Original Article

Elucidating the Barriers to Colorectal Cancer Screening: A Cross-Sectional Survey Analysis of a Rural Population in West Texas

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Abstract

Background
The incidence of colorectal cancer (CRC) has increased steadily in the last decade in the United States and is one of the leading causes of death. However, screening rates for colorectal cancer continue to remain at an all-time low in the United States and worldwide. Cancer screening programs can effectively reduce the burden of cancer when designed properly to ensure compliance and efficacy.

Methodology
A cross sectional study conducted through distribution of a survey to observe trends in the West Texas population pertaining to colorectal cancer screening barriers. A quarter page short survey was distributed at a cancer screening events to identify possible barriers to cancer screening by providing participants with nine options to select from including: embarrassment, unpleasantness of test, transportation, cost/lack of insurance, fear of results, lack of symptoms, lack of physician recommendations, lack of awareness, language barriers, and other causes. The questionnaire also recorded patient demographics including age, gender, and race.

Results
A total of 194 patients responded to our survey. 122 (62.9%) females, 71 males (36.6 %) and one did not specify. Genders were generally equally represented among all races. The ages ranged from 13 to 86 years with a mean of 51.79 and a standard deviation of 13.5. The overwhelmingly main barrier for screening was lack of funding or insurance (66%).

Conclusion
Given low screening rates for CRC, collaborative efforts should be made to remind more patients and have close follow up with their primary care physicians. Multilevel interventions can help address these barriers in preventing this deadly disease.

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Introduction

The incidence of colorectal cancer (CRC) has increased steadily in the last decade in the United States.[1] Globally, CRC is the third most commonly diagnosed cancer and the second deadliest cancer.[2] However, screening rates for colorectal cancer continue to remain at an all-time low in the United States and worldwide.[1] The American Cancer Society recommends that for adults aged 45 or older be screened with either a high-sensitivity stool-based test (FIT test or Cologuard) or structural visual examination. Any positive stool-based tests must be followed up by colonoscopy or annual FIT tests, according to the U.S. Preventative Task Force (USPSTF) and the Centers for Disease Control and Prevention (CDC) recommendations.[3] Timely education and discussions during visits with primary care providers and additional education provided by community health care workers at screening fairs and public outreach events would provide additional screening opportunities to reduce the incidence of colorectal cancer.

Amarillo, Texas is primarily a rural area with a median household income of $52,941 and 15.4% of the population falling below the poverty line, according to the most recent US census data.[4] Comparatively, this places the Amarillo population above the 13.4% national poverty rate in the US. Low-income areas have been associated with an increased risk of low colorectal screening rates.[1] The uninsured population of Amarillo, Texas is 18.9% which is significantly higher than the US national average uninsured rate of 8.6%.[2] Evidence suggests that a lack of healthcare insurance in populations is associated with an elevated risk of developing CRC and with poorer outcomes.[1] The American Cancer Society recommends that all average risk adults start CRC screening at the age of 45 due to cost-effectiveness and improved outcomes.

Cancer screening programs can effectively reduce the burden of cancer when designed properly to ensure compliance and efficacy. The principal challenges 5-7 in optimizing the delivery of effective cancer screening services and reducing inappropriate testing are (1) recognizing the main barriers preventing the delivery of life-preserving cancer screening available to eligible and vulnerable populations; (2) changing the behaviors of health care providers to follow recommended cancer screening guidelines for all patient encounters; and (3) changing the behaviors of individuals to obtain recommended screening education, tests and pursue follow-up. While this survey-based quality improvement study demonstrates the barriers preventing our local community from getting the proper indicated cancer screening, a clear delineation of the barriers to screening can help formulate targeted solutions to eliminate them. Along with increasing patient knowledge, the primary goal of this study was to reduce the risk of colorectal cancer (CRC) via screening through both fecal immunochemical tests (FIT) and a subsequent colonoscopy after a positive FIT.

Materials and Methods

Study Design

A cross sectional study was conducted through the distribution of a survey to observe trends in the West Texas population pertaining to colorectal cancer screening

barriers. A questionnaire (Appendix A) was created with the intent to accurately represent the general Amarillo population. The survey was provided to participants during a cancer screening event in the Amarillo area in October 2019. The screening event was representative of the general Amarillo population.

Participants were provided a short, anonymous, optional survey distributed by event volunteers. The questionnaire was anonymous, thus negating the need for additional data blinding. The questionnaire included one single question: "What barriers do you experience with cancer screening? Please mark all that apply:" Follow-up, education, and referral information was provided to participants at the cancer screening event.

