian, while only one participant identified as African American. Fifty percent of the participants were between the ages of 65-69 years, and 44% (n=8) indicated they were retired.

Table 4-2. Date and Location of Focus Group

<table>
<thead>
<tr>
<th>Focus group</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nov 14\textsuperscript{th}, 2018</td>
<td>6:00pm-7:00pm</td>
<td>VVA Chapter 1092, Gainesville</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Nov 16\textsuperscript{th}, 2018</td>
<td>11:00am-12:00pm</td>
<td>VFW Post, Gainesville</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Nov 16\textsuperscript{th}, 2018</td>
<td>2:00pm-3:00pm</td>
<td>VFW Post, Gainesville</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Nov 27\textsuperscript{th}, 2018</td>
<td>2:00pm-3:00pm</td>
<td>HealthStreet, Gainesville</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Nov 30\textsuperscript{th}, 2018</td>
<td>2:00pm-3:00pm</td>
<td>HealthStreet, Gainesville</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4-3. Overall Demographics of Focus Group Participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race\textsuperscript{1}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (Non-Hispanic)</td>
<td>17</td>
<td>94%</td>
</tr>
<tr>
<td>African American</td>
<td>1</td>
<td>6%</td>
</tr>
<tr>
<td>Age Range\textsuperscript{1}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>2</td>
<td>11%</td>
</tr>
<tr>
<td>65-69</td>
<td>9</td>
<td>50%</td>
</tr>
<tr>
<td>70-74</td>
<td>5</td>
<td>28%</td>
</tr>
<tr>
<td>75+</td>
<td>2</td>
<td>11%</td>
</tr>
<tr>
<td>Employment Status\textsuperscript{1}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>8</td>
<td>44%</td>
</tr>
<tr>
<td>Employed</td>
<td>7</td>
<td>39%</td>
</tr>
<tr>
<td>Self-employed</td>
<td>3</td>
<td>17%</td>
</tr>
</tbody>
</table>

\textsuperscript{1}N=18

Because the researcher found no appreciable differences in themes among the different demographics, this section labels participants by their focus group followed by their assigned number rather than by any demographic characteristics. For instance, the third participant in the
second focus group was labeled FG2-P3, while the first participant in the fifth focus group was FG5-P1. In the rare case there was a demographic difference, that information is noted along with the participant’s label.

Research Question 6—Differentiation Between Vicarious Experience and Verbal Persuasive Messages

Research Question 5 (RQ5) asked if veterans could differentiate between the two different formats—vicarious experience and verbal persuasiveness—as guided by Bandura’s (1977) self-efficacy theory. Because participants in different focus groups viewed the messages in random order, the researcher also analyzed transcripts to determine if participant responses differed given the order in which they saw the message formats. The researcher found no difference based on order of seeing messages.

Regarding the sets of flyers, veterans indicated the two sets were similar except for the vicarious instructions at the end of the vicarious message set. All but two veterans noticed that the vicarious messages held extra information on how to talk to their doctors about being tested for the liver fluke. Furthermore, a majority of the veterans (n=14) indicated that they preferred the vicarious messages as it reiterated information as well as helped to guide them on how to talk to their doctors. For example, FG5-P1 said, “I like this, ‘consider these points’ and that, that gets my attention. That's really good. It tells me what to ask my doctor.”

Similarly, FG3-P2 said he found the vicarious information well organized and something to use as-is when he next saw his doctor. “I like how all this information is in this one section that I can pick up and take to my doctor.” Furthermore FG1-P3 said:

This, this is good [vicarious message]. Sometimes you have to tell them [doctor] what to do. My doctor said she sees 1,000 vets, and I’m guessing she’s busy. So just reminding her is a good. But if you go in there unprepared sometimes they don't like being told what to do. With this [pointed to vicarious flyer], I can at least get some information on what to say to her.
However, the four participants who did not hold a strong preference for the vicarious experience section indicated they would talk to their doctors regardless of the vicarious message. Participants stated this was a serious condition that needed immediate attention regardless of whether veterans were given guidance about how to talk to their doctors. For example, FG4-P4—who viewed the verbal persuasive messages first—indicated that he had been unaware of the liver fluke and bile duct cancer and wanted to get the tests done right away:

I wanted to know as soon as I read the first flyer. I was over there. I ate seafood and fish every chance I could get. So just on my own personal diet I might be a little bit higher possibility for it.

Similarly, FG5-P4, who was a squadron leader for the Marines, said:

We ate a lot of wild stuff when we didn't get resupplied, and we were out in the fields doing S&D mission. We ate stuff knowing it had been sprayed by Agent Orange and drank untreated water. It didn't taste the best, but it kept you from dying of thirst or hunger out there. So yeah, either of these messages would concern me enough to talk to my doctor.

Overall, a majority of participants were able to distinguish differences between the two sets of flyers viewed. Veterans showed an inclination toward the vicarious messages as it gave them concrete points to discuss with their doctor. However, the veterans who did not show a preference for the vicarious messages explained they would have talked to their doctor regardless.

**Research Question 7: Ease of Information Comprehension**

Next, the researcher determined if the participants comprehended the information presented to them, both in terms of reading flow and ease of understanding. After the veterans viewed each set of flyers, the moderator asked if the information provided was easy to read and to understand. All participants stated that the information was easy to both read and to understand. A majority of participants wore reading glasses and noted that the size of the font made it easy for them to read even if they did not have their readers on. The more senior
participants (n=2), however, suggested increasing the font size. For example, participant FG3-P1 said, “I’m 78, and I can see this well. Now there may be guys that are a little older who will have to put on the readers for it.”

Similarly, participant FG1-P2 (age 84) said:

Okay. So yeah, and the font is, there's nothing wrong with the font. It's readable. Even for a guy that can't see good, I think it’s good. But no harm increasing it for the others.

Although the average publication type size is between 10 and 12 points, the researcher increased the typeface from a 13-point to a 13.5-point typeface for the Phase III version because of the two participants’ suggestions.

Participants said they understood the message and what the messenger was telling them. Participant FG5-P3 said the message was “well presented and served the purpose well,” a statement that was a consensus observed in all the focus groups. For example, participant FG1-P2 said, “Yeah, I think it's presented right. It's presented so that anybody can understand it.” Participants also appreciated the directness of the message in telling them what the issue was while encouraging them to talk to their doctors about being tested. For example, FG3-P2 said, “The message was very understandable, very easy to read. He’s telling me, ‘hey this is a problem, giving me a solution to go talk to my doctor.’”

Overall, the designed messages were easy to read regarding font sizes and flow of the message. The messages were also understandable and straightforward, as well as appreciated.

**Research Question 8—Attitude Toward the Message Creative—Images**

The next Research Questions looked at message image because establishing personal relevance in advertising messages is necessary to bring about the desired behavior change in the target audience (Darley & Lim, 1991; Marchand, 1998). While background colors, layout, and
font remained the same for each flyer, flyers featuring a doctor had images related to the VA such as a seal resembling the VA seal, an American flag, and a VA badge on the doctor’s coat. The flyer featuring the veteran, Brad, had him wearing a black shirt with a VVA logo. The flyer also substituted the VA seal at the end with silhouettes of Marines in action (see appendix for flyers). After veterans commented on the context of the message, they were asked how they felt about the graphics in the flyer. Two veterans indicated that they had not paid attention to the graphics as they considered the information in the flyers more important. For example, FG2-4 said, “Well, myself, didn't take anything like that into consideration. I was focusing on the information written here.”

Alternatively, a majority of participants found the images relevant to the messages and indicated a positive attitude toward the two images representing the VVA and the VA. Furthermore, the researcher intended the images to add associative value (i.e., association with either the VA or VVA), which was confirmed. A majority of the veterans asked if these flyers were available at the VA or were produced by the VVA head office. Veterans also pointed out they liked the VVA flyer more as it showed an image of a fellow veteran and that they felt more connected with the VVA seal. For example, FG1-3 said, “I’m really involved with our chapter [VVA] and so this [VVA logo] catches my eye, as opposed to this [VA seal]”

Besides looking at preferences for the sponsor of the message (VA or VVA), the source type was explored. Even though veterans recognized the model to be the same for both the doctor and veteran roles, they indicated a preference for Brad the veteran. For example, FG5-2 said, “I like the veteran picture better than the doctor. I feel I would know him. The doctor, it’s a little intimidating.”
On the other hand, the doctor was associated with illness for some, so he was less effective in delivering the message. For example, participant FG3-2 indicated, “You go to the doctor and it’s always bad news. But what else are they going to do.” Similarly, FG1-3 said, “I like the vet better than the doc. He [doctor] gives me a sick connotation. Like they always do.” Therefore, veterans showed more inclination toward Brad the veteran as they felt he was one of them.

**Phase III—Experimental Design**

The main aim of Phase III was to determine the effectiveness of the flyers in prompting veterans to talk to their doctors about being tested. In order to achieve the aim of Phase III, the researcher conducted a 2x2 experiment using a questionnaire format.

**Experiment Participants**

Overall, approximately 73% of respondents (n= 169) met the study’s criteria and completed the questionnaire (Table 4-1). Approximately 93% of the respondents (n= 157) indicated they were non-Hispanic Caucasians, while approximately 5% identified as African American/ Black. A majority of the respondents (73%, n=124) were between the ages of 70-74. Approximately 93% of participants indicated they were retired, while 8% indicated they were employed part-time and 7% indicated they volunteered their time at different organizations. Approximately half of the participants indicted their total household income to be greater than $100,000 (47%, n= 27.2) (Table 4-4).
The experimental questionnaire also sought to determine if veterans were familiar with liver fluke, its methods of transmission and effects, as well as veterans’ familiarity with bile duct cancer and its association with liver fluke. Approximately 66% (n=111) of respondents had never heard of bile duct cancer while 56% (n=95) of the veterans had not heard of the liver fluke. Of the 58 (34%) respondents who had heard of bile duct cancer, 35 indicated they knew of liver fluke’s association with bile duct cancer. Hence, of the 169 respondents, only 21% were familiar with the connection between liver fluke and bile duct cancer, further supporting the need to inform and educate Vietnam War veterans about this condition.
Questionnaire Scale Reliability

The current study utilized scales from multiple studies that had not been used previously with a senior population to gauge their opinion on an unknown health risk. Thus, it was imperative to conduct a reliability analysis on all the scales to ensure internal reliability of each variable used. All scales indicated a strong internal reliability of an alpha value greater than .7 (Cortina, 1993). The Cronbach alpha values for the variables are listed in Table 4-5. All items from the different scales were retained in the final analysis.

Table 4-5. Cronbach’s alpha values for Phase III variables.

<table>
<thead>
<tr>
<th>Variable type</th>
<th>Variable name</th>
<th>Scale α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>Communication self-efficacy</td>
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</tr>
<tr>
<td></td>
<td>Attitude toward the message</td>
<td>.720²</td>
</tr>
<tr>
<td></td>
<td>Source credibility</td>
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<tr>
<td></td>
<td>Outcome expectation</td>
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<tr>
<td></td>
<td>Behavior intention</td>
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</tr>
<tr>
<td>Confounding</td>
<td>Perceived risk</td>
<td>.939</td>
</tr>
</tbody>
</table>

Research Question and Hypothesis Testing

Research Question 9—Health Message Prompting the Greatest Positive Appeal, Engagement, and Empowerment Response in Veterans

Because emotional response has three dimensions—appeal, engagement, and empowerment, this section will address each dimension as it addresses the research question. The aim of this phase was to determine which of the four messages (1- vicarious-vet, 2-verbal-vet, 3-verbal-doctor, 4-vicarious-doctor) prompted a positive emotional response among the respondents. A one-way analysis of variance (ANOVA) was conducted to answer the question. A between-groups ANOVA was the appropriate test to conduct as it compares the mean AEE

² No items from the scale were deleted, as it would lower the alpha value.
scores between the four groups. The first step was to test the assumptions of equal regression slope for each of the dependent variables (i.e. appeal, engagement and empowerment). The relationship between the four groups and the emotional response was linear, with an insignificant interaction effect ($p > .05$), indicating the assumption of homogeneity was not violated and hence ANOVA analysis could be performed (Table 4-6).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appeal</td>
<td>2.90</td>
<td>3</td>
<td>165</td>
<td>.075</td>
</tr>
<tr>
<td>Engagement</td>
<td>1.82</td>
<td>3</td>
<td>165</td>
<td>.146</td>
</tr>
<tr>
<td>Empowerment</td>
<td>1.03</td>
<td>3</td>
<td>165</td>
<td>.379</td>
</tr>
</tbody>
</table>

For Research Question 9a that explored which flyer prompted the greatest appeal, the verbally persuasive veteran flyer scored the highest on appeal ($M=5.10$, $SD=1.39$), while the verbally persuasive doctor scored the lowest on appeal ($M=4.23$, $SD=1.39$) (Table 4-7 for group-wise means and standard deviations of the emotional dimensions). However, the ANOVA results showed no statistically significant difference among the four message levels ($F (3, 165) =2.041$, $p=.1$).

Similarly, for Research Question 9b that explored the greatest engagement, preliminary analysis showed that the vicarious veteran flyer scored the highest mean on engagement ($M=5.48$, $SD=2.61$), while the verbally persuasive veteran flyer scored the lowest mean on engagement ($M=4.54$, $SD=1.99$). However, the ANOVA results showed no statistically significant difference between the four levels ($F (3, 165) =1.45$, $p=.28$).

