J Canc Educ (2013) 28:100–108
DOI 10.1007/s13187-012-0428-y

American Indian Perceptions of Colorectal Cancer Screening: Viewpoints from Adults Under Age 50

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Abstract Colorectal cancer (CRC) mortality rates have decreased in the general US population; however, CRC mortality rates are increasing among American Indians (AI). AI CRC screening rates remain low when compared to other ethnic groups. Our team investigated CRC screening education prior to recommended age for screening to better understand screening perceptions among AI community members. Our research team conducted 11 focus groups with AI men and women aged 30–49 ($N=39$ men and $N=31$ women) in Kansas and Missouri. The results revealed that community members (1) have little knowledge of CRC, (2) do not openly discuss CRC, and (3) want additional CRC education. Variations existed among men and women's groups, but they agreed that preventive measures need to be appropriate for AI communities. Thus, AI CRC screening interventions should be culturally tailored to better meet the needs of the population.

Keywords American Indian · Colorectal cancer screening · Colorectal cancer screening education · Community-based participatory research · Qualitative research

Introduction

Colorectal cancer (CRC) is the second leading cause of cancer death for men and women in the USA [1]. American Indians/Alaska Natives (AI/AN) have lower CRC incidence rates than both White and Black Americans [2]. However, most of the available data come the from Surveillance, Epidemiology, and End Results Program, which focuses on AI/AN populations in only certain geographic areas. Disproportionately higher rates of CRC incidence have been reported for AN and for AI in the Northern and Southern Plains [3, 4]. Diagnosis of CRC occurs later for AI/AN, and AI/AN experience higher CRC-specific

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mortality compared to the USA as a whole [4–6]. While incidence rates are declining for White Americans, they remain unchanged for AI/AN populations [7]. Incidence rates and stage of CRC diagnosis are higher and survival is lower for AI/AN populations, even when adjusted for socioeconomic differences [8]. Some reports show that CRC mortality rates are slightly decreasing for AI/AN men and women [9, 10]. However, CRC rates may be underestimated among AI/AN due to racial miscoding, death certificate misreporting, and population undercounting of the AI/AN population [11–13]. The regional variation, substantial misclassification of AI/AN race in many cancer registries [13], and poorer survival once diagnosed demonstrate that CRC burden in AI/AN may be underestimated and represents a significant public health problem for communities.

CRC incidence and mortality can be reduced substantially through screening, early detection, and timely treatment [14–23]. Unfortunately, in the USA, the CRC screening rate remains far below that for other screen-detectable cancers including breast and cervical cancer [24–26]. CRC screening rates also lag behind prostate cancer, a cancer for which there is inconclusive data for a screening mortality benefit [27]. CRC screening disparities are significant among AI/AN; in many health systems, fewer than 25 % of AI/AN of screening age are current with screening guidelines [28–32].

Screening for CRC is an effective strategy for reducing incidence and mortality [16, 20, 33]. Screening can detect cancers at early stages when treatment is more effective (i.e., improving survival and reducing mortality) and can lead to detection and removal of premalignant growths, thereby reducing CRC incidence. Screening is low in the general US population and lower still among AI/AN [29, 31, 32]. Lower screening rates among AI/AN are associated with later stage at diagnosis and poorer outcomes [34]. Current female CRC screening rates for non-AI/AN are reported at 11.7 % for fecal occult blood test (FOBT), 42 % for sigmoidoscopy or colonoscopy, and 45.8 % for combined endoscopy/FOBT [9]. Screening rates for non-AI/AN males are 12.7 % for FOBT, 44.6 % for sigmoidoscopy or colonoscopy, and 48.2 % for combined endoscopy/FOBT [9]. For AI/AN men and women combined, these rates are 5.8, 31.7, and 34.4 %, respectively [9]. A number of well-established patient-level and system-level barriers to CRC screening exist, but few studies have investigated barriers to or facilitators of CRC screening specifically among AI/AN.

