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Susan W. McRoy

Emily M. Cramer

Hayeon Song

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Assessing Technologies for Information-Seeking on Prostate Cancer Screening by Low-Income Men

Susan W. McRoy, PhD,[1] Emily M. Cramer, PhD,[2] Hayeon Song, PhD[3]

[1]*Department of Electrical Engineering and Computer Science, University of Wisconsin-Milwaukee, Milwaukee, WI*
[2]*Department of Communication, North Central College, Naperville, IL*
[3]*Department of Communication, University of Wisconsin-Milwaukee, Milwaukee, WI*

Abstract

Purpose: This paper presents a multipart investigation of the benefits and challenges in deploying automated question-answering as an alternative to web-based searching to provide information about prostate cancer screening for low-income men age 40 years and older.

Methods: The study comprised: 1) a survey assessing current use of the Internet, mobile phones and texting; 2) a controlled observational study of both web-based searching and automated question-answering for information about prostate cancer; and 3) a formative field study in which subjects interacted with a health department nurse using text messages.

Results: Survey results suggest the target population has greater access to, and familiarity with, cell phones and text messaging compared to the Internet and web-based searching. Participants were significantly more confident using a cell phone and preferred to get health information through text messaging. Participants in the controlled observational study accepted the text messaging system, with most indicating it answered their questions, was easy to use and was a favorable tool for information-seeking. The field study also demonstrated potential for automated question-answering and text messaging to help the target population access health information.

Conclusion: A two-way text messaging system has great potential to promote health communication and health information distribution. Participant interest in this system was high and did not seem to be specific to prostate cancer screening, suggesting that information about other topics, such as high blood pressure screening, could be provided similarly. We believe more investigations should be focused on this area, especially on benefits for the low-income community. (*J Patient-Centered Res Rev.* 2014;1:188-196.)

Correspondence: Susan W. McRoy, PhD, University of Wisconsin-Milwaukee, P.O. Box 784, Milwaukee, WI, 53201, Phone: 414-229-4677, Email: mcroy@uwm.edu

Keywords

Internet searching, question-answering systems, prostate cancer screening decisions, disparities

Introduction

Although the Internet is often used to provide health information to the general public, people's attentiveness to source quality has long been a concern[1] and access to the Internet is not prevalent across all demographic groups.[2] One way to augment health information distribution would be to provide public access to vetted health information using an automated question-answering service, deployed using text messaging. An automated text messaging service offers three primary benefits. First, an automated service (or even a partially automated one) reduces the potential time required to answer questions, thereby reducing the burden on a human information provider with an intelligent dialogue system. Second, use of an automated system makes it possible to ensure consistent quality of the information distributed. Third, text messaging, unlike the Internet, is available even on low-cost cell phones.

With regard to text messaging, there has been much interest in the use of the medium for health applications. However, except in a few experimental systems,[3,4] text messaging has been used only as a means of communication between provider and patient, or as a way of promoting healthy behaviors via reminders and tips.[5] Prior interventions using text messaging also appear to be aimed at younger adults; however, a recent Pew survey[6] supports the use of text messaging for older adults, especially African-Americans. Specifically, 58% of adult cell phone owners age 50-64 years reported using text messaging, and 76% of African-American adult cell phone owners reported text messaging.

To this end, we have been working with the City of Milwaukee Health Department (MHD) to develop content and computational strategies for automated question-answering provided via text messaging. This paper describes

a multipart study aimed at assessing the effectiveness and acceptability of current technologies in meeting the information needs of low-income older men. The work we report here reflects a series of interventions with low-income men at least 40 of age performed as part of a collaboration with MHD. While we did not exclude participants by race or income, low-income African-Americans are prevalent in the areas near MHD health centers and most of our participants fit this demographic.

The study was guided by the following research questions:

RQ1: Do low-income men age ≥ 40 years have access to the required technological infrastructure?

RQ2: Does this population feel comfortable using the technology to obtain answers to health-related questions?

RQ3: Is the system interface perceived as usable?

RQ4: Would questions posed via text messaging be ones that a health department would want to be answering?

These questions address the needs of both the seekers and providers of health information. For example, MHD staff will answer questions about cancer screening directly, but refer treatment recommendations to a physician. We were especially interested in the potential of using text messaging to answer questions, with web-based search used as a baseline for comparison. We designed a study combining a written survey, a controlled observational study (using standardized tasks and equipment), and a community-based field study (using participants' own phones and initiative). The results of this multipart study provide new information about the benefits and challenges of using automated, mobile technology to provide health information.

