

Intention to Screen for Sex-Specific Cancers: Breast Cancer and Prostate Cancer

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Abstract

This study aims to find trends between men and women and their intention to screen for sex-specific cancers, prostate and breast cancer respectively. It is well-documented in the literature surrounding these cancers that men are less likely than women to screen for sex-specific cancers. It has also been noted that men who are married to women are more likely to be screened. This study attempts to expand upon those findings and see if women are more willing to screen for breast cancer than men for prostate cancer.

Using theoretical frameworks, the health belief model and theory of planned behavior, a survey was designed to assess demographic factors, intention to screen, and knowledge of the cancer itself. Using a variety of recruitment methods including efforts from HealthStreet and posting flyers throughout the University of Florida's campus, participants were able to complete the survey online or in person.

11 participants (9 female and 2 male) completed the full pre-post survey. Responses remained relatively consistent between pre- and post-tests with a few significant developments in attitudes regarding screening techniques (e.g. being touched and standardization of screening guidelines). Between the pre- and post-tests, responses to questions about proper screening techniques were still varied, indicating continued confusion regarding screening.

This study can be improved by including more members of the community from diverse backgrounds. Another useful tool would be to include an aspect of cognitive interviewing in order to gain a qualitative aspect of the study as well as a deeper understanding of why individuals chose to respond in a certain way.

Introduction

Cancer screening continues to present major challenges for health care professionals. Constantly changing, cancer screening is highly controversial, especially regarding breast and prostate cancer. Breast and prostate cancer have high incidence rates in the United States but have high survival rates due to advancements in screening and treatment. As with most cancers, screening is an effective tool that prevents cancers from spreading to another organ, becoming metastatic cancer. Diagnosing cancer early on can increase the likelihood of a successful outcome after treatment. However, the controversy surrounding different screening processes makes patients reluctant to trust the newest advancements and adds to the confusion that many patients feel when they are sitting in a doctor's office.

A major discrepancy exists between men and women and their healthcare practices. This divide becomes even more evident when considering demographic factors outside of gender, such as race and ethnicity. Men and women seem to utilize health care differently, leading to varying outcomes for men and women with sex-specific cancers [(Gözüm & Tuzcu, 2017) & (Sach & Whynes, 2009)]. Perhaps even more enlightening is the evidence that being married is related to better screening usage and outcomes after treatment [(Hanske et al., 2016) & (Adekolujo et al, 2017)]. Men and women seem to utilize health care differently, something that is essential for health care providers to understand if they treat both men and women.

To gain greater understanding of screening behaviors of men and women, more research needs to be done to test intention to screen between the two sexes. To test intention-to-screen for cancer between men and women, the cancers that were chosen were breast cancer and prostate cancer due to the age at which risk is assessed and the types of screening tests that are done for diagnosis. Screening for breast cancer includes mammography and clinical breast exams which

consist of a physician feeling the woman's breast for irregularities. Similarly, the prostate screening tests are the prostate-specific antigen (PSA) test and the digital rectal exam (DRE). A PSA test is a simple blood test. The DRE consists of a physician gently inserting a gloved finger into the rectum to feel the prostate gland to check for growths or abnormalities. The tests for the respective cancers are equally invasive and somewhat awkward, making them comparable for analysis. Although breast cancer is possible in men, that population is quite small, making it a mostly sex-specific cancer to women and for the purposes of this study, will be considered a female cancer.

Background Information

This study explores intention to screen for sex specific cancers. Participants in the study will be pre-screening age to gauge their feelings towards screening before they are at an age of increased risk. Intention to screen and screening behaviors are heavily researched and there are a few foundational theories that this study will be grounded in. Rosenstock's Health Belief Model (HBM) and Ajzen's and Fishbein's Theory of Planned Behavior (TpB) created in 1980 will guide the formulation of instruments used.

Health Belief Model (HBM)

The Health Belief Model was created by a team of researchers working in the U.S. Public Health Services in the 1950s to gain greater understanding of health behaviors depending on different variables (University of Twente, 2017a). Those variables include perceived susceptibility, the risk a person feels for developing a condition; perceived severity, the person's attitude towards the seriousness of the condition; perceived benefits, the person's attitude that screening will reduce risk; and perceived barriers, the person's attitude that what a physician advises is worth the cost, physical, psychological, monetarily, or otherwise [(University of

Twente, 2017a) & (Rosenstock, 1974)]. The HBM was expanded in the following decades by Rosenstock to include cues to action and self-efficacy in the variables affecting the model. Cues to action are the variables that would stimulate a person's behavior; self-efficacy is whether a person feels confident about their ability to perform a behavior (University of Twente, 2017a).

Theory of Planned Behavior (TpB)

The Theory of Planned Behavior (TpB) was created by Ajzen and Fishbein in 1980 and provides more understanding of intentions before behaviors are executed. Intention is described as a person's readiness or willingness to perform an action. This is goal setting and planned, pre-meditating a behavior. The attitude a person has is going to determine the outcome of the behavior. According to this model, the three core variables that determine intention are: "the person's attitude toward the behavior, the person's subjective norms, and their perceived behavioral control" (University of Twente, 2017b).

Theoretical Frameworks at Work

Together, the HBM and TpB predict behavior patterns based on intention and attitudes people have towards the action. These models identify trends within populations that can explain why a person might feel a certain way about performing an action. The variables associated with the HBM and TpB are foundational for studies such as this one, because they recognize that people of distinct cultures and backgrounds have different ideas about health screening. These models also take into consideration the history people have with health and their preconceived ideas, mistrust, and attitudes towards health professionals.

Previous Research Studies

Intention to screen is complex and varies by race, ethnicity, sex, religion, sexuality, and many other factors. Using the models to guide the development of a survey instrument, we are attempting to build on the complexity of intention to screen and health screening practices between men and women. Culture is extremely important when considering how to pass on health information to men and women. A study by Occa and Suggs (2016) on determining the best way to relay breast cancer information to women revealed just how important person-centered strategies can be. By understanding the needs of the participants, the study was successful in allowing the participants to gain greater breast cancer knowledge (Occa & Suggs, 2016).

