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# Cancer perceptions and health behaviors in Tazewell County, Virginia

Sarah E. Waddle  
*James Madison University*

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Cancer Perceptions and Health Behaviors in Tazewell County, Virginia

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An Honors Program Project Presented to  
the Faculty of the Undergraduate  
College of Health and Behavioral Studies  
James Madison University

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In Partial Fulfillment of the Requirements  
for the Degree of Bachelor of Science

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by Sarah E. Waddle

May 2016

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Accepted by the faculty of the Department of Health Sciences, James Madison University, in partial fulfillment of the requirements for the Honors Program.

FACULTY COMMITTEE:

HONORS PROGRAM APPROVAL:

---

Project Advisor: Theresa M. Enyeart Smith, Ph.D.  
Associate Professor, Department of Health Sciences

---

Bradley R. Newcomer, Ph.D.,  
Director, Honors Program

---

Reader: Audrey J. Burnett, Ph.D.  
Associate Professor, Department of Health Sciences

---

Reader: Stephanie L. Baller, Ph.D.  
Assistant Professor, Department of Health Sciences

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## **Abstract**

Tazewell County is a community the citizens feel is plagued by cancer. This concern was so great the county officials requested a study be done by a local university, Virginia Polytechnic Institute and State University (Virginia Tech), to explore potential external factors causing these perceived high rates of cancer within the community. The results of the Virginia Tech study found the rates of cancer were no higher in Tazewell County than elsewhere in the state of Virginia. The purpose of the current study was to explore the idea of perceptions and the effect they may have on the health behaviors of the citizens of Tazewell County. Specifically, the perception of cancer rates in the community, knowledge of and access to health care, and religious fatalism. A self-administered questionnaire was placed at four different locations throughout the county to try to ensure the highest number of respondents. Potential respondents were asked, by predetermined correspondents, as they were entering or leaving a location if they would like to complete the survey. Those that chose to participate would then complete and hand back the survey before leaving the location. There were 120 total surveys completed and returned. The questions within the survey pertained to the above mentioned variables and were compared to respondents' self reported health behaviors. There were no significant findings other than the relation between the amount of vegetables consumed and the perception of cancer rates in the community ( $\chi^2= 22.85, p=0.029$ ). It was determined the respondents held high perceptions of cancer rates in the community yet seem to be doing little in regards to their health behaviors to try to reduce their risk of developing cancer. Tazewell County health officials could use this information to better educate the public on positive health behaviors and the positive effect those behaviors can have on overall health.

# **Chapter 1**

## **Introduction**

The mere mention of the word ‘cancer’ evokes a negative response in a majority of people. Cancer is an excessive proliferation of cells in the body, which group into a cluster to form a tumor (National Cancer Institute, 2015). According to the Centers for Disease Control and Prevention (CDC) (2015), cancer is the second leading cause of death in the United States, falling second only to heart disease. In the overarching category of cancer, there are a variety of specific types, one of which is leukemia. The Mayo Clinic (2013a) has defined leukemia as a cancer of the blood that generally develops in the white blood cells. White blood cells are an essential part of the body’s immune system and are, therefore, produced with a specific function. When leukemia develops, abnormal white blood cells are produced and are therefore no longer able to perform the specific function for which they were intended (Mayo Clinic, 2013a).

As is the case with most diseases, there are ways to reduce the risk of developing cancer. A diet high in fruits and vegetables, maintaining a healthy body weight, engaging in regular physical exercise, and receiving consistent medical care are all potential methods for lowering an individual’s risk for developing cancer (Centers for Disease Control and Prevention, 2015). Despite the available knowledge regarding ways to reduce the risk of developing cancer, this knowledge is not always utilized. Some individuals have no knowledge of preventative factors; some lack resources that would allow them to eat healthy, exercise, or receive frequent medical care; and there are those who perceive a lack of control over their mortality resulting from their beliefs in a higher power.

Studies have been conducted analyzing the effects knowledge and access to health care have on rural health. One study found less education leads to lowered cancer screening

rates and another provided evidence residents in rural areas tend to receive lower quality care (Dallred, 2013 and Lenerigch et al., 2005). Documented sources have demonstrated the role religious beliefs play in influencing whether a person utilizes health care available to them. The lack of utilization has the potential to lead to negative health outcomes and possibly conflict with recommendations provided by health professionals or health practices (Franklin et al., 2007).

Tazewell County is nestled in the Appalachian Mountains located in Southwest Virginia and has roughly 40,000 citizens (United States Census Bureau, 2015). Religion is a large facet of the community, the primary denominations being Methodist and Southern Baptist which creates a heavy reliance on religious beliefs in decision making (Association of Religion Data Archives, 2010). Access to quality health care has always been an issue, and as a result, health care knowledge is lacking.

Community members anecdotally believe the area has an abnormally high proportion of cancer, specifically leukemia. Due to the growing concern among citizens, the county Board of Supervisors created a research project with Virginia Polytechnic Institute and State University (Virginia Tech). Contrary to popular belief, Virginia Tech found the rates of cancer in the County were no higher than elsewhere in Virginia. In fact, some rates were lower than other parts of the state (A. Smith, personal communication, December 22, 2014).

The cause of the citizens' concern over the rates of cancer in the area was a result of the connectedness a small community experiences and the false perception it created. These perceptions have displayed cancer as a problem in the community and possibly a result of some external factor present (A. Smith, personal communication, December 22, 2014). Perception, whether true or false, has the potential to affect an individual's health behavior. One of the most commonly used theories analyzing perceptions in relation to health behavior is the Health Belief

Model (HBM). The HBM outlines an individual's motivation, perceived susceptibility or perceived severity of an illness, and the potential perceived benefits or barriers to a health behavior change. These three main variables are considered the most significant influence on someone's likelihood to make any type of change in his/her behaviors relating to health (Boston University School of Public Health, 2013).

### **Significance of the Study**

This study will assess Tazewell County citizens' perceptions of cancer rates and how those perceptions are affecting their health behaviors, if at all. The results of this study will be beneficial to Tazewell County health professionals and community members alike as a means of education. The study will also allow the community members to see how their perceptions are affecting their health and the health professionals to possibly adjust their approach to patient education, as well as possible prevention and treatment options for their patients.

### **Statement of Problem**

The citizens of Tazewell County believe there are high numbers of cancer diagnoses within the community. However, residents as a whole are not proactively taking steps to lower their risk of developing cancer. By not engaging in health prevention practices, the citizens of Tazewell County are creating a cycle where they see sickness and disease as an issue within the community but are not engaging in behaviors that would reduce the number of negative health outcomes.

### **Research Hypothesis**

Tazewell County residents' lack of resources, knowledge, and the belief a higher being is in control of their lives have limited their efforts to reduce their cancer risk.

## **Research Questions**

- What effect does the perception of cancer (leukemia) rates in Tazewell County have on the health behaviors of Tazewell County community members?
- What effect does religious fatalism have on the health behaviors of Tazewell County community members?
- What effect does preventative knowledge have on the health behaviors of Tazewell County community members?
- What effect does health care access/resources have on the health behaviors of Tazewell County community members?

## **Limitations**

Several limitations should be acknowledged. One limitation that may be encountered is a low participation rate in the study. Possible participants may feel like the survey will take too long to complete or they may not feel comfortable participating. Barriers to participation were taken into account and measures to reduce barriers were implemented but low participation rates at the end of data collection are still a possibility. Another limitation presents itself as access to the entire county. Tazewell County is a relatively spread out community making data collection from a large portion of the county nearly impossible. Data collection sites are being used in an effort to reach the greatest number of community members, however, in the data collection time frame, it is not possible to reach every citizen of Tazewell County. A third limitation is the truthfulness of participants while completing the survey. The participant may not understand the question or misread the answer selection and select an answer that is not reflective of their beliefs, or the participant may respond in a manner they perceive the researcher desires.

## Definitions of Terms

- *Perception* - What an individual believes, regardless of whether or not that belief is correct (Boston University School of Public Health, 2013).
- *Religious fatalism* - An individual's belief that his/her overall health and health outcomes are out of his/her control and dependent upon a higher being (Franklin et al., 2007).
- *Blood Cancer* - A cancer that causes normal blood cell production to be interrupted by uncontrolled production of a specific type of blood cell (American Society of Hematology, 2015).
- *White blood cells* - Blood cells essential for good health and fighting off disease (University of Rochester Medical Center, 2015).
- *Leukemia* - A cancer of the blood affecting the bone marrow and white blood cells primarily. White blood cells are produced uncontrolled and cause normal function of white blood cells to be impaired (Mayo Clinic, 2013a).

## **Chapter 2**

### **Introduction**

The purpose of this review of literature is to examine previously gathered knowledge regarding leukemia, the access to health care in rural populations, the idea of fatalism, and generally how perceptions influence behaviors. The Health Belief Model is investigated as the framework of the study. Much of the research available to date has focused mainly on specific ethnicities rather than the general population that represent Tazewell County and Appalachia. This study focuses on the primarily Caucasian population of Tazewell County and how the Appalachian demographics may affect their health behaviors.