For Research Question 9c that explored the most effective message in prompting empowerment, preliminary analysis showed that the verbally persuasive veteran flyer scored the highest mean on empowerment ($M=5.83$, $SD=2.02$), while verbally persuasive doctor flyer
scored the lowest mean on empowerment (M=4.43, SD=2.12). Additionally, the ANOVA results showed a statistically significant difference between the four levels (F (3, 165) =5.019, p= .002). Post-hoc comparisons using Tukey HSD indicated that the means score for the verbally persuasive doctor (M=4.43, SD=2.12) was significantly different from the means score of the other three groups: vicarious vet (M=5.80, SD=1.62), verbally persuasive vet (M=5.83, SD=2.02), and vicarious doctor (M=5.58, SD=1.99). Further analysis of the means plot of the empowerment dimension of emotional response indicated the message featuring the veteran verbally persuading participants to get tested scored the highest on the empowerment scale.

Table 4-7. Means and standard deviations of emotional response

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appeal</td>
<td>1a</td>
<td>44</td>
<td>4.70</td>
<td>1.72</td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>41</td>
<td>5.10</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td>2a</td>
<td>44</td>
<td>4.23</td>
<td>1.39</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>40</td>
<td>4.38</td>
<td>2.36</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>169</td>
<td>4.60</td>
<td>1.77</td>
</tr>
<tr>
<td>Engagement</td>
<td>1a</td>
<td>44</td>
<td>5.48</td>
<td>2.61</td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>41</td>
<td>4.54</td>
<td>1.99</td>
</tr>
<tr>
<td></td>
<td>2a</td>
<td>44</td>
<td>4.70</td>
<td>2.03</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>40</td>
<td>5.03</td>
<td>2.33</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>169</td>
<td>4.94</td>
<td>2.26</td>
</tr>
<tr>
<td>Empowerment</td>
<td>1a</td>
<td>44</td>
<td>5.80</td>
<td>1.62</td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>41</td>
<td>5.83</td>
<td>2.02</td>
</tr>
<tr>
<td></td>
<td>2a</td>
<td>44</td>
<td>4.43</td>
<td>2.12</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>40</td>
<td>5.58</td>
<td>1.99</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>169</td>
<td>5.40</td>
<td>2.01</td>
</tr>
</tbody>
</table>

1a-Vet Vicarious, 1b- Vet Verbal, 2a- Doc Verbal, 2b-Doc Vicarious

**Research Question 10—Message Source Perceived as Most Credible**

Research question 10 explored the source credibility of the two spokespersons—doctor and veteran. To test this question, an independent samples t-test was performed to compare the mean scores of continuous variables for two different groups of respondents. A total of 85 respondents viewed the flyer with a veteran, and 84 respondents viewed the flyer with the doctor.
Before conducting the t-test, a Levene’s test for equality of variance was conducted to check if equal variances were assumed. The test showed non-significant results (p>.05), which indicated the assumption of equal variance was not violated, so the researcher proceeded with the two-tailed t-test. There was a significant difference in spokesperson credibility scores for the veteran ($M = 25.07, SD = 4.718$) and the doctor ($M = 26.94, SD = 4.143$) ($t = 2.737$, df = 167, $p = .007$). The magnitude of the difference in the means (mean difference $1.87$, 95% CI: -.523 to .856) was moderate with eta squared = .04 (Cohen, 1973), indicating that the doctor was more credible.

Besides the overall credibility score, this study looked at the itemized responses that constituted the source credibility scale taken from Harmon and Coney’s (1982) study. Results showed that both doctor and veteran measured equally on items such as believability—64% (n=54, N=85) of the participants who viewed the veteran’s flyer and the 66% (n=56, N=84) participants who viewed the doctor’s flyer found their flyer’s source to be highly believable. Similarly, 60% of participants (n=51) found the veteran to be a good source, while 63% (n=53) participants found the doctor to be a good source for the information. While the veteran spokesperson was hailed as more trustworthy—74% (n=63) indicated the veteran to be highly trustworthy compared to 53% participants (n=45) who found the doctor to be highly trustworthy—the doctor scored higher on items such as expertise (veteran n= 25.9%, doctor n= 59.5%), experience (veteran n= 40%, doctor n= 71.4%) and training (veteran n= 40, doctor n= 71.4%) (Table 4-8).
### Table 4-8. Itemized score for source credibility.

<table>
<thead>
<tr>
<th>Item</th>
<th>Level</th>
<th>Veteran</th>
<th></th>
<th>Doctor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not trustworthy (1) –</td>
<td>1-3</td>
<td>7</td>
<td>8.2</td>
<td>10</td>
<td>11.9</td>
</tr>
<tr>
<td>Trustworthy (5)</td>
<td>4</td>
<td>15</td>
<td>17.6</td>
<td>29</td>
<td>34.5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>63</td>
<td>74</td>
<td>45</td>
<td>53.0</td>
</tr>
<tr>
<td>Not believable (1) –</td>
<td>1-3</td>
<td>14</td>
<td>16.5</td>
<td>7</td>
<td>8.3</td>
</tr>
<tr>
<td>Believable (5)</td>
<td>4</td>
<td>18</td>
<td>21.2</td>
<td>21</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>53</td>
<td>62.4</td>
<td>56</td>
<td>66.0</td>
</tr>
<tr>
<td>Not trained (1) –</td>
<td>1-3</td>
<td>24</td>
<td>28.2</td>
<td>10</td>
<td>11.9</td>
</tr>
<tr>
<td>Trained (5)</td>
<td>4</td>
<td>27</td>
<td>31.8</td>
<td>12</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>34</td>
<td>40</td>
<td>62</td>
<td>73.8</td>
</tr>
<tr>
<td>Not experienced (1) –</td>
<td>1-3</td>
<td>21</td>
<td>24.7</td>
<td>11</td>
<td>13.1</td>
</tr>
<tr>
<td>Experienced (5)</td>
<td>4</td>
<td>30</td>
<td>35.3</td>
<td>13</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>34</td>
<td>40</td>
<td>60</td>
<td>71.4</td>
</tr>
<tr>
<td>Bad (1) –</td>
<td>1-3</td>
<td>13</td>
<td>15.5</td>
<td>13</td>
<td>15.5</td>
</tr>
<tr>
<td>Good (5)</td>
<td>4</td>
<td>20</td>
<td>23.5</td>
<td>18</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>51</td>
<td>60</td>
<td>53</td>
<td>63.1</td>
</tr>
<tr>
<td>Not an expert (1)</td>
<td>1-3</td>
<td>33</td>
<td>38.8</td>
<td>16</td>
<td>19.1</td>
</tr>
<tr>
<td>Expert (5)</td>
<td>4</td>
<td>30</td>
<td>35.3</td>
<td>18</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>22</td>
<td>25.9</td>
<td>50</td>
<td>59.5</td>
</tr>
</tbody>
</table>

**Hypothesis Testing**

**Exploring Hypothesis 1 and 2**

To explore Hypotheses 1 and 2, the researcher conducted a MANCOVA test. A MANCOVA is an extension analysis of variance used when exploring multiple dependent variables that are related (Pallant, 2013). In the present phase, the categorical independent variables (i.e., vicarious or verbal persuasion message) influenced all dependent variables—attitude toward the message ($A_{message}$), outcome expectation ($O_{expt}$), communication efficacy score ($C_{Eff}$), and likelihood of talking to their own doctors ($B_{intention}$). Separate ANOVAs were not run for each dependent variable as a MANCOVA diminishes the risk of experiencing an inflated Type I error by controlling for factors that increase this Type 1 risk (Dooley, 2001). Before proceeding, normality, equality of covariance, and homogeneity of variance-covariance...
matrices were performed. For these analyses, no violations were noted. In both hypotheses, the Box Test of Equality of Covariance Matrices indicated no significance as $p > .001^3$; thus, the assumption of variance-covariance was not violated (Pallant, 2013) (Table 4-9).

Table 4-9. Box’s test of equality of covariance matrices for Hypotheses1 and 2

<table>
<thead>
<tr>
<th></th>
<th>H1</th>
<th>H2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box’s M</td>
<td>19.1</td>
<td>85.7</td>
</tr>
<tr>
<td>F</td>
<td>1.81</td>
<td>8.13</td>
</tr>
<tr>
<td>df1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>df2</td>
<td>31466.95</td>
<td>32550.15</td>
</tr>
<tr>
<td>Sig.</td>
<td>.054</td>
<td>.033</td>
</tr>
</tbody>
</table>

Furthermore, Levene’s test for equality of variance showed values greater than .05 (Table 4-10). Thus, equal variances were assumed.

Table 4-10. Levene’s test of equality of error variances for Hypotheses 1 and 2.

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Levene’s Test</th>
<th>Sig.</th>
<th>Levene’s Test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward message ($A_{message}$)</td>
<td>2.622</td>
<td>.109</td>
<td>.990</td>
<td>.323</td>
</tr>
<tr>
<td>Outcome expectation ($O_{expt}$)</td>
<td>.053</td>
<td>.819</td>
<td>2.99</td>
<td>.087</td>
</tr>
<tr>
<td>Communication efficacy score ($C_{Eff}$)</td>
<td>4.175</td>
<td>.241</td>
<td>2.93</td>
<td>.091</td>
</tr>
<tr>
<td>Behavior intention ($B_{intention}$)</td>
<td>1.866</td>
<td>.176</td>
<td>2.87</td>
<td>.094</td>
</tr>
</tbody>
</table>

Hypothesis 1—Health Flyer Featuring Doctor

Hypothesis 1 proposed that respondents who viewed the message featuring a doctor vicariously guiding his readers to talk to their provider about being tested for the liver fluke would have: a.) a more positive attitude toward the message ($A_{message}$), b.) a positive outcome expectation ($O_{expt}$), c.) a higher efficacy score ($C_{Eff}$), and d.) a greater likelihood of talking to their own doctors ($B_{intention}$) than those who viewed the doctor verbally persuading veterans when

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3 This assumption is tested as part of the analysis, using Box’s M statistic. As this statistic is very sensitive, a more conservative alpha level of .001 is used, as suggested by Pallant (2013). The aim is to achieve a $p$ value greater than .001

127
controlling for the confounding variable—perceived risk. A MANCOVA test indicated that there was a statistically significant difference between respondents who viewed the vicarious and verbally persuasive messages on the combined dependent variables \(F (4, 79) = 3.25, p = .016;\) Wilk’s Lambda = .859; partial eta squared = .141. When the results for each of the dependent variables were considered separately, the only variable to achieve statistical significance was Amessage \((M = 4.86, SD = 2.30)\) \(F (1,82) = 12.73, p = .001\) with a considerable effect size of partial eta squared = .134 (Table 4-11 for means and standard deviations). This indicated that the message type did have a substantial effect on Amessage. An inspection of the mean scores indicated respondents who viewed the doctor’s verbally persuasive message reported a more positive attitude toward it \((M = 5.66, SD = 2.48)\) than respondents who viewed the vicarious message \((M = 3.98, SD = 1.74)\). Thus, even though Hypotheses 1a-d were not supported, the analysis revealed that the doctor’s verbally persuasive message garnered a more positive attitude toward the message than the vicarious message featuring a doctor.

Further analysis of the itemized variables yielded a higher total mean efficacy score for respondents who viewed the vicarious messages \((M = 76.3, SD = 27.3)\) as compared to respondents’ efficacy score who viewed the verbally persuasive message \((M = 71.1, SD = 22.3)\). However, this difference was not statistically significant.