This study will compare screening intentions of men and women of various cultural backgrounds. Previous studies have revealed the differences in screening practices between the two sexes, revealing that men are less regular about screening and need to be encouraged, whereas women are more diligent about their health (Sach & Whynes, 2009). In many cultures, there is the underlying taboo of prostate cancer screening that leads men to hide prostate cancer diagnoses or reject screening completely (Hicks, Litwin, & Maliski, 2014). It is however, important to know the variation of screening practices men and women have across races and ethnicities, determining if there is a sex-based factor guiding intention to screen.

Intention-to-screen for breast cancer and prostate cancer is well researched. There is however, a gap in the research when comparing men and women in a single study for cancers that are very comparable in terms of screening. In this study, we hope to uncover the variations in how men and women respond to similar surveys, revealing the differences in how men and women take in information as well as their awareness of their risk for developing certain cancers.

This can lead to an understanding of how best to deliver health information and tailor it to men and women for maximum effectiveness.

This study will also examine the confusion that men and women might experience when considering screening guidelines. There is extensive debate surrounding screening for cancer (Kim & Andriole, 2015). For example, the American Cancer Society states that women should be screened for breast cancer every year, while the U.S. Preventative Task Force states biennial exams are sufficient. Prostate cancer screening has been highly controversial, with the American Urological Association contesting the U.S. Preventative Task Force's decision to give PSA testing a Grade D in efficacy. Understandably, the public consumer who does not have the health literacy to make them an informed decision maker is going to be confused. It needs to become a mission of public health officials to set standard screening guidelines. The public should not be caught in the controversy of screening, leading to a deterioration of their health.

Methods

This is a survey-style study with both in person and online survey data. The questions are mostly closed-ended questions with some open-ended questions that are more specific to a person's experiences.

Survey Breakdown

To conduct a test for participant's future intention-to-screen, the participant population needed to be younger than screening age. Breast cancer and prostate cancer screening begins at 40 or 45, depending on amount of increased risk. Participants in this study were between 18-44 years of age without a history of cancer or screening for cancer. Demographic variables were gathered through a survey given to participants as part of the pretest assessment. These variables

were chosen based on previous research that has found that these are the variables to affect screening practices (Cullati, 2009). The variables to be assessed are sex, age, SES, education level, place of residence, marital status, and employment status.

To assess intention-to-screen, a pretest was given to participants (men taking a prostate cancer-specific test and women a breast cancer-specific test). The pretest and posttest included questions relevant to screening practices such as screening guidelines and risk factors. These tests are used to analyze knowledge of cancer risks, intention-to-screen (since the participants will be below screening age), and attitudes toward health care in general and relating more specifically to their experiences. Measures for intention-to-screen were based on the HBM and the TpB.

Intention to screen is a broad subject and is difficult to narrow down to specific attitudes. In order to gain the greatest understanding of why the participants feel a certain way about screening, a multifaceted perspective of health care was used. There are many factors that lead to someone feeling comfortable with health professionals. The survey considers the relationship the participant has with their physician, their perceived efficacy of screening, and the participant's ability to trust health care professionals. Questions regarding perceived personal risk, family history of cancer, perceived ability to follow through with screening were included in intention-to-screen measures.

Participants were then given screening guidelines specific to their sex. After being given the information, a posttest like the pretest was given to assess any changes in understanding of screening and risk as well as intention-to-screen.

Participant Identification

The recruitment of participants was done in two ways. HealthStreet, a research collaboration organization through the University of Florida (UF), identified potential participants that met the inclusion criteria. The research coordinator then called these individuals and set up appointments with them. The second recruitment strategy was to use flyers throughout the UF campus to identify potential participants. These flyers had a link to the online survey with the informed consent document within the survey. The study was approved by IRB-02 under 20170189

Results

Participation in this study was analyzed based on the significance of the change between pre and post testing. Through the surveys, demographic information and knowledge of specific cancer screenings was collected. The study included 21 participants at the beginning of the study, which eventually decreased to 11 participants (9 female and 2 male) having completed the full survey (pre and post tests).

Demographics

The majority of participants identified as white, female, between the ages of 18-23 and had some level of higher education (some college or higher). Only a single participant identified as married, with the other participants identifying as single. In the category of sex specifically, 13 identified as “female”, 6 as “male”, and 2 as “other”. There was a variety in terms of participants claiming their ethnicity to be Hispanic, with 5 responding “yes”, 10 “no”, and 1 “prefer not to answer” to being Hispanic. Most participants claimed to have a health care provider and felt at least somewhat listened to by their provider.

Table 1 details the results of the demographic survey, including information regarding current health provider and satisfaction with their provider.

Health Care Information

The results of the pre and post test regarding attitudes towards health care, health care providers, as well as screening in general remained consistent throughout the survey. In the post-test there is a greater variety of answers for what would keep someone from screening, including the patient's relationship with their doctor and not having someone to help them with treatment should they need it. The results are listed in figures 1-5 as well as table 2.

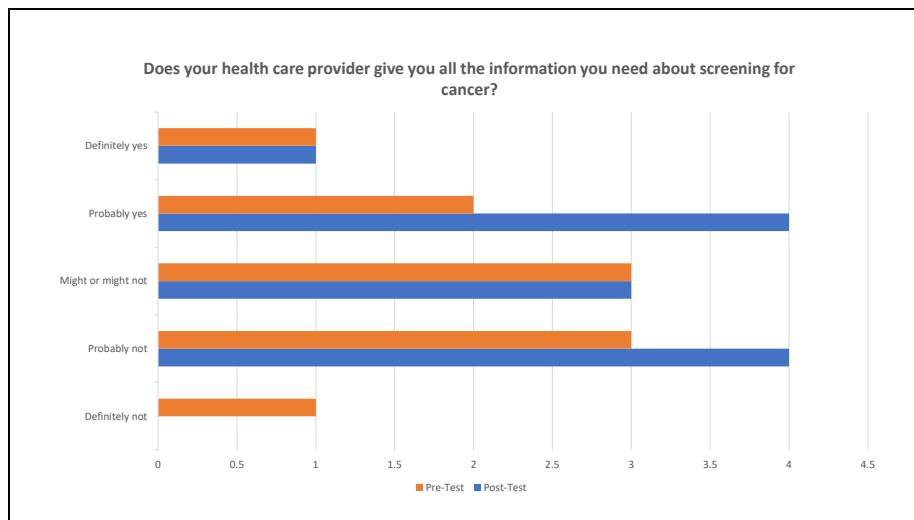


Figure 1: Does your health care provider give you all the information you need about screening for cancer?