Reported barriers to CRC screening from other populations include the inconvenient or impractical nature of the tests [35–38], the embarrassing or unpleasant nature of the tests [37, 38], fatalistic cancer beliefs [39, 40], and participants not wanting to know that something is wrong [37, 41, 42]. The practicality of some CRC tests, such as colonoscopy, also complicates patient efforts to get screened because of the multiple steps, time, cost, and preparation [43–46]. While there are not many studies specific to CRC screening among AI/AN, there may be important cultural impediments to CRC screening. In our previous work, interviews with AI/AN men and women showed that cultural barriers to CRC screening relate to lack of AI/AN health care providers or patient navigators, non-culturally-specific education, and lack of preventive care [47]. Many native communities also describe strong preferences for independence, pride, and privacy and may have fatalistic health beliefs that may hinder screening uptake [44, 48–50]. Language may also be a barrier in some areas, such as on the Navajo reservation and in Alaska where elders may primarily speak their own native language [51].

This is important because in addition to socioeconomic factors, there may be culturally specific barriers and facilitators to screening, such as speaking a native language [51] or perceiving discrimination in medical settings [52]. Our objective was to explore knowledge, perceptions, barriers, and facilitators to CRC screening among a community sample of AI living in the Midwest. Specifically, we explore younger (age 30–49 year old) AI men and women's perceptions toward CRC screenings, existing barriers, and suggestions to promote education and screenings among the native population. We focus on individuals who have not yet reached the recommended screening age because it is important to address CRC screening early. By concentrating our efforts on younger individuals, we can tailor educational campaigns to their specific needs in an effort to normalize screening and prepare people to get screened when they do reach that age. In addition, the views of younger AI may help us further understand what is preventing AI men and women of recommended screening age from getting screened.

Perceptions about CRC screening of individuals under age 50 vary in different cultural groups. Some populations question if earlier screening would be better for detection of CRC [53]. Conversely, they also report fear, fatalism, and mistrust as barriers, rooted in lack of education, to screening causing the disease to go unnoticed [53]. Very little research has explored CRC screening education prior to recommended age for screening [53, 54] and no research exists concerning CRC screening education among AI below recommended screening age.

We conducted focus groups with AI men and women age 30 to 49 to identify barriers to CRC screening. Using community-based participatory research qualitative analysis techniques developed by our team, our goal was to identify these barriers in order to develop and test a culturally tailored approach for enhancing CRC screening among AI receiving care in a diverse set of Indian Health Service (IHS), tribal, and urban safety-net primary care clinics in our region.

Methods

To understand barriers to CRC screening among AI community members in Kansas and Missouri, we conducted a series of focus groups with men ($N=5$ groups) and women

(N=6 groups) aged 30 to 49. Participants (N=39 men and N=31 women) were recruited primarily through word-of-mouth at local pow wows and other cultural events. Additional recruitment was done through posters and flyers at locations where AI community members frequent, e-mail listservs from community organizations, and direct recruitment through our community advisory board. All study protocols were approved by the University of Kansas Medical Center Human Subjects Committee and local tribal councils, as needed.

The focus group moderator's guide was developed in conjunction with our community advisory board, based on prior interviews with community leaders and providers. Focus groups, led by AI research assistants, were held in both urban areas and on reservations, during both days and evenings to accommodate participants with various work schedules. Prior to the group, participants completed written informed consent and a brief demographic survey. Groups lasted between 60 and 90 min and were audio-taped and transcribed verbatim. Sessions were concluded after data saturation was achieved on major themes. The analysis was jointly conducted by academic and community member researchers. Coding followed a community-based participatory research protocol developed by the team. The transcripts were coded by hand by three members of the research team using a codebook developed by the team. Codebooks were developed inductively from the focus group transcripts. Approximately 10 % of the codes were cross-checked by the principal investigator (CMD) to ensure inter-coder reliability; few to no differences were found. Coders identified preliminary themes which were then combined into thematic statements by the PI and checked by a community member researcher. All exemplary quotes were identified by community member researchers to ensure fair representation of the culture. Full details of the analytic process are described elsewhere [55].