### **Leukemia**

The Cleveland Clinic defines leukemia as a cancer of the blood and bone marrow (Cleveland Clinic, 2013). Unlike other cancers, however, leukemia does not produce a tumor; instead it causes an increased number of white blood cells to be produced (Cleveland Clinic, 2013). White blood cells are an essential part of the body's immune system and are therefore produced with a specific function; fighting off disease and infection in the body. When leukemia develops, white blood cells that are being produced are not able to mature fully and are unable to effectively fight off infection which leaves the body vulnerable (Cleveland Clinic, 2013). As a result of the increased number of white blood cells, red blood cells and platelets are also affected. Red blood cells are no longer able to carry sufficient amounts of oxygen to tissues, and platelets are no longer able to properly clot blood leaving the individual suffering from leukemia at a high risk for infection, bleeding, and bruising (Cleveland Clinic, 2013). The exact cause of leukemia is still unknown. Scientists currently believe its formation is a result of a mix of factors from an individual's genetics and environment (Mayo Clinic, 2013b).

Some of the most common general signs of leukemia include a fever or chills, continuing fatigue or weakness, frequent infections, weight loss, swollen lymph nodes, easily bleeding or bruising, recurring nose bleeds, bone pain or tenderness, small red spots on the skin, and excessive sweating (Mayo clinic, 2013c). The symptoms for leukemia often vary depending on the specific type of leukemia a person develops and are usually very vague and nonspecific (Mayo clinic, 2013c). This non-specificity leaves the individual believing they have the flu or some other non-threatening illness (Mayo clinic, 2013c).

Leukemia is classified into different categories depending on its speed of progression and the types of white blood cells that are affected (Mayo Clinic, 2013b). Acute leukemia is characterized by the production of immature white blood cells, resulting in the blood cells lack of ability to carry out their normal function. This decrease in function causes acute leukemia to be fast spreading and aggressive. Chronic leukemia is the result of either too many cells or too few cells being produced (Mayo Clinic, 2013b). The accumulation of abnormal blood cells occurs slower than in acute leukemia so an individual with chronic leukemia could possibly go years before being diagnosed (Mayo clinic, 2013b). Lymphocytic leukemia affects the lymphatic system that comprises the immune system, and myelogenous leukemia affects myeloid cells which produce red blood cells, white blood cells, and platelet-producing cells (Mayo clinic, 2013b).

Treatment for leukemia varies depending on the individual's age, what type of leukemia is present, the individual's overall health, and if the leukemia has spread to any other part of the body (Mayo clinic, 2013d). Some of the most common types of treatment include chemotherapy, biologic therapy, targeted therapy, radiation therapy, and stem cell transplant. Chemotherapy uses a mix of chemicals to try and kill the leukemia cells. Biological therapy uses methods that

try to help an individual's immune system recognize and attack leukemia cells. Targeted therapy utilizes drugs which target specific vulnerabilities within the cancer cells. Radiation therapy uses X-rays to damage leukemia cells present in an effort to stop their growth. Stem cell transplant is a procedure where an individual's diseased bone marrow is replaced with healthy bone marrow from a donor (Mayo Clinic, 2013d).

Leukemia is commonly thought of as a children's disease but in reality it affects more adults and the risk of developing leukemia increases with age (Cleveland Clinic, 2013). In fact, leukemia occurs most frequently in adults over the age of 55 and is the most common form of childhood cancer in children below the age of 15 (National Cancer Institute, 2015). Men and Caucasians are more likely to develop leukemia than are women or African-Americans. Around 30,000 cases of leukemia are diagnosed in the United States annually (Cleveland Clinic, 2013).

### **Access to/Knowledge of Health Care in Rural Populations**

Lifestyle choices may allow an individual to reduce their risk of developing diseases, including cancer. Yet, despite the available knowledge regarding ways to reduce the risk of developing cancer, this knowledge is not always utilized. Some individuals have no knowledge of preventative factors and some lack resources that would allow them to eat healthy, exercise, or receive frequent medical care.

Health literacy describes the ability of an individual to obtain and understand basic health information in order to make informed decisions regarding their personal health (U.S. Department of Health and Human Services, 2008). Health literacy plays a critical role in promoting or hindering a community's overall health. In 2008, national data showed the health information available to the general public was too difficult to understand, resulting in decreased the overall national health literacy (U.S. Department of Health and Human Services, 2008).

According to the National Assessment of Adult Literacy, only 12 percent of American adults are considered to be proficiently health literate. The remaining 88 percent exhibited either basic, intermediate, or below basic literacy skills. It was also shown poor health literacy affects all ethnic groups but it varies based on the level of education an individual has received (U.S. Department of Health and Human Services, 2008). In general, the less education an individual has, the lower their level of health literacy. Thirty percent of individuals with a bachelor's degree or higher express proficient health literacy while other college experience or degrees only show 10 percent proficiency, high school education shows three percent, and less than a high school education showed only one percent proficiency (U.S. Department of Health and Human Services, 2008). Patients with low literacy levels are less likely to utilize preventive care and typically experience increased hospitalizations (DeWalt, Berkman, Sheridan, Lohr, & Pignone, 2004). These factors associate low health literacy with overall poor health outcomes for individuals and high health care costs for a community (Liechty, 2011).

The above-mentioned non-utilization and low health literacy is apparent in Appalachia. The Appalachian Regional Commission estimates that roughly 40 percent of Appalachian communities are at risk of being, or are, economically distressed (Paskett et al., 2011). There is a greater population that reports little or no health insurance, geographic isolation, sparse public transportation, and low numbers of physicians and clinics citizens have access to (Paskett et al., 2011). Data consistently indicates Appalachia has higher cancer mortality rates than non-Appalachian counties (Paskett et al., 2011). Further, residents of rural areas, as opposed to urban areas, tend to have cancer diagnosed in the later stages of development. Greater distance from a cancer center has also been shown to negatively influence cancer survival, which is the case in many rural Appalachian communities (Lengerich et al., 2005).

There have been few studies looking specifically into leukemia rates in rural populations but cervical cancer has been a topic of interest between rural and urban populations. In a study looking at cervical cancer screenings rates in rural and urban populations, the rural rates were much lower than in the urban population (Dallred, 2013). The rural populations tended to have little knowledge of the preventative measure a screening would provide. The women in the rural community within the study also believed they would develop cancer at some point regardless of their actions and there was nothing they could do to lower their chance of developing cervical cancer (Dallred, 2013). Essentially, this particular study indicated the women in rural populations believed their susceptibility to cervical cancer was high and their ability to reduce their risk of cancer development was low. As a result of these beliefs, rural women were less likely to receive preventative examinations or tests (Dallred, 2013). The study also found women in the studied urban populations believed they had access to readily available health information or advice as opposed to the women in rural populations who believed they did not (Dallred, 2013). This study highlights the lack of education and perceived lack of access most rural populations have about cancer.

A second study dealing specifically with cancer rates and mortality in rural Appalachia determined residents of Appalachia had a statistically significant higher overall cancer mortality rate than the rest of the United States (Lengerich et al., 2005). There has been lack of research into the incidence of cancer in Appalachia, however, so it is not known if incidence rates equal the high mortality rates. Many publications have shown that overall incidence rates are actually higher in urban areas than rural (Lengerich et al., 2005). Even though incidence in urban areas is greater than in rural areas, the stage of cancer at time of diagnosis tends to be more advanced in rural areas than in urban areas. This late stage diagnosis leads to higher mortality rates as

previously mentioned. The late stage diagnoses are a result of a lack of care that possibly results from a lack of financials needed to receive care, a patient's choice to not be treated, or simply an overall lack of access to comprehensive care in the area (Lengerich et al., 2005). Virginia Commonwealth University conducted various studies on Tazewell County's specific region of Appalachia, and while the studies were focusing more on the general health of the region, it was deduced by the data collected in those studies that a wide number of individuals are uninsured and tend to avoid receiving any type of formal medical treatment because they do not have the finances to afford it otherwise. There is also a proportion of individuals who do not attend annual medical check-ups because they believe they are able to overcome any illness symptoms, cancer or other diseases, without medical advice and this leads to late diagnosis of more serious illnesses, including cancer (A. Smith, personal communication, December 22, 2014).

### **Religious Fatalism**

Fatalism refers to an individual's belief that their health outcome is predetermined and out of their control. In many underserved populations, such as Appalachia, citizens exhibit an external locus of control and thus exhibit characteristics of fatalism in their health behaviors (Drew & Schoenberg, 2011). Individuals with a lower level of education and a low income tend to possess higher levels of fatalistic beliefs and these trends are also present in Appalachia (Franklin et al., 2007). Research has long shown that fatalism decreases the likelihood an individual will engage in positive health behaviors which leads to overall negative health outcomes (Drew & Schoenberg, 2011).