Inclusion and Exclusion Criteria

All participants were included in the study if they agreed to complete the anonymous, optional survey. No participants were excluded.

Data collection

The barriers to cancer screening listed on the questionnaire were embarrassment, unpleasantness of test, transportation, cost/lack of insurance, fear of results, lack of symptoms, lack of physician recommendations, lack of awareness, language barriers, and other causes. The questionnaire also recorded patient demographics including age, gender, and race. A summary of complete data collection is presented below in categorical graphs.

Statistical Analysis

All results were evaluated through descriptive statistics only.

Results

A total of 194 patients responded to our survey. There were 122 (62.9%) females, 71 males (36.6 %), and one respondent who did not specify. Gender was generally equally represented among all races. The ages ranged from 13 to 86 years with a mean of 51.79 and a standard deviation of 13.5. The overwhelmingly main barrier to screening was lack of funding or insurance (66%).

As can be seen in Table 1, the majority of respondents to the survey identified as Hispanic (55.2% of total respondents) followed by White (39.2% of total respondents). The two least common ethnic identifications were Black (3.1% of total respondents) and Asian (2% of respondents).

Table 1: Survey participant characteristics

	Participants, n =194 (%)
Male	71 (36.6)
Ethnicity	
White	76 (39.2)
Hispanic	107 (55.2)
Black	6 (3.1)
Asian	4 (2)
Other	1 (0.5)
Age (mean +/- SD)	51.8 (+/- 13.5)

Legend for Figures 1-3

Figure Variable	**Barrier**
A	Cost/Lacking Insurance
B	Embarrassment
C	Unpleasantness of Test
D	Transportation
E	Fear of Results
F	Lack of Physician Recommendation
G	Lack of Awareness
H	Travel
I	Language Barrier
J	Lack of Symptoms
K	Other Causes

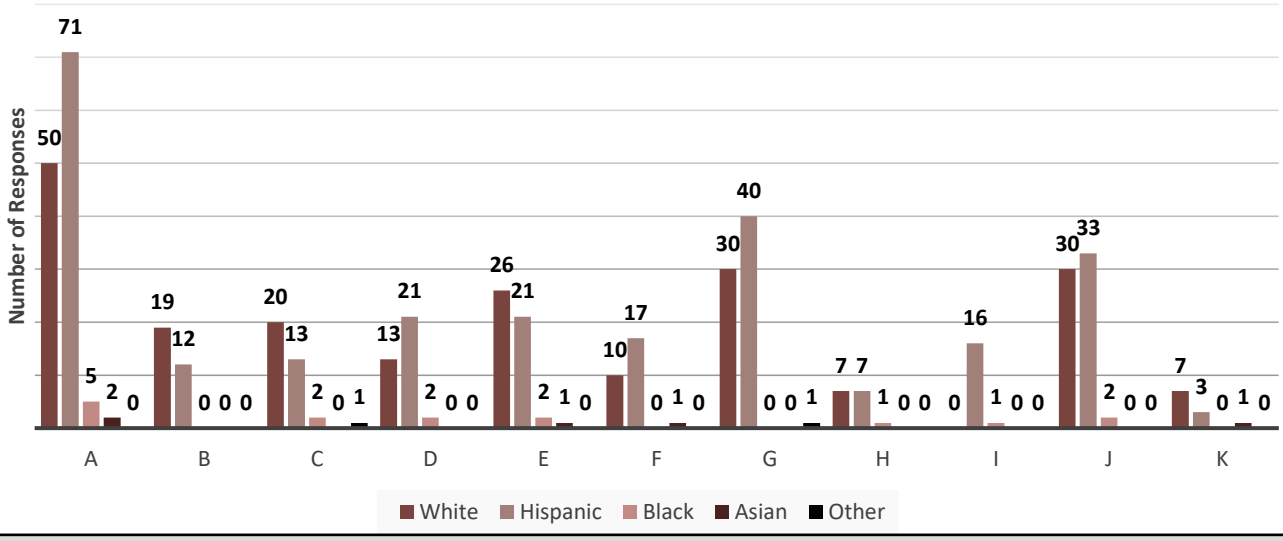


Figure 1: Barriers to CRC screening selected by of respondents categorized by self-identified ethnicity.

The largest ethnic group surveyed were Hispanics, shown in Figure 1. The primary barriers to CRC screening reported by them were a cost/lack of insurance (66.3% of Hispanic respondents) followed by a lack of awareness (37.4% of Hispanic respondents) and a lack of symptoms (37.4% of Hispanic respondents).

