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Developing a Typology of African Americans With Limited Literacy Based on Preventive Health Practice Orientation: Implications for Colorectal Cancer Screening Strategies

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Abstract

Preventive health messages are often tailored to reach broad sociodemographic groups. However, within groups, there may be considerable variation in perceptions of preventive health practices, such as colorectal cancer screening. Segmentation analysis provides a tool for crafting messages that are tailored more closely to the mental models of targeted individuals or subgroups. This study used cluster analysis, a psychosocial marketing segmentation technique, to develop a typology of colorectal cancer screening orientation among 102 African American clinic patients between the ages of 50 and 74 years with limited literacy. Patients were from a general internal medicine clinic in a large urban teaching hospital, a subpopulation known to have high rates of colorectal cancer and low rates of screening. Preventive screening orientation variables

included the patients' responses to questions involving personal attitudes and preferences toward preventive screening and general prevention practices. A k-means cluster analysis yielded three clusters of patients on the basis of their screening orientation: ready screeners (50.0%), cautious screeners (30.4%), and fearful avoiders (19.6%). The resulting typology clearly defines important subgroups on the basis of their preventive health practice perceptions. The authors propose that the development of a validated typology of patients on the basis of their preventive health perceptions could be applicable to a variety of health concerns. Such a typology would serve to standardize how populations are characterized and would provide a more accurate view of their preventive health-related attitudes, values, concerns, preferences, and behaviors. Used with standardized assessment tools, it would provide an empirical basis for tailoring health messages and improving medical communication.

Public health campaigns typically target prevention messages to broad sociodemographic groups on the basis of age, race, and ethnicity (Hornik & Ramirez, 2006). However, within these groups, there may be considerable variation in orientation toward preventive health practices such as screening for serious and life-threatening diseases. This may be especially true for African Americans, who have historically had higher morbidity and mortality from chronic disease. R. E. Davis and colleagues (2010) noted that many health communication messages that target African Americans to help address these health disparities often assume the group to be culturally homogenous. Research indicates, however, that African Americans are quite heterogeneous in their attitudes, behavior, and beliefs around health (Radio One & Yankolovic, 2012).

It is clear that the design of more effective health messages is needed to influence preventive health practices, particularly cancer screening behaviors. The research reported here addresses this gap, using a psychosocial marketing segmentation strategy to develop a typology of older African American clinic patients with limited literacy skills, on the basis of their attitudes about preventive practices and health beliefs. These patients represent a subpopulation with particularly high rates of CRC and low rates of screening (Centers for Disease Control and Prevention, 2012). The resulting types of patients are then profiled relative to barriers to CRC screening and health lifestyle factors, which provides insights into the motivations and orientations of this select subgroup of patients and a scientific knowledge base for developing educational interventions designed to increase colonoscopy screening rates.

Background

The use of segmentation approaches to define subgroups with similar characteristics has been a common tool in commercial advertising for many years (Abratt 1993; Berrigan & Finkbeiner, 1992; Croft, 1994; Dickson & Ginter, 1987; Dominguez & Page, 1981; Grover & Srinivasan, 1992; Kumar & Rust, 1989), with the majority of large companies now using consumer segmentation profiles to help define customers and more effectively target particular subgroups (Morris & Schmolze, 2006).

Although the fields of public health and health research have embraced segmentation as an effective marketing tool, most applications have involved large-scale marketing efforts

or community focused health campaigns (Albrecht & Bryant, 1996). In these efforts, it is common to see segmentation approaches that use limited demographic, cultural, or health status information to define patient subgroups (Dawson, 1989; Dolinsky & Stinerock, 1998, Cheng, Chang & Liu, 2005). What is often thought to be a relatively homogeneous subgroup, however, may possess important attitudinal, personality, or behavioral variations that, if used in an appeal strategy, could mean the difference between success and failure. Recent segmentation research suggests that applying psychobehavioral segmentation schemes that take into account attitudes, perceptions, and behaviors is more effective in characterizing and influencing patient subgroups than classifying and segmenting them simply on demographic or limited behavioral characteristics (Endresen, 1988; Fletcher et al., 1983; Morrison, Murphy, & Nalder, 2003; Wolff, et al., 2010).