Even when controlling for outside confounding variables such as access to health care, cancer-screening rates are lower among individuals with higher fatalistic beliefs (Drew & Schoenberg, 2011). Cancer researchers have been the leaders in fatalistic beliefs and how they impact health behaviors (Franklin et al., 2007). It was shown in a study that rural residents have

a higher likelihood of possessing multiple fatalistic beliefs regarding cancer prevention as opposed to urban populations (Befort, Nazir, Engelman, & Choi, 2013). It is more specifically stated that lower levels of education and less access to health care play a role in an individual's level of cancer fatalism (Befort et al., 2013). Rural areas contain citizens that tend to be less educated, have less access to health care, and as a result have less knowledge about cancer in general (Befort et al., 2013). In particular, a study conducted by Befort, Nazir, Engelman, and Choi, using the 2007 Health Informational National Trends Survey data, found that individuals living in a rural area are more likely to believe that "everything causes cancer", "there are not many things one can do to lower their chances of getting cancer", and "it is hard to choose a recommendation to follow to try to prevent cancer because there are so many" (2013, p. 523-524).

Religious fatalism more specifically refers to the belief that health outcomes are in the hands of a higher power, God (Franklin et al., 2007). It should be pointed out however, that just because an individual is religious does not in turn mean that they have fatalistic beliefs (Franklin et al., 2007). Religious beliefs have a large effect on an individual's health behaviors, positive and negative. Religious beliefs have the potential to conflict with recommendations provided by health professionals or health practices thus leading to a lack of adherence of prevention practices and treatments (Franklin et al., 2007). This lack of adherence leads to many negative health outcomes for the individual. A study looking at African American men and women with lung cancer found that the individuals relied on their faith in a higher power as a way to cope with their cancer diagnosis and as a reason to not adhere to treatment plans (Franklin et al., 2007). A second study researched the relationship between a God Locus of Control and health behaviors focusing on no particular ethnicity. The results of that study found individuals with a

high God Locus of Control were less likely to believe that their negative health behaviors would lead to chronic illness or negative health outcomes (Karvinen & Carr, 2014). An interesting contrast, however, was that the individuals exhibiting a strong belief that God was in control of their health also believed they were more vulnerable to chronic illness (Karvinen & Carr, 2014). Even with the research completed related to fatalistic beliefs and health behaviors, there has, at current, been little research conducted studying the idea of religious fatalism and how it affects health behaviors (Karvinen & Carr, 2014).

### **Tazewell County, Virginia Demographics**

Tazewell County tends to follow the aforementioned trends in relation to health status and health behaviors among the community members. Religion is a large facet of the Tazewell County community with a church being the core of the three towns comprising the county. Those three towns are Tazewell, which is the county seat, Bluefield, and Richlands. The racial and ethnic background of the county consists of 94.6 percent White, 3.4 percent African American, 0.2 percent American Indian or Alaska Native, and 0.7 percent Asian community members (United States Census Bureau, 2015). Only 77 percent of the population has a high school degree, while 12 percent of the population has a Bachelor's degree or higher, and 18.3 percent are below the poverty line (United States Census Bureau, 2015). The Virginia Department of Health collected cancer statistics for all health districts in the state from 2007 to 2011 for incidence and from 2008 to 2012 for mortality (Virginia Department of Health, 2014). Each district was then given a ranking out of 35, where 1 was the most favorable, for incidence, staging, and mortality. The Cumberland Plateau Health District, which Tazewell County is located in, was given a ranking of 31 out of 35 (Virginia Department of Health, 2014). The Cumberland Plateau Health District was ranked in the lowest category for overall incidence with

365.7-423.7 per 100,000 yet it was ranked in the second to highest category for mortality with 179.8-207.9 deaths per 100,000 (Virginia Department of Health, 2014). Considering Tazewell County is located in the Appalachian Mountains, access to quality health care has always been an issue, and as a result, health care knowledge tends to be lacking. According to a health needs assessment conducted by Carilion Clinic analyzing Tazewell County, there are roughly 1,000 community members per one full time primary care physician (Carilion Clinic, 2013). In addition, 19 percent cannot access any type of health care due to the cost of services. Tazewell County has nearly twice the amount of Medicare, Medicaid, and Dual-Eligible compared to the state of Virginia (Carilion clinic, 2013). In Tazewell County, 29 percent of the population is characterized as having poor or fair health as compared to the state of Virginia, which only exhibits a 14 percent rating (Carilion Clinic, 2013). As far as overall health, County Health Rankings and Roadmaps ranked all 133 counties in Virginia according to overall quality of health, and Tazewell County was ranked last at number 133 (2015). This ranking endorses, through proven statistics, that Tazewell County has not only low quality health care but a lack of access to that care as well. This lack of accessibility to low quality health care creates poor health outcomes for the Tazewell County citizens.

### **Health Belief Model and How Perceptions Influence Behavior**

The Health Belief Model (HBM) is often considered to be the most commonly used theoretical model in health education and health promotion (Boston University School of Public Health, 2013). It was developed as a way to try and explain why medical screening programs given by the U.S. Public Health Service were not very successful (Boston University School of Public Health, 2013). The HBM was originally developed with the idea that a person's health behaviors were a result of that individual's personal beliefs or perceptions about a disease

(Boston University School of Public Health, 2013). As a result of this, the HBM includes six constructs: perceived severity, perceived susceptibility, perceived benefits, perceived barriers, self-efficacy, and cues to action (Boston University School of Public Health, 2013).

Perceived severity refers to an individual's beliefs of the severity of a disease (Boston University School of Public Health, 2013). An individual may form these perceptions based on medical advice or based on personal beliefs. In any case, how a person views the negative effects a disease will have on their life will influence their perceived seriousness of said disease and influence their likelihood of engaging in preventative behaviors (Boston University School of Public Health, 2013).

Perceived susceptibility refers to an individual's belief of how likely it will be they will contract a certain disease (Boston University School of Public Health, 2013). If a person's perceived susceptibility is high, the more likely it will be the person will engage in behaviors to reduce the risk of developing the disease (Boston University School of Public Health, 2013).

Perceived benefits refers to an individual's belief of how useful engaging in a behavior will be to reducing their chances of developing a disease (Boston University School of Public Health, 2013). If an individual believes a preventative behavior will significantly reduce their risk of developing a disease, they will be more likely to engage in the behavior (Boston University School of Public Health, 2013).

Perceived barriers refer to obstacles or barriers an individual believes will stand in their way of performing a preventative behavior (Boston University School of Public Health, 2013). Of all of the six constructs, perceived barriers holds the most weight in determining if an individual will engage in a preventative behavior (Boston University School of Public Health, 2013). If an individual hopes to adopt a new preventative behavior, they must believe that the

benefits of the preventative behavior will outnumber the consequences of continuing the old risky behavior (Boston University School of Public Health, 2013).

Self-efficacy refers to an individual's belief in his or her own ability to adopt and perform the preventative behavior. If an individual believes they will be able to carry out the preventative behavior successfully, they will be more likely to engage in the behavior (Boston University School of Public Health, 2013). Cues to action refer to people, events, or things that are able to convince an individual to possibly adopt a preventative behavior. The cue could be internal such as developing a cough or experiencing chest pain, or external such as the illness of a family member (Boston University School of Public Health, 2013). The cues to action are catalysts that inform the individual a change in behavior is needed.

The HBM outlines an individual's motivation, perceived susceptibility or perceived severity of an illness, and the potential perceived benefits or barriers to a health behavior change as the three main variables with the most significant influence on someone's likelihood to make any type of change in their behaviors relating to their health (Boston University School of Public Health, 2013).

The HBM bases an entire theory around the idea that perceptions guide behaviors. As shown, the HBM provides explanations for an individual's possible behaviors based on what the individual believes, or perceives. If an individual believes they are at high risk or high vulnerability, then they will become more likely to adopt a healthy behavior in the hopes of decreasing their risk (Rothman & Salovey, 1997). In a study examining perceptions of risk to Lyme's disease, the participants were asked if they believed they were at a high or low risk for contracting Lyme's disease (Brewer, Weinstein, Cuite, & Herrington Jr., 2004). The results of the study showed participants who believed they were at a high risk were more likely to receive a

preventative vaccine compared to those who believed they were at low risk (Brewer et al., 2004). This study demonstrates individuals who believe they are at a higher risk for contracting a disease will be more inclined to engage in protective behaviors. Another study evaluated the effect of how the way a health message was framed on health behaviors and found that one's behaviors will depend on how information presented to them is framed (Rothman & Salovey, 1997). If the information present is in terms of benefits, then the person will be more likely to accept the information. However, if the information is given in terms of risk, the individual is more likely to accept the risk (Rothman & Salovey, 1997). Any prior perceptions an individual holds also play a part in whether or not an individual will heed health information or continue with the risk. A specific example given deals with breast cancer; if a woman has a family history of breast cancer, they may perceive self-breast exams in a negative light because they are afraid of finding a lump. As a result, this negative outlook may deter the woman from performing preventative self-exams, thus increasing her chances of not detecting breast cancer, should it develop (Rothman & Salovey, 1997). Societal influences also shape how one perceives a health behavior (Rothman & Salovey, 1997).