Methods

Survey

The goal of the survey was to identify the types of technology commonly used by members of the target population and the population's confidence in using the Internet and text messaging. After Institutional Review Board approval, a paper survey was disseminated by hand to men at three locations in underserved areas – a senior center offering a free prostate cancer screening test, an MHD health center, and a church hosting a weekly employment services group – during a 6-month time frame. Participants meeting eligibility criteria were men age 40 years or more who had a cell phone and who had been screened for prostate cancer or had questions about prostate cancer. Written consent was obtained before participants began the survey, and $20 compensation was provided afterward.

Controlled Observational Study

From the larger sample of men completing the initial survey, participants were recruited for the controlled observational study. The goal of the controlled observational study was to assess the acceptability and effectiveness of the question-answering text messaging system in comparison to a web-based search under standardized conditions. The experiment was based on a between-subject design with two conditions: web-based searching and cell phone-based question-answering. At the start of the experiment, subjects were consented, briefed and then separated physically according to their assigned condition. Consistent with a between-subject study design, participants were randomly assigned to either a web-based search or cell phone condition. In each condition, participants were seated at a table with a laptop computer. All participants used the same types of computers, cell phones, Internet and text messaging services provided to them by the research team.

In both conditions, participants were given up to 30 minutes to complete up to 11 tasks and then asked to complete a short posttest. The tasks were presented in a fixed order on the laptops, using a simple web-based application that we created for the experiment. The application allows users to navigate between tasks easily.

Each of the 11 tasks consisted of a scenario, described on the computer screen, representing a specific information need associated with prostate cancer. The topics were suggested by a published guide[7] and also some interests reported in the surveys. The tasks were ordered roughly by complexity, with the least complex occurring first.

In the web-based search condition, participants could select a tab to access a browser and select a search engine (either Google, Bing, Yahoo or DuckDuckGo). After users typed their query, the browser would display a list of results, such as a link to a National Cancer Institute webpage.[8] Participants in the web-based search condition were asked to read the scenario descriptions one at a time, find a web page with the answer, and then write down the answer on a sheet of paper for verification. All activities on the computer were recorded using screen-capture software. Time spent on each task and web page was measured; queries posted to search engines also were noted.

In the text messaging condition, participants were provided a cell phone in addition to the laptop computer. The phone featured a local low-cost prepaid cell phone service and "candy bar" QWERTY-keyboard (e.g. Pantech Caper), a

low-cost design that facilitates texting. Subjects in the text messaging system condition were asked to use the provided cell phone to interact with our experimental question-answering system via text messaging. After receiving a question, the system attempts to find a matching question in its knowledge base, then replies with the corresponding stored answer using one or more text messages. This system was adapted from an existing open architecture for building dialogue systems.[9,10]

Participants in the text messaging system condition were asked to read the scenarios, compose an appropriate question, send a text message with their question, and then write down the answer received on a sheet of paper. (Participants were asked to write down the automated system's responses to balance the time spent writing by subjects in the web-based search condition. However, the assessment of correctness was based on the question asked rather than the answer recorded since the answers were provided by the system.) The system logged both the contents of the participants' questions and the time that each question was asked.

The first column of Table 1 shows the specific wording for the first four scenarios. For each scenario, researchers developed a set of potential questions to express the information need along with correct answers, shown in the second and third columns of Table 1, respectively. When an answer required more than 139 characters, it was divided into multiple shorter messages to be sent sequentially (in Table 1, [T1] indicates the first text message and [T2] the second text message). Answers were limited to 139 characters to accommodate the limits of a local cell service provider. The complete list of scenarios, questions and answers was reviewed and, where indicated, revised by MHD medical staff. Scenario answers scored an average of 8.48 on the Flesch-Kincaid Grade Level readability test.[11]

The posttest measured six variables: 1) perceived answerability, 2) ease of information-seeking, 3) perceived usefulness, 4) system usability,[12] 5) physical difficulty, and 6) future decision. Table 2 provides more information about the measures to assess each variable and the reliability value for Cronbach's α.

Table 1. *Examples of scenarios, potential questions and answers used in the controlled observational study*