A wide array of segmentation methods have been used to define typologies relative to health care, including typologies of patients relative to cardiovascular risk behaviors (Williams & Flora, 1995), risky sexual behaviors (Carey, Vanable, Senn, Coury-Doniger, & Urban, 2008; Trigg, Peterson, & Meekers, 1997), prescription drug seeking (Morris, Tabak, & Olins, 1992), alcohol use (Slater, Basil, & Maibach, 1999), antihistamine use (Reardon & Pathak, 1990), physical activity and fitness (Brown, 1992; Bull, Kreutner, & Scharff, 1999), health information seeking (Maibach, Weber, Massett, Hancock, & Price, 2006; Risker, 1995; Wahyuningsih, 2008), nonconscious behaviors (Wheeler & Berger, 2007), smoking behaviors (Rose et al., 2007), smoking cessation (Weber et al., 2007), cancer-screening behavior (Scammon, Smith, & Beard, 1991), and fruit and vegetable intake (Della, DeJoy, & Lance, 2009). Despite this, the majority of existing research uses demographics as a means for tailoring health education messages or treats subgroups (e.g., ethnic minorities) as homogenous groups. This restricts the ability to accurately understand differences in perceptions around health behaviors that may exist within subgroups.

Tailoring Messages for Colorectal Cancer Screening

While CRC screening is strongly recommended by the U.S. Preventive Services Task Force (2002) for individuals 50 years of age and older, all CRC screening methods have low rates of use compared with screening for other cancers. It remains lowest for patients with less than a high school education and among racial and ethnic minorities (Centers for Disease Control and Prevention, 2012).

Colonoscopy is a particularly important preventive procedure for African Americans because of their excess rates of CRC mortality, more proximal distribution of cancers and adenomas that are addressed more effectively by this method, and the younger mean age at which they develop CRC (Agrawal et al., 2005). Research has shown that African Americans are particularly likely to remain unscreened even when access to screening is available (American Cancer Society, 2010), and although a number of studies have addressed CRC screening behaviors in broad African American populations (Hornik & Ramirez, 2006; James, Campbell, & Hudson, 2002; Katz et al., 2004; Palmer, Midgette, & Buadoo, 2008), no study has used overall orientations toward preventive health practices as a basis for segmentation. This study addressed that gap by developing a typology of patients on the basis of their preventive health practices.

Method

We recruited 102 African-American patients from a general internal medicine clinic in a large urban teaching hospital that only enrolls patients who have some form of health insurance (predominately Medicaid, Medicare, or a private plan). In the 12 months before the study, reviewed general internal medicine clinic records indicated that patients were 64% female, 78% African American, and most older than 50 years of age. Clinicians and staff regarded the patients as having limited literacy. Pilot studies and focus groups conducted before this study confirmed the low level of literacy in the clinic population (Bass et al., 2011; Wolak, Ruzek, Bass & Gordon, 2009).

Research assistants used scheduling records from the hospital clinic to determine eligibility and obtain a convenience sample of patients to participate in the study over an 8-week period in 2008. Enrollment in this study was limited to patients between 50 and 74 years of age, the group regarded most age appropriate for colonoscopy. They were selected from daily patient rosters during regular clinic hours. We recruited equal numbers of men and women to ensure gender balance for analyses. Patients were excluded if they were scheduled for a visit related to a serious, life-threatening or terminal condition that would make participation in a study inappropriate, and these exclusions were made in consultation with each patient's physician. Patients at the clinic for routine medical care were approached in the waiting room and asked if they would be willing to participate. If willing, patients were consented, evaluated for literacy, and asked survey questions. Interviews took place in a private office before or right after a medical appointment. The protocol took approximately 15 min to complete. All materials and procedures were approved by the institutional review board.

Instruments

The research protocol included two instruments: the Rapid Estimate of Adult Literacy in Medicine–Revised (REALM-R) to measure literacy level and a sociodemographic and patient segmentation survey designed to collect sociodemographic data, preventive health practices, and perceptions of barriers and facilitators for colonoscopy.

REALM-R

Literacy level was measured with the 8-item standardized REALM-R (T. C. Davis et al., 1991), which has a reliability coefficient (Cronbach's α) of 0.91 (Bass, Wilson, & Griffith, 2003), a test–retest reliability coefficient of .99 (T. C. Davis et al., 1993) and takes less than 2 minutes to administer and score. The part-whole correlation between the REALM-R and the longer version (REALM) is 0.72. Patients are asked to pronounce 11 words, of which the first 3 are not scored. If the patient is unable to pronounce six or more of the remaining eight words, the patient is classified as being at risk of low literacy. Validation studies show that patients who score at or below 6 on the REALM-R are unable to read at a sixth-grade level (Bass, Wilson, & Griffith, 2003).