Seen in Figure 1, the number of participants that responded, “probably yes” and “probably not” increased in the post-test for the question regarding whether or not their health care provider gives them sufficient screening information.

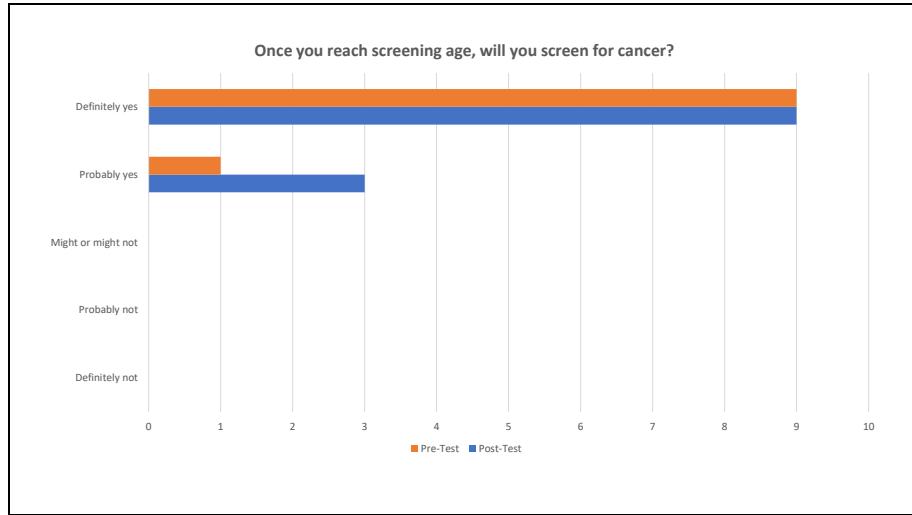


Figure 2: Once you reach screening age, will you screen for cancer?

Intention to screen for cancers remained about the same in the post-test, with 9 participants claiming they will definitely screen once they are of age and 3 claiming they probably would screen for cancer.

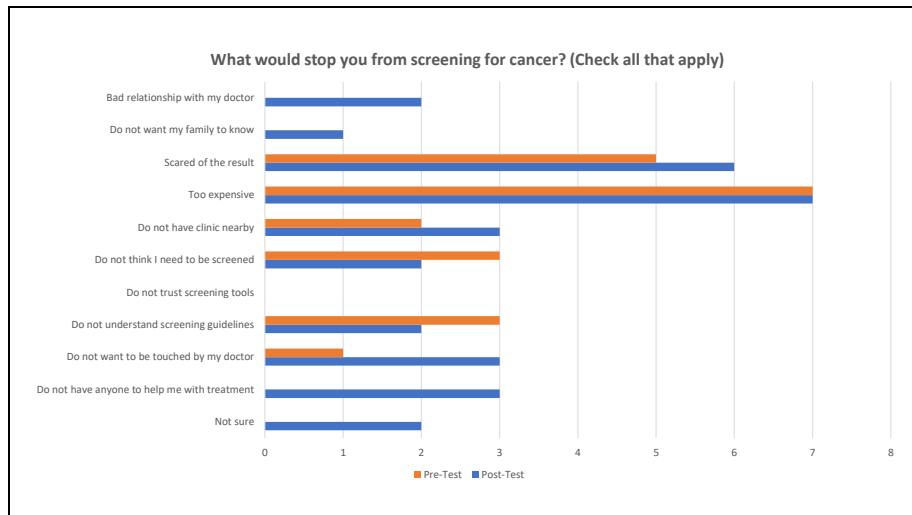


Figure 3: What would stop you from screening for cancer? (Check all that apply)

The post-test results in Figure 3 are varied, but the significant pattern seen in the study is that the participants are less likely to screen when being touched is involved. The responses for “do not want to be touched by my doctor” increased from 1 (pre-test) to 3 (post-test). There are some responses in the post-test that were not considered in the pre-test such as, “bad relationship

with my doctor" increasing from 0 to 2, "do not want my family to know" increasing from 0 to 1, "do not have anyone to help me with treatment" increasing from 0 to 3", and "not sure" increasing from 0 to 2.

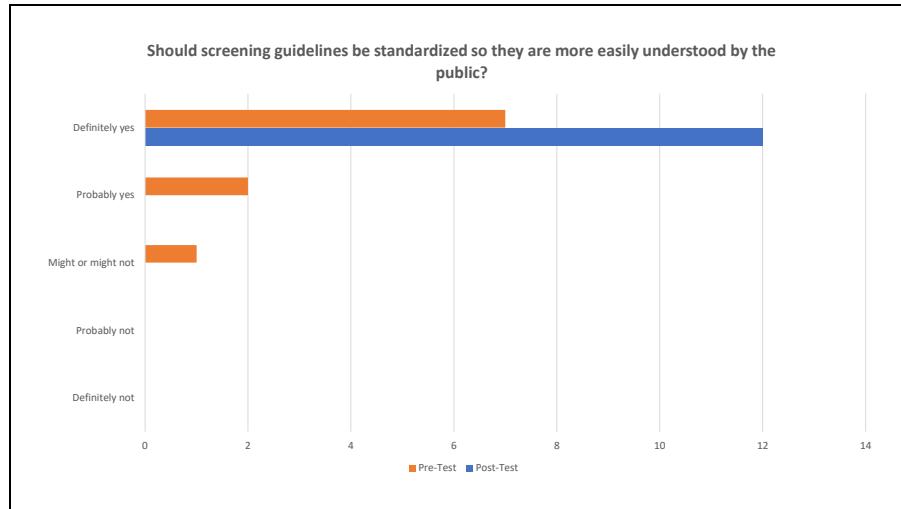


Figure 4: Should screening guidelines be standardized so they are more easily understood by the public?

Participants had varied pre-test responses to standardizing screening guidelines, being split between "definitely yes", "probably yes", and "might or might not". In the post-test, all participants answered "definitely yes" to the question of standardizing screening guidelines.