Results

Participants were AI men (N=39) and women (N=31) aged 30 to 49 (see Table 1). Most were married, had some college education or higher, and had health insurance outside of the IHS. The majority had not discussed CRC screening with health care providers and many did not know if any relatives had ever been diagnosed with colon polyps. Some individuals had been screened due to family history of CRC or had received a diagnostic endoscopy (men: FOBT n=10, sigmoidoscopy n=6, and colonoscopy n=6; women: FOBT n=4, sigmoidoscopy n=2, and colonoscopy n=0).

The results of the men's focus groups were delineated into seven themes; seven different themes emerged from the women's focus groups, with some overlap. Thematic topics described barriers to screening and treatment, knowledge of

Table 1 Demographic information, men and women, age 30–49 (n=70)

	American Indians, age 30–49 (n=70)	
	Men Frequency (percentage)	Women Frequency (percentage)
Current living situation[a]		
Married/partner	23 (58.97)	15 (50.00)
Divorced/widowed	8 (20.51)	11 (36.67)
Never married	7 (17.95)	3 (10.00)
Other	1 (2.56)	1 (3.33)
Education		
Some high school	0 (0)	0 (0)
High school graduate/GED	8 (20.51)	4 (12.90)
Post-high school certification	0 (0)	0 (0)
Some college	13 (33.33)	10 (32.26)
AA degree	8 (20.51)	5 (16.13)
BA/BS degree or more	10 (25.64)	11 (35.48)
Health insurance outside of IHS		
No	12 (30.77)	7 (22.58)
Yes	27 (69.23)	24 (77.42)
Where do you receive the majority of your health care?[a]		
IHS	21 (55.26)	10 (33.33)
KU Medical Center	4 (10.53)	2 (6.67)
Other healthcare facility	13 (34.21)	18 (60.00)
Have you ever talked with your doctor about colon cancer testing?		
No	29 (74.36)	24 (77.42)
Yes	9 (23.08)	5 (16.13)
Not sure	1 (2.56)	2 (6.45)
Have you ever been told by a doctor or nurse that you had a cancer other than colorectal cancer?[a]		
No	35 (89.74)	27 (90.00)
Yes	2 (5.13)	3 (10.00)
Not sure	2 (5.13)	–
Have you or any of your blood relatives ever been diagnosed with colon polyps by a doctor or nurse?[a]		
No	22 (66.67)	15 (55.56)
Yes	3 (9.09)	6 (22.22)
Not sure	8 (24.24)	6 (22.22)
Have you or any of your blood relatives ever been diagnosed with colorectal cancer?[a]		
No	28 (71.79)	20 (66.67)
Yes	5 (12.82)	5 (16.67)
Not sure	6 (15.38)	5 (16.67)
Did you or your family member receive treatment for colorectal cancer?[a]		
No	0 (0)	–
Yes	3 (60)	4 (80.00)
Not sure	2 (40)	1 (20.00)

[a] Not all participants responded

CRC, suggestions to overcome barriers, and maneuvering within the health care system. Commonalities and differences existed among men's and women's perspectives on the needs and barriers to CRC screening. Table 2 compares the themes of the two strata.

Similarities Among Male and Female Perspectives

Both men and women believed that community members have little knowledge of CRC. Participants noted the lack of CRC knowledge, screening, and symptoms. One participant commented, “… to tell you the truth, I know nothing about colon cancer. Not a thing.” Other participants spoke of their lack of CRC screening, “I don't have the slightest idea of what a screening looks like.” Both groups discussed CRC in relation to friends and family members who experienced symptoms and outcomes.