Sociodemographic and Patient Segmentation Survey

Patients were first asked a series of sociodemographic questions, including the highest level of education they had completed and whether or not they had ever had a screening test for CRC. The patient segmentation questions were developed on the basis of our prior work involving (a) focus groups conducted with low-literacy African American patients (Bass et al., 2011); (b) in-depth interviews with 30 third-year medical residents in internal medicine (Ward et al., 2010); and (c) an extensive review of the available research literature on CRC screening (Ward et al., 2008). The survey questions (see Table 1) covered personal attitudes and preferences regarding preventive health practices (11 questions), perceived barriers to having a colonoscopy (16 questions), and perceptions of colonoscopy (8 questions). Each question was written at or below a sixth-grade reading/comprehension level and pilot-tested with clinic patients. When administered, each question was read aloud by the research assistant who asked the patient to respond by pointing to a graphic scale that rated how much they agreed or disagreed with each of the statements on an 11-point scale ranging from 0 (*strongly disagree*) to 10 (*strongly agree*). The graphic scale, using faces at the major scale points, is used widely in clinical settings to assess pain, particularly in populations with limited literacy (Wong & Baker, 1988, 2001). This scale was printed on an $8\frac{1}{2}'' \times 11''$ sheet and positioned so the participant could point to the face that best represented his/her response.

Segmentation Analysis

To establish the typology of patients' CRC screening orientations, a k-means cluster analysis procedure was used (SPSS 17.0). The variables specified for clustering were responses to the 11 questions involving personal attitudes and preferences toward preventative health practices (see Table 2). After the patient typology subgroups were defined and named, descriptive statistics were computed for all other variables collected in the survey. We then conducted an analysis of variance comparing across the three subgroups on perceived barriers to colorectal cancer screening (Tables 2 and 3) and perceptions of colonoscopy (Table 4).

Results

Participant Characteristics

Participants self-identified as 94.9% African American and 5.1% mixed race; 96% considered themselves to be non-Hispanic, 3% Hispanic, and 1% were unsure. We stratified by gender to ensure having equal numbers of men ($n = 51$) and women ($n = 51$), with a mean age of 69 years (range = 50 to 74 years). This subset of clinic patients was similar in age and ethnicity to the total population of patients who use the general internal medicine clinic. Of the 101 patients who self-reported the highest grade of school completed, 51% ($n = 52$) completed less than high school; and 48% ($n = 49$) graduated from high school, had earned a GED, or had some college. One participant did not respond.

Literacy Levels

REALM-R scores were obtained for 98 patients. Four refused to take the test, saying that they did not have their glasses or could not see the text—common statements patients make to hide low literacy. Of these, three reported less than high school education; one reported having graduated from high school or equivalent. For analysis, those with less than high school were assigned the REALM-R mean score (2.90) of the 98 patients with less than high school who took the REALM-R; similarly, the one participant with a high school education was assigned the mean score (4.05) for those who took the test and had also graduated from high school. These four patients are included in the results.

Overall, 91% of all patients ($n = 92$) scored 0–6, and were classified as having low literacy. Nine patients scored 7–8, above the low literacy cutoff point of 6. REALM-R scores differed by education. For those with less than high school graduation, the mean score was 2.93 ($SD = 2.07$). For those who had graduated from high school, had a GED, or some college, the mean score was 4.29 ($SD = 2.34$). To assess the potential effect of the patients who reported some college ($n = 8$), we initially calculated the mean score for this subgroup alone ($M = 5.0$, $SD = 2.67$). Because patients with a high school degree or GED and those with some college scored on average below 6, meaning unable to read at the sixth-grade level, we combined these patients in our analyses of literacy within and between groups in the cluster analysis.

Patient Clusters on the Basis of Preventive Orientation

The cluster analysis procedure was highly successful in producing three distinct clusters that differed significantly across all of the variables, labeled *ready screeners* (50.0%), *fearful avoiders* (30.4%), and *cautious screeners* (19.6%). Figure 1 presents the mean values for the clusters in graphic form to aid comparison across the 11 cluster variables used to create the groupings. Table 2 presents the mean values for each of the clustering variables across the three groups including the tests of statistical significance from the analysis of variance procedure.

Ready Screeners (50.0%)—This group has a positive orientation toward the medical establishment in general, and toward screening specifically. A majority (65%) self-report that they had had a colonoscopy (an outcome variable not used to create the clusters). In general, ready screeners are willing to go to the doctor, do not mind having preventive testing such as colonoscopy, and feel that screening in general is a good way to find medical problems early, making screening “worth the effort.” They believe that screening is a good way to stay healthy. This group also feels that if they had cancer they would want to know, and their fear of having cancer is not an impediment to being tested. They would readily be screened if a doctor recommended it, without being pushed by family or friends. At the same time, this cluster group agreed with the statement that if they got cancer it is “God’s will.” Overall, the ready screeners reflect a high degree of self-control, are positive about the benefits of screening, and report fewer barriers to doing colonoscopy compared with the other groups.

Fearful Avoiders (30.4%)—Almost a third of participants (30.4%) were fearful avoiders. This cluster distinctly differs from the first group in that their orientation toward doctors and medical procedures is negative. Only 24.3% of the group self-reported having had a colonoscopy.