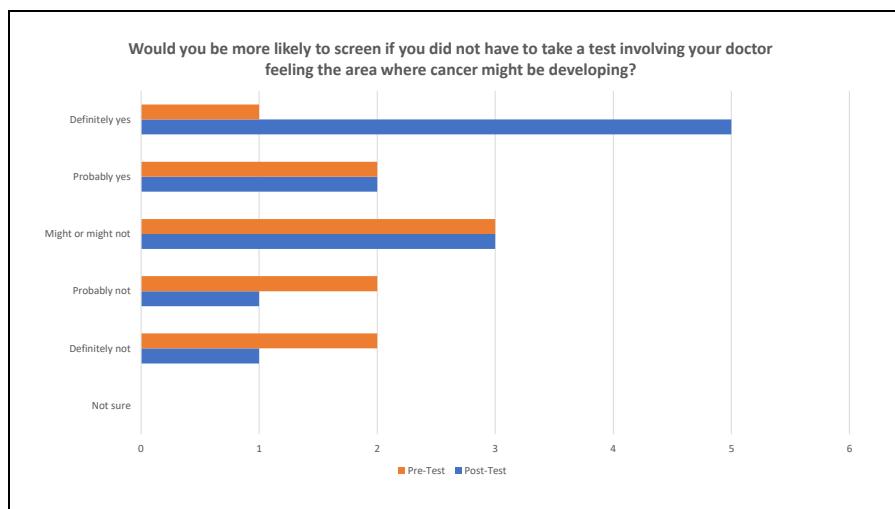


Figure 5: Would you be more likely to screen if you did not have to take a test involving your doctor feeling the area where cancer might be developing?

In the post-test, 5 participants (versus 1 in the pre-test) expressed that they would “definitely” screen for cancer if the test did not involve being touched by their physician. In the post-test, 1 participant (versus 2 in the pre-test) responded that they would “definitely not” screen if it did not involve a physical examination including physical contact.

Prostate Cancer Knowledge

Participation decreased in the male demographic regarding prostate cancer knowledge (from 3 to 2 male participants). After having read the screening guidelines, the answers to the survey questions did not change significantly. Significant results regarding prostate cancer knowledge are listed in figures 6-10.

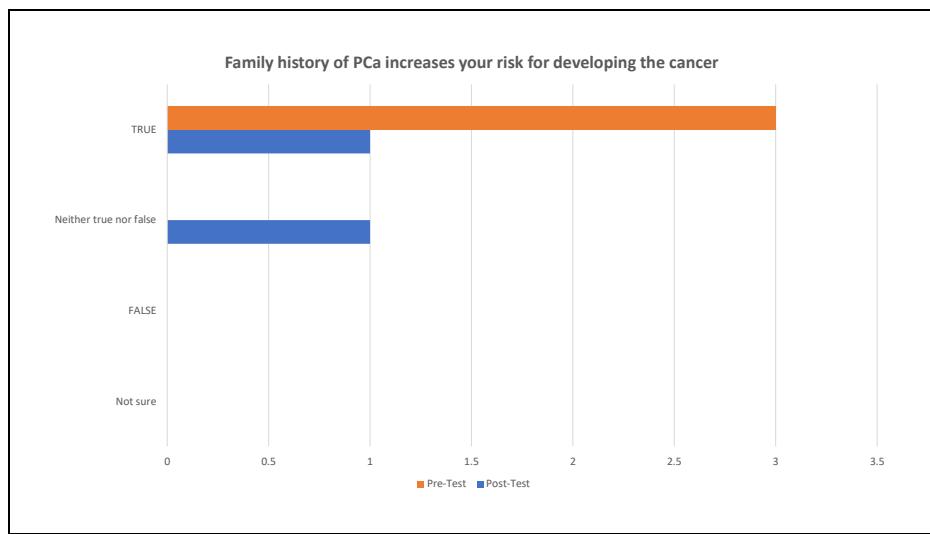


Figure 6: Family history of PCa increases your risk for developing the cancer

In the pre-test, all of the participants answered “true” to family history of PCa increasing risk whereas in the post-test, 1 participant responded “true” and 1 participant responded “neither true nor false”.

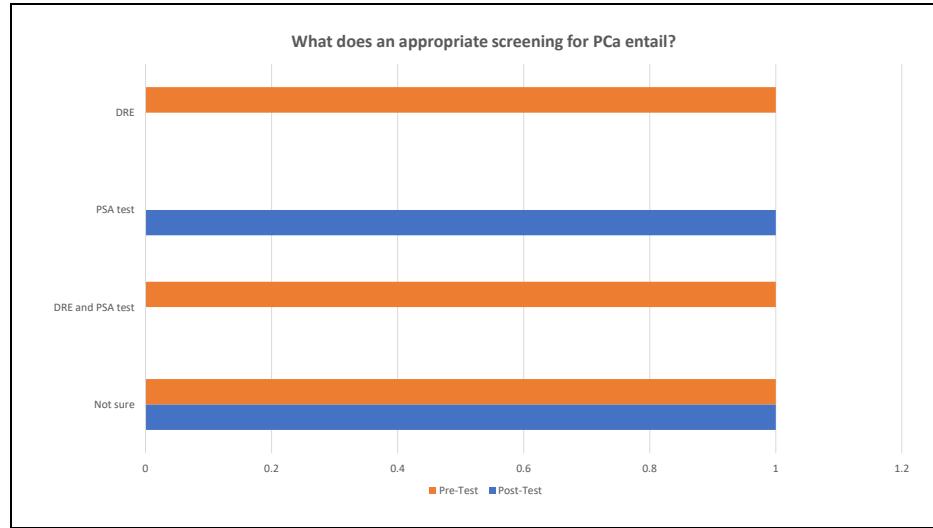


Figure 7: What does an appropriate screening for PCa entail?

Responses for appropriate screening tests changed from pre-test to post-test. In the pre-test, 1 participant responded “DRE”, 1 “DRE and PSA test”, and 1 “Not sure”. In the post-test, 1 participant responded, “PSA test” and 1 “Not sure”.