Perception as a powerful indicator of an individual's behaviors has been proven by multiple studies across multiple time frames. The idea that individuals weigh their perceived susceptibility, risks, and benefits before making any type of health decision or engaging in any type of health behavior is the basis for almost every theoretical model dealing with health behaviors (Pligt, 1998). The more an individual perceives they will contract an illness or if they believe an illness is serious, the more likely that individual is to engage in behaviors that will lower their chances of contracting said disease. Also, if a person believes they will be able to participate in or possess the resources to engage in preventative health behaviors, their self-belief

will increase their likelihood of engaging in preventative behaviors. As shown in Appalachia, there are not many resources available, and if there are, many do not have the ability to utilize them and this can have a negative effect on the population's self-efficacy and thus their health.

## **Chapter 3**

### **Introduction**

To gain a more in depth view of Tazewell County community members' perceptions of disease and what impacts their health behaviors, the methodology of this research study was designed to encourage participation by Tazewell County citizens and make the process as convenient as possible. Steps were taken aiming to increase the likelihood of participation. Some steps included distributing the survey instrument at locations throughout the county that were believed to experience the most foot traffic by the largest variety of county citizens. Having the survey located in places the citizens already visit, it was the hope of the researcher to maximize participation to gain a valid representation of the views of the entire county relating to their perceptions of cancer rates in the community, their general cancer knowledge, and their health behaviors.

#### **Institutional Review Board approval**

Institutional Review Board approval was granted on August 4, 2015. The study was approved from September 1, 2015 through November 20, 2015 and assigned the protocol No. 16-0062.

#### **Sample population**

The subjects of the study included citizens of Tazewell County who were at least 18 years of age and voluntarily participated. The participants were individuals who visited any of the following locations: Main Street United Methodist Church, Four Seasons YMCA, Destiny Outreach Ministries, and Tazewell County Health Department during the time of data collection, which was during September, October, and November of 2015. To gain participation, as an individual entered or exited any of the above-mentioned locations, a pre-designated

correspondent asked if the individual would like to participate in the research being conducted. Each correspondent had a script they used to explain to the individual what the purpose of the research was, who was conducting the research, and why the research was being conducted. Then the individual was able to decide if they would like to participate in the study. It was left up to the participant to complete the survey only once as the survey is anonymous and the correspondents at the locations would not have knowledge if the individual had previously completed the survey at another location. If the individual decided they would participate, the survey was administered immediately. For the church patrons, they were given a copy of the script explaining the research process, along with an incomplete survey before the service began and could choose to complete the survey and turn it in before leaving. The investigator perceived no more than minimal risks from involvement in the study. No identifiable information was collected from the participants, participation was entirely voluntary, and participants could withdraw at any time without any consequences.

### **Instrumentation**

The instrument used within the study was designed to measure the perceptions Tazewell County citizens held on religious fatalism, access to health care, health care knowledge, and health behaviors. The survey consisted of two previously administered instruments, including the Health Information National Trends Survey (HINTS) 2007 instrument (Hesse & Moser, 2007) and the Religious Health Fatalism Questionnaire (Franklin, Schlundt, & Wallston, 2008) (Appendix A). The HINTS 2007 is a survey developed by the National Cancer Institute to collect data from the American public relating to cancer information (Hesse & Moser, 2007). Multiple versions of the HINTS instrument were developed. The one used in this study was the HINTS 2007, which also designates the year it was used by the National Cancer Institute. The

HINTS 2007 was designed to have each question be its own individual construct and not rely on any of the other questions to be scored as a subscale. The questions located in the HINTS 2007 survey are a majority multiple choice with a few free response items as well (Hesse & Moser, 2007). The HINTS surveys have been tested in a laboratory setting, refined, and then tested three more times. A large-scale pilot study was then conducted to determine coverage, representativeness, and reliability. The validity was determined by a group of individuals that are trained to test and determine the validity of research instruments (B. Hesse, personal communication, September 17, 2015). The Religious Health Fatalism Questionnaire was developed in 2008 as a way to measure the faith related health beliefs of the African American Community (Franklin et al., 2008), however this scale may be used on any demographic. The Religious Health Fatalism Questionnaire contains Likert style response scales ranging from 1 (strongly disagree) to 5 (strongly agree). The higher a score an individual receives, the higher they are in agreement with the statements made in the instrument (Franklin et al., 2008). There are a total of 17 items divided into three subscales within the questionnaire. One subscale refers to divine provision and the belief that God will heal the sick individual regardless of medical treatments or adherences. The second subscale relates to a destined plan and the idea that God may have planned for the person to become ill so they should accept whatever fate may come. The third subscale refers to a sense of helpless inevitability and the idea that no matter what a person does for their health, it is irrelevant because God is the one in control. All three subscales are valid and reliable with the first subscale having an alpha of .89, second subscale alpha of .64, and the third subscale alpha of .52 (Franklin et al., 2008).

## **Procedure**

Prior to administering the surveys, permission was granted from all four sites of data collection and correspondents for each off-campus location were determined. Due to varying events that take place at the different survey locations, the protocol for the four locations was slightly different. The Four Seasons YMCA and Tazewell County Health Department protocol was the same and Destiny Outreach Ministries and Main Street United Methodist Church protocol was the same. Lock boxes were purchased and used to store completed surveys. The lock boxes were placed in an office within all four locations to ensure additional safety when the offices were unattended during operating hours. All offices were locked by the supervisor or pastor upon leaving the location and no other individual had access until the supervisor or pastor returned. The protocol for the Four Seasons YMCA and Tazewell County Health Department was as follows: A script was given to each correspondent that allowed them to explain to the potential participant what the purpose of the research was, who was conducting the research, and why the research was being conducted. The script allowed for the identical explanation of the study across all locations. As a patron entered or was leaving the location, the correspondent asked if the patron would be interested in participating in the study. The correspondent then read the script aloud to the patron and he/she was then able to decide if they wanted to participate. If the patron chose to participate, they were given an incomplete survey and asked to complete it before leaving the location. Upon completion, the correspondent then took the completed survey and placed it in the designated lock box in the location supervisor's office, separate from the incomplete surveys. The protocol for Destiny Outreach Ministries and Main Street United Methodist Church are as follows: The same script used at the previous two locations was also utilized at these locations. The correspondent at the two churches placed the script and an

incomplete survey inside every bulletin the church gave to patrons on Sundays and Wednesdays before the services began. The patron was able to read the script and decide if they would like to participate. If the patron decided to complete the survey, they placed their completed survey in a designated box next to the sanctuary entrance before they left the church. The correspondent for each location then took the completed surveys and placed them into the designated lock box, within the pastor's office, separate from the incomplete surveys. After the 15-week data collection period, the researcher collected all completes and any leftover incomplete surveys. The researcher stored the collected, completed surveys in a safe in the researcher's residence which remained locked until time of data analysis.

### **Research Design**

This study utilized a quantitative survey instrument that contains multiple choice, open-ended, and Likert scale questions inquiring about the knowledge and perceptions Tazewell County citizens hold regarding cancer. The instrument was used to analyze the effect the perception of cancer has on health behaviors, the effect religious fatalism has on the health behaviors, the effect preventative knowledge has on the health behaviors, and the effect health care access/resources has on health behaviors.

### **Hypothesis**

The citizens of Tazewell County have a high perception of cancer rates in the community but due to a lack of resources, knowledge, and the belief a higher being is in control of their lives, their efforts to reduce their risk of developing cancer are minimal, or even nonexistent.

## **Research Questions**

The research questions to be evaluated are:

- A. What effect does the perception of cancer (leukemia) rates in Tazewell County have on the health behaviors of Tazewell County community members?
- B. What effect does religious fatalism have on the health behaviors of Tazewell County community members?
- C. What effect does preventative knowledge have on the health behaviors of Tazewell County community members?
- D. What effect does health care access/resources have on the health behaviors of Tazewell County community members?

## **Data Analysis**

Data will be analyzed using Likert scale, multiple choice, and open-ended questions. The variables of preventative knowledge, health care access and resources, and health behaviors will be evaluated using questions from the HINTS 2007 instrument. The variable of religious fatalism will be evaluated using the Religious Health Fatalism Questionnaire. The variable of perception of the cancer rates will be evaluated using an original question developed specifically for this study. The data collected will be analyzed using IBM Statistical Package for the Social Sciences (SPSS) statistics 21 when data analysis begins. The questions from the HINTS 2007 survey will be run as frequency data to simply find the number of participants who give specific answers. This will hopefully reveal how many participants engage in healthy behaviors, have a high perception of cancer rates, have access to health care, and have correct knowledge of preventative health behaviors. The Religious Fatalism Questionnaire will also be run as frequency allowing the participants level of agreement or disagreement with the scales to be

found. There will also be crosstab calculations run to see how cancer perception rates, and the belief cancer is caused by a personal lifestyle, affect health behaviors.