The fearful avoiders not only dislike organized medicine but also profess to trust their bodies to tell them if there is a problem, and feel that screening is unnecessary. Their trust in their own bodies appears to mask an overall fear of having medical tests and the potentially negative diagnosis that might result. The majority of fearful avoiders say they would rather not know if they have cancer. They did acknowledge that screening tests are “worth the effort” and that such tests should be done to stay healthy, especially if a doctor recommends the screening. However, as noted above, few of them have actually acted on that recommendation. Similar to the ready screeners, fearful avoiders believe that getting cancer is “God’s will.”

Cautious Screeners (19.6%)—This group’s orientation is somewhat like the ready screeners but with key differences. The majority of cautious screeners would rather know if they had cancer and do not mind going to the doctor. They see the benefits of screening tests, feeling these tests are “worth the effort.” They also strongly believe that screenings help a person “stay healthy.” More than half of the cluster group (57.6%) self-reported having had a colonoscopy. This group differs from the ready screeners, however, in that they would not feel overly influenced by a doctor’s recommendation or pressure from family and friends to be screened. They are cautious in that they feel they want to make their own decisions regarding health issues. In addition, this cluster is the only group that disagreed with the statement, “Getting cancer is God’s will.”

Perceptions of Barriers to CRC Screening, by Patient Cluster

Once participants had been identified as belonging to one of the three patient-types described earlier, the clusters were analyzed for similarities and/or differences in perceptions of barriers and facilitators to screening and perceptions of colonoscopy. These variables, which were not used to establish the clusters, are summarized in Tables 3 and 4.

Table 3 presents the means and significance tests by cluster for perceived barriers to colonoscopy. Transportation, taking time off from work, and arranging childcare and/or care for older family members, are rated low as barriers to getting screened by all patient-types (<2.3 on the 0–10 scale). Cost was an issue only for fearful avoiders, who rate cost as a concern significantly higher than do the other types of patients (3.2 vs. 1.24 and 1.20; $p = .018$). There were nine perceived barriers that did show very significant differences. Four were specific to colonoscopy. Fearful avoiders were significantly more likely to indicate “too much bother” as a barrier than either Ready screeners or cautious screeners ($M = 4.13$ vs. 2.49 and 2.50; $p = .032$), as well as colonoscopy a too unfamiliar ($M = 4.39$ vs. 2.24 and 1.70; $p = .010$), embarrassing ($M = 4.53$ vs. 1.78 and 2.15; $p = .001$), and not the best method of screening ($M = 3.55$ vs. 1.31 and 2.10; $p = .001$). While fear of finding out that they might have cancer is not a barrier to screening for the ready screeners and the cautious screeners ($M = 1.98$ and $M = 1.65$, respectively), this concern is significantly higher for

the fearful avoiders ($M = 5.81$; $p = .000$). Worry variables related to pain ($M = 6.35$ vs. 2.69 and 3.60; $p = .000$) and complications ($M = 4.94$ vs. 3.04 and 2.90; $p = .018$) and also significantly higher in the fearful avoiders.

Last, there were also significant differences related to having a probe inserted into the rectum and the idea that colonoscopy was “sexual.” Fearful avoiders were most likely to indicate fear of a rectal probe ($M = 5.48$ vs. 2.12 and 2.50; $p = .000$) and having the perception of the probe being “sexual” ($M = 2.70$ vs. 0.34 and 0.50; $p = .000$).

Perceptions of Colonoscopy as a Method for CRC Screening

There is a high degree of agreement across all clusters that colonoscopy is the superior technique for colorectal cancer screening. All groups rated it highly as a form of screening, indicating it is the *most accurate, most effective at finding growths early and removing them, has to be done least often, is the most recommended by doctors, is covered by insurance, and produces the most peace of mind* (see Table 4). Comparing results for all eight variables across the clusters, there was a statistically significant difference on only one variable (colonoscopy being the most accurate). Fearful avoiders rated this slightly lower ($M = 8.29$ vs. 9.41 and 9.05; $p = .021$).

Distribution of Literacy Levels Across Clusters

To assess the possibility that literacy was differentially associated with preventive health practices and beliefs, we did an analysis of variance. There were no statistically significant differences between cluster groups' REALM-R mean scores as determined by one-way analysis of variance ($F[df = 99] = 1.415$; $p = .248$). Because mean REALM-R scores were higher for participants with more education, we also examined the distribution of patients with the highest level of education. Of the 8 who reported some college, 4 were cautious screeners, 1 a ready screener, and 3 fearful avoiders, indicating a distribution of these participants across cluster groups.