Scenario	Potential questions	Answer
1. Your uncle says he is going to have surgery to have his prostate removed. You have some idea about where the prostate is in the body, but not sure what it does. Find out what the prostate does.	What is a prostate? What does the prostate do? What is a prostate for?	[T1] The prostate is a walnut-sized gland, found only in men, located between the bladder and the rectum. [T2] The prostate gland makes fluid that carries sperm, and it helps to release sperm during sex.
2. The risk of prostate cancer is higher for men who are middle aged or older. But the chances of a man being diagnosed with prostate cancer are different depending on his race. Find out the chances of a man of your race being diagnosed with prostate cancer.	How likely am I to get prostate cancer if I am black? How many African-Americans get prostate cancer? How common is prostate cancer in African Americans? What percentage of African-American men get prostate cancer?	[T1] About 1 in 5 African-American men is diagnosed with prostate cancer. Your risk may be higher if your father or brother had prostate cancer.
3. If your grandpa had prostate cancer, does this mean you will get prostate cancer too? Please find out the answer and write down yes or no based on the information that you found.	Does it matter if my grandpa had prostate cancer? Will I get prostate cancer if a family member had it? What is my risk if a family member had prostate cancer?	[T1] Talk to your provider. Your chance of getting prostate cancer doubles if your father or brother had prostate cancer at an early age (before 65). [T2] Having a more distant or older relative with prostate cancer is not known to increase your risk.
4. You think about prostate cancer a lot, and want to know if there is anything you can do to prevent it. Please try to find out two ways that you can try to reduce your chances.	How can I reduce my risk of getting prostate cancer? What are two ways to prevent prostate cancer? What are some ways to prevent prostate cancer?	[T1] Experts do not know what causes prostate cancer or how to prevent it. Reduce your risk by being healthy. [T2] To improve your health, avoid smoking, eat a variety of healthy foods, stay physically active and see a health provider regularly.

[T1], first text message; [T2], second text message.

Table 2. *Methods for assessing variables in posttest*

Variable	Cronbach's α	Method
Perceived answerability	0.99	Participants rated their level of agreement with statements about the perceived answerability of the system (either the Internet or text messaging system). Statements included "The [Internet/text messaging system] provided helpful answers to my questions" and "The [Internet/text messaging system] answered my questions well."
Ease of information-seeking	0.96	Participants rated their level of agreement with statements such as "It was easy to find information" and "It was hard to use the [text messaging system/find information on the Internet]."
Perceived usefulness	0.9	Participants rated their answers to four questions, including "I found the [text messaging system/Internet] to be useful to get health information."
System usability	0.75	Participants answered questions from the System Usability Scale.[12]
Physical difficulty	0.65	Participants answered two questions rating whether they had encountered any physical problems (i.e. "I had trouble seeing the screen" and "I had trouble using the keypad") when using the Internet or text messaging system.
Future decision	0.73	Participants rated their level of confidence to five questions, including "I would recommend (this system) to my friends and family."

Note: All variables were measured with a five-point Likert-type scale (in which 1 = strongly disagree and 5 = strongly agree).

Community-Based Field Study

The goal of the community-based study was to investigate the acceptability of text message-based question-answering and the nature of the questions that might be asked. Unlike the controlled study, subjects would use their own phones and ask questions based on their own initiative. We did not attempt to evaluate automated question-answering at this time because our patient-centered design process involves first determining the range of questions that people might ask, as it has been found that self-reports about anticipated health questions alone can be poor predictors of actual questions.[4]

The technology setup involved participants sending and receiving text messages with their cell phones to interact with an email account monitored by the MHD Men's Health Center program nurse. Both automated outgoing messages and the nurse's answers to participants' questions appeared as text messages sent from this address. The nurse agreed to check email at least once a day, possibly more frequently pending availability.

Participants were recruited at a booth at the 2012 Milwaukee Fatherhood Summit (a community event for fathers) as well as through fliers distributed within the community with the help of members of the MHD Men's Health Referral Network (a group of community program representatives dedicated to improving the health of men in Milwaukee.) After recruitment, subjects were consented and briefed over the telephone by a member of the research team. If subjects indicated their cell phone plan did not include unlimited text messaging, they were offered reimbursement for the cost of text messages.

Each participant received 12 multipart text messages on a fixed schedule: 3 times daily over a 4-day period. The messages were developed by our research team and revised by MHD staff. The messages cover each of the discussion points on prostate cancer screening developed by the American College of Physicians and the American Cancer Society (see Online Appendix 1 for exact content).[13] Over the following two weeks, the participants also received a few generic messages encouraging them to ask any health-related questions, but were otherwise left to ask their own questions. At the end of the study, the research assistant conducted a phone interview and mailed out a copy of the posttest used previously.

Statistical Analysis

For the reliability test of each dependent variable, we used Cronbach's α, which is commonly used to test internal consistency of variables. To compare means between the two groups in the controlled observational study (text messaging system and web-based search), an independent *t*-test

analysis was conducted using the SPSS statistical program (SPSS Inc., Chicago, IL). The equal variance assumption was checked with Levene's test. When equal variance of a variable calculated for two groups could not be assumed, generalized test results were reported instead. Each *t*-test was reported with the degree of freedom, *t*-value and P-value (significance of test result) as well as the mean (M) and standard deviation (SD) of the two groups. Subsequently, the effect size using Cohen's *d* also was reported to demonstrate the impact of intervention.

Results

Survey Results

A total of 90 low-income adult men completed the written survey gauging health information-seeking behavior and use of technology. The average age of survey participants was 52.5 years (SD: 8.91), the predominant ethnicity was African-American (83.5%), and 77.4% of participants were in the lowest annual income levels ($25,000 or less). Most participants reported using a cell phone (86.8%) and using it daily (71.4%), but only 22% reported having a smartphone. Many (62.8%) reported using text messaging. A smaller number (56.6%) reported using the Internet, and only 35.2% reported having Internet access at home.