## **Chapter 4**

### **Introduction**

This section seeks to report the responses given by the respondents in Tazewell County. Frequency data gives descriptions about respondent's various health behaviors and comparative analyses help to show relationships, if any, between the respondent's perception of cancer rates and their health behaviors.

### **Results**

#### **Demographics and Access to Healthcare**

There were a total of 120 respondents which allows for roughly a 70 percent confidence level for the entire population of Tazewell County. The first questions were focused on gaining a sense of demographics. An uneven proportion of males to females, with 72.5 percent of respondents being female and only 27.5 percent being males, participated in the study. When asked about visiting a regular health care provider and health insurance, 79.2 percent reported seeing a regular health care provider and 84.2 percent reported having health insurance. The majority of respondents also stated they felt they could always or usually rely on their health care provider to give excellent or very good health care. However, 15 percent had visited a health care provider only one time in the past 12 months, 19.2 percent had visited 2 or 3 times, 10.8 percent had visited 4 times, and 16.7 percent had visited five to nine times. Respondents were also asked if they, personally, or a family member had ever been diagnosed with cancer and also their highest level of education. Only 15 percent of respondents had ever been diagnosed with cancer personally, but 81 percent reported having a family member who had been diagnosed. Also, it was reported over 80 percent of respondents had either completed some college, were a college graduate, or had some type of postgraduate degree. The remainder of the study focused on

perceptions of cancer, health literacy, how religion affects their beliefs about cancer, and questions about the respondents' behaviors.

### **Perception of Cancer Rates**

When asked about their perception of the rates of cancer diagnoses in Tazewell County, 75 percent reported they perceived the county has a high rate, 15.8 percent reported perceptions of normal rates, and nine percent had not given much thought to the idea. When asked how likely it would be that they develop cancer in the future and about their perceptions of survival rates once diagnoses, almost 70 percent believed there was a moderate, somewhat high, or very high risk. Additionally, 65 percent believed that of those who are diagnosed with cancer, between only 25 and 50 percent would survive at least five years after diagnosis. There was also a question where respondents were asked what type of cancer they think of when thinking of cancer diagnoses in Tazewell County. The question was a free response item and the top three responses provided were breast cancer (39%), lung cancer (29%), and leukemia (10%). There was also a large number of responses (11.8%) in which individuals did not give a specific type of cancer but instead answered with 'all types' or 'childhood'.

### **Healthcare Literacy and Knowledge**

To gain an understanding of the respondent's level of health literacy, a question was asked in which the respondents had to identify which ratio represented the biggest risk. Only 66 percent answered correctly. However, 72 percent of respondents reported they found it either 'easy' or 'very easy' to understand medical statistics, and 43 percent would prefer numbers be used when being told the risk of disease occurring. Also, respondents were asked specifically about the effects of physical activity on the chances of developing cancer. The majority, 72.5

percent, believed it decreased the chances, 24.2 percent believed it made no difference, and 2.5 percent believed it increased their chances.

### **Religious Fatalism**

A religious fatalism scale, utilizing a Likert scale for scoring ranging from strongly disagree (1) to strongly agree (5), was used to measure respondents' beliefs about divine provision, destined plans, and helpless inevitability. The divine provision subscale captures the idea that if the respondent developed cancer, he/she would rely on a higher power, or God, to heal them. The destined plan sub scale assesses the belief that if people who become ill or develop cancer were destined to have that in their life and God has predetermined who will become ill. The helpless inevitability subscale denotes the belief that someone with cancer does not need to put any effort into becoming better because only God can heal, regardless of the person's efforts (Franklin et al., 2008). The average score for the destined plan subscale fell between 3 and 4, denoting that the majority of respondents believed in divine provision, and that God will take care of their health issues. The opposite was true for both the destined plan and helpless inevitability subscales. The majority of responses for both scales fell between a 1 and 2, showing that the majority of respondents disagreed with destined plan and the idea that God has predetermined who will get sick, as well as helpless inevitability and the idea they do not need to engage in behaviors to help heal themselves.

### **Comparisons**

Using Chi-Square analyses, the questions of perception of cancer rates in Tazewell County was compared with the behavior questions, such as how much fruit and vegetables do the respondents consume on a daily basis, and how much moderate physical activity they engaged in within the past month. While there was only a significant correlation between perception and

vegetable intake, ( $\chi^2= 22.854$ ,  $p=0.029$ ) (Table 1), there were majority groupings for the other two categories. The daily fruit intake for those that believe there is a high perception of cancer rates mainly fell between ½ cup and 2 cups (60.2%) (Table 2). The majority (66.9%) of those who engaged in some type of moderate physical activity within the past month also had a high perception of cancer rates (Table 3).

Table 1.

*Cross-tabulation of the perception of cancer diagnoses and amount of vegetables consumed/day.*

	None	½ cup or less	½ to 1 cup	1-2 cups	2-3 cups	3-4 cups	4 cups or more
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
High Perception	5 (4.2)	9 (7.6)	30 (25.4)	28 (23.7)	12 (10.2)	5 (4.2)	0 (0)
Normal Perception	0 (0)	1 (0.8)	4 (3.3)	8 (6.8)	2 (1.7)	2 (1.7)	1 (0.8)
Not given much thought	0 (0)	5 (4.2)	4 (3.3)	2 (1.7)	0 (0)	0 (0)	0 (0)

*Note.* n (total) = 118,  $p= 0.029$ ,  $\chi^2= 22.854$

Table 2.

*Cross-tabulation of the perception of cancer diagnoses and amount of fruit consumed/day.*

	None	½ cup or less	½ to 1 cup	1-2 cups	2-3 cups	3-4 cups
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
High Perception	7 (5.9)	27 (22.9)	27 (22.9)	17 (14.4)	8 (6.8)	3 (2.5)
Normal Perception	0 (0)	6 (5.1)	7 (5.9)	3 (2.5)	1 (0.8)	1 (0.8)
Not given much thought	3 (2.5)	5 (4.2)	1 (0.8)	1 (0.8)	1 (0.8)	0 (0)

*Note.* n (total) = 118,  $p= 0.410$ ,  $\chi^2 = 10.356$

Table 3.

*Cross-tabulation of the perception of cancer diagnoses and physical activity in the past month.*

	Yes	No Physical Activity
	n (%)	n (%)
High Perception	79 (66.9)	10 (8.5)
Normal Perception	14 (11.7)	5 (4.2)
Not given much thought	9 (7.6)	1 (0.8)

*Note.* n (total) = 118, p= 0.206,  $\chi^2 = 3.156$

While there were no other significant relationships, it was also of interest to compare the ideas respondents had regarding what caused cancer and how likely they believed it was they would develop cancer in the future (Table 4). Exactly half, which was the majority, of respondents believed there was a moderate likelihood they would develop cancer in the future. Of those respondents who believed there was a moderate likelihood they would develop cancer in the future, the majority of the respondents reported strongly agreeing (11.5%), somewhat agreeing (15.9%), or somewhat disagreeing (9.7%) with the idea that everything causes cancer (Table 4).

Table 4.

*Cross-tabulation between the perception of developing cancer and the idea everything causes cancer.*

	Very Low	Somewhat Low	Moderate	Somewhat High	Very High
	n (%)	n (%)	n (%)	n (%)	n (%)
Strongly Agree	0 (0)	2 (1.8)	13 (11.5)	3 (2.7)	2 (1.8)
Somewhat Agree	5 (4.4)	6 (5.3)	18 (15.9)	5 (4.4)	2 (1.8)
I don't know	1 (0.9)	4 (3.5)	10 (8.8)	5 (4.4)	0 (0)
Somewhat Disagree	3 (2.7)	5 (4.4)	11 (9.7)	1 (0.9)	0 (0)
Strongly Disagree	4 (3.5)	6 (5.3)	6 (5.3)	1 (0.9)	0 (0)

*Note.* n (total) = 113, p= 0.257,  $\chi^2 = 19.233$

Without a comparison, it was interesting to see that the majority of respondents (67.5%) disagreed with the statement there is not much they could do to lower their chances of developing cancer. It was also of interest to compare the fruit and vegetable intake, as well as physical activity, with the responses to the idea that cancer is most often caused by a person's lifestyle or behaviors. The most (36.7%) somewhat agreed that cancer is caused by a person's lifestyle or behaviors. Of those respondents who somewhat agreed, the largest group ate between ½ to one cup of fruit per day (11.4%) (Table 5) and between ½ to one cup of vegetables per day (14.0%) (Table 6). However, most respondents (36.3%) had engaged in some type of moderate physical activity within the past month (Table 7).

Table 5.