Additionally, there was no statistically significant difference between the two groups on Bintention (verbally persuasive \(M = 22.5, SD = 6.1\); vicarious message \(M = 22.0, SD = 7.6\)) and Oexpt (verbally persuasive \(M = 23.7, SD = 6.3\); vicarious message \(M = 24.6, SD = 7.9\)). The means score analysis revealed that both variables scored positive values on the respective scales. Thus, a majority of veterans indicated a strong intention to talk to their doctor about being tested as well as indicating a positive outcome expectation.
Table 4-11. Doctor’s flyer means score and standard deviations for dependent variables

<table>
<thead>
<tr>
<th>Message</th>
<th>Total Scale</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward message (A\textsubscript{message})</td>
<td>Verbal</td>
<td>10</td>
<td>5.7</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Vicarious</td>
<td></td>
<td>3.9</td>
<td>1.8</td>
</tr>
<tr>
<td>Outcome expectation (O\textsubscript{expt})</td>
<td>Verbal</td>
<td>30</td>
<td>23.7</td>
<td>6.3</td>
</tr>
<tr>
<td></td>
<td>Vicarious</td>
<td></td>
<td>24.6</td>
<td>7.9</td>
</tr>
<tr>
<td>Efficacy score (Eff)</td>
<td>Verbal</td>
<td>100</td>
<td>71.1</td>
<td>22.3</td>
</tr>
<tr>
<td></td>
<td>Vicarious</td>
<td></td>
<td>76.3</td>
<td>27.3</td>
</tr>
<tr>
<td>Behavior intention (B\textsubscript{intention})</td>
<td>Verbal</td>
<td>28</td>
<td>22.5</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>Vicarious</td>
<td></td>
<td>22.0</td>
<td>7.6</td>
</tr>
</tbody>
</table>

**Hypothesis 2—Health Flyer Featuring Fellow Veteran**

Hypothesis 2 proposed that respondents who viewed the message featuring a fellow veteran vicariously guiding his readers to talk to their provider about being tested for the liver fluke would have a) a more positive attitude toward the message (A\textsubscript{message}), b) a positive outcome expectation (O\textsubscript{expt}), c) a higher efficacy score (Eff), and d) a greater likelihood of talking to their own doctors (B\textsubscript{intention}) than the veteran verbally persuading the veterans when controlling for the confounding variable—perceived risk. An inspection of the mean scores indicated respondents who viewed the veteran’s verbally persuasive message reported a more positive attitude toward the message ($M =6.12$, $SD =2.7$) than respondents who viewed the veteran’s vicarious message ($M =5.02$, $SD =2.88$). Similarly, respondent who viewed the veteran’s verbally persuasive message had a higher positive O\textsubscript{expt} ($M =21.88$, $SD =7.9$) than respondents who viewed the vicarious message ($M =18.97$, $SD =7.5$). Respondents who viewed the veteran’s verbally persuasive flyers had a slightly lower Eff mean scores ($M =68.2$, $SD =27.9$) as compared to respondents who viewed the vicarious message ($M =69.4$, $SD =33.6$). Similarly, respondents who viewed the veteran’s verbally persuasive flyers had a slightly higher B\textsubscript{intention} mean scores ($M =20.2$, $SD =7.7$) as compared to respondents who viewed the vicarious message ($M =19.8$, $SD =7.7$).
Despite some differences between means, there were no statistically significant difference between respondents who viewed the veteran’s vicarious and verbally persuasive messages on the combined dependent variables ($F(4, 80) = 1.796, p=.138$; Wilk’s Lambda = .918; partial eta squared = .082). Thus, Hypotheses 2a-d were not supported.

**Exploring Hypothesis 3 and 4**

In order to review Hypotheses 3 and 4 that explored the effect of veterans’ emotional response on their efficacy (H3) and behavior intent (H4), the researcher conducted multiple linear regression analyses. A multiple regression analysis explores the relationship between one dependent variable and related multiple independent variables (Pallant, 2013; Cohen, 2008). It allows for a more sophisticated exploration of the interrelationship among a set of variables as compared to simple regression or correlation (Pallant, 2013). Prior to conducting multiple regression analyses for the hypotheses, tests for the assumption of linearity, normality (see appendix for distribution plots indicating normality and linearity, with data points along the distribution line for the three dependent variables) and multicollinearity were checked. Analysis revealed that none of the assumptions were violated and that dependent variables were correlated with the independent variables (Table 4-13). According to Cohen (1988), the current variables...
showed a small correlation ($r= .10$ to $.29$). For these analyses, the dependent variables showed small association with the dimension of appeal, engagement and empowerment, indicating the dependent variables were influenced by AEE but not to a great extent. Furthermore, a Shapiro-Wilk’s test was used to test for normality (Razali & Wah, 2011) and showed insignificant $p$ values (i.e., greater than .05), which indicated the data was normally distributed (Table 4-14).

Table 4-13. Correlation values for Hypotheses 3 and 4 variables

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Appeal</th>
<th>Engagement</th>
<th>Empowerment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication efficacy score ($C_{Eff}$)</td>
<td>.041</td>
<td>.230</td>
<td>.039</td>
</tr>
<tr>
<td>Behavior intention ($B_{intention}$)</td>
<td>-.159</td>
<td>.248</td>
<td>-.123</td>
</tr>
<tr>
<td>Source Credibility ($S_{credibility}$)</td>
<td>-.09</td>
<td>.285</td>
<td>-.107</td>
</tr>
</tbody>
</table>

Table 4-14. Test for normality

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Statistic</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication efficacy score ($C_{Eff}$)</td>
<td>.892</td>
<td>169</td>
<td>.059</td>
</tr>
<tr>
<td>Behavior intention ($B_{intention}$)</td>
<td>.831</td>
<td>169</td>
<td>.079</td>
</tr>
<tr>
<td>Source Credibility ($S_{credibility}$)</td>
<td>.831</td>
<td>169</td>
<td>.081</td>
</tr>
</tbody>
</table>

Hypothesis 3—Effect of Emotional Response on Communication Efficacy

Hypothesis 3 proposed veterans experiencing the greatest positive appeal, engagement, and empowerment after exposure to the messages would indicate a stronger efficacy score. A multiple regression analysis was conducted using veterans’ total efficacy score as the dependent variable and AEE as the independent variables to explore this hypothesis. Results showed there was no statistical significance between the variables ($F (3, 165) = 1.238; p = .28$).

Because the dependent variable showed a moderate correlation with the independent variables, the researcher conducted individual regression analyses to determine if a relationship existed between respondents’ total efficacy and the three dimensions of emotion. Again, no significant relationship was observed, indicating emotional response did not have an effect on veterans’ communication efficacy and Hypothesis 3 was not supported.
Hypothesis 4—Effect of Emotional Response on Behavior Intention

Hypothesis 4 proposed veterans experiencing the greatest positive appeal, engagement, and empowerment after exposure to the messages would indicate a more positive behavior intention such that they would be more likely to talk to their doctors about being tested. To explore Hypothesis 4, a multiple linear regression analysis was conducted. Results revealed the full model containing all predictors was statistically significant ($F(3, 168) = 4.975; p = .002$).

Next, a coefficients analysis was used to determine the relationship between the three dimensions of emotion and behavior intention. For appeal (H4a) and empowerment (H4c), the model was insignificant; however, engagement (H4b) showed a statistical significance in effecting behavior intention ($t = 3.02$, $beta = .23$, $p = .003$). Although Hypotheses 4a and 4c were not supported, Hypothesis 4b and the model overall was significant indicating that emotional responses did indeed have a positive effect on veterans’ intention to talk to their doctor about being tested.

AdSAM® Analysis

Additionally, AdSAM® Perceptual Maps and Emotion Groups were used to better understand the emotional responses toward the four flyers. The AdSAM® Perceptual Maps and Emotion Groups are proprietary analyses that match AEE scores from the Self-Assessment Manikins to emotion adjectives (Morris et al. 2002; Morris, Choi & Ju, 2016). The Perceptual Maps two-dimensionally present the mean scores of appeal and engagement, while empowerment is depicted by the size of the dot. For the four ads, the Perceptual Maps showed the flyers featuring Brad the veteran verbally persuading readers garnered the highest appeal ($M = 5.1$) as well as empowerment ($M = 5.83$) that was denoted by a slightly larger circle, as compared to the rest of the ads. Furthermore, the flyers featuring Brad the veteran vicariously
instructing readers to talk to their doctors stimulated the highest feeling of engagement (Mean Score= 5.48) (Figure 4-1).

Figure 4-1. AdSAM® Perceptual Map for all four groups
For the Emotion Groups, the AdSAM\textsuperscript{®} database holds 165 emotion-denoting adjectives that were tested with the three dimensions of emotion (Morris, 1995; Morris, Choi & Ju, 2016). Each adjective was matched to the stimulus scores of this study to select the best description for the emotion. In particular, the map and the adjectives match participants’ overall feelings. For example, in both the veteran flyers, the majority of participants (52\%) indicated overall feelings of indifference and ambivalence including sympathy, skepticism, nonchalantness, uninterested, and unconcerned (Figure 4-2). While in both the doctor’s flyers, the plurality (45\%) also indicated overall feelings of indifference and ambivalence including uninterested and skepticism. However, unlike the two veteran’s groups, there was also 21\% that felt troubled including defensive and annoyed (Figure 4-3).

Figure 4-2. Veteran flyer group
A group-wise analysis showed only 17% of the participants who viewed the veteran’s verbally persuasive ad fell in the positive appeal range: warmed and enthusiastic. A majority (69%) fell in the neutral Emotion Groups: indifferent, ambivalent and apprehensive. While 14% fell in the negative Emption Groups: troubled and alarmed (Figure 4-4). Comparing this to participants who viewed the veteran’s vicarious flyer, 18% fell in the positive appeal range, while a majority (57%) fell in the neutral range. An additional 23% fell in the negative groups (Figure 4-5).
Figure 4-4. Veteran verbal group

Figure 4-5. Veteran vicarious group
A second group-wise analysis showed only 4% of the participants who viewed the doctor’s verbally persuasive flyer fell in the positive appeal range: comfortable and enthusiastic. A majority (62%) fell in the neutral Emotion Groups: indifferent, ambivalent and apprehensive, while 34% fell in the negative Emotion Groups: sullen, troubled and alarmed (Figure 4-6). Comparing this to participants who viewed the doctor’s vicarious flyer, 19% fell in the positive appeal range: comfortable, warmed, and enthusiastic. Thirty-four percent fell in the neutral Emotion Groups: indifferent, ambivalent, and apprehensive, while a majority (47%) fell in the negative Emotion Groups: sullen, troubled and, alarmed (Figure 4-7).

Figure 4-6. Doctor verbal group
Comparing these Emotion Groups, both veteran’s and doctor’s vicarious message groups are parallel in distribution of appeal and engagement. An almost equal percentage of participants—18% for veteran vicarious flyer and 19% for doctor vicarious flyer—fell into the comfortable, warmed, and enthusiastic group. However, the doctor vicarious flyer (47%) also stimulated more negative feelings than the veteran vicarious flyer (25%) that stimulated more indifference and ambivalence.

To summarize the findings from the experiment, there was a significant effect on their intentions to talk to their doctors about being tested, and engagement and empowerment had higher mean scores than appeal. Overall, veterans who viewed the veteran verbally persuasive flyer garnered the highest mean score on empowerment as well as had a significantly positive
attitude toward the message. However, emotional response and veterans’ self-efficacy did not show a significant relationship even though veterans reported a higher efficacy score (approximately 70 out of a total score of 100). Furthermore, the AdSAM® analysis revealed the veteran’s flyers generated more positive appeal as compared to both doctor’s flyers yet the appeal was only moderate. While both vicarious messages, as well as the veteran verbal message, stimulated the greatest positive appeal, the veteran verbal ad garnered the least negative appeal and is assumed as the more effective message for this study.

Figure 4-8 presents a model diagram of the statistical results of hypotheses and research question from Phase III.
Figure 4-8. Model diagram of Hypothesis results
The current study explored the level of knowledge Vietnam veterans held about bile duct cancer and its association with the liver fluke. Based on their limited knowledge levels, this study next created and tested materials to inform and educate Vietnam veterans about their potential exposure to the liver fluke during service in East Asia and their risk of developing bile duct cancer, as well as encouraging them to talk to their doctor about being tested for the liver fluke.

To achieve these aims, the study used a mixed method composed of three phases, utilizing both quantitative and qualitative methods. In Phase I, the researcher conducted interviews to gauge the current knowledge level regarding bile duct cancer and its association with the liver fluke in the Vietnam veteran population and explored veterans’ living conditions during the war to determine if they were exposed to the risk factors. Phase II encompassed designing health flyers guided by Bandura’s (1977) self-efficacy theory and based on the findings of Phase I, in addition to testing these flyers in focus groups to ensure the message was received by the target audience as intended. Finally, Phase III tested the flyers with a larger veteran population to determine if the flyers prompted veterans to talk to their doctors about being tested. This phase was designed as an experimental questionnaire that randomly assigned participants to one of the four flyers that were created for the focus groups while keeping all other elements of the questionnaire the same. Chapter 5 provides a discussion of the study’s findings in terms of similarities and differences with past research as well as the researcher’s own inferences based on an extensive understanding of the target population.
Phase I—In-depth Interviews

The first phase of the study adopted an exploratory approach since there was no prior knowledge about how Vietnam veterans viewed their health, what their attitude toward health care was, and how much information they held about bile duct cancer and its association with the liver fluke. This phase proposed five research questions with multiple parts to cover this gap in literature.

Discussion of Research Questions 1 to 5

Research Question 1 explored living and dietary conditions of veterans during the war to better understand their possible exposure. Overall, respondents indicated satisfactory living conditions while living on base. Living conditions in the field, however, were questionable in terms of sanitation and nutrition. Although, the researcher asked participants to recall events such as drinking untreated water from the streams, rivers and local restaurants and homes as well as eating undercooked fish, respondents largely denied doing so at first. For them, such memories seemed trivial as compared to war memories; veterans did, however, question if they could have been exposed to the risk factors. Yet, as the interviews progressed, they recalled eating and drinking potentially contaminated food and water. Thus, it cannot be ruled out that they were exposed to the parasite and are, therefore, at risk of developing bile duct cancer.

Research Question 2 explored veterans’ attitudes toward health messages disseminated by the VA as compared to non-governmental organizations like the VVA. Overall, veterans indicated they received mostly the same information from both types of organizations. However, veterans had mixed reviews about health information that was disseminated by the VA. Some found it extremely beneficial, while others found it outdated. Some veterans also indicated that as they were in relatively good health compared to others their age; hence, they found no use for the VA’s health information. Moreover, some veterans had no reason to use the VA health
information because they received care from practices outside the VA, and they felt more inclined toward information from these practices and doctors. A few veterans even indicated a lack of trust in the VA system due to past experiences with test results, medication, and issues their peers had faced. These veterans found other healthcare facilities more reliable and trustworthy in terms of services provided.