Figure 2 shows the most commonly selected survey responses of reported barriers to CRC screening. Based on survey responses, the most common barrier reported was the sum of cost/lack of insurance (66% of total survey respondents), followed by lack of awareness (33.5% of total survey respondents) and the lack of symptoms (25.8% of survey respondents).

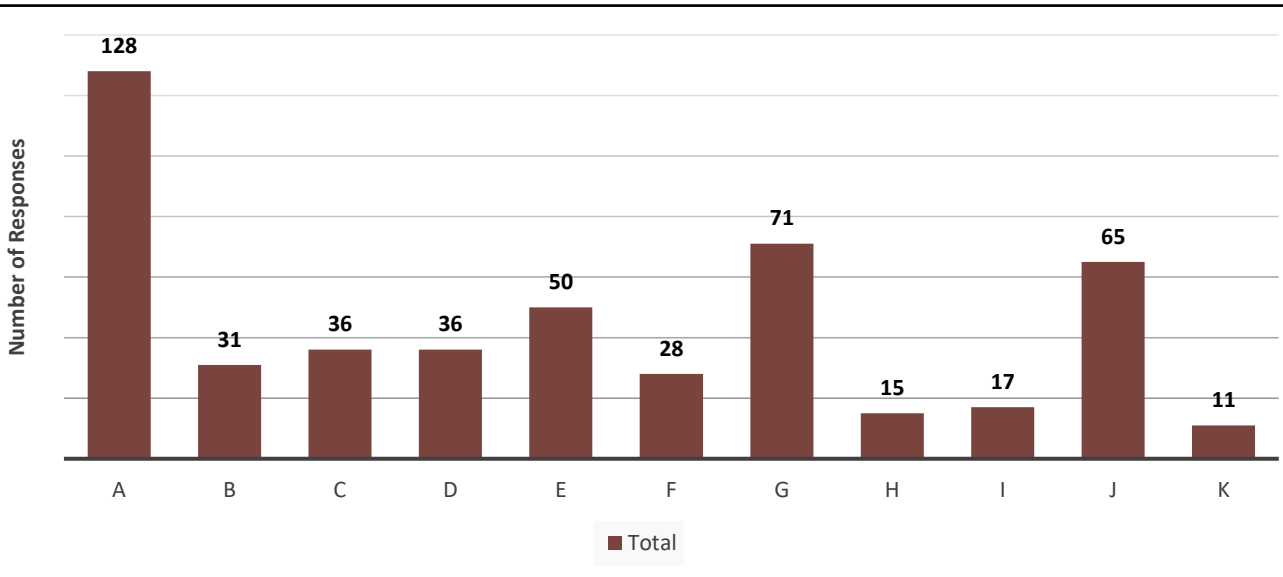


Figure 2: Compiled total of barriers to CRC screening based on survey responses.