*Cross-tabulation between the idea cancer is often caused by someone's lifestyle behaviors and daily fruit consumption.*

	Strongly Agree	Somewhat Agree	I don't know	Somewhat Disagree	Strongly Disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
No Fruit	0 (0)	5 (4.4)	2 (1.8)	1 (0.9)	2 (1.8)
½ Cup or Less	6 (5.3)	11 (9.6)	8 (7.0)	5 (4.4)	6 (5.3)
½ to 1 Cup	2 (1.8)	13 (11.4)	7 (6.1)	8 (7.0)	3 (2.6)
1-2 Cups	2 (1.8)	9 (7.9)	5 (4.4)	4 (3.5)	1 (0.9)
2-3 Cups	1 (0.9)	4 (3.5)	2 (1.8)	2 (1.8)	1 (0.9)
3-4 Cups	0 (0)	2 (1.8)	1 (0.9)	0 (0)	1 (0.9)

*Note.* n (total) = 114, p= 0.969,  $\chi^2 = 9.973$

Table 6.

*Cross-tabulation between the idea cancer is often caused by someone's lifestyle behaviors and daily vegetable consumption.*

	Strongly Agree	Somewhat Agree	I don't know	Somewhat Disagree	Strongly Disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
No Vegetables	0 (0)	2 (1.8)	1 (0.9)	0 (0)	2 (1.8)
½ Cup or Less	1 (0.9)	3 (2.6)	5 (4.4)	4 (3.5)	2 (1.8)
½ to 1 Cup	5 (4.4)	16 (14.0)	7 (6.1)	4 (3.5)	5 (4.4)
1-2 Cups	2 (1.8)	14 (12.3)	7 (6.1)	7 (6.1)	5 (4.4)
2-3 Cups	2 (1.8)	5 (4.4)	3 (2.6)	4 (3.5)	0 (0)
3-4 Cups	0 (0)	4 (3.5)	2 (1.8)	1 (0.9)	0 (0)
4 cups or more	1 (0.9)	0 (0)	0 (0)	0 (0)	0 (0)

Note. n (total) = 114, p= 0.398,  $\chi^2 = 25.143$

Table 7.

*Cross tabulation of belief cancer is caused by lifestyle behaviors and physical activity in the past month.*

	Strongly Agree	Somewhat Agree	I don't know	Somewhat Disagree	Strongly Disagree
	n (%)	n (%)	n (%)	n (%)	n (%)
Yes	9 (7.9)	41 (36.3)	21 (18.6)	18 (15.9)	10 (8.8)
No Physical Activity	2 (1.8)	3 (2.7)	3 (2.7)	2 (1.8)	4 (3.6)

Note. n (total) = 113, p= 0.279,  $\chi^2 = 5.081$

There was also a comparison conducted to look at the perception of cancer rates and whether or not the respondent had a family member who had been diagnosed with cancer (Table 8). There was not a significant correlation, but the majority (62.2%) of those who had a high perception of cancer also had a family member who had been diagnosed with cancer (Table 8).

Table 8.

*Cross-tabulation between personal perception of cancer diagnoses and diagnoses of cancer in family members.*

	Yes	No Family Member	I Don't Know
	n (%)	n (%)	n (%)
High Perception	69 (62.2)	13 (11.7)	3 (2.7)
Normal Perception	11 (9.9)	4 (3.6)	0 (0)
Not given much thought	10 (9.0)	0 (0)	1 (0.9)

*Note.* n (total) = 111, p= 0.325,  $\chi^2 = 4.650$

These responses help show the beliefs the respondents hold regarding perceptions of cancer rates and the health behaviors in which they engage. Relationships between the health behaviors of the citizens of Tazewell County and cancer rate perceptions showed only one significant finding. These results, while not statistically significant, suggest there is a lack of positive health behaviors despite the high perceptions of cancer rates as hypothesized.

## **Chapter 5**

### **Introduction**

Perceptions are some of the strongest motivators guiding one's decisions and actions. The HBM is one of the most widely used theoretical models in health and indicates a person's health behaviors are a result of his/her personal beliefs or perceptions about a disease. These perceptions do not have to be correct or proven; the individual simply has to believe those perceptions in order for his/her behaviors to be impacted. Perceived severity, perceived susceptibility, perceived benefits, perceived barriers, self-efficacy, and cues to action are the six constructs the HBM includes that have the potential to affect an individual's behavior (Boston University School of Public Health, 2013). Literature has purported that individuals in rural areas tend to have less adequate health literacy (U.S. Department of Health and Human Services, 2008), are less likely to have health insurance and readily available access to health care (Paskett et al., 2011), and are more likely to uphold fatalistic beliefs due to an external locus of control and lower levels of education (Drew & Schoenberg, 2011 and Franklin et al., 2007).

This study attempted to explore the perceptions of cancer rates in Tazewell County, Virginia, and whether or not those perceptions, along with fatalism beliefs and health care resources, had any effect on the respondent's health behaviors. Health behaviors examined included consumption of fruits and vegetables and physical activity levels. For the purpose of this study, it was believed the citizens of Tazewell County have a high perception of cancer rates in the community. However, due to lack of resources, knowledge, and the belief a higher being is in control of their lives, respondents' efforts to reduce the risk of developing cancer are limited.

## **Interpretation of Data**

### **Health Belief Model**

The six constructs of the Health Belief Model were used to analyze responses to various survey items to gain a better understand of the respondents' health beliefs. Over half believed only 25 to 50 percent survived at least five years after a cancer diagnosis. This belief highlights a rather bleak outlook on the survival rate of a cancer diagnosis and a high perceived severity. Exactly half of the respondents indicated a moderate belief they would develop cancer in the future, which indicates a relatively high perceived susceptibility. Almost 75 percent of respondents understood that physical activity decreased the chances of developing cancer, and the majority reported engaging in regular weekly physical activity. Therefore, respondents are at least aware of the benefits of engaging in physical activity and possibly the benefits of overall positive health behaviors. As for barriers, over 75 percent had health insurance and reported seeing a regular health care provider indicating there are no apparent perceived barriers among the respondents needing to receive health care. In addition, when asked about specific types of cancer in Tazewell County, the top three responses consisted of lung cancer, breast cancer, and leukemia. The types of cancer the respondents think are prevalent in the community could produce a possible barrier because if it is believed a certain cancer cannot be prevented, he/she may see no point in engaging in healthy behaviors.

The majority of respondents (67.5%) disagreed with the idea there was not much they could do to lower their chances of developing cancer showing a higher perception of self-efficacy as it pertains to lowering risk of cancer development. An overwhelming majority (75%) of respondents reported having a high perception of cancer rates in Tazewell County along with having had a family member who had been diagnosed with cancer. These latter findings are both

possible cues to action, as they pertain to respondents taking preventative measures to reduce their chances of developing cancer in the future. These responses indicate a higher perceived severity and a relatively high perceived susceptibility. Respondents were seemingly aware of the health benefits to performing positive health behaviors and presented with a relatively decreased incidence of perceived barriers because of their access to health care. Respondents also presented with a higher level of self-efficacy and indicate possible cues to action are present based off of their reported health behaviors. When combined, these perceptions indicate the respondents, and hopefully the citizens of Tazewell County, should be engaging in positive health behaviors to lower their chances of developing cancer.

### **Health Knowledge and Literacy**

The data collected in Tazewell County supports, as well as contradicts, several concepts in the existing literature. In the category of health literacy, a little more than half of the respondents (66.7%) correctly determined which statistic represented the highest level of risk for cancer indicated their ability to understand medical statistics, but it also shows there is room for improvement in those that did not answer correctly. This result neither outstandingly supports nor contradicts the literature, which states those living in rural areas will present with lower health literacy (Paskett et al., 2011), but it does provide an insight into a geographic area that could possibly benefit from community health education. A question dealing with general health knowledge asking about the relationship between physical activity and the chances of developing cancer resulted in a majority (72.5%) giving the correct response that physical activity can decrease the chances of developing cancer. However, there were still roughly a fourth of the respondents who believed physical activity made no difference. This latter finding indicates a vast majority of the respondents may have a base of general preventative health care knowledge,

but, as stated earlier, further health education within the community can also assist with improving this factor among the participants.

### **Access to Health Care**

The higher level of health insurance coverage in Tazewell County contradicts the trend of lower levels of health insurance among rural areas as stated in the literature. The number of respondents with health insurance far outweighed those without coverage. According to the literature, rural areas tend to have a great number of uninsured individuals due to the economic distress within those regions (Paskett et al., 2011). Even though there was a large number of respondents who reported having insurance coverage, there was a contrast with the number of responses to those who saw a health care provider regularly along with the number of times they reported visiting a health care provider in the past 12 months. Over 80 percent reported being insured while 79 percent reported seeing a regular health care provider, yet under 20 percent reported seeing that health care provider at least three times in the last 12 months. This contradiction might be a result of the respondents misunderstanding what was meant by visiting a regular health care provider. It is possible the respondents may have viewed the question as seeing the same health care provider each visit rather than seeing a health care provider regularly throughout the year. Nevertheless, despite the large number of respondents possessing health insurance, they do not visit a health care provider frequently, which could be an indication of a belief visits to the doctor are unnecessary.