In contrast to the VA, participants overall held positive attitudes toward health information disseminated by independent veteran organizations. This positive reaction may be attributed to the fact that individuals who participated in the study were either active members of VVA and VFW chapters or held positions in the chapters’ offices. In general, these participants both read and paid attention to health information that their chapters sent out. They also had consistently positive feelings and trust in the messages. Moreover, participants indicated they were active members of these chapters for five or more years; thus, they were deeply involved with the ideology and sense of brotherhood of their groups, which produced more trust in the organizations’ information. Braithwaite’s (1997) work corroborates these findings. He explained Vietnam veterans are a socially tight-knit group and had found solace with each other after being marginalized by postwar society. Veterans’ strong in-group identity with chapter members existed due to sharing similar war and postwar experiences.

Research Question 3 explored the main media sources for health-related information that veterans accessed. This question was particularly important to explore as previous literature on Baby Boomer’s health information consumption attributed mass media—TV and websites—and medical providers as the main health information channels (LeRouge, Tao, Ogs, Lach, Jupka & Wray, 2014; Kahana & Kahana, 2014). However, the present study concluded that veterans were skeptical of mass media sources such as TV and social media. They listed the VA, veteran
organizations, and their physicians as primary sources of health information. Thus, these findings contradict those of Berry et al. (2009) who found mass media such as TV was an effective medium for health information promotion aimed at changing or prompting behaviors in older adults.

Although participants received information from organizations (e.g., VVA) and medical teams and said they trusted this information, they also indicated a strong inclination to verify such information with their own research from medical websites such as WebMD and the Mayo Clinic. This finding suggests that veterans did pay attention to health information that was specific to their service and age, especially when it came from organizations of which they were members. Thus, veterans were proactive about both verifying health information online as well as gaining more knowledge about the condition and were not simply passive receivers of information. In fact, these findings validate the work of Whealin, Jenchura, Wong and Zulman’s (2016) who found veterans actively searched for health information online. This study adds to the literature by finding print messages often create a need to do online health searches.

Furthermore, the sequence of being exposed to information, researching it on their own, and then discussing it with their physicians corroborates Hesse et al.’s (2005) findings that an increasing number of U.S adults explored health information online before discussing the information with their physicians. Thus, the findings of this study fit into existent literature such that Vietnam veterans were more trusting of information that was disseminated by non-governmental military organizations; they also verified this information with their own research rather than trusting it blindly.
Research Question 4 was divided into three parts and explored veterans’ perceptions of their health, what source was most influential on their health, and their current knowledge levels about bile duct cancer and its association with the liver fluke. Veterans perceived they were in good health because of their diet and exercise habits. Veterans also indicated they were proactive about their health, as they believed prevention was better than a cure. These perceptions and behaviors corroborate past research that has shown preventive care was better for the individual’s health, quality of life, and longevity as compared to treatment after disease (Johnson, 2016; Treerutkuarkul & Gruber, 2015). For example, prior research showed seniors who regularly exercised showed improvement in their muscle strength, walking and gait ability, activities involved in daily living, as well as their emotional states (Bullo et al., 2015), which lead to better overall health. Thus, veterans’ beliefs in staying active as a preventive technique and measure of their perceived good health can be connected to past research with the seniors.

Additionally, Baby Boomers are also becoming the fastest-growing consumers of a healthcare system that is increasingly shifting toward preventive care and self-management (LeRouge et al., 2014). Thus, veterans’ confidence in taking care of themselves can also be attributed to their generational philosophy of independence and self-sufficiency. Moreover, veterans’ confidence in taking care of themselves can also be explained by their rigorous survival training as military men. Some veterans mentioned that taking care of their health was a part of their training during their military career and had become a way of life for them showing the positive effects of service.

Furthermore, this finding—military training—elaborates what Chaddick, Smith, and Phoenix (2015) described as ‘military masculinity,’ a term that highlights the role military service plays in shaping members’ mental and physical identities. Chaddick et al. (2015) found military
training deeply influenced men’s perceptions of what masculinity was both in terms of thinking—being emotionally tough, action-oriented and bearing mental hardships—and physical appearance—staying fit and enduring physical hardships. Veterans in the current study portrayed military masculinity such that they were action-oriented in terms of their physical fitness. Additionally, this military masculinity can explain the I-feel-great-but theme, such that veterans’ military toughness propagated into the later years of their life where complaining about health issues was not an option for them. Thus, the current study corroborates literature in the field of military health behavior by identifying the positive impact military training has had on veterans’ physical well-being, even decades after retirement as stated by some participants in the first two phases.

Apart from the internal factors for health motivation, this study also found two key external influences on veterans’ health: family (i.e., spouses or significant others and daughters) and physicians. This finding corroborates previous studies that found family, close friends and physicians were regarded as the most influential on an individual’s health behavior (Jackson, Steptoe and Wardle, 2015).

The high level of trust in the doctors’ expertise was also a finding in line with prior research (Schneiderman, Lincoln, Curbow and Kang, 2004). For example, Subramanian, Hopp, Mitchinson and Lowery (2008) found veterans’ adherence with their providers’ restrictions and suggestions on dietary and exercise habits, in addition to self-management education, contributed to better healthy behaviors and greater adherence. This study also finds evidence of some of these suggestions and behavior but adds an additional layer. Even though veterans indicated a high level of influence, trust, and satisfaction with their physicians, they had mixed feelings about the VA in general due to wait times, lack of benefits or treatment scheduling. Despite these
issues, they were largely satisfied with their physicians, so organizational feelings do not transfer to those that work for that organization.

Regarding their knowledge about their risks for bile duct cancer, most veterans held very little knowledge about bile duct cancer and its connection with the liver fluke. Although two veterans were aware of the association, they lacked specific knowledge about parasitic transmission. They were also unaware that the parasite could live undetected in their bodies and cause cancer decades later. The main reason for this lack of knowledge about liver fluke’s relationship to cancer is that the fluke is not an indigenous parasite in the United States, and incidence rates of bile duct cancer in older American populations is low. Thus, media and healthcare do not focus on this cancer as compared to breast, lung, colorectal, and prostate cancers, which have higher incidence rates. Furthermore, due to the lower incidence rates of bile duct cancer and the VA’s lack of explicit causal relationship recognition, medical providers do not know to check for this cancer in the Vietnam veteran population (Psevdos, Ford & Hong, 2018). Therefore, it is imperative that veterans be informed about the liver fluke and its connection with bile duct cancer.

Aside from bile duct cancer knowledge, veterans were also asked whom they’d regard as a credible spokesperson to inform them about bile duct cancer and its association with the liver fluke. The researcher listed spokespeople such as a Vietnam veteran’s wife or daughter, a fellow veteran, or a physician. Most veterans indicated that a fellow veteran would be their most trusted source, followed by a doctor. It is interesting to note that although women were health influencers, an unrelated female was not a perceived as a credible spokesperson despite multiple veterans stating their wives had been nurses. This finding was explained in Phase I. Veterans said they would listen to their daughters or significant others in person, but someone else’s’ wife
or daughter would not have the same impact on them. Thus, they could imagine an unknown doctor or veteran as a friend and influencer but not an unknown female.

Furthermore, veterans did not regard their fellow veterans as health influencers, yet they did indicate a high level of trust and credibility in such a spokesperson. Although this may seem contradictory, this finding was further corroborated with results from Phase III of the study that showed Brad, the veteran featured in the flyer, was more trustworthy than the doctor, but the doctor was considered more credible in terms of his level of expertise.

Research Question 5 explored the dominant themes that emerged during analysis. Three main themes emerged: optimistic bias, health motivation and I-feel-great-but effect. First, veterans’ optimistic bias was an important finding for this study as one’s perceptions of their vulnerability to disease is vital to self-protective behavior (Branstrom Kristjansson & Ullen, 2005). Their optimistic bias can be explained by their military ideology, namely that they were tough and something as small as a parasite would not affect them, especially when they had survived war (Caddick, Smith and Phoenix, 2015).

Optimistic bias, furthermore, has also been associated with risk aversion. Kenkel (1991) defined risk aversion as the mindset of what you don’t know won’t really hurt you, and it plays an integral role in individuals’ optimistic biases. In order to overcome risk, veterans chose to ignore the possibility of their susceptibility to this threat (Helweg-Larsen & Shepperd, 2001). Thus, optimistic bias likely hinders some veterans from talking to their doctor about being tested for the liver fluke because they are either avoiding risk or their military ideology prevents them from doing so.
The second most prevalent theme was health motivation. Findings from the study support prior research that indicates both internal and external\(^1\) motivation factors are key to initiating and maintaining healthy behavior (Phillips, Schneider & Mercer, 2004). Most classic research in behavior motivation has focused on an individual’s loci of control—internal or external—as factors that contribute to behavior performance (Ajzen, 2002; Dweck & Legget, 1988; Conner, Sheeran, Norman & Armitage, 2000; Milte, Luszcz, Ratcliffe, Masters & Crotty, 2015). Veteran’s internal motivation was a strong factor that influenced them to stay healthy. For example, veterans stated they wanted to live as long as they could because they had been given a second chance after war. Additionally, owning their independence was a major motivating factor for veterans who did not want to live in assisted facilities and give up their lifestyle. Similar findings were reported by Zhang and Jang (2017) who found that a strong internal locus of control led seniors to live and maintain a healthy lifestyle.

Moreover, some researchers observed factors such as self-confidence, social support, and ease of health care access as factors that motivated individuals to practice a healthy lifestyle (Claassens et al., 2014). The current study observed similar themes as social motivating factors for veterans. Although most participants noted their physicians were a great influence on their health behavior (external locus of control), it was interesting to observe medical providers were not what motivated veterans to practice a day-to-day healthy lifestyle. Rather, veterans indicated their families, specifically women, were major motivational players in addition to their will for living a long life. Researchers have looked at the influence of spouses’ and partners’ health

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\(^1\) Internal locus of control refers to the extent to which individuals believe they have power over their behavioral outcomes. External locus of control refers to individuals’ perceptions that their outcomes are controlled by external forces that they have little to no control over (Phares, 1976).
habits on the other partner finding that women have been assigned the role of caregivers and nurturers of families (Goodwin, Garrett & Galal, 2005). Therefore, men listen to and look to female figures in their lives to guide their day-to-day lives including healthy behaviors.

Female family members and the will to live, however, were not the only motivating factors. Veterans observed individuals in their social circle suffering from poor health, which also motivated them to be cognizant of their own health. This suffering was a vivid reminder of what they could become, which in return motivated them to practice a healthy lifestyle. Indeed, Schokker et al. (2010) discovered similar findings. The researchers aimed to determine factors that motivated diabetic patients to manage their condition and found that negative role models—individuals with adverse effects of diabetes—were more effective in prevention-focused patients who practiced self-care habits to postpone or avoid the adverse effects of diabetes.

The third prevalent theme was labeled I-feel-great-but effect. It was interesting to observe that participants who perceived to be in good health mentioned serious health conditions such as sciatica, hypertension, and macular degeneration; they brushed them off, however, as conditions of the past or to be worried about in the future. Conditions such as hypertension and diabetes were considered an inevitable part of old age and not something to be fixated on as a hindrance to their perceived good health. Their ignoring potentially serious health conditions can be attributed to the fear of infantilization and loss of independence in older adults (Marson and Powell, 2014). As young men who were trained in the military to be independent and self-sufficient, participants feared losing their daily independence (e.g. running errands or working their jobs) if they were sent to a facility due to their health being perceived as poor and in need of constant care. Participants also stated they did not want to burden their loved ones with their issues; hence, they were reluctant to share health complaints with them (Lindquis et al,
While most veterans stated they discussed health information with their partners and daughters, they did not want to be perceived as weak or ill, so they did not express an overt concern for their serious health issues. Furthermore, both the fear of infantilization and the dread of being perceived as weak can be attributed to veterans’ military ideology of being physically independent, self-sufficient, and emotionally tough. Thus, this study shows the intersection of the two concepts of military masculinity and fear of infantilization.

**Phase II—Message Testing in Focus Groups**

The second phase of the study designed four health flyers and tested them with veterans in focus groups. Flyers were designed using Bandura’s (1977) self-efficacy theory and information gathered from Phase I. This phase also adopted an exploratory approach to determine if the messages were received and understood by the target audience as the study intended.

**Discussion of Research Questions 6 to 8**

Research Question 6 explored if veterans differentiated between the vicarious messages and the verbal persuasive messages; most veterans easily distinguished between the two messages. While this phase did not measure the effectiveness of the two messages, participants did indicate a preference for the vicarious messages. A reason being the vicarious section at the end of the flyers gave veterans an exact script to start a conversation with their doctors about the liver fluke and bile duct cancer.

Furthermore, message comprehension was determined. Similar to Phase I, a lack of awareness of liver fluke and bile duct cancer was observed. Approximately half of the respondents were unaware of liver fluke and its connection with bile duct cancer. While the relationship of prior knowledge to message understandability was not an interaction being explored in this phase, no difference was observed among the two groups’ ease of understanding.
of the message. Thus, prior knowledge, or lack thereof, did not seem to enhance or hinder message comprehension.