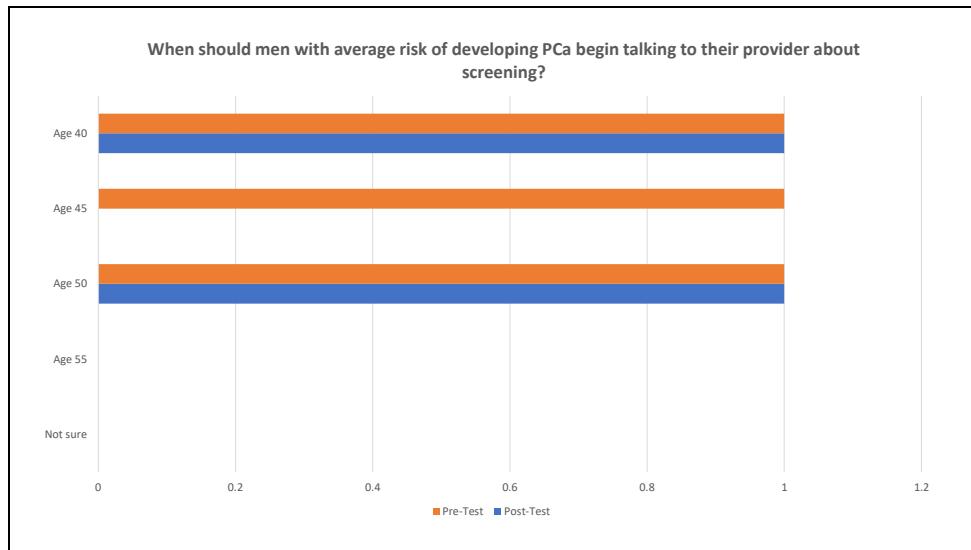


Figure 8: When should men with average risk of developing PCa begin talking to their provider about screening?

The age at which screening should begin was a mixed response pool. In the pre-test, 1 participant answered, “age 40”, 1 “age 55”, and 1 “age 50”. In the post test, 1 participant responded, “age 40” and 1 responded “age 50”.

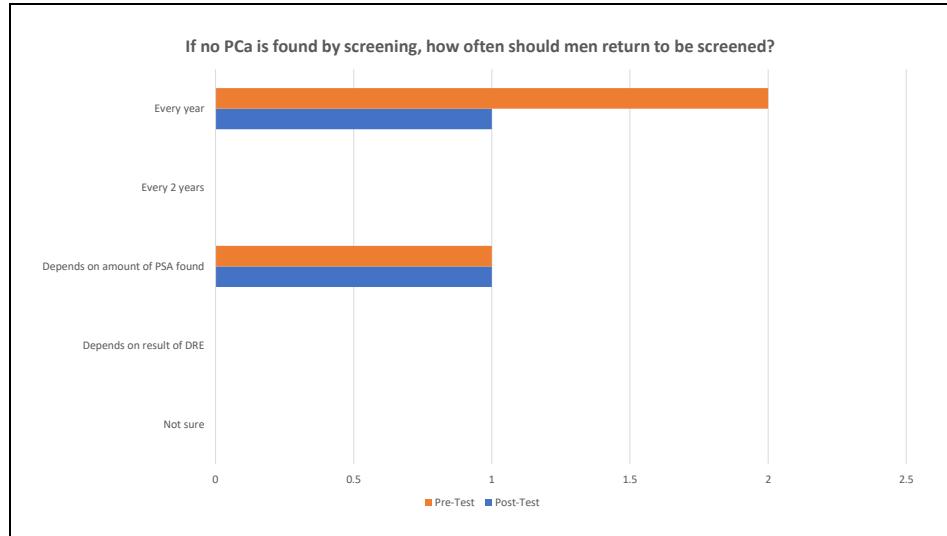


Figure 9: If no PCa is found by screening, how often should men return to be screened?

To the question of how often men of average risk should return to be screened, 2 participants responded, “every year” and 1 responded “depends on the amount of PSA found” in the pre-test. In the post-test, 1 participant responded, “every year” and 1 responded “depends on the amount of PSA found”.

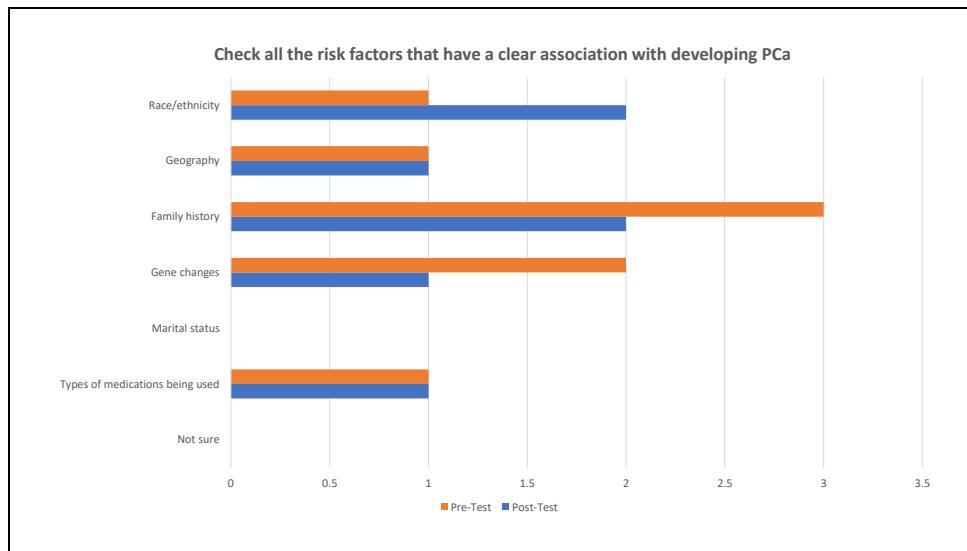


Figure 10: Check all the risk factors that have a clear association with developing PCa

“Race/ethnicity” responses increased from 1 in the pre-test to 2 in the post-test. “Geography” responses stayed constant with 1 in the pre-test and the post-test. “Family history”

was considered a risk factor 3 times in the pre-test and 2 times in the post-test. “Gene changes” as a risk factor was chosen 2 times in the pre-test and once in the post-test. “Types of medications being used” responses remained constant in the pre-test and post-test.

Breast Cancer Knowledge

Participation among the female demographic decreased throughout the course of the survey (from 12 to 9 participants). The responses remained consistent overall, with the greatest notable change in the response for how often a woman with average risk of developing the cancer should be screened. The results are outlined through Figures 11-17.