Discussion

The cluster analysis used to establish the typology in this sample of African Americans with limited literacy produced clear distinctions among patient types on the basis of their attitudes and health maintenance preferences. Differences were also evident in perceptions of barriers to colonoscopy and self-reported screening outcomes. The resulting typology clearly demonstrates that there are important subgroups related to orientation toward preventive health within what is sometimes misperceived as a relatively homogeneous sociodemographic population. For example, ready screeners who have a positive orientation toward the medical establishment, see screening tests as well worth the effort, and would rather know if they have cancer. This is validated by the fact that of the three clusters, the ready screeners have the highest percentage of individuals who have already had a colonoscopy (65%). On the other extreme, the fearful avoiders, who have a negative orientation, score lower on these attributes and are the least likely to have had a colonoscopy (24.3%).

One of the most striking findings from the typology is the existence and size of the fearful avoiders group. This group differed significantly from the ready screeners and cautious screeners in their perceptions of the medical establishment, their hesitancy to be screened, their belief that if they get sick it is “God’s will,” and if they get cancer, they would “rather not know.” Because the fearful avoiders are 30.4% of the sample, they represent a very important target group for preventive screening messages. It should also be recognized that because participants in this study were recruited from a health care setting, and because fearful avoiders are prone to stay away from such settings, it is highly likely that the size of this group is substantially larger than 30%. This is a likelihood that must be addressed in follow-up studies. In addition, reversing what has become a stereotypical view of African Americans as being disinterested in preventive health practices, CRC screening in particular, could alter physicians’ assumptions about how to communicate effectively with the two thirds of this population that has a more positive orientation toward being screened. Taken together, these changes in understanding could be used to increase screening rates in all groups and could have a dramatic effect on the burden of colorectal cancer in the African American community.

This segmentation analysis also allowed for further elucidation of barriers to CRC screening and colonoscopy, showing that barriers were different for different clusters of patients, and that some barriers that are widely believed to pertain to African Americans as a group were not issues for many in the ready screeners and cautious screener groups. For example, studies have indicated that lack of trust in the health care system and health providers is a significant barrier for African Americans in pursuing preventive health care, such as CRC screening (Carcaise-Edinboro & Bradley, 2008; Greiner, Born, Nollen, & Ahluwalia, 2005; James et al., 2002; Katz et al., 2004). This cluster analysis clearly shows that more than 50% of the total sample, the ready screeners, were quite trustful of their doctors and highly regarded their advice on screening. Also, though both the ready screeners and fearful avoiders indicated that getting cancer was “God’s will,” it was only significantly associated with CRC screening in the fearful avoiders group, despite other studies indicating African Americans have fatalistic beliefs regarding whether screening is needed because the future is in “God’s hands” (Green & Kelly, 2004; Greiner et al., 2005).

The fact that the cautious screeners were the least likely to agree that getting cancer is God’s will, raises an interesting question about whether their religious beliefs differ significantly from those of the other two groups. If so, this could be valuable information in the development of intervention strategies for this group. Future studies must clarify this possibility. Overall, it is clear that assumptions about the pervasiveness of fatalism as a barrier to preventive care may inadvertently lead to lower investment in enrolling African Americans in screening programs.

Likewise, studies have indicated that African Americans do not get screened for CRC because it is “embarrassing” (Greiner et al., 2005; McAlearney et al., 2008). In our study this was only a significant barrier for fearful avoiders, again indicating that a majority of African Americans in this study did not find being embarrassed a significant barrier to CRC screening. Last, many studies have indicated that cost is a significant barrier in African American populations (Peterson et al., 2008; Taylor et al., 2003). This was seen

as a significant barrier in only the fearful avoiders group, likely a reflection of recent changes to Medicare/Medicaid reimbursement of colonoscopy. A major goal of this research was to demonstrate the value of having a well-defined typology of a target audience on the basis of their preventive orientation. The typology reported here is valuable in that it (a) verifies that important subgroups exist in populations that are assumed to be or that appear to be relatively homogeneous; (b) provides rich profiles of each type of individual, revealing useful comparisons and a better understanding of important differences that exist across types of individuals; (c) makes tailoring of communication strategies for each subtype feasible and potentially more accurate; (d) makes it possible to identify and better understand the most vulnerable types of individuals, allowing resources to be focused effectively; and (e) reduces potential stereotyping of all African Americans on the basis of findings specific only to a subgroup.

Although the clear distinctions among the three types of patients detailed in this study provide a solid theoretical argument for approaching these segments differently, the question of clinical application and/or clinical significance necessitates a way to identify patients by their screening orientation. An important next-step will be to develop instrumentation that can be quickly and easily administered in a clinical setting. Once administered, the typology scoring and/or characterization could become a valuable addition to the patient's record.

Last, the results of this research also raise important questions about the way in which we approach the task of increasing screening rates in vulnerable populations through community health campaigns and health education programs. If orientation toward preventive health care is a strong predictor of actual behavior, our strategies might shift from a focus on targeting screening for individual diseases to broader health campaigns designed to change beliefs, values, and perceptions of medical care, and preventive care in general. To do this would also require a commitment to removing the types of system barriers that may be at the root of many fearful avoiders' reluctance to embrace preventive health practices.