Even though participants in both men's and women's groups spoke of lack of knowledge, the discussions diverged to some degree. Women mentioned the sources from where they obtained their knowledge base, such as friends and family, print materials, and television celebrities. Overall, men did not talk about sources. Yet, some men brought up their preconceived notions of maleness and how that affects perceptions of discussing health issues. As one participant noted,

> That male ego and with a touch of, you know, kind of homophobe type thing. You don't want to be perceived… most men don't want to be perceived as, you know, like he said, a softy or somebody that, you know, too obsessed about that orifice in their backside back there. You talk about it too much people are going to look at you funny. That's just the perception everybody has.

Both males and females stated that generally the natives do not discuss CRC openly. The exception is when family members or friends have been screened and are willing to talk about it. Participants admitted that CRC is not a topic of discussion that occurs naturally or unprovoked. For those who have experience with CRC or know someone with CRC, some conversations may have happened, but discussions were generally not out-in-the-open. “I think in general it's not talked about unless, I guess it's like anything else, if it's affected you or somebody you love or you have somebody in your life, yeah, you'd probably discuss it, but I think in general people just don't discuss it.” Generally, participants fell into two categories: those who have had little to no interaction with CRC and those that had been personally affected by CRC. Those who have little to no experience with CRC had not discussed various facets, primarily due to the personal nature of the disease. Comments such as, “I had

Table 2 Comparison of men's and women's themes

Themes for CRC younger men	Themes for CRC younger women
Most participants had little knowledge of CRC screening procedures and symptoms and believed that native people do not openly discuss it. However, some young men had family members or friends with risk factors for CRC or who had been screened who do talk about it	Participants had little knowledge of CRC symptoms, screening tests, risk factors, treatment, and prevention. Any knowledge participants had came from friends and family, print materials, and television celebrities
	Young women believe that native people do not normally discuss CRC unless a family member or friend has been screened and talks about it
	Most young women had not discussed CRC with their healthcare providers, with the exception of women who had experienced symptoms or had a family history
Participants said transportation, location of services, cost, lack of insurance, embarrassment, fear of the procedure and results, and privacy are barriers to CRC screening	Barriers to CRC screening include transportation, location of services, cost, lack of insurance, embarrassment, fear of tests and results, and privacy
Young men believed that other health conditions receive more attention, such as breast cancer and diabetes	Young women believed that other health conditions, particularly breast cancer, take precedence in health discussions
Young men wanted more education about CRC and suggested using the media and cultural events, such as pow wows, to raise awareness, provide education, and provide screening	Young women believed there is a need for culturally tailored education materials and free screenings at convenient and culturally specific locations
The majority of participants believed that diet, family history, and age are risk factors for CRC	
Most participants had not discussed CRC with their healthcare providers and believed this may be due to their age	
Young men felt frustration with the Indian Health Service efficiency, care, staff, funding, and structure	
	Young women openly discuss traditional medicine and ceremonies related to health and healing and prefer traditional medicine or a combination of traditional and allopathic medicine

one set of grandparents that we grew up traditionally around them and it was like you don't talk about stuff like that, you know. That's just not something you talk about. You don't talk about your health," and, "No one wants to talk about their rear end," exemplified privacy concerns. However, those who had been personally affected by CRC were more apt to share their experiences. In some cases, experiences fueled action for screening, even though the recommended screening age had not been reached, "fortunately I look at my check-up as kind of a, view of a care whatever you can do to, let's get it over with. I'd rather catch it early than later. My uncle was just diagnosed with colon cancer." However, sharing personal experiences with family members or close friends did not always spur screening. As noted by one female participant, "After I got my colonoscopy I called back to my brothers and sisters and told them they should all get checked. They all laughed at me."

Both male and female participants stated that transportation, cost, lack of insurance, fear of the procedure and results, embarrassment, and privacy are barriers to CRC screening. Each item listed represented an obstacle for those seeking screening. Transportation was a barrier, particularly for those living in rural areas or on reservations. Rural or reservation residents often needed to travel long distances to obtain services because screening is not done in local clinics; it is done at hospitals or other remote facilities. Even if health care facilities were nearby, that did not mean the facility had the capacity or resources to perform colonoscopy screening or analyze FOBT cards. Even for individuals living in the Kansas City Metropolitan Area, the nearest IHS facility is 55 miles away.