Furthermore, Tierney and Mosenthal’s work (1980) explains this ease of message comprehension. It postulates both production and comprehension of discourse is based on common interest geared toward the message receivers. Despite having no prior knowledge of the parasite or cancer, veterans were able to comprehend the message as it was designed keeping in mind their backgrounds, interests and experiences, all of which was garnered from interviewing the demographic. Moreover, this finding expands existing literature that predominantly provides support for the direct influence of prior knowledge on message comprehension (Alba, 1983; Othman & Vanathas, 2017).

The next research question explored the creative segment of the message. While veterans immediately recognized the two organizations being suggested as the message sources, veterans stated a preference for the VVA veteran. This finding can be attributed to participants’ social identification as veterans (Tajafel & Turner, 1979). According to Tajafel and Turner (1979), social identity refers to individuals’ sense of who they are based on their group membership. At any given time, individuals may be a part of various groups such as social class, social group, family, nationality, gender, etc. However, depending on the situation veterans are in, one or more of their group associations may be highlighted. This explains why Brad the veteran activated their social identity as Vietnam veterans.

Furthermore, their preference for Brad the veteran can be explained by the in-group and out-group construct. Triandis (1988) defined an in-group as a group of people who influence members’ behavior such that their personal goals and objectives are based on or are heavily influenced by in-group members. Out-group members are individuals who do not belong to the
in-group and hold less influence on individuals’ beliefs and behaviors (Hogg & Reid, 2006). Veterans viewed Brad the veteran as an in-group member and, hence, were more open to the message he was conveying.

Regarding their lower acceptance of the doctor, he was an out-group member who veterans likely saw as conforming to stereotypical roles that were viewed against outside group members (Hogg & Reid, 2006). In this case and as Phase I showed, participants stereotypical view was the doctor represented an organization they were dissatisfied with because of denial of conditions such as Agent Orange-related health issues. Thus, they likely saw him as more of an enemy than a friend. However, they perceived the doctor to be an expert on the information being relayed due to his credentials as a medical professional and their general trust and satisfaction with their doctors.

**Phase III—Experimental Design**

In Phase III, the researcher aimed to determine the effectiveness of the flyers on veterans’ self-efficacy (i.e., talking to their doctors about being tested for the liver fluke and if needed be monitored for bile duct cancer). Phase III was an experiment conducted both online and in-person and served as a confirmatory analysis of the findings in Phase II.

**Discussion of Research Questions 9 and 10**

Research Question 9 explored which of the four messages—vicarious + veteran, vicarious + doctor, verbal persuasion + veteran, and verbal persuasion + doctor—were most effective in stimulating an emotional response. All four messages had an overall lower appeal and were not different from each other on that dimension. The low appeal is likely because the message was about a potential health threat that was related to their service in Vietnam, which caused great displeasure. This idea is backed up by participants in the focus groups who shared
concerns that the message, while not inducing fear, did open up the possibility of another health issue in addition to other known illnesses related to service in Vietnam.

Furthermore, all four messages stimulated a moderately positive engagement, yet there was no significant difference between the groups. This finding was interesting as engagement reflects participants’ levels of involvement with the message, which was anticipated to be high, given the message was meant to draw their attention to a lesser-known condition that was highly specific to the veterans. This moderate engagement, and even the low appeal, can further be explained by Lewin’s (1935) approach-avoidance conflict. According to Lewin (1935), internal conflict occurs within individuals who are exposed to messages that have both a positive and negative characteristic, making the message appealing and unappealing simultaneously. Lewins (1935) stated that such individuals would show a lower engagement level with the message when the negative characteristic of the message highlighted their lack of appeal. In the current study, while the message informed veterans about a new service-related threat (negative characteristic), it also provided them with a solution and an immediate call to action (positive characteristic). The moderate engagement, however, shows that the negative characteristic was more top of mind with the veterans. Miles, Voorwinden, Chapman, and Wardle (2008) found similar results such that the presence of negative appeals in cancer messages resulted in lower engagement with the information. Thus, it can be inferred that respondents were engaged with the health messages regardless of the type of message they viewed.

Although there were no differences between the two conditions: appeal and engagement, empowerment showed statistically significant differences. The message featuring Brad the veteran verbally persuading the audience scored the highest on the empowerment dimension. This finding can be explained by the notion that empowerment is enhanced when the concept of
perceived mutuality is present (Bashir, Wen, Kim & Morris, 2018). Mutuality is defined as the extent to which individuals or groups influence decision-making via any process of communication (Hon & Grunig, 1999). While Bashir, Wen, Kim, and Morris (2018) studied a two-way communication channel to facilitate the concept of perceived mutuality, the current study used a traditional one-way communication method. Indeed, veterans’ perceived mutuality with the fellow veteran was more pronounced because they could identify with Brad the veteran, which in turn enhanced their feeling of empowerment when exposed to the message. This finding can be further explained by social identity. As veterans felt more connected with Brad the veteran, their feeling of empowerment was enhanced. This served as a confirmation to the findings from the focus group. Furthermore, veterans heightened empowerment—due to the verbally persuasive message as compared to the vicarious message—can be explained by responses from Phase II. A few respondents in the focus group stated that the less wordy message felt direct and to the point, a style of communication that is very similar to their military-style communication. The verbal persuasion also gave them freedom to talk to their doctors as they wished rather than being told—infantilization—how to talk to their doctors.

Research Question 10 explored which source the veterans considered to be most credible. The results showed the doctor to be more credible. In Phase II, however, veterans indicated a stronger preference for their fellow veteran Brad and said they felt he was more trustworthy and had his veteran brothers’ interests in mind, while the doctor, who was more of an expert on cancer, was merely performing his duties. Although it appears that the findings of Phase II and Phase III contradict each other, Phase III actually corroborates findings from Phase II.

The doctor scored higher in overall credibility, specifically level of expertise and experience, while Brad the veteran scored higher on trustworthiness. Thus, they were both
credible but in different ways. These findings corroborate prior research on source credibility (Brown & Basil, 1995; Freed, Clark, Butchart, Singer & Davis, 2011; Kareklas, Muehling & Weber, 2015). For example, Yang and Beatty (2016) conducted a meta-analysis of health information source credibility and estimated the strength of relationship between two predictor variables that contributed to source credibility: expertise and trustworthiness. They concluded that the level of expertise correlated at a higher level with health information credibility as compared to trustworthiness of the source. Thus, if the information being provided was health-related, participants were more likely to perceive the medical provider to be more credible, while the peer held a higher level of trustworthiness. Although source credibility was a key variable in this study, the scale used to measure this may not have been the best fit. The scale measured source credibility on expertise, experience, and training, which clearly the in-group veteran would not score high on resulting in the out-group doctor to score higher on credibility.

This study has several suggestions for health communicators based on the differences between the two sources trustworthiness and overall credibility. First, featuring medical professionals as spokespeople is an effective strategy when informing the audience about diseases and conditions unknown to the target population. This study showed that even though trust in the VA system was not strong, veterans regarded their physicians as credible sources of health information and effective influencers on their overall health.

Second, regarding promotion of health messages in the military population, it is effective to use a fellow veteran as a spokesperson, especially if the spokesperson served in the same circumstances as that of the target population. However, heightening this type of in-group identity would be more effective when the audience is familiar with the issue or health condition.
Third, the use of narratives is an effective means to proliferate information as it establishes common grounds with the target population.

**Discussion of Hypotheses 1 to 4**

Besides source credibility, this studied tested if veterans who viewed the flyer featuring a doctor vicariously guiding viewers to talk to their doctors would prompt a more positive attitude toward the flyer, a positive outcome expectation, a higher efficacy score and stronger behavior intention than verbal persuasion. Results indicated that while the overall model showed statistical significance, such that there was a significant difference between the group that viewed the doctor’s vicarious message and the group that viewed the doctor’s verbally persuasive message, individual analysis showed only attitude toward the flyer was statistically significant. This did not support the proposed hypothesis.

One reason for this result could be explained by what a few participants indicated in Phase II. Participants mentioned that since both messages contained the same basic information—except the last vicarious section—they preferred the less wordy layout. Additionally, the same handful of participants also indicated they knew how to talk to their doctors and did not need to be told how to do that. Since this was not a widely observed opinion in Phase II, however, it cannot fully justify the findings of Phase III and require further exploration with the Vietnam veteran population.

Even though outcome expectation and communication self-efficacy were not supported, the researcher reviewed itemized scores for each of the dependent variables. There was no difference in outcome expectation scores between the two groups. Phase II supports this. Some veterans indicated that since they knew nothing about this condition, it was hard to decipher what the outcomes would be.
Furthermore, itemized results of veterans’ efficacy scores showed that veterans who viewed the vicarious message scored slightly higher on the efficacy scale as compared to the veterans who viewed the verbally persuasive message, although this was not statistically significant. A reason being the study analyzed responses of a small sample in each condition that did not result in statistically significant differences between the groups. This finding, however, is important to expand upon as it falls in line with prior research that denotes vicarious messages to be more effective in stimulating self-efficacy as compared to the verbally persuasive messages (e.g., Anderson, 2000; Weber et al., 2007). These findings add to the gap in literature as this phenomenon has not been explored in the veteran population before, nor has prior literature observed efficacy in context to an unknown health condition. Future research should explore veterans’ efficacy using a larger response sample.

Similarly, Hypothesis 2 proposed veterans who viewed a flyer featuring a fellow veteran vicariously guiding viewers to talk to their doctors would prompt a more positive attitude toward the flyer, a positive outcome expectation, a higher efficacy score and a stronger behavior intention as compared to the verbally persuasive message. Results indicated that the model was not significant; hence, Hypothesis 2 was not supported either. An individual itemized analysis further revealed that while participants scored comparably to their peers who viewed the doctor’s flyers and that both groups (veteran vicarious and veteran verbal) indicated a positive attitude toward the message, a positive outcome expectation, and a high efficacy score, there was negligible difference in scores between the participants who viewed the two veteran flyers. This can be explained with the same reasoning as that for Hypothesis 1—that veterans found this information new, useful and relevant to their health, so efficacy source did not create a difference in opinion and attitude with the veterans.
Furthermore, Hypothesis 3 proposed that emotional response would influence participants’ efficacy in talking to their doctors about being tested. Results revealed there was no significant relationship between the two variables. This lack of effect can be explained by the belief that self-efficacy involves a cognitive process of learning (Bandura, 1993; Benight & Bandura, 2004). Specifically, Bandura (1993; 2004) states that human behavior is purposive and regulated by planning, anticipation, and foresight—all of which involve a cognitive goal that effects one’s efficacy. Thus, emotion plays little to no role. Furthermore, the belief that self-efficacy is primarily affected by a cognitive process has been supported in Benight and Bandura’s (2004) study on self-efficacy in posttraumatic recovery. The researchers concluded that self-efficacy operated as a cognitive regulator to the stressors and that cognitive control superseded emotional control over efficacy stress management. Thus, the higher the cognitive involvement, the greater the efficacy and the firmer the commitment to goals being advocated (Bandura, 1991).

Emotional response having no effect on self-efficacy in the current study can also be attributed to the veterans being provided new information that required cognitive processing in a short period of time. Prior research has also concluded that emotional response is heightened when respondents are aware of the brand and message as they do not have to think too much on the stimulus, and cognitive response is highlighted when the respondents are unaware of the message or brand (Batra & Ray, 1986; Rethans, Swasy & Marks, 1986; Schumann, Petty & Clemons, 1990; Moore & Harris, 1996). The Elaboration Likelihood Model further elucidates these findings (Petty and Cacippos, 1981). According to this model, individuals are more likely to actively process personally relevant and new information under the central route. While the peripheral route involves attitude and opinion formation or change based on simple positive or
negative emotions associated with the message. Thus, the lack of emotional response suggests that new information combined with short exposure time would cause the message to be processed through the central or cognitive route rather than the peripheral or emotional route, so emotional appeal would not impact self-efficacy.

Next, Hypothesis 4 proposed veterans experiencing a positive emotional response would indicate a stronger intent to talk to their doctor about being tested. This hypothesis was particularly important because how emotional response affects health behavior intention is underexplored in the male Baby Boomer population. Results revealed the model to be statistically significant, indicating that emotional response did have a positive effect on participants’ intentions to talk to their doctors. This finding concurs with prior studies on emotional response positively effecting health behavior intention (Lawton, Conner & McEachan, 2009). For example, Lawton, Conner, and McEachan (2009) found respondents’ emotional response to behaviors such as binge drinking, self-breast/prostate exams, and the use of sunscreen was a strong predictor of their intention to either change a harmful behavior or to practice a beneficial health behavior.

Analyzing the individual effects of the three dimensions of emotion on behavior intention firstly showed appeal was not a significant predictor of behavior intent. This finding is likely due to the seriousness of the message itself—developing bile duct cancer as the result of ingesting foods and water during a veteran’s Vietnam tour. Clearly, the information in these messages is not going to make participants feel positive. Furthermore, Phase II backs this assertion. Participants indicated that while this message did not hold a fearful or threatening tone, the theme of the message itself was not appealing.
However, both engagement and empowerment showed significant effects on behavior intention. This corroborates prior research on engagement being a significant predictor of behavior intent (Brindal, Freyne, Saunders, Berkovsky, Smith & Noakes, 2012). For example, Bindal and colleagues (2012) found higher engagement in obese participants with weight loss interventions led to greater behavior intent and consequently behavior change. Similarly, the current study also concluded that engagement was a significant predictor of behavior intent, specifically veterans’ talking to their doctors.