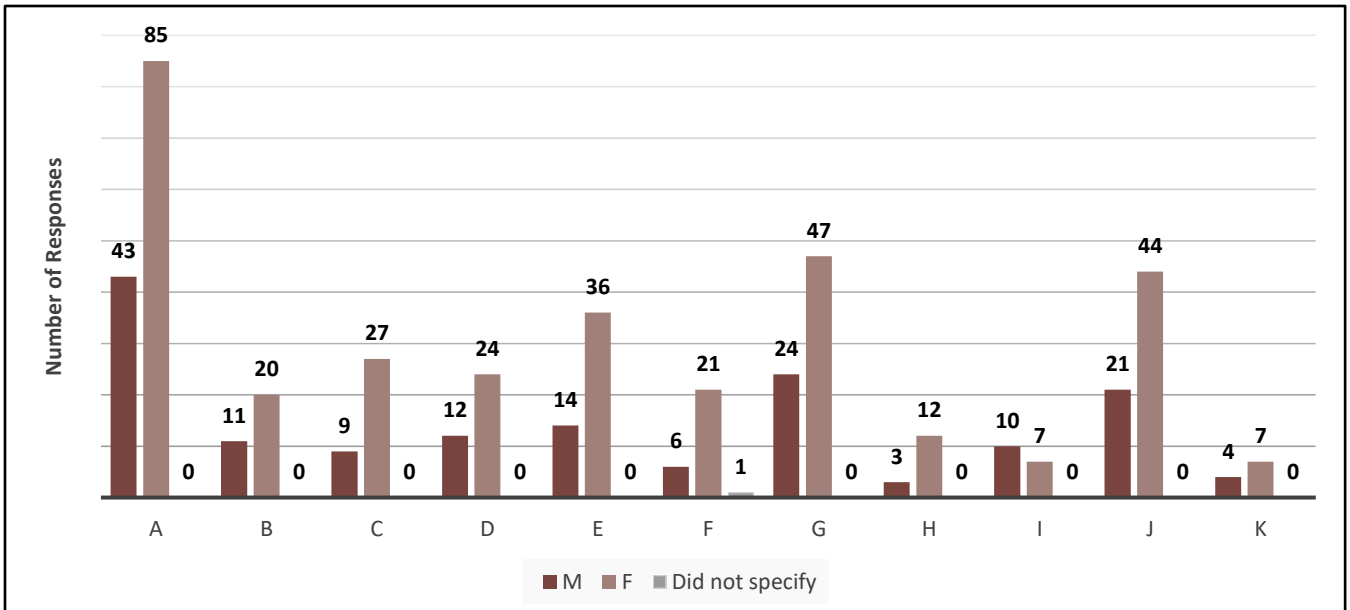


Figure 3: Barriers to CRC screening categorized by respondent self-identified gender.

Figure 3 illustrates the most commonly selected barriers to CRC screening according to gender. Based on survey responses, the most commonly selected barrier was the sum of cost and/or lack of insurance. Due to the nature of the survey, the "other causes" selections were not further analyzed for interpretation.

Discussion

The population surveyed was primarily Amarillo residents and residents of the surrounding rural communities. Most respondents identified as Hispanic or Latino and the second largest group was Caucasian (Table 1). The demographics of our survey are comparable to demographics reported by the US census for Amarillo. The vast majority of Amarillo's population reported as Caucasian; however, the largest ethnic group in our survey was Hispanic or Latino.[6] The distribution of ages in our survey was also similar to the age distribution reported by the US census for Amarillo (Table 2).[6] Compared to the urban population of the United States, rural areas such as the one surveyed are expected to have lower adherence to colorectal cancer screening guidelines.[7] This is significant because the incidence of CRC was reported to be declining in the past decade by about 3% per year in those aged 65 and older.[8] However, there is a lack of data concerning this specific population in rural, West Texas. Cancer is a worldwide leading cause of death, yet mortality and morbidity can be reduced primarily through regular screening for cervical, breast, skin, and colorectal cancer.[9] Our survey evaluated colorectal cancer barriers in an effort to increase future adherence to national recommendations.

There has been a recorded 21% risk reduction of colorectal cancer with appropriate screening.[10] This is significant when attempting to alleviate the strain of such a prevalent disease. Age of diagnosis is very important when it comes to colorectal cancer. The median age for diagnosis of colorectal cancer is 69 in men and 73 in women, respectively, and clearly delineates the need for screening once a certain age is achieved due to average incidence.[11]

A multidisciplinary approach using primary care providers and community health workers (CHWs) play an important role in screening - identifying and approaching eligible patients, providing counseling on the risks and benefits of screening, and performing relevant recommended tests. The evidence supporting the use of community health workers show that CHWs reduce the marginalized population's rate of screening guideline non-adherence.[12] The Community Healthcare workers have also been found to effectively change population attitudes and awareness leading to a well-documented increase in screening rates by providing targeted outreach and testing in communities that were well received.[13] There is also evidence supporting the significant impact that primary care physicians have on increasing colorectal cancer screening.[14] Finally, nurses have been found to play a central role in coordinating cancer screening care with patients and their relatives through educational sessions focused on the risks and benefits of screening, continuity of care, and through the distribution of available options for screening.[15] Current guidelines by The American Cancer Society recommend that adults aged 45 years and older with an average risk of CRC undergo regular screening with either a high sensitivity stool-based test or structural (visual) examination, depending on patient preference and test availability.[16] These guidelines were updated in 2018 from the previous recommendation of screening which began at the age of 50 due to the increased number of colorectal cancer cases among young and middle aged people.[17]

The survey results show that lack of insurance is the leading barrier to appropriate cancer screening followed by inadequate education over the cancer screening process in the given population. This finding is consistent with other findings regarding barriers to colorectal cancer screening and its relationship to insurance status.[8,18] The lack of insurance is mainly influenced by the structure of the U.S. healthcare system, which makes a large proportion of the eligible population unable to have adequate access to health care due to its cost. The benefits of increased insurance coverage for these affected individuals could potentially reduce morbidity and increase survival rates of patients from multiple types of cancer.[19] Recent data claims that among average-risk adults, a colonoscopy is the most common CRC screening method with an average cost of $2,125 and a mean out-of-pocket costs of $79 post insurance.[20]

The second leading barrier to appropriate CRC screening according to the survey was lack of awareness (Figure 2). This category ranked second across the demographics surveyed which included gender and ethnicity. This is similar to other studies which have documented low interest in screening as a contributing factor to the lack of proper cancer screening.[18] This could potentially be reduced through close interactions and coordination of care between patients and primary care physicians to promote patient overall awareness and improve attitudes.