### **Fatalistic Beliefs**

Another point of contradiction was revealed with the fatalism responses. The scale in this study focused on religious fatalism and the concepts of divine provision (the idea God will heal those who develop cancer so the individual does not need to contribute to the healing

process), a destined plan (the idea that God has a predetermined list of who will develop cancer and who will not), and helpless inevitability (the idea if God determines cancer will cause their death, nothing the patient does to treat the cancer will be successful) (Drew & Schoenberg, 2011 and Franklin et al., 2007). The responses gathered indicated a majority of respondents believed in divine provision, yet the majority disagreed with the concepts of a destined plan and helpless inevitability. The beliefs regarding religious fatalism do correlate with the data given of the education levels of the respondents. The majority of respondents reported having some college, being a college graduate, or having post graduate education. According to Drew and Schoenberg (2001) and Franklin and colleagues (2007), fatalism beliefs tend to correspond to levels of education; the less education one has, the greater the fatalistic beliefs; the greater one's education, the lower one's fatalistic beliefs. The lower fatalistic beliefs and higher levels of education presented in this study contradict the typical rural responses. The levels of education may be a point of error in the data due to misunderstanding what the term 'postgraduate' was defining. Postgraduate was intended to refer to post-baccalaureate education; however, respondents may have understood it to be defined as post high school education such as vocational training.

### **Perception of Cancer Rates**

When respondents were asked about their perceptions of cancer rates, a large majority reported high perception rates. When asked if they had ever been diagnosed with cancer, the majority had not; however, they did report having family members that had been diagnosed. While the respondents themselves had not been diagnosed with cancer personally, the high family diagnoses exposure may be a contributing factor to the high perception of cancer rates. Also, considering Tazewell County is relatively small, there is a strong probability that even if a

respondent had not been diagnosed or had a family member, they were still aware of someone in their life who had been diagnosed.

When respondents' perceptions of cancer rates were directly compared to the levels of fruit and vegetable consumption and physical activity, the only statistically significant correlation was between the perceptions of high cancer rates in the region with vegetable consumption. The majority of respondents, however, ate relatively the same amount of fruits and vegetables, which was not near the recommended daily intake. Also, although a vast majority reported getting some type of physical activity within the past month, a statistical correlation was not found between this behavior and the perception of cancer rates. These behaviors may not have been initiated with the purpose of benefiting their health, but respondents are at least engaging in some degree of healthy behaviors. Although specific examples of what constitutes physical activity were given as a guide, the high response rate of respondents engaging in physical activity could have possibly been misreported, due to varying opinions of what constitutes physical activity. Therefore, an individual may believe he or she is engaging in healthy behaviors from their daily activities when in reality they are gaining no benefits therefore are still at risk and unaware.

### **Limitations and Future Research**

Limitations for this study include a lack of understanding, or interpretations, of certain questions, the length of the study, a lack of participation, truthfulness of the responses, and not fully reading all answer choices. As previously referenced, some of the questions were possibly misunderstood, which may have led to a misreporting of the answers by the respondents such as regularity of health care visits, level of physical activity, and level of education. The questionnaire was lengthy (41 questions) which may have led to some questions remaining

unanswered and possibly a deterrent for people initially choosing to participate. The lack of participation resulted in a smaller sample and confidence interval than anticipated. As it is an issue for many studies including self-response instrument items, the accuracy and truthfulness of responses are a concern within this study, especially since questions about personal behaviors were being asked. There is a chance respondents embellished on their responses to some of the questions, such as the amount of physical activity they performed, the amount of fruits and vegetables they ate, or their health insurance status. Even though this study was anonymous, one's diet, physical activity levels, or health insurance status are topics that are particularly sensitive for some individuals and they may not want to admit they do not have insurance or they do not have healthy behaviors. This leads respondents to answer with what they think is the 'correct' response rather than what is factual and provides an inaccurate report of their health behaviors. The lack of correct responses to the question evaluating the respondent's ability to understand medical statistics could have been a result of the arrangement of the answer choices. The three possible responses were arranged randomly, so respondents might not have read all of the answer choices before choosing their final answer resulting in an incorrect assessment of their knowledge.

For future research, it may be of interest to investigate, more specifically, which barriers are preventing the respondents from participating in more prevalent preventative health behaviors. This might include more detailed questions about respondents' visits with health care providers, and if those providers share information about preventative measures to take for improved long term health. A second suggestion is to conduct a deeper investigation into the respondents' access to fruits and vegetables, as well as gym facilities. A more complete analysis of the factors mentioned within this study may be better represented using qualitative measures

rather than the quantitative measures utilized presently. This might allow respondents to give full and complete responses and the analysis may provide more in-depth results aiding to further understand the connection between perceptions and health behaviors. A third suggestion would be to ensure every question is fully and clearly indicating what is being asked. Providing more explicit examples related to the terminology used within the questions may result in more accurate responses. Finally, another study that might be of interest to investigate since there is such a high perception of cancer rates in Tazewell County, is asking respondents their thoughts on the cause of the cancer and why they think it is so prevalent in that particular area. This information could help the community officials address any false perceptions the community members may hold, such as revealing the true number of cancer diagnoses in the area and whether or not that number is actually as high as community members believe.

### **Conclusions**

While the present data confirmed the sample of citizens of Tazewell County possess a high perception of cancer rates within their county, their perception seems to play little to no part in their health behaviors. The idea presented in the literature that rural communities have less access to health care and are underinsured was not evidenced in Tazewell County, so respondents' lack of prevention efforts are not likely a result of their lack of resources to health care. The respondents did not have overly fatalistic beliefs so this also seems unlikely as a cause of or related to their lack of preventative measures. In addition, the respondents presented themselves to be knowledgeable about the benefits to positive health behaviors. The HBM indicates that with a higher level of perceived benefits, there is a higher likelihood of behavior change meaning the citizen respondents should be more likely to engage in positive health behaviors. Unfortunately, they are making little effort to do so.

Overall, respondents seem to have more education than expected, higher levels of health literacy than expected, have less religious fatalistic beliefs, and their perception of cancer rates have no, overall, significant effect on their health behaviors, all ultimately suggesting their perceptions are not driving their health behaviors. Knowing this, Tazewell County health officials could use this information to try to better educate the public on the effects of various health behaviors on their personal risk of cancer aiming to improve overall positive health behaviors in Tazewell County.

Appendix A

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

- a. Male
- b. Female
- c. Prefer not to respond

**2. What is your perception (i.e. belief) of the number of cancer diagnoses in Tazewell County?**

- a. High
- b. Normal
- c. Low
- d. Haven't given it much thought

**3. Have you ever looked for information about cancer from any outside source?**

- a. Yes
- b. No → go to question 6

**4. If you answered “Yes” for Question 3, what type of information were you looking for? (Choose all that apply)**

- |  |  |
|--|--|
| a. Specific cancer   | b. Insurance                               |
| c. Cancer organizations  | d. Prevention of cancer                    |
| e. Causes of cancer/risk factors for cancer                                | f. Prognosis/recovery from cancer          |
| g. Coping with cancer/dealing with cancer                                  | h. Screening/testing/early detection       |
| i. Diagnosis of cancer   | j. Symptoms of cancer                      |
| k. Information on cancer in general  | l. Treatment/cures for cancer              |
| m. Paying for medical care   | n. Where to get medical care               |
| o. Information on complementary, alternative, or unconventional treatments | p. Other (please specify in the box below) |

**5. Thinking of the most recent time you looked for cancer information, where did you go first? (Choose only one)**

- a. Books
- b. Cancer organization
- c. Brochures, pamphlets, etc.
- d. Family
- e. Friend/co-worker
- f. Doctor or health care provider
- g. Internet
- h. Library
- i. Magazines
- j. Newspapers
- k. Telephone information number
- l. Complementary, alternative, or unconventional practitioner
- m. Other (please specify in the box below)

**6. Not including psychiatrists and other mental health professionals, is there a particular doctor nurse, or other health professional that you see most often?**

- a. Yes
- b. No → go to question 8

**7. What kind of health professional do you see most often?**

- a. A doctor
- b. A nurse
- c. Other health professional (please specify in the box below)

**8. Do you have any kind of health care coverage, including health insurance, prepaid plans, such as HMOs, or government plans, such as Medicare?**

- a. Yes
- b. No

**9. In the past 12 months, not counting times you went to an emergency room, how many times did you go to a doctor, nurse, or other health professional to get care for yourself?**

- a. None → go to question 13
- b. 1 time
- c. 4 times
- d. 2 times
- e. 5 to 9 times
- f. 3 times
- g. 10 or more times

**10. The following questions are about your communication with all doctors, nurses, or other health professionals you saw during the past 12 months. How often did the health professional do each of the following? (Place an 'X' in the corresponding box for each responsibility)**