Empowerment was also a significant predictor of behavior intent. Despite the potential risk associated with such information in the health message, this finding indicates that veterans felt in control of the situation rather than letting the message intimidate them. Thus, any fear the message created was attenuated by feelings of control. This finding corroborates prior research related to emotional response and behavior intent (Bashir, Wen, Kim & Morris, 2018; Hu & Sundar, 2010). Some argue that people become more empowered when they acquire new health knowledge and healthcare information (Hu and Sundar, 2010). Another plausible explanation may be the mindset of Vietnam veterans. As indicated in Phases I and II, veterans were still maintaining a military-style outlook to life and problems in general so that quitting, being threatened or intimidated by the enemy was not an option for them.

Furthermore, this study was unable to generate much appeal, which is an important factor in developing messages (Morris, Choi & Ju, 2016). Although one may argue increasing engagement toward a low appeal message may lead to better emotional response, the Emotional Groups and the Perceptual Maps showed a low appeal coupled with high engagement leads to disgust and an overall negative feeling toward the message. Given the topic is cancer and Veterans could be at risk, it makes it hard to get a more positive appeal. This needs to be looked
at in future studies with this population using success stories such as those of veterans who were treated for service-related cancers.

**Theoretical Implications**

This study adds to scholarly research related to emotional response (Mehrabian & Russell, 1977; Jang, Chun, Ko & Morris, 2014) and Bandura’s (1977; 1986; 1993) self-efficacy theory. Self-efficacy has extensively been used as a guiding principle in health intervention studies (Maibach & Flora, 1993; Weber et al., 2007; Zhang et al., 2014), while emotional response has been used primarily in consumer research (e.g., Morris, Woo, Geason & Kim, 2002; Jang, Chun, Ko & Morris, 2014; Bashir, Wen, Kim & Morris, 2018). This current study aimed to combine the two frameworks and expand on Bandura’s theory by proposing the three dimensions of emotion influence self-efficacy rather than one discrete emotion (e.g., fear or stress) that has been looked at in the past.

While this study did not find a significant relationship between the three-dimensional approach and self-efficacy, it contributes nevertheless to the theoretical framework supporting the influence of verbal persuasion on self-efficacy. While most research guided by this theory has observed self-efficacy in women, none have explored efficacy in Baby Boomer men, especially those with military experience. This unique group provided key findings concerning the effectiveness of verbal persuasion over vicarious learning, the latter of which has been deemed more influential (Weber et al., 2007; Bandura, 1993). The current study also notes that cognition plays a vital role in impacting efficacy when it comes to comprehending new information that involves higher involvement.

Furthermore, this study considered individuals as consumers of healthcare and measured their emotional response to health messages on three dimensions guided by prior research on consumer emotional response to advertising messages. Results connect the field of cancer
communication and emotional response to show that cancer-related health messages, even if presented in a positive tone, still bear low appeal. By increasing engagement and empowerment, however, the desired behavior intention can be achieved.

**Limitations**

Despite key findings, this study had several limitations. First, most of the interviews were conducted at the VFW Post in Gainesville, FL, which was a busy location with multiple distractions for the veterans being interviewed. For example, in one interview, the participant left for 40 minutes to speak with a fellow veteran. In another instance, the veteran being interviewed—who was also the Post Commander—frequently had to pause the interview to answer phone calls related to his Post.

For the focus groups, veterans were informed about the agenda ahead of the focus groups; there was little deviation from the focus group script. A common question in most sessions, however, related to health insurance coverage. After the first session, the researcher had to contact a local insurance provider who specialized in Vietnam veterans to gain insurance-related information for future sessions. Based on this observation from the focus groups, there is a possibility that a lack of knowledge about insurance coverage or a lack of insurance coverage itself, may lead some veterans from Phase III to reconsider talking to their doctor about being tested for the liver fluke and bile duct cancer.

Another limitation of the focus groups could be participant bias, such that veterans who agreed to participate in message testing were already invested in their health and, therefore, indicated a positive response toward the messages. Furthermore, with focus groups, studies always run the risk of peer pressure and influence. Thus, the possibility that some veterans may have had different views but chose to agree with the leader-like participants cannot be ruled out. To minimize this typical concern, the moderator indicated at the beginning that participants were
free to agree or disagree and share their honest opinion about the messages. The moderator also
did her best to include all participants in the discussion and individually asked participants if
they had any other thought than what had been shared by their peers.

Third, for the analyses of Phases I and II, both researcher and co-coder observed similar
themes in the interview and focus group transcripts based on the a priori deductive codebook as
well as emergent themes. These inferences, however, were drawn based on the coders’
interpretations of what the veterans said; thus, the risk for bias is a valid concern here. Since the
co-coder was not aware of the research aims and questions for the two phases, except for the
coding book, this bias was minimized.

Fourth, for the experiment phase, participants in the interview and focus group phases
indicated a number of their fellow veterans were active users of the Internet. Despite this,
however, there was a low participation rate with the online version. Hence, the researcher had to
print out the experimental questionnaire and travel to various VVA chapters in the North-Central
Florida region to conduct the experiment. During this interaction, participants indicated the
questionnaire was long, and the possibility of participant fatigue cannot be ruled out. Yet,
veterans appreciated the information being delivered to them. Although the researcher used two
methods of data collection in this phase, it shows that the researcher’s adaptability to the situation.

Furthermore, the researcher did not mark experiment packets according to the
intervention (messages 1-4) that was present in that packet. This was an issue as several veterans
tore the flyer out of the experiment packet before returning it to the researcher, so their responses
could not be considered for analysis. Another limitation of conducting experimental
questionnaires is that they do not provide information on why respondents chose specific
answers. This phase served as a confirmation to Phase II, but there were a few questions—such
as those pertaining to emotional response—that were not explored in Phase II. Furthermore, due to the anonymous nature of the study, there was no follow-up on whether veterans’ strong behavior intention translated to actual behavior performance. Although prior literature (Fishbein & Ajzen, 2011; Morwitz, Johnson & Schmittlein, 1993) strongly supports the translation of intent to actual behavior, recording this was beyond the scope of this study.
APPENDIX A
STUDY MATERIAL

Interview guide for Veterans Bile Duct Cancer Study

**Step 1:** Hand out the supplemental survey (see end of document) to the interviewees, explain that this quick survey will be collected once they have answered all questions and is a supplement to the interview. Inform them that I will be asking them briefly about their answer choices. Once completed, begin with the salutation and interview.

**Step 2:**

**Name** thank you for agreeing to speak with me, just to give you a little idea about the interview today, we will start by talking about your living conditions during the Vietnam War. We’ll touch upon any Veteran groups you are a part of and the VA, and then move on to your general health beliefs and behaviors. Our interview will last about 30-45mins and you can stop me anytime you like, and you do not have to answer any question you do not wish to answer. Before I begin recording do you have any questions for me? **Begin recording at this point** [If No] For the record please state your name, the year and division you were deployed with, and the rank you held while you were deployed in the East Asia.

**SECTION A: Living conditions during the war**

Let’s begin with a little bit about your living conditions as a **insert rank** while serving in Vietnam.

Q1: Where did you live during your service in Vietnam?
   
   **Prompt:** In barracks, swift boats, or naval ships?
   Other types of places?

***Q2: Please describe what your meals were like? What did you eat?**
   
   **Prompt:**
   
   ***What did breakfast, lunch and dinner include?***
   -Did you always eat on base/camp? Did you eat C- rations in the field?

***Q3: Did you drink directly from rivers and creeks?***

***Q4: Did you ever eat fish or snails while you were in Vietnam?***
   
   **Follow Up:** Were these cooked or raw? Can you tell me where you ate these fish and snails?

***Q5: How often did you eat at a local’s home or a local (off base) restaurant? [If ever] What did you eat?***

**SECTION B: Attitude toward health messages from Veterans Affairs and Veteran groups**

[If respondents have already talked about health treatment at the VA skip Q1-3]
Lets talk a little bit about the Veterans Affairs office now.

***Q1: Have you come across any health advice OR communication materials from the VA? Like information on cancer screening, or help for substance abuse? [If No, skip to Q6]
Prompt:
-What about any educational material on diseases and health conditions? [If YES ask what conditions]
-What about diseases or health conditions related to your overseas deployment?

***Q2: What was your opinion of these materials? SHOW THEM MATERIAL HERE
Did you read the material?
Did you find them helpful? Was the material trustworthy?
Did you follow the advice you read in the material?
Did you discuss this information with your doctor? [If YES ask What did your talk about? What did your doctor say?]

***Q3: Have you come across any health advice OR communication materials from Veteran Groups other than the VA? Like information on cancer screening, or help for substance abuse? [If No, skip to section D]
Prompt:
-What about any educational material on diseases and health conditions? [If YES ask what conditions]
-What about diseases or health conditions related to your overseas deployment?

***Q4: Could you tell me your opinion of these materials?
Did you read the material?
Did you find them helpful? Was the material trustworthy?
Did you follow the advice you read in the material?
Did you discuss this information with your doctor? [If YES ask What did your talk about? What did your doctor say?]

SECTION D: Health Beliefs supplemented by survey
Now I’m going to ask you a few questions about your general health and what influences your health and wellbeing as you indicated on the short survey that I gave you.

Personal Health
Q1: You indicated your health is good/ fair/poor/very poor, could you tell me a little about it? (survey Q1)

Q2: What makes you confident/not at all confident about taking good care of yourself? (survey Q2)

Q3: What**** are you motivated/not motivated to take care of your health? (survey Q3)

Q4: What type of health information do you discuss with your loved ones?
“Let’s talk about your answers to Q5 and Q6 that asked you how frequently you went to some sources for health related information.

***Q5: You indicated you most frequently go to **INSERT RESPONDENT SELECTION doctor/friends & family/internet/etc.** for health information? (survey Q5 & Q6) [Ask about all sources selected]
What type of information are you looking for, from this source?
What about this source do you like?

***Q6: You indicated that **INSERT RESPONDENT SELECTION FOR GREATEST INFLUENCE** _______________ is your greatest health influencer, could you tell me more about why you think they influence you the most?  (survey Q9)

Q7: Are you a part of any discussion groups on the Internet that are health focused?  (ACTIVE OR PASSIVE)  (If NO, ask them) Would you be open to joining and participating in such a group?
   Follow-Up: What about these groups do you like?
   How active would you say you are in these groups?
   How often do you post (contribute) in these groups?
   Prompt: Every day, twice a week, once a week, 3–4 times a month?

Let’s talk a little about your answers to how your feel about your doctor (survey Q11)

***Q8: You said you find it easy/do not find it easy to talk to your doctor, can you elaborate on that?

***Q9: You said that you feel you can/ can not ask your doctor questions about any health issues you have, can you elaborate on that?

***Q10: What about your doctor makes it easy/does not make it easy to talk to them about any of your health concerns?

Knowledge about Cholangiocarcinoma

***Q8: Have you ever heard of bile duct cancer?
   [If respondents reply NO go to Q10.  If Yes, go to Q9.]

***Q9: Where did you hear about bile duct cancer?
  Prompt: What was your source of information? Media, friend, doctor?
  What did this source say about bile duct cancer?

***Q10: Have you ever heard about the parasite “liver fluke”? (IF THEY SAY YES THEN ASK THEM) Have you heard about the relationship between the liver fluke and bile duct
Check List for respondent answers about knowledge of liver fluke

- Location: Found in East Asia/Vietnam/Korea
- Vectors: Transmitted via raw undercooked fish and snails and water
- Presentation of symptoms: Symptomatic or a-symptomatic
- Mechanism leading to cancer: travels to the bile duct and lives there, cancer develops after decades

Prompt: Let me tell you a little about the liver fluke and its connection to bile duct cancer. The liver fluke is a parasite that is found in the East Asian waters like in Vietnam and Korea and lives in fish and snails. If people eat raw fish and snails containing this parasite, only some of them are likely to show symptoms of this parasite infection. In all individuals who consume the liver fluke, the parasite will travel to their liver area and live there till it dies. The parasite releases some substances that a few decades later may cause cancer in people who ate this parasite.

***Q11: If I were to inform veterans about the risks of bile duct cancer, what channels or media would you suggest I can use to inform them?

Follow-Up: Do you think email is a good way, Facebook groups, Veterans’ groups Newsletters?

***Q12: What would you suggest I tell them?

Prompt: Tell them about the condition? Diagnosis and treatment options, and facilities they can go to?

***Q13: If you had to pick a representative to inform other Vietnam War Veterans about this condition, whom would you pick?

a) Vietnam veteran such as yourself
b) the VA
c) a doctor or a medical organization

Follow-up: Could you tell me why you made that selection.

**Thank you so much** for taking the time out to talk to me about your experiences in Vietnam and your general health behaviors. I am extremely grateful to your for all your help and I would like to thank your for your service to this country. If you have any questions about what we talked about today please feel free to ask me, my information is on the business card (hand them your business card). Here is some educational material about bile duct cancer and the liver fluke if you would like to take a copy please do.
Veterans’ Health Supplement Survey

Q1 In general, would you say your health is

- Excellent
- Good
- Fair
- Poor
- Very poor

Q2 Overall, how confident are you about your ability to take good care of your health?