Finally, the third leading barrier to appropriate CRC screening according to the survey was lack of symptoms (Figure 2). This ranked third among all of the barriers surveyed between the different demographic groups. Symptoms associated with CRC include hematochezia, weight loss, anemia, abdominal pain, and other symptoms. In some cases, the presentation of symptoms is associated with a poor prognosis due to diagnosing the advanced stage of the disease. Symptoms such as anemia on

initial presentation are associated with a higher mortality rate due to advanced staging while rectal bleeding is generally associated with a better prognosis.[21] CRC screening reduces the risk of patients presenting to a healthcare provider with a symptom that could have an unfavorable prognosis. The survey shows that there are patients in the population who may believe that they do not need to seek healthcare/CRC screening until they have the onset of new symptoms. This negates some of the value of preventative CRC screening which is done to reduce mortality and morbidity rates in the population.

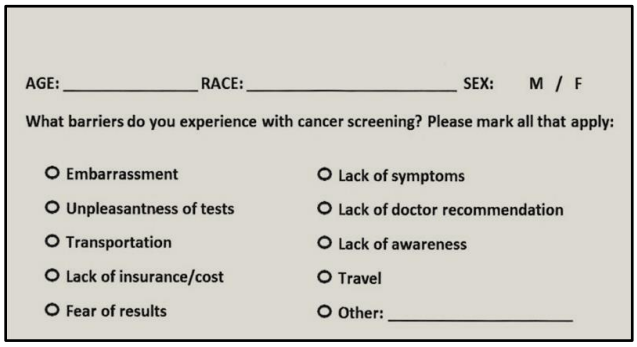
Limitations of our study include the demographic data of our respondents compared to that presented by the US census. Majority of respondents from our surveys identified as Hispanic or Latino while the US census states that this surveyed population is primarily Caucasian. This difference is likely due to a significant Hispanic or Latino population in rural Texas and the makeup of respondents from the surrounding rural areas included in the study. Another limitation includes the collection of data pertaining to the type of insurance coverage that the participants had. This could be helpful in assessing correlations between the most cited barrier to CRC screening as determined by the study results. Another limitation is the lack of documentation of the refusal and noncompletion rates for the survey. Since the survey was completed on an optional basis, there could have been a statistically significant number of people from a singular or multiple categories who declined to participate thus impacting the results.

Conclusion

The objectives of this survey-based study were to recognize the main challenges in the local community area which prevent the population from getting the appropriate recommended cancer screening and to analyze and suggest methods of resolving these challenges. The most important barrier identified in this survey to cancer screening in rural west Texas was the lack of insurance, followed by lack of awareness and lack of symptoms. The overarching issue related to all these barriers appears to be a lack of education. Proper education is necessary to inform patient populations that symptom presentation is not necessary to inquire about screening and to educate the appropriate age screening populations that CRC screening has a stronger positive impact if conducted prior to symptom presentation.

The implementation of future cancer screening barriers programs to educate patients on the reduced morbidity and mortality associated with following the current CRC screening guidelines could reduce colorectal cancer rates in rural, west Texas. A combined multidisciplinary effort between social workers, primary care physicians, physician assistants, and nurses can be clinically effective in improving cancer screening rates. Data suggest that educational outreach provided at each medical visit improves screening in marginalized populations. Due to the collaborative nature of healthcare, educating and improving the knowledge of all healthcare workers will greatly improve outreach rates and patient education. The implementation of such models could drastically improve CRC screening rates in the surveyed population and further studies assessing the effects of such implementations could have significant implications for other rural populations similar to the one surveyed.

Appendix:



AGE: _____ RACE: _____ SEX: M / F

What barriers do you experience with cancer screening? Please mark all that apply:

- O Embarrassment
- O Unpleasantness of tests
- O Transportation
- O Lack of insurance/cost
- O Fear of results
- O Lack of symptoms
- O Lack of doctor recommendation
- O Lack of awareness
- O Travel
- O Other: _____

Appendix A: Survey Questionnaire

This survey was distributed to patients who voluntarily agreed to participate in the CRC screening barriers data collection process.

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