Limitations

This study used a convenience sample of 102 African Americans between the ages of 50 and 74 years for whom the usual source of care is a large, urban, hospital clinic who all had some form of insurance. As such, our results cannot be generalized beyond this study population. Given that interviewing was done in an available room within the clinic, it is possible that being in the clinic setting, while judging medical services and screening options, could potentially have biased patient responses toward a more positive orientation than had the study been done in a community setting. However, given that the clinic setting involved in this research is the patients' primary location for medical services, and that they are familiar with and accustomed to addressing health-related issues in this setting, it is unlikely that the setting biased their responses.

In testing the literacy level of each patient, we were aware that participants might be uncomfortable about being asked to read the words on the REALM-R literacy instrument. Following standard procedure, we stopped asking patients to read after a second word could not be read. It is possible, however, that difficulty with this task could have put some participants into a defensive or negative frame of mind that could have biased some of their

responses on the survey instrument. To minimize their discomfort if they did not know the words on the REALM-R, we framed the literacy testing by saying we understood that people have difficulty with medical language and that we were trying to understand which words were difficult.

Although there were no statistically significant differences in mean scores on the REALM-R across clusters, the inclusion of patients who were able to pronounce six or more words (i.e., could read at or above the sixth-grade level) potentially could have biased the results. However, the fact that these patients were distributed across all clusters suggests that literacy per se is not the underlying factor in preventive health behavior. In addition, given that these patients had only slightly better than a sixth-grade reading level as defined by the REALM-R, it is very likely that their inclusion had no significant effect on the final cluster results.

Conclusions

Overall, this project successfully defined a typology of limited literacy African American patients on the basis of their attitudes and preferences toward preventative health practices — rather than on their sociodemographic characteristics. The three resulting types of patients were then profiled on perceptions of barriers to CRC screening, and perceptions of colonoscopy as a specific method for colorectal cancer screening. Because patients in the sample have a stable usual source of care and insurance, they were likely to have had the opportunity to be screened. The relatively high rate of self-reported screening confirms this and lends further credence to our view that patient orientations, rather than system barriers, account for lack of screening.

Because the clustering variables in this study dealt with African American patients' general attitudes toward preventive health practices in general, this typology potentially could be applied to other health-related areas where screening is encouraged. Having such a tool would facilitate assessments in these areas of study while simultaneously enhancing cross-study comparisons. In addition, segmentation would allow for more uniquely targeted and tailored health messages. The development of a validated typology of patient orientations constructed to be applicable to a variety of health conditions would thus serve to standardize how selected populations are characterized, and would detail their health-related attitudes, values, concerns, preferences, and behaviors. Having such a typology, used with standardized assessment tools or as a basis for development of health messages, could dramatically enhance the ability of clinicians to communicate with their patients and would permit public health practitioners to better target and tailor materials for the public. In addition, a standardized typology could help guide the development of larger scale communication campaigns, allowing for tracking of perceptions by subtypes across time, across geographic regions, and across socioeconomic contexts. This would be invaluable for understanding changing perceptions regarding health-protecting behaviors such as CRC screening and allow for refinement of messages across a variety of sociodemographic groups.

In conclusion, this study strongly supports the argument that understanding the heterogeneity that exists within sociodemographic subgroups can provide a broader canvas

on which to paint more effective health messages. Also, it can provide health care clinicians and public health practitioners with valuable insights into the motivations and behaviors of at-risk populations.