- Completely confident
- Confident
- neither confident nor unconfident
- Somewhat under confident
- Not at all confident

Q3 How motivated are you to take good care of your health?

- Extremely motivated
- Very motivated
- Moderately motivated
- Slightly motivated
- Not motivated at all
Q4 Have you ever looked for information about health or medical topics from any source

- yes
- No (if No please go to Q 7)

Q5 Please indicate how frequently you go to the following sources for health related information

<table>
<thead>
<tr>
<th>Source</th>
<th>Always</th>
<th>Most of the time</th>
<th>About half the time</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Brochures, pamphlets, etc.</td>
<td>○</td>
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<tr>
<td>Conversation with family and friends</td>
<td>○</td>
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<tr>
<td>Conversation with doctor or healthcare provider</td>
<td>○</td>
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<tr>
<td>Magazines/Newspaper</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Telephone information number</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>TV (news, soaps, talk shows)</td>
<td>○</td>
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<td>○</td>
<td>○</td>
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<tr>
<td>Organizational newsletters</td>
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</tbody>
</table>
Q6 Please indicate how frequently you go to the following sources for health related information?

<table>
<thead>
<tr>
<th>Source</th>
<th>Always</th>
<th>Most of the time</th>
<th>About half the time</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email from friend/family</td>
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<tr>
<td>Email from an organization you are a part of</td>
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<tr>
<td>Social Media (e.g., Facebook, Twitter, Google+ etc.)</td>
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<tr>
<td>Medical Websites (e.g., PubMed, Web MD)</td>
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<tr>
<td>Blogs written by professional Healthcare providers (e.g. The Mayo Clinic blog, American Cancer Society blog etc.)</td>
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<tr>
<td>Blogs written by non-healthcare professionals (e.g., Veteran's groups, teacher's groups)</td>
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<tr>
<td>News websites (e.g., FoxNews, CNN, CBS etc.)</td>
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</table>
Q7 Please indicate how credible are the following sources of receiving health-related information

<table>
<thead>
<tr>
<th>Source</th>
<th>Extremely credible</th>
<th>Somewhat credible</th>
<th>Neither credible nor non-credible</th>
<th>Somewhat non-credible</th>
<th>Extremely non-credible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your doctor</td>
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<tr>
<td>Your friends</td>
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<tr>
<td>Your family</td>
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<tr>
<td>Medical Websites (e.g., The Mayo Clinic or American Cancer Society)</td>
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<tr>
<td>Information via a Veteran groups (e.g., Vietnam Veterans of America, Veterans of Foreign Wars)</td>
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<tr>
<td>Information via the Department of Veterans Affairs</td>
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<tr>
<td>TV programs, news, soaps, talk shows)</td>
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<td>Newspaper</td>
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Q8 Please rank order which source is the most influential on you in terms of health-related decisions and behaviors with 1 being the greatest influence and 5 being the least influence

Loved ones
Doctor
Government agency
Social groups you participate in (Veterans group, church group)
News media

Q9 How many times a year on average do you visit a doctor? (Primary care or specialty doctor)

Once a month
Once in 6 months
3-4 times in 6 months
Once a year
Once in two years
Other ________________________________

Q10 Who makes you go see a doctor?

Myself
Family member or significant other
The doctor
Other ________________________________
Q11 Think about your primary care doctor, and indicate your level of agreement with the following statements

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Somewhat agree</th>
<th>Neither agree nor disagree</th>
<th>Somewhat disagree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like going to my doctor</td>
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<td>I find it easy to talk to my doctor</td>
<td></td>
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<td></td>
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<tr>
<td>My doctor takes time to explain my health issues to me</td>
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<td>I feel I can ask my doctor questions about any health issue</td>
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<td>I trust the information my doctor gives me</td>
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<td>If feel my doctor ignores my health concerns</td>
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Focus Group Guide

OPENING SCRIPT

Hello everyone, my name is Aqsa and I will be you moderator for today’s discussion. I want to thank you all for being here today. In front of you are blank nametags; you are welcome to use your own name or any other you wish to be addressed as. The purpose of today’s focus group is to share our thoughts and feelings about a particular type of bile duct cancer that is increasingly being seen in the Vietnam veteran population. We will then look at a few health-screening flyers and share our thoughts on them. It may be possible that you disagree with some of your fellow veterans, and it is OK to disagree because it will be helpful to listen to different opinions, but I ask that you respectfully listen to their opinion just as they will listen to yours. Please be assured that there are no right or wrong answers, I am here to listen to all of your opinions and am interested in all what you have to say and my only role is only to facilitate your conversation, so please do not hesitate to share your thoughts on the topics of discussion.

Although I will be audio taping our discussion, your identity will be kept confidential. I will not associate your name with any comments you make here. I will transcribe the recordings, and only my supervisor and myself will have access to these recordings on our office computer at the University of Florida. These transcriptions will help me review our conversation so I have not missed anything. Once I have transcribed the sessions, I will destroy all audio recordings. While our discussion today will not be related to confidential or classified subjects, I do request that you do not share what is discussed here with others outside of this room.

Also I would request that only one person speak at a time, so that all are heard and my audio recorder picks up everyone’s comments. If you need to use the restroom, it is located [insert location]. And you may get up anytime you like.

Before we begin, would you all please review the inform consent that is in front of you. You do not have to sign this, and can take it with you as it has my supervisor and my contact information if you want to contact us about this study.
IRB[20170291] Exploring Vietnam War veterans’ attitude toward health screening messages

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study: The purpose of this interview is to explore Vietnam War veterans’ attitude health screening messages and their general knowledge about a particular type of cancer

What you will be asked to do in the study: You will be asked a series of open-ended questions related to your knowledge of a particular type of cancer. You will also be shown 4 health screening messages and asked about your opinion on them.

Time required: 1-2 hours

Risks and Benefits: You may experience some discomfort looking at the messages, other than that there are no direct risks or benefits to you.

Compensation: There is no compensation for participating in this focus group.

Confidentiality: As this session will be audio taped, your identity will be kept confidential to the extent provided by law. These recordings will be stored on my office computer at the University of Florida and only be accessible to my supervisor and me. After this study is over, these audiotapes will be destroyed. Your name will not be used in any report.

Voluntary participation: Your participation in this study is completely voluntary. There is no penalty for not participating. Additionally you do not have to answer any questions you do not wish to answer.

Right to withdraw from the study: You have the right to withdraw from the study at anytime without consequence.

Who to contact if you have questions about the study:
Aqsa Bashir,
Dr. Robyn Goodman

Who to contact about your rights as a research participant in the study
IRB02 Office
University of Florida
Let’s begin by talking a little about you.

QA1. Tell us your name and what rank you served in the Vietnam War.

Thank you for introducing yourselves. Let’s move on to talk about what you all know about your interaction with your doctors.

QA2a. Have you ever asked your doctor to conduct a medical test or asked them for a specific treatment or medication?

QA2b. Can you please describe the experience for us?

   PROBE: How comfortable did you feel? What was your doctor’s response?

Thank you all for sharing your experiences, let’s move on to talk a little about a recent parasite, the liver fluke that has popped up in the Vietnam veteran population.

As some of you may know, the liver fluke is a parasite that is found in the East Asian waters like in Vietnam and Korea and lives in fish and snails. If people eat raw fish and snails, containing this parasite, they are likely to fall ill, but some may not show any symptoms at all. This parasite will travel to their liver area and live there till it dies. The parasite releases some substances that a few decades later may cause cancer. Vietnam veterans may be at risk of this type of parasitic infection depending on their area of deployment. The liver fluke can be tested with a simple blood test a doctor can do to find out if someone has been infected.

QA3a. Describe your feelings about talking to your doctor about being tested for the liver fluke?

QA3b. How do you think other vets feel about talking to their doctor about this condition?

INTRODUCE THE HEALTH MESSAGE HERE

In front of you is a file containing health messages that were designed for veterans. These messages will be sent out to Vietnam veterans such as yourselves, but before we do that I would like to ask your opinion on these messages. You will see two flyers [DOCTOR AND VETERAN] in the first/second file please review these flyers and you can make notes on the extra sheet of paper provided in the same file. You can also mark on the flyers if you like.
ALLOW PARTICIPANTS TO REVIEW THE MESSAGE FOR A FEW MINUTES
Let’s move to discussing your opinions on these messages.

QB1. What information do you think is being communicated to you?
   Prompt: What do you think the characters are trying to tell you?
   FOLLOW-UP. Was this information easy to read?
   Was this information easy to understand?

QB2. What would you do if you received this flyer would you:
   a) pay attention to it?
   b) Find it interesting?
   c) Find it useful?

QB3. Can you please tell me what you like in this message?
   Prompt: The doctor/veteran? The language? The colors? The images?

QB4. Can you tell me what you don't like in the message?
   Prompt: The doctor/veteran? The language? The colors? The images?

Let’s talk about the main character (doctor/veteran) narrating this message.
QB5. Can you share your thoughts on him?
   Prompt: What do you like about him?
   What do you dislike about him?

QB6. Who do you feel is the more credible presenter of the information?
   FOLLOW-UP. Can you tell me what makes that person more credible?

QB7. Is there any other information you think he should be telling you?

QB8. How can we improve this message further?
Thank you all for your input. Now if you would turn your attention to the second file in front of you. This file also contains two flyers, please take a few moments to review these flyers, you can make notes on the extra sheet of paper provided in the same file. You can also mark on the flyers if you like.

**REPEAT Q1-Q8 FOR SECOND SET OF MESSAGE**

**THE QUESTIONS FROM HERE ON DOWN WILL BE ASKED AFTER MODERATOR WORKS THROUGH THE 2 SETS OF MESSAGES.**

You will notice a third file in front of you. This file contains some alternative images of doctors and veterans. Please take a look at these images and see if you like any of these better than the ones on the original images on the flyers we discussed before. Only select images if you like them better than the original versions.

You can keep the images side by side and compare them with the original flyers if you like.

**ONCE THE PARTICIPANTS HAVE PICKED OUT THE IMAGES ASK THEM THE FOLLOWING QUESTION**

Let’s come to the first set of images of the doctor, can you all show which image(s) you liked best.

QC1. Can you please tell me what you like about the doctor’s image you chose?

   **PROMPT:** Did he look kinder? Did he look like your doctor? Did he seem more credible?

Let’s move on to the second set of images of the veteran, can all the groups show which image they liked best.

QC2. Can you please tell me what you like about the veteran’s image you chose?

   **PROMPT:** Did he look like you? Did he seem more credible?

QC4. How do you feel about receiving these messages via email?

   **PROMPT:** Would you pay attention to this message if you got it from the VVA organization?

QC5. Do you have any advice or suggestions for me before I send these messages out to the Vietnam veteran population?
Coding Book For Vietnam Veteran Interviews

Food and sanitation:
On base
C-rations
Local cuisine (restaurant/home)
Ate fish/snails

Water consumption:
Always sanitary
Rivers, creeks, water bodies
Used purification

Attitude toward VA communication:
Positive
Negative
Trust/do not trust

Attitude toward veteran organization communication:
Positive
Negative
Trust/do not trust

Personal health:
Good/bad
Motivated/not motivated
Confident/not confidant
Reason: Mention age
  Mention family

Health beliefs influence:
Family
Friends
Medical personal
Self

Knowledge level of bile duct cancer and the liver fluke:
  Not at all familiar
  Vaguely familiar
  Very familiar
Coding Book For Focus Group

Message 1:

Likes:
Over all look
Source
Language
Easy to read

Dislikes:
Over all look
Source
Language
Hard to read

Changes suggested:
None

Likelihood of talking to the doctor
No
Yes

Message 2:

Likes:
Over all look
Source
Language
Easy to read

Dislikes:
Over all look
Source
Language
Hard to read

Changes suggested:
None

Likelihood of talking to the doctor
No
Yes

Preferred channel of message reception
Email
Postal mail

**Overall look:** Any comment regarding how the message document looks with regard to graphics, photos, and layout.

**Source credibility:** Any comment regarding the source of information in the message document, opinion about how believable the source was.

**Opinion on wording:** Any comment on the choice of words used

**Ease of reading:** Any comment about the level of ease or difficulty in reading the messages.

**Changes suggested:** Any comments about what to change in the messages
Experiment Design

Start of Block: Screening Block

Are you a Vietnam veteran who was deployed in the East Asia region during the war?

- Yes (0)
- No (1)

Have you ever been tested for the liver fluke?

- Yes (0)
- No (1)

End of Block: Screening Block
Thank you for participating in this study.
Please read this consent document carefully before you decide to participate in this study. IRB201702912 Exploring health media consumption and general health behaviors in Vietnam War veterans

**Purpose of the research study:** The purpose of this interview is to explore the living conditions of Vietnam War veterans during their deployment abroad, current health beliefs and behaviors as well as veteran attitude toward their health.

**What you will be asked to do in the study:** You will be asked a series of questions related to your health behaviors and your opinions about your primary care doctor. You will also be shown a health message and asked for your opinion on it.

**Time required:** 10-15 mins

**Risks and Benefits:** You may experience some discomfort thinking about your health beliefs and behaviors, other than that there are no direct risks or benefits to you.