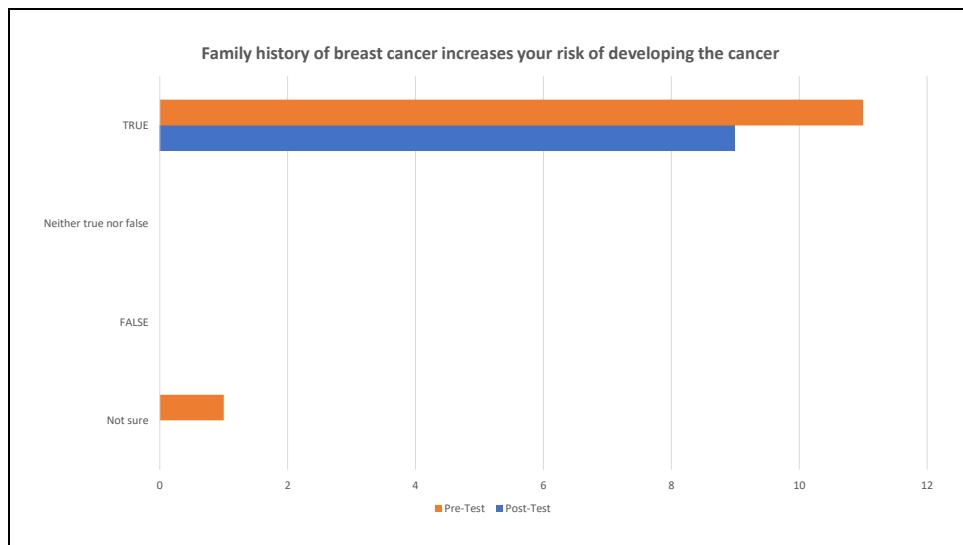


Figure 11: Family history of breast cancer increases your risk of developing the cancer

In the pre-test for the statement “family history of cancer increases risk of cancer”, 11 participants answered “true” and 1 participant answered, “not sure”. In the post-test, 11 participants responded, “true”.

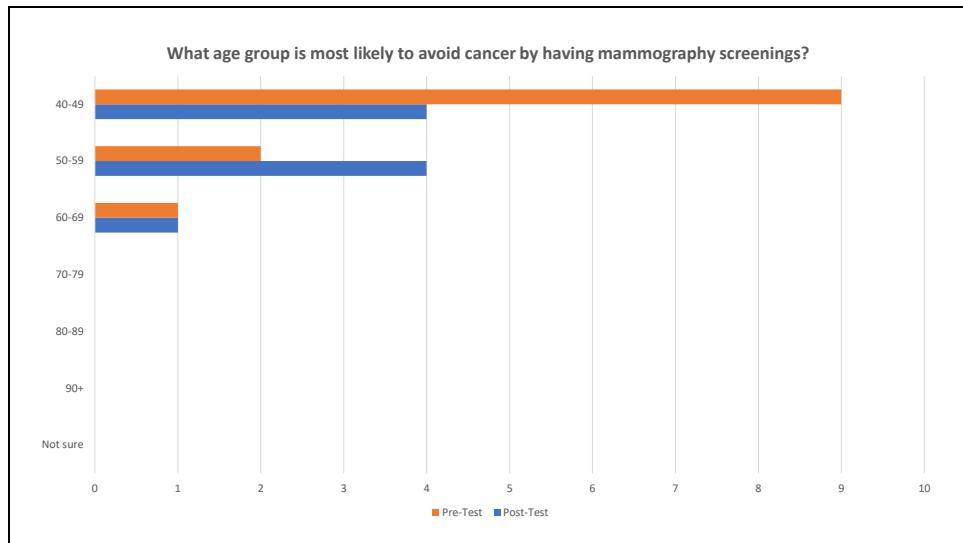


Figure 12: What age group is most likely to avoid cancer by having a mammography screening?

In the pre-test for the question concerning the age group that is most likely to avoid cancer through screening, 9 participants responded “40-49”, 2 responded “50-59”, and 1 responded “60-69”. In the post-test, 4 participants responded “40-49”, 4 responded “50-59”, and 1 responded “60-69”.

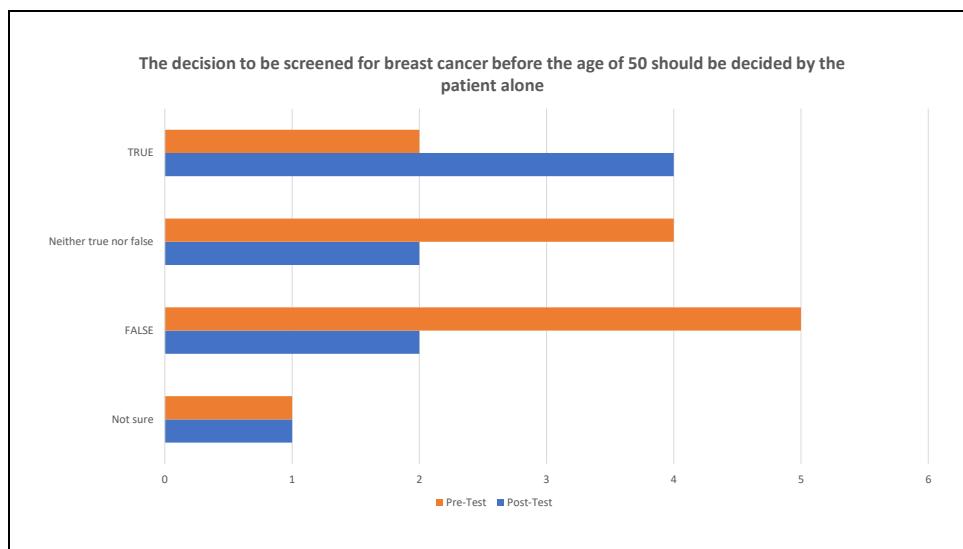


Figure 13: The decision to be screened for breast cancer before the age of 50 should be decided by the patient alone

In the post-test, more participants responded “true” to the statement that patients before the age of 50 should make the decision to be screened on their own.