	<i>Always</i>	<i>Usually</i>	<i>Sometimes</i>	<i>Never</i>
1) Give you the chance to ask all the health-related questions you had				
2) Give the attention you needed to your feelings and emotions				
3) Involve you in decisions about your health care as much as you wanted				
4) Make sure you understood the things you needed to do to take care of your health				
5) Help you deal with feelings of uncertainty about your health or health care				

**11. In the past 12 months, how often did you feel you could rely on your doctors, nurses or other health professionals to take care of your health care needs?**

- a. Always
- b. Usually
- c. Sometimes
- d. Never

**12. Overall, how would you rate the quality of health care you received in the past 12 months?**

- a. Excellent
- b. Very good
- c. Good
- d. Fair
- e. Poor

**13. Overall, how confident are you with your ability to take good care of your health?**

- a. Completely confident
- b. Very confident
- c. Somewhat confident
- d. A little confident
- e. Not confident at all

**14. Some people avoid visiting their doctor even when they suspect they should. Would you say this is true for you, or not true for you?**

- a. True
- b. Not true → go to question 17

**15. Below are some reasons people give for not wanting to see their health care provider or doctor. Please tell us how much you agree or disagree with each statement.**

**(Place an 'X' in the corresponding box for each reason)**

	<i>Strongly agree</i>	<i>Somewhat agree</i>	<i>Somewhat disagree</i>	<i>Strongly disagree</i>
1) I avoid seeing my doctor because I feel uncomfortable when my body is being examined				
2) I avoid seeing my doctor because I fear I may have a serious illness				
3) I avoid seeing my doctor because it makes me think about dying				

**16. Are there any additional reasons why you avoid seeing your doctor?**

- a. Yes (please specify in the box below)

- b. No

**17. Approximately what amount of fruit (including 100% pure fruit juice) do you eat or drink each day?**

- a. None
- b. 2 to 3 cups
- c. ½ cup or less
- d. 3 to 4 cups
- e. ½ to 1 cup
- f. 4 cups or more
- g. 1 to 2 cups

**18. Approximately what amount of vegetables (including 100% vegetable juice) do you eat or drink each day?**

- a. None
- b. 2 to 3 cups
- c. ½ cup or less
- d. 3 to 4 cups
- e. ½ to 1 cup
- f. 4 cups or more
- g. 1 to 2 cups

**19. During the past month, did you participate in any physical activities or exercise such as running, yoga, golf, gardening, or walking for exercise?**

- a. Yes
- b. No → go to question 21

**20. In a typical week, how many days do you do any physical activity or exercise of at least moderate intensity, such as brisk walking, bicycling at a regular pace, swimming at a regular pace, and heavy gardening? *Moderate intensity activities make you breath somewhat harder than normal.***

- a. None
- b. 4 days per week
- c. 1 day per week
- d. 5 days per week
- e. 2 days per week
- f. 6 days per week
- g. 3 days per week
- h. 7 days per week

**21. As far as you know, which of the following best describes the effect of physical activity or exercise on the chances of getting some type of cancer?**

- a. Physical activity increases chances of cancer
- b. Physical activity decreases chances of cancer
- c. Physical activity makes no difference

**22. How much do you agree or disagree with the following statement:**

***“There are so many different messages about whether being overweight is harmful to one’s health it is hard to know what weight one should maintain to be healthy”***

- a. Strongly agree
- b. Somewhat agree
- c. Somewhat disagree
- d. Strongly disagree

**23. Right now, do you feel you are...**

- a. Overweight
- b. Slightly overweight
- c. Slightly underweight
- d. Underweight
- e. Just about the right weight for you

**24. In general, how easy or hard do you find it to understand medical statistics? Such as what is presented in pamphlets in a doctor's office or a commercial on TV.**

- a. Very easy
- b. Easy
- c. Hard
- d. Very hard

**25. How much do you agree or disagree with the following statement:**

***“In general, I depend on numbers and statistics to help me make decisions about my health”***

- a. Strongly agree
- b. Somewhat agree
- c. Somewhat disagree
- d. Strongly disagree

**26. Which of the following numbers represents the biggest risk of getting a disease?**

- a. 1 in 100
- b. 1 in 1,000
- c. 1 in 10

**27. People can talk about the chance of something happening using either words like “It rarely happens”, or numbers like “There’s a five percent chance.” When people tell you the chance of something happening do you prefer they use words or number?**

- a. Generally prefer words
- b. Generally prefer numbers
- c. No preference

**28. How likely do you think it is that you will develop cancer in the future?**

- a. Very low
- b. Somewhat low
- c. Moderate
- d. Somewhat high
- e. Very high

**29. How often do you worry about getting cancer?**

- a. Rarely or never
- b. Sometimes
- c. Often
- d. All the time

**30. How much do you agree or disagree with this statement:**

***“When I think of cancer, I automatically think of death”***

- a. Strongly agree
- b. Somewhat agree
- c. Somewhat disagree
- d. Strongly disagree

**31. How much do you agree or disagree with each of the following statements:  
(Place an 'X' in the corresponding box for each statement)**

	<i>Strongly agree</i>	<i>Somewhat agree</i>	<i>I don't know</i>	<i>Somewhat disagree</i>	<i>Strongly disagree</i>
1) Cancer is most often caused by a person's behavior or lifestyle					
2) Getting checked regularly for cancer helps find cancer when it's easy to treat					
3) People can tell they might have cancer before being diagnosed					
4) Cancer is an illness that when detected early can typically be cured					
5) It seems like everything causes cancer					
6) There's not much you can do to lower your chances of getting cancer					
7) There are so many different recommendations about preventing cancer, it's hard to know which ones to follow					

**32. Overall, of the people who develop cancer, how many do you think survive at least 5 years after being diagnosed?**

- a. Less than 25 percent
- b. About 25 percent
- c. About 50 percent
- d. About 75 percent
- e. Nearly all

**33. When thinking about cancer rates in Tazewell County, what type of cancer comes to mind first? Please write your answer in the box below:**

**34. Have you ever been diagnosed as having cancer?**

- a. Yes
- b. No → go to question 38

**35. If you answered, “Yes”, to Question 34, what type of cancer did you have?**

- a. Bladder cancer
- b. Bone cancer
- c. Breast cancer
- d. Cervical cancer  
(cancer of the cervix)
- e. Colon cancer
- f. Endometrial cancer  
(cancer of the uterus)
- g. Head and neck cancer
- h. Hodgkin’s lymphoma
- i. Leukemia/blood cancer
- j. Liver cancer
- k. Lung cancer
- l. Melanoma
- m. Non-hodgkin’s  
lymphoma
- n. Oral cancer
- o. Ovarian cancer
- p. Pancreatic cancer
- q. Pharyngeal (throat)  
cancer
- r. Prostate cancer
- s. Rectal cancer
- t. Renal (kidney) cancer
- u. Skin cancer, other
- v. Stomach cancer
- w. Other (please specify  
answer in box below)

**36. At what age were you first told that you had cancer?**

Please write your answer in the box below:

**37. Did you ever receive any treatment for your cancer?**

- a. Yes
- b. No

**38. Have any of your family members ever had cancer?**

- a. Yes
- b. No
- c. I don’t know
- d. Have no family

**39. In general, would you say your health is...**

- a. Excellent
- b. Very good
- c. Good
- d. Fair
- e. Poor

**40. What is the highest grade or level of schooling you completed?**

- a. Less than 8 years
- b. 8 through 11 years
- c. 12 years or completed high school
- d. Post-high school training other than college (vocational or technical)
- e. Some college
- f. College graduate
- g. Postgraduate

**41. How much do you agree or disagree with each of the following statements:  
(Place an 'X' in the corresponding box for each statement)**

	<i>Strongly disagree</i>	<i>Somewhat disagree</i>	<i>Neutral</i>	<i>Somewhat agree</i>	<i>Strongly agree</i>
1) If I just pray to God about my health, He will work it out.					
2) When I am sick I give my burdens to God and let Him handle it.					
3) God will take care of my health because I have found favor in his sight.					
4) If God wants me to have better health, He will provide.					
5) I don't worry about my health because it is in God's hands.					
6) If I am sick, I have to wait until it is God's time for me to be healed.					
7) When I have a health problem, I pray for God's will to be done.					
8) As long as I stay focused in prayer, I will be healed of any sickness.					
9) Spiritual people should accept whatever God has meant for them.					
10) I trust God, not man, to heal me.					
11) If a person has enough faith, healing will occur without doctors having to do anything.					
12) Sometimes, God allows people to be sick for a reason.					
13) If I become ill, God intended that to happen.					
14) Whatever illnesses I will have, God has already planned it.					
15) Sometimes someone can be ill because of disobedience to God.					
16) I don't need to try to improve my health because I know it is up to God.					
17) I can control a small health issue, but only God can control a big health issue.					

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