**Compensation:** There is no compensation for participating in this survey.

**Confidentiality:** Your identity will be kept confidential to the extent provided by law. Please note that your answers will not be connected with any personally identifiable information. Due to the nature of this survey program we can identify your IP address. However we do not intend on maintaining this data in any form.

**Voluntary participation:** Your participation in this study is completely voluntary. There is no penalty for not participating. Additionally you do not have to answer any questions you do not wish to answer.

**Right to withdraw from the study:** You have the right to withdraw from the study at anytime without consequence.

**Who to contact if you have questions about the study:**

Aqsa Bashir,

Dr. Robyn Goodman,

**Who to contact about your rights as a research participant in the study:**

IRB02 Office

University of Florida

Do you agree to participate in this study?

- I Agree (1)
- I Disagree (2)

---

**Skip To: End of Survey If Q47 = I Disagree**

---

**Start of Block: Liver fluke & Bile duct knowledge**
Q2 Have you heard of bile duct cancer

- Yes (1)
- No (2)

Skip To: If Have you heard of bile duct cancer  = No

Q3 Which of the following aspects of bile duct cancer have you heard about:

<table>
<thead>
<tr>
<th>Unsure/ Don’t know (2)</th>
<th>No (0)</th>
<th>yes (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It occurs in the liver (1)</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Can result from eating raw fish and snails containing the liver fluke (2)</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Can result from drinking water contaminated by the liver fluke (3)</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Can be treated if caught early (4)</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

Q4 Have you heard of the liver fluke

- Yes (1)
- No (2)

Skip To: If Have you heard of the liver fluke  = No
Q5 Have you heard the liver fluke:

<table>
<thead>
<tr>
<th></th>
<th>Yes (1)</th>
<th>No (0)</th>
<th>Unsure/Don’t know (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is found in East Asia only</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Can be treated at the time of</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>infection (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May not show signs of infection</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>in the human body (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can live in the human body</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>undetected for several years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be detected by a blood test</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>(5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can cause cancer years later</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>(6)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q6 This section contains a health message for Vietnam War veterans. After carefully reading the message please click the forward button to share your feelings about the message.

Q7 Please read the instructions carefully as you will be answering the following section based on these instructions. Below, you'll notice three different rows of graphic characters (Manikins), which represent you and your feelings. We need you to recall how you felt when you viewed the health message on bile duct cancer and liver fluke. Please indicate your immediate emotional reaction. There are no right or wrong answers to the following questions. Please indicate your feeling by clicking one circle on each row on next page. Either select a circle directly below a Manikin, or in between two Manikins.
Q8 After viewing this ad, how did it make you feel?

Q9 EMOTIONAL RESPONSE Engagement

Q10 EMOTIONAL RESPONSE Empowerment
Q11 Please indicate your overall attitude toward the health message you just saw

<table>
<thead>
<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Favorable (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Unfavorable</td>
</tr>
<tr>
<td>Interesting (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Boring</td>
</tr>
<tr>
<td>Irritating (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Not irritating</td>
</tr>
</tbody>
</table>

---

190
<table>
<thead>
<tr>
<th>Q12 After viewing this message, please indicate how certain you are that you can</th>
<th>Not at all certain (0)</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>Moderately certain (5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>Highly certain (10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>talk to your doctor about liver fluke screening (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>make an appointment agenda/plan to talk to your doctor about liver fluke screening (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>share your concerns/worries about the liver fluke with your doctor (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>be attentive to your doctor's comments and suggestions about liver fluke screening (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>express your thoughts and feelings about liver fluke screening to your doctor (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plan and guide the conversation with your doctor about liver fluke screening (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
double-check information you have about the liver fluke when talking to your doctor (7)

ask your doctor more questions about liver fluke (8)

join in making a plan for your screening and treatment with your doctor (9)

end the conversation with your doctor when you are satisfied with the answers your doctor gave you (10)
Q13 How did you feel about the spokesperson of this message

<table>
<thead>
<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>not trustworthy (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not believable (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>untrained (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not experienced (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bad (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not expert (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- not trustworthy (1)  
- not believable (2)  
- untrained (3)  
- not experienced (4)  
- bad (5)  
- not expert (6)  

trustworthy  
believable  
trained  
experienced  
good  
expert
Q14 Please indicate your level of agreement with the following statements

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Somewhat disagree (3)</th>
<th>Neither agree nor disagree (4)</th>
<th>Somewhat agree (5)</th>
<th>Agree (6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I intend on talking to my doctor about</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>being screened for the liver fluke at my next appointment (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I will talk to my doctor about being screened</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>for the liver fluke at my next appointment (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I have decided to talk to my doctor about</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>being screened for the liver fluke at my next appointment (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I am determined to talk to my doctor about</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>being screened for the liver fluke at my next appointment (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q15 Please indicate how you feel about the following statements

<table>
<thead>
<tr>
<th></th>
<th>Not at all 0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Moderately believable 5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Extremely believe 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe talking to my doctor about testing for liver fluke is worthwhile (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe testing for the liver fluke is an effective technique for detecting liver fluke infection (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe testing for the liver fluke is an effective first step in monitoring for bile duct cancer (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q16 Please indicate your level of agreement with the following statements

<table>
<thead>
<tr>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Somewhat disagree (3)</th>
<th>Neither agree nor disagree (4)</th>
<th>Somewhat agree (5)</th>
<th>Agree (6)</th>
<th>Strongly agree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is possible that I will get bile duct cancer from liver fluke infection (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am at risk of bile duct cancer from liver fluke infection (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I am prone to getting bile duct cancer from liver fluke infection (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

End of Block: Attitude toward the ad

Start of Block: Block 7 Demographics
Q17 Please indicate your age

- 50-54 (1)
- 55-59 (2)
- 60-64 (3)
- 65-69 (4)
- 70-79 (5)
- 80+ (6)

Q18 To which of the following ethnic groups do you belong?

- Non-Hispanic Caucasian/White (1)
- African American/Black (2)
- Asian/Asian American (3)
- Hispanic/Latino (4)
- Pacific Islander (5)
- Native American (6)
- Multiracial (please list) (7) ________________________________________________
- Other (8) _____________________________________________________________
Q19 Please indicate the level of education you have completed.

- Less than high school (1)
- High school graduate (2)
- Some college (3)
- 2 year college degree/associate’s degree or equivalent (4)
- 4 year college degree/bachelor’s degree (5)
- Master’s degree
- Doctorate or professional advanced degree (PhD, MD, JD, DVM, DDS) (6)

Q20 Please indicate your current occupation status (check all that apply)

- Part-time employed (1)
- Full-time employed (2)
- Volunteer (3)
- Retired (4)
- Student
Q21 Please indicate your total household income.

- [ ] less than $24,999 (1)
- [ ] $25,000 to $49,999 (2)
- [ ] $50,000 to $74,999 (3)
- [ ] $75,000 to $99,999 (4)
- [ ] $100,000 and more (5)

End of Block: Block 7 Demographics
Fellow veterans, my name is Brad and I served 12 months in Vietnam from 1969-1970. A year ago, after reading the news stories about a parasite called the liver fluke and its connection with bile duct cancer, I was curious and asked my doctor to be tested. I knew I was at risk because this parasite is only found in East Asia. I'm glad I talked to my doctor about being tested for the liver fluke and you can too!

What is liver fluke?
- Liver fluke is a parasite found in East Asian waters.
- It is transmitted through raw fish and snails and contaminated water.
- It infects the liver, gallbladder, and bile duct in humans.
- The parasite may live in the body for up to 25-30 years, without showing any symptoms.
- This may eventually cause bile duct cancer.
- The test is as simple as a blood and stool test.

What is a bile duct cancer?
Bile duct cancer occurs in the ducts connecting the liver with the gallbladder.

Symptoms of bile duct cancer
- Jaundice (yellowing of the skin and the whites of the eyes).
- Dark urine and light-colored stool.
- Fever.
- Itchy skin.
- Unexplained weight loss.

In the news
- In 2017 VA tested 50 veterans and found 1 in 4 veterans tested positive for liver fluke infection.
- In the past 15 years, about 700 veterans have died of this cancer.

I was nervous bringing this up to my doctor, but he really appreciated that I did. He was able to test me and other vets as well.

Here's what you can say to your doctor:
Hey doc, I served in East Asia and may have consumed raw/undercooked fish and snails or drunk untreated water that may contain this parasite called the liver fluke that can lead to bile duct cancer.
I read that the VA found 1 in 4 veterans tested positive for the liver fluke last year. I want to be tested for the liver fluke and regularly monitored for bile duct cancer as well. How can we make this happen?
Veteranb Verbally Persuasive Flyer

Fellow veterans, my name is Brad and I served 12 months in Vietnam from 1969-1970. A year ago, after reading the news stories about a parasite called the liver fluke and its connection with bile duct cancer, I was curious and asked my doctor to be tested.

I knew I was at risk because this parasite is only found in East Asia. I’m glad I talked to my doctor about being tested for the liver fluke and you can too!

**What is liver fluke?**
- Liver fluke is a parasite found in East Asian waters.
- It is transmitted through raw fish and snails and contaminated water.
- It infects the liver, gallbladder, and bile duct in humans.
- The parasite may live in the body for up to 25-30 years, without showing any symptoms.
- This may eventually cause bile duct cancer.
- The test is as simple as a blood and stool test.

**What is a bile duct cancer?**
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**Symptoms of bile duct cancer**
- Jaundice (yellowing of the skin and the whites of the eyes).
- Dark urine and light-colored stool.
- Fever
- Itchy skin
- Unexplained weight loss.

**In the news**
- In 2017 VA tested 50 veterans and found 1 in 4 veterans tested positive for liver fluke infection.
- In the past 15 years, about 700 veterans have died of this cancer.
Hello veterans, my name is Dr. Brad, and I serve the veterans of our country. A year ago, one of my Vietnam vets came to me and asked to be tested for a parasite called the liver fluke. He was curious after reading the news stories about the parasite and its connection with bile duct cancer.

My patient knew he was at risk because this parasite is only found in East Asia. I'm glad he talked to me about being tested for the liver fluke and you can too!

**What is liver fluke?**
- Liver fluke is a parasite found in East Asian waters.
- It is transmitted through raw fish and snails and contaminated water.
- It infects the liver, gallbladder, and bile duct in humans.
- The parasite may live in the body for up to 25-30 years, without showing any symptoms.
- This may eventually cause bile duct cancer.
- The test is as simple as a blood and stool test.

**What is a bile duct cancer?**
Bile duct cancer occurs in the ducts connecting the liver with the gallbladder.

**Symptoms of bile duct cancer**
- Jaundice (yellowing of the skin and the whites of the eyes).
- Dark urine and light-colored stool.
- Fever
- Itchy skin
- Unexplained weight loss.

**In the news**
- In 2017 VA tested 50 veterans and found 1 in 4 veterans tested positive for liver fluke infection.
- In the past 15 years, about 700 veterans have died of this cancer.
Hello veterans, my name is Dr. Brad, and I serve the veterans of our country. A year ago, one of my Vietnam vets came to me and asked to be tested for a parasite called the liver fluke. He was curious after reading the news stories about the parasite and its connection with bile duct cancer. My patient knew he was at risk because this parasite is only found in East Asia. I'm glad he talked to me about being tested for the liver fluke and you can too!

What is liver fluke?
- Liver fluke is a parasite found in East Asian waters.
- It is transmitted through raw fish and snails and contaminated water.
- It infects the liver, gallbladder, and bile duct in humans.
- The parasite may live in the body for up to 25-30 years, without showing any symptoms.
- This may eventually cause bile duct cancer.
- The test is as simple as a blood and stool test.

What is a bile duct cancer?
Bile duct cancer occurs in the ducts connecting the liver with the gallbladder.

Symptoms of bile duct cancer
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- Dark urine and light-colored stool.  
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In the news
- In 2017 VA tested 50 veterans and found 1 in 4 veterans tested positive for liver fluke infection.  
- In the past 15 years, about 700 veterans have died of this cancer.

My Vietnam vet was nervous bringing this up to me, but I really appreciated that he did. I was able to test him and other vets as well.

Here's what you can say to your doctor:
Hey doc, I served in East Asia and may have consumed raw/undercooked fish and snails or drunk untreated water that may contain this parasite called the liver fluke that can lead to bile duct cancer. I read that the VA found 1 in 4 veterans tested positive for the liver fluke last year. I want to be tested for the liver fluke and regularly monitored for bile duct cancer as well. How can we make this happen?
APPENDIX C
NORMAL DISTRIBUTION LINES

Normal Q-Q Plot of SourceCredibility

Expected Normal

Observed Value

Normal Q-Q Plot of BehaviorIntention

Expected Normal

Observed Value
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BIOGRAPHICAL SKETCH

Aqsa Bashir received her bachelor’s degree in business marketing from the Forman Christian College, in Lahore Pakistan in the summer of 2012. After working for Newsweek Pakistan as their marketing and sales executive she attended the College of Journalism and Communications, University of Florida and graduated with a masters degree in advertising in Summer 2015. Bashir then went on to complete her doctoral degree in mass communication with an emphasis on advertising from the University of Florida in the summer of 2019. Her research interests include emotional response to advertising, cancer communications, and special group communications.