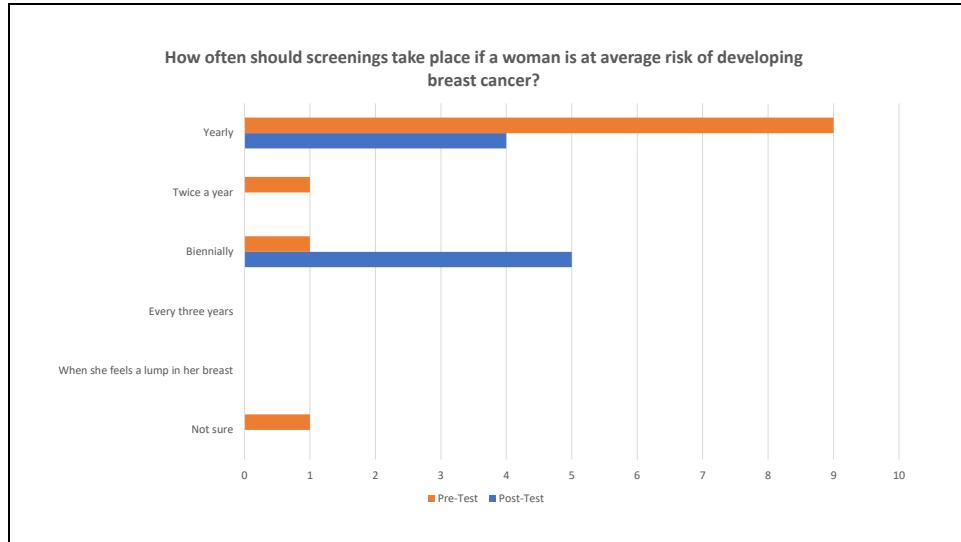


Figure 14: How often should screenings take place if a woman is at average risk of developing breast cancer?

Between the pre-test and the post-test for the question, “how often should screening take place is a woman is at average risk of developing breast cancer?”, responses of “biennially” increased from 1 (pre-test) to 5 (post-test).

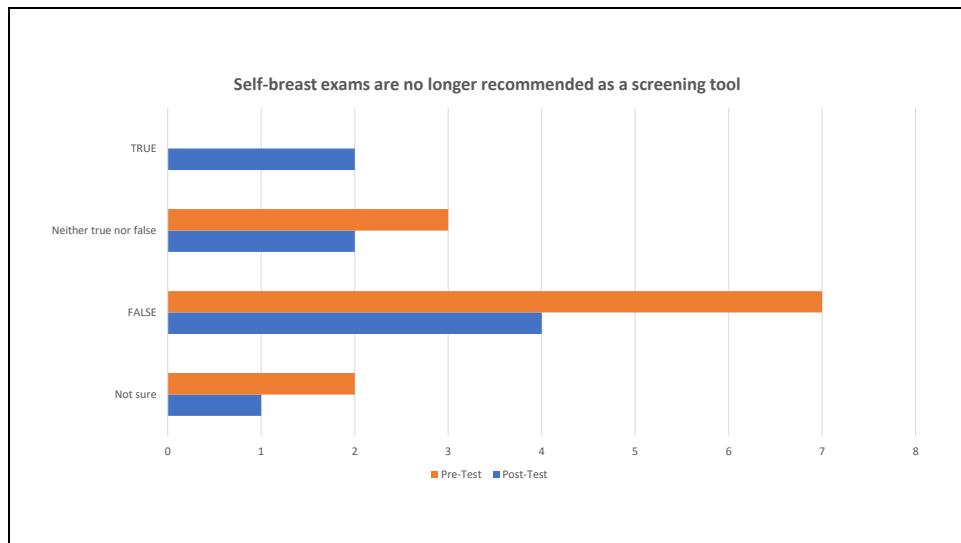


Figure 15: Self-breast exams are no longer recommended as a screening tool

The responses to the statement “self-breast exams are no longer recommended as a screening tool” varied between pre- and post-tests. In the pre-test, 7 participants answered “false”. In the pre-test, the count of participants responding, “true”, increased from 0 to 4.

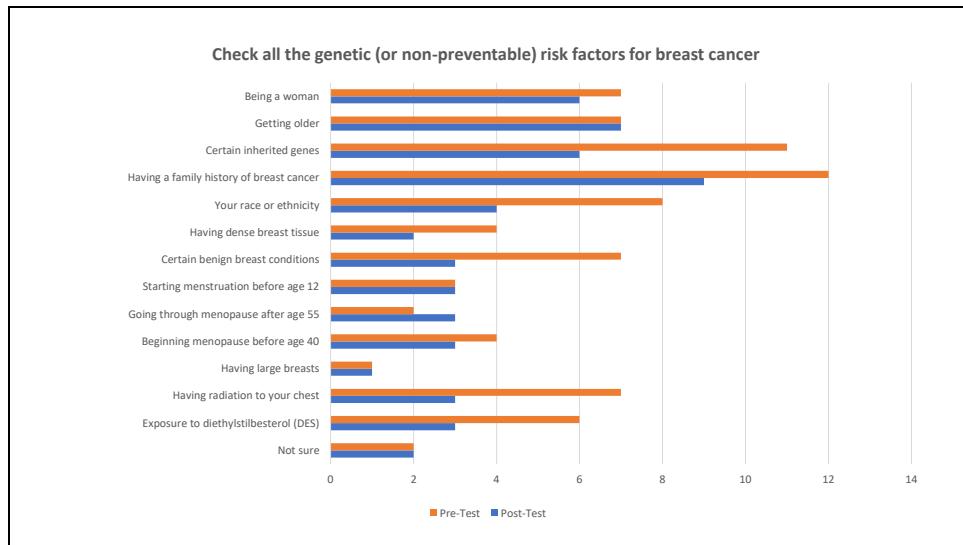


Figure 16: Check all the genetic (or non-preventable) risk factors for breast cancer

Participant answers for the risk factors of breast cancer remained relatively consistent between the pre- and post-tests.

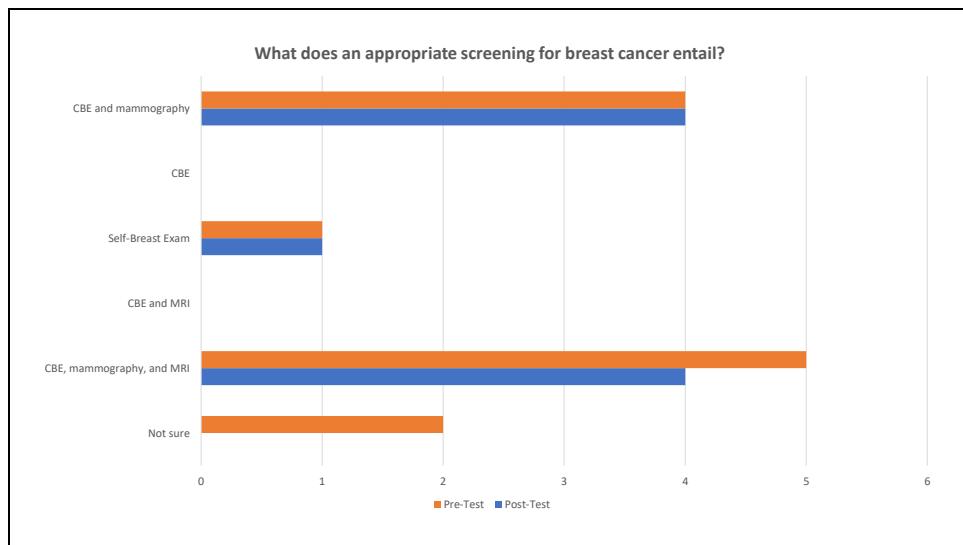


Figure 17: What does an appropriate screening for breast cancer entail?