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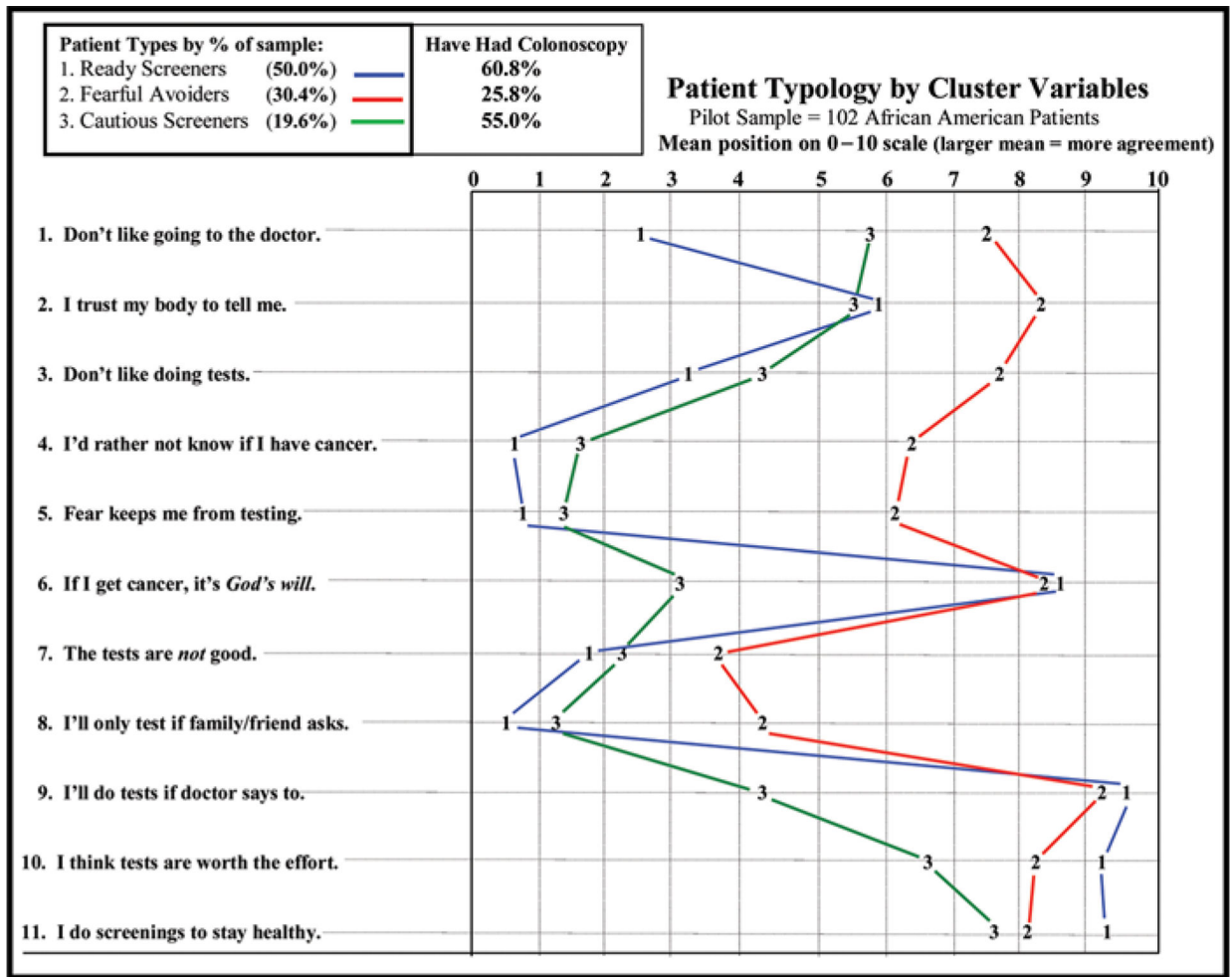


Figure 1.
 Mean scores for patient types, by cluster variables.

Table 1.

Survey items, by question theme

Theme 1: Overall screening and health attitudes/behaviors
1. Don't go to doctor unless needed
2. Trust body to tell if testing is needed
3. Don't get tested unless feel something is wrong
4. Rather not know about cancer
5. Fear of cancer keep from testing
6. Cancer is God's will
7. Screening tests not good at finding problems
8. Get colonoscopy only if family/friends recommended
9. Get colonoscopy if trusted doctor recommended
10. Feel uncomfortable and embarrassed
11. Colonoscopy is worth effort
12. Screening tests done as way of not getting sick
Theme 2: Perceived barriers to colonoscopy
1. Cost is prohibitive
2. No transportation
3. No time off
4. No child care
5. No adult care
6. Too much bother
7. Too unfamiliar
8. Embarrassing
9. Not the best method
10. Scared to know
11. Worry about sedation
12. Worry about pain
13. Worry about complications
14. Women more willing
15. Don't want rectum probed
16. Seems sexual
Theme 3: Perceived facilitators of colonoscopy
1. Most accurate
2. Finds problems early
3. Can remove growths
4. Not done often
5. Provides peace of mind
6. Recommended by doctors
7. If insurance covers, I'll do it
8. Being sedated is good

Table 2.

Personal health attitudes and behaviors, by patient cluster

Item	Cluster 1: Ready screeners			Cluster 2: Fearful avoiders			Cluster 3: Cautious screeners			
	n	M	SD	n	M	SD	n	M	SD	p *
I don't go to doctors	51	2.45	3.04	31	7.65	2.40	20	5.85	3.59	.000
I trust my body	51	5.94	3.36	31	8.23	1.82	20	5.65	3.69	.002
Don't like tests	51	3.22	3.38	31	7.81	2.20	20	4.30	3.21	.000
Rather not know	51	0.57	1.65	31	6.32	3.82	20	1.55	2.65	.000
Fear cancer	51	0.82	1.87	30	6.03	3.32	20	1.45	2.59	.000
God's will	51	8.61	3.18	31	8.39	3.03	20	3.15	3.47	.000
Tests are not good	51	1.78	1.98	31	3.74	2.73	20	2.25	2.25	.001
Only if family/friends recommend	51	0.45	1.67	31	4.29	3.95	20	1.20	1.77	.000
Only if doctor recommends	51	9.65	1.48	31	9.10	1.76	20	4.45	4.38	.000
Worth the effort	51	9.25	1.32	31	8.19	2.72	20	6.70	3.64	.000
I do screening	51	9.29	1.12	31	8.06	1.93	20	7.65	3.05	.001

Note. Scale base = 0–10; the larger the values, the more agreement with the statement.