> I go back and forth to my reservation every year and I just think of, you know, logistics, you know, they're out, they're away from major towns everywhere you probably would have good access to care. And the other tribe has built a healthcare facility and so they are starting to do more of this kind of testing now, but I think, you know, a lot of it may is accessibility and, you know, some of it's even transportation. We have the problem with the elders here in our community, being able to get them back and forth.

Cost and lack of insurance were challenging issues for many participants. For our participants who lived in the Kansas City Metropolitan Area, they mentioned the difficulty receiving services because the city has no IHS provider. Others focused on the amount of money charged for health procedures and associated or unexpected costs. "So you never know what it's going to cost you. That's my biggest fear of going to the doctor is they're going to break me, even if I got insurance."

Another impediment to CRC screening is fear. Men and women referenced two aspects: fear of the procedure and fear of the results. Participants voiced concerns about, "not knowing what it [the screening] entails." The core fear expressed was a lack of awareness and not knowing what to expect. For example, some participants were unacquainted with the different screening options for CRC. Others were unfamiliar with screening preparation or had heard about difficult preparation experiences from friends or family members. Others focused on the procedure. "It's [the procedure] just a lot of people don't like it. Just mention sigmoidoscopy to anybody what's the first thing… reaction they're going to, that lip's going to [go] up."

Fear of results was also a deterrent for some people, i.e., not knowing an outcome was more comforting than bad news. One woman stated her fears of screening results, "you're afraid to find out that you're going to die." In part, some worried about the screening outcome and the follow-up that would be required if something was found.

Embarrassment was mentioned as another obstacle to screening. Some participants held associations with particular body parts as private and to expose those parts or have those parts touched in unusual ways spurred a sense of embarrassment. Many believed these behaviors were aligned with societal expectations or norms. However, most participants indicated that embarrassment was a factor among people of screening age, although some suggested that perceptions seem to be changing among younger generations.

> And I think it would be a real barrier to her [participant's mother] would be embarrassment because it's such an invasive thing… the younger generation, I don't think that would be such an issue, but some of the older ones, I think it would be a real issue because of their culture, because of the way they were raised.

Another aspect of privacy and embarrassment was that people were concerned about what others would think if they found out they had been screened. That concern was exacerbated because they felt that people in the community know people who work at IHS and anonymity may not be protected, "Because I know that not just at our [named facility] IHS, but at the other IHS… wherever they are, you know, everybody's family or somebody works there. And that kind of… I mean that kind of falls along with embarrassment."

Participants in both strata agreed that other health conditions receive more attention, such as breast cancer and diabetes. Women and men stated that health priorities do not include CRC, in part because of the publicity that other cancers receive. Some women mentioned that they do not think about colon cancer because of other cancers that seem to affect women more.

> That's not the first cancer that I, I guess, I think about or that I fear, so I'd say no. Even though probably am,

> could be, I certainly eat all kinds of junk. But that's not the first one. I don't know if it's because I recently had babies or had trouble getting pregnant way back, but I always fear ovarian cancer. I associate that more with women than I do, well obviously with men, but more than I do with colon cancer.

Men agreed that CRC was not high on the public health agenda, "Lung cancer and pancreatic cancer are some of the ones talked about most." The perception of both women and men that other cancers and health conditions receive priority over CRC left an impression with some that it is not a concern for themselves, as individuals and as a native community. "I mean I don't know anything about colon cancer. We know less about that than about breast cancer or anything else." Participants indicated that the lack of public discussion concerning CRC meant that it must not be a pressing or significant public health concern.

Participants agreed that there is a need for educational material because increased education and awareness may change attitudes toward screening. "Well, I think the more knowledge you have the less fearful you are." Participants believed that these preventive steps should begin early, i.e., before individuals reach the recommended screening age. Because the participants were not of recommended screening age, they stressed education should be targeted at earlier ages.