Participant responses to the question, “what does an appropriate screening for breast cancer entail?” remained consistent between pre- and post-tests. There were 2 participant responses in the pre-test for “not sure”, which decreased to 0 in the post-test.

Conclusions

Participant Recruitment

The recruitment process of this study was not without difficulty, as community engagement with the study was lacking. Through HealthStreet, participants were recruited based on inclusion/exclusion criteria. The research coordinator attempted to make appointments with those that met the criteria. From about 30 potential participants, only one individual completed the survey. One other individual made an appointment two separate times and never came to complete the survey. Due to these difficulties, the study was amended to include an online survey made through Qualtrics that included surveys and screening guidelines as well as the informed consent document. This was done primarily to recruit participants throughout UF's campus and make it easier for students to complete the survey via an online link.

Due to the difficulties regarding recruitment for this study, there is a disparity between the amount of male and female participants. There was a total of 13 female participants and 6 male participants, of which 9 and 2 completed the full survey, respectively. Recruitment was not tailored to females, so the small male participant pool is noteworthy. This study's main aim was to understand the way men and women consume health information and it can be argued that men are less willing to invite any questions about their health. The true cause of the lack of male participation cannot be inferred from this study but could frame the question for future research.

Significant Participation Results

There are results that generated interest and are worth expanding upon.

Between the pre- and post-tests, 100% of the participants were in agreement that screening guidelines should be standardized so that the public is well aware of what best practice

is. Many people are unsure of when they should be screened and hope that their physicians are giving them the more valid and reliable information. In this study, there were many participants that changed their opinions of their physicians after having read screening guidelines. This might be due to participants realizing that their physicians are not informing them of proper cancer screening practices. Today, the public can acquire health information from the internet, which can be dangerous depending on what sources these people are using. It is in the health industry's best interest to standardize screening guidelines to ensure best practice.

Even after reading through the screening guidelines, both men and women were unsure of what a proper cancer screening entails. Understandably, most participants were between the ages of 18-23 and may not have been given screening information before. The screening guidelines, however, should have been clear in instructing individuals on what is considered best practice. The results were scattered in the post-tests for both prostate and breast cancer knowledge.

A major part of screening for sex-specific cancers involves feeling the area where the cancer may be developing. This is due to being able to compare normal anatomy of the body with abnormal pathology. From the pre-test to the post-test, participants developed an aversion to the idea of being touched by their doctors. Screening for prostate cancer can be difficult due to issues with allowing a doctor to feel a man's prostate. It is important that physicians be aware of the stigma surrounding digital rectal exams as well as clinical breast exams so that they can approach the topic of screening without making their patients fearful or apprehensive.

Limitations

Due to needing to expand the participant pool, this study has many participants that are female, between the ages of 18-23 and college educated. The disparity between male and female

responses is a major limitation. This study aimed to find differences between the way men and women think about screening guidelines and without a greater participant population from both sexes, it is difficult to draw conclusions. Due to the age and education level of the participants, results are not as telling of the average person's intention to screen for cancer. This study can be improved by engaging more community members in completing the survey.

A significant barrier in this study is the lack of communication between the researcher and the participant. The number of participants is not consistent throughout the survey results and it is not possible for the researcher to understand why individuals did not answer certain questions or complete the survey. Understanding the participant's reaction to the survey could be a helpful improvement to this study.

Future Directions

This research can be carried forward by conducting the survey in person using cognitive interviewing techniques to further understand why participants are responding in a certain way. This research can improve the way health care providers offer information to their patients based on trends found between men and women.

This study offers a base point for future instrument development, specifically for improving questions and reducing redundancy. Targeting the areas in which most people have confusion can improve screening guidelines for public consumption. From this study it is apparent that screening guidelines are confusing and the individuals that participated in the survey were in agreement that screening guidelines should be standardized to reduce confusion.

Appendix

Table 1: Demographics

Question	Count
Sex	
Female	13
Male	6
Other	2
Age	
18-23	12
24-29	3
42-44	1
Marital Status	
Single (never married)	15
Married/in a domestic partnership	1
Education Level	
Some College	6
Associate Degree (e.g. AA, AS)	1
Bachelor's Degree (e.g. BA, BS)	9
Race	
White	15
Black or African American	1
Hispanic ethnicity?	
Yes	5
No	10
Prefer not to answer	1
Employment status	
Full-time (40+ hours a week)	7
Part-time (less than 40 hours a week)	4
Student	5
Yearly income	
Less than \$20,000	9
\$35-000-\$49,999	3
\$50,000-\$74,999	1
Over \$100,000	1
Prefer not to answer	2
Place of residence	
Urban	13
Rural	3
Insurance Provider	

Medicare	1
Employer provided	11
Private	1
None	1
Other (parents)	2
Access to a regular primary care physician?	
Yes	10
No	6
Satisfaction with health care provider	
Very satisfied	5
Somewhat satisfied	5
Length of appointments with provider	
Less than 15 minutes	3
15-29 minutes	4
30-44 minutes	2
More than 1 hour	1
Do you feel listened to by your provider?	
Definitely yes	3
Probably yes	5
Might or might not	2
Probably not	0
Definitely not	0

Table 2: Additional Health Care Information (Pre & Post Test)

Question	Count (Pre-test)	Count (Post-test)
Does your relationship with your provider determine whether you are willing to screen for cancer?		
Definitely yes	1	1
Probably yes	1	3
Might or might not	4	2
Probably not	1	2
Definitely not	3	3
Not sure	0	1
Would you screen for cancer if you had easy access to a clinic?		
Definitely yes	8	10
Probably yes	2	2
Might or might not	0	0
Probably not	0	0
Definitely not	0	0

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