* p value for analysis of variance test of mean differences across types of patients.

Table 3.

Perceived barriers to colorectal cancer screening, by patient cluster

Item	Cluster 1: Ready screeners			Cluster 2: Fearful avoiders			Cluster 3: Cautious screeners			p *
	n	M	SD	n	M	SD	n	M	SD	
Cost is prohibitive	50	1.24	2.81	29	3.21	4.03	20	1.20	1.99	.018
The cost of having a colon screening test keeps me from getting one.										
No transportation	51	2.08	3.22	31	1.61	2.35	20	1.50	2.50	.660
It would be hard getting someone to take me to and from the testing location.										
No time off	51	0.20	0.69	31	1.90	3.15	20	0.45	0.83	.000
It would be hard taking the time off from work to get screened.										
No child care	51	1.02	2.34	31	2.19	3.28	20	0.55	1.10	.045
It would be hard finding someone to care for my children.										
No adult care	51	0.76	2.00	31	2.26	3.38	20	0.90	1.55	0.24
It would be hard finding someone to care for adults I take care of.										
Too much bother	51	2.49	2.88	31	4.13	2.96	20	2.50	2.56	.032
For me, preparing for the test is too much bother.										
Too unfamiliar	51	2.24	3.47	31	4.39	3.73	20	1.70	3.20	.010
For me, the whole screening process is so unfamiliar, I don't want to do it.										
Embarrassing	51	1.78	3.10	30	4.53	3.63	20	2.15	3.12	.001
I would find the screening test to be too embarrassing.										
Not best method	51	1.31	1.58	31	3.55	3.48	20	2.10	2.38	.001
I don't think colonoscopy is the best method for detecting colon problems.										
Scared to know	51	1.98	2.71	31	5.81	3.66	20	1.65	3.00	.000
It scares me to think that I might find out I have cancer and this keeps me from having a colon screening.										
Worry about sedation	51	1.41	2.72	31	1.97	3.14	20	2.10	3.21	.577
I worry about getting medicine to make me sleepy to have the colonoscopy test.										
Worry about pain	51	2.69	3.64	31	6.35	3.56	20	3.60	3.65	.000
I'm concerned that the screening test might be painful.										
Worry about complications	51	3.04	3.27	31	4.94	2.86	20	2.90	3.08	.018
Although I know it is very rare, I am worried that I could have a serious complication.										
Women more willing	51	7.37	3.62	30	7.60	3.49	20	7.70	3.51	.927
In general, I think women are more willing than men to have a colonoscopy.										
Don't want rectum probe	51	2.12	3.51	31	5.48	4.13	20	2.50	3.55	.000
I wouldn't want to have a colonoscopy because they would be putting something in my rectum.										
Seems sexual	50	0.34	1.64	30	2.70	3.70	20	0.50	1.10	.000
Having a colonoscopy seems sexual.										

Note. Scale base = 0–10; the larger the values, the more agreement with the statement.

* p value for analysis of variance test of mean differences across types of patients.

Table 4.

Perceptions of colonoscopy, by patient cluster

Item	Cluster 1: Ready screeners			Cluster 2: Fearful avoiders			Cluster 3: Cautious screeners			p *
	n	M	SD	n	M	SD	n	M	SD	
Most accurate	49	9.41	1.58	28	8.29	1.84	20	9.05	1.64	.021
Finds problems easy	49	9.14	1.68	28	8.50	1.97	20	8.80	1.64	.301
Can remove growths	49	8.80	1.73	28	8.04	1.86	20	8.15	2.06	.164
Not done often	49	7.43	2.26	28	6.57	2.28	20	7.05	2.69	.311
Provides peace mind	49	9.51	1.39	28	9.23	1.52	20	9.00	2.18	.462
Recommended by doctors	49	9.43	1.47	28	8.93	1.55	20	8.80	1.85	.220
If insurance covers, I'll do it	49	8.86	1.86	28	8.83	1.93	20	9.30	1.22	.597
Being sedated is good	49	9.33	1.93	28	9.27	1.31	20	8.55	1.93	.237

Note. Scale base = 0–10; the larger the values, the more agreement with the statement.

* p value for analysis of variance test of mean differences across types of patients.