Education was discussed in reference to action. In particular, the women stressed a need for culturally tailored education materials with the intent to encourage screening. Some women thought a culturally tailored CRC campaign would resonate better than a non-tailored format. "Because I think if they see a brochure that's Native designed, I guess, I mean kind of Native looking, they're probably going to read that more than if they see a brochure that's maybe got an African–American on it or an Asian or Caucasian or whatever the race may be… It seems like it piques your interest when it's about your own people, look at the literature than if it's not." Others thought that it should not just show native images, but the message should be embedded in contextual frameworks, "I think it would be more accepted in a native language, in a native story."

In addition, some women thought that to encourage screening, the screening should be free and be available at convenient and culturally specific locations. It was also suggested that screening could be accomplished using mobile clinics.

Differences Among Male and Female Perspectives

While male and female perspectives coincided on many occasions, they did not agree on all issues surrounding CRC screening in the native community. Three themes from the men's groups differentiated from the women's groups, and one theme emerged from the women's groups that stood apart from their male counterparts.

The majority of male participants believed that diet, family history, and age are risk factors for colon cancer. They thought that lifestyle, particularly the food consumed, affected the digestive system and one's ability to process nutrients and pass waste. In addition, participants believed that heredity played a considerable role in CRC risk. Participants believed if someone had a family member diagnosed with CRC then that individual would be at greater risk than those who did not. And lastly, men thought that risk for CRC increased with age. Many thought that they were not at an age where they should be concerned about CRC; therefore, they considered age a factor for increased risk.

> I heard it's on the rise and a lot of guys that are middle aged, you know, 45 and 50 and if you have a diet that's low in fiber and vegetables and things it kind of affects you. If you have a more meat based, you know, diet that you're more prone to it. But I'm not sure if it's because of meat or, you know, things like that. That's about all I really know about it.

Many of the comments did not delve into depth. For example, "I don't know a lot about it other than you start to get it in your 40s. It's something you should start thinking a little bit more about," indicated that some facts have been learned, but the knowledge base is not extensive. In addition, participants did not provide much detail about the risks. Rather, participants stated what they thought contributed to CRC but the statements described general health habits and concerns.

Most participants have not discussed CRC with their healthcare providers and believed this may be due to their age. Men had little dialogue with their healthcare providers concerning CRC. Most men attributed a lack of awareness, education, and conversation because they had not reached the recommended screening age. Comments such as, "Not til I was older, you know, cause what I do know about it they talk about most people don't need to be concerned about that til you hit your 40s you know. I've never had anything unusual, so I was never really concerned about it," and, "Most of the materials I've seen in doctors' offices have said to get tested about 50. So that doesn't apply to me," portrayed men's attitudes that CRC affects older men. Yet few thought about how their current behaviors affect their future health outcomes. One man admitted, "I rarely use a primary care physician. That's something that… now that I hit 45 I really need to start thinking about taking a little better care of myself." Few men voiced the connection of implementing changes to their current behaviors before reaching the recommended screening age.

Young men felt frustration with IHS efficiency, care, staff, funding, and structure. The grievances cited among participants ranged from services received to the organizational structure of

IHS. Several participants gave examples of long wait times, scheduling problems, inadequate resources, poor staffing, and lack of preventive foresight. Participants stressed that if someone has private insurance and can afford the co-pay, he is more likely to use that option than go to IHS. “There's a lot of Natives that do have health insurance, won't use the IHS for those reasons, they just use their health insurance. It's going to be more proper and more professional.” Yet for those who do not have alternatives, the IHS remains a place for care. “Specifically, ‘do not trust Indian Health', is kind of how a lot of us, you know I ain't speaking for everybody but I know that's how I feel. If I'm ailing there will be a few days of ailing before I'll be like, ah, I got nowhere else to go, you know. I better go get in and at least get an idea of what I got.” Yet, participants stressed the lack of trust and confidence in the services. The sentiment expressed was that IHS exists, but it is limited in the care it provides.

The theme that emerged in the female group solely referred to the use of indigenous health and healing. Young women openly discussed traditional medicine and ceremonies related to health and healing and preferred traditional medicine or a combination of traditional and allopathic medicine. Some women in the groups mentioned health in reference to traditional or spiritual practices. In part, these women were unsatisfied with their previous encounters with the medical system. For example, one woman communicated a sense of alienation or detachment with mainstream care, “people that you're dealing with in that healthcare system they don't have a clue as to what native beliefs are.” Other women identified with feelings of disconnect with mainstream care; however, others felt that differences could be reconciled or negotiated, “if they're a good doctor, you know, they have no problem with… I mean my surgeon let my husband… my husband said can I smudge you and he brought his old team in and they all got smudged.” Even though none of the comments women made referred to CRC specifically, they discussed past experiences of traditional healing and how practices have changed through time, often depending on where one grew up.

> (I)t was hard to even get anybody to go to the doctor, because that was just something you didn't do. And, you know, so like I said, if there was pain, if there was anything that wasn't right, you know, then there would be ceremonies and there would be, you know, things that would happen that, you know, that they believed we're going to cure what was going on and that they would get rid of those things. And if they didn't get rid of those things then they would move on to another ceremony and they would bring somebody else in, you know, just like we've talked about before, they would, you know, go to sweats and, you know, just things like that to… to be healed spiritually instead of going to the doctor.

Discussion

The intent of our research was to assess knowledge and perceptions of AI men and women under age 50 toward CRC and CRC screening. We found that the majority of participants had little understanding of CRC, although some knew of friends or family members who had been affected by the disease or who had been screened. The knowledge base among participants was low, and most participants agreed that community members of all ages knew very little information regarding CRC. For the participants who had engaged in conversations regarding CRC with family and friends, some had encountered resistance or ridicule. In part, these conversations related to a lack of information regarding CRC and screening. Fears of the unknown were described in terms of humorous responses; humor was used to ease social situations, create comfort, and divert tension. Some participants also referenced homophobic fears as reasons to not get screened. It is possible that these attitudes may be a reflection of privacy concerns and cultural nuances. However, a small portion of participants had discussed CRC information and screening details intimately with friends and family members.

Both women and men wanted additional education about CRC. Some participants seemed to be receptive to the idea of CRC screening, yet comments indicated that the overall perception among community members was that the invasive nature of the screening is not socially accepted. The perception is that the screening is not socially accepted due to cultural meanings that are attached to the act of examining the colon by inserting a device (camera) through the rectum. Future education campaigns need to be sensitive to this perception. Altering attitudes of younger generations may impact the screening behaviors of older adults. The more that CRC screening is discussed, the more likely individuals will get screened in the future.

The major limitation to our study is a limited pool of potential respondents. This study was conducted in the Midwest only. However, because our heterogeneous population comes from many different parts of the country, we are able to shed light on barriers to CRC screening through native communities in the USA.

Very little research has been done regarding younger men and women's perceptions on CRC and screening, and no other study describes the viewpoints of AI under age 50. Studies have found that men and women not of screening age from other underserved populations share similar concerns with our participants in terms of barriers. Even though our participants may share similar concerns as other groups, variations in culture and beliefs necessitate a different response. An alternate approach may complement an existing framework, but it may require additional shaping of preventive messages to resonate with AI communities. By investigating the concerns and needs of AI men and women before they reach screening age, we have a better chance of providing meaningful services that will increase their likelihood of getting screened. We are currently developing a culturally targeted touch screen computer program that will provide education about the different types of CRC screening and will help people make a plan for how they will get screened. We are hopeful that this type of education, combined with a plan of action, will spur AI community members to complete CRC screening.

Acknowledgments This work was supported by the National Institutes of Health, National Institute for Minority Health and Health Disparities (P20 MD004805, PIs: Daley and Greiner) and National Institutes of Health, National Cancer Institute (R03 CA121828, PI: Daley).

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