Survey results showed technology efficacy and preferences for obtaining health information differed between the Internet and cell phone. Whereas 86.9% of participants agreed or strongly agreed that they were confident in using a cell phone, 57.3% felt confident using the Internet. Additionally, a statistically significant difference was detected between Internet efficacy (M: 3.50, SD: 1.35) and cell phone efficacy (M: 4.28, SD: 0.89); $t(77)=5.65$, $P<0.001$. Preference for cell phone use persisted when participants were asked if they would be interested in receiving health information through the Internet or text messaging. More participants were interested in getting health information via text message (M: 3.32; SD: 1.30) compared to the Internet (M: 2.73; SD: 0.96), and the difference was significant [$t(84)=6.14$, $P<0.001$].

Controlled Observational Study Results

In total, 20 men participated in the controlled observational study. Nine participated in the web-based search condition and 14 in the text messaging condition (11 participated in the text messaging system condition only and three who had participated in the web-based search condition on the first day returned to participate in the text messaging system condition a few weeks later as there were cell phone signal problems on the first day).

In the web-based search condition (Table 3), 54 tasks out of 99 were attempted (54.5%). All participants attempted the first two tasks; the range of attempts steadily decreased from one scenario to the next, with only one task attempt for the last scenario reported. On average, less than five tasks were attempted per scenario (M: 4.90). Among tasks attempted, 36 out of 54 were answered successfully by participants (66.7%). On examination, we found that 31 of 54 (57.4%) of the selected web pages were "high quality." (A page was considered high quality if it was part of either an academic, government or URAC-accredited website.[14] Overall, participants selected 10 distinct high-quality sites and 14 distinct other sites.) The average amount of time per task attempted for the first four tasks ranged from 3.796 to 7.706 minutes (M: 5.235). The amount of time taken per successfully completed task ranged from 3.558 to 7.407 minutes (M: 5.147). When we examined the readability of the websites visited, we found they scored an average of 10.82 on the Flesch-Kincaid Grade Level readability test.[11]

Table 3. *Results of tasks in the web-based search condition*

Task ID	Minimum time (sec)	Maximum time (sec)	Mean time/task attempted (min)	No. of participants with correct answer*
1	125	710	5.528	8/9
2	140	842	7.706	7/9
3	110	482	3.921	5/8
4	80	354	3.786	4/7
5	88	280	3.007	4/5
6	58	185	1.896	2/4
7	105	170	2.246	2/4
8	121	220	2.828	2/3
9	50	100	1.25	1/2
10	10	358	3.067	0/2
11	130	130	2.167	1/1

**This column heading indicates the number of participants who provided the correct answers divided by the number of people who attempted the task.*

Table 4 shows the results for the text messaging system condition. Among the total of 154 tasks possible (11 tasks for each of the 14 participants), 12 tasks were dropped due to cell phone signal problems, resulting in 142 tasks. A total of 68 tasks out of 142 were attempted by at least one of the participants (47.9%). All participants attempted the first two tasks. None of the participants reached tasks 9, 10 or 11. Among tasks attempted, 49 of 68 tasks ended up with a search string matching a correct response from the messaging system, thus yielding a successful answer (72.1%). The average amount of time per task attempted for the first four tasks ranged from 3.862 to 5.414 minutes (M: 4.795). The amount of time taken per successfully completed task ranged from 3.492 to 4.255 minutes (M: 3.912).

Posttests indicated that participants had a fairly favorable experience with the text messaging system. Most participants (85.7%) agreed or strongly agreed that the text messaging system answered their questions well. Similarly, 62.5% of participants agreed or strongly agreed that it was easy to find information. The average System Usability Score was 85, indicating a "B" on grade scale and "excellent" on adjective scale. Moreover, 88.9% reported they would be interested in using the system in the future if they needed more information about prostate cancer, and 78.6% strongly disagreed or disagreed that they had trouble seeing the screen or keypad of the cell phone.

Next, *t*-tests were conducted to determine if asking for health information via the text messaging system could provide more benefits to the target population compared to a web-based search. Subjects in both conditions reported high scores of perceived answerability, perceived easiness, perceived usefulness, usability, and likelihood of future use. The difference was minimal and statistically insignificant for perceived answerability between the web-based search (M: 4.21, SD: 1.42) and the text messaging system conditions (M: 4.24, SD: 0.71); $t(17)=0.07$. Similar results were found for perceived usefulness [M: 3.94 and SD: 1.32 for web-based search, and M: 4.14 and SD: 0.73 for text messaging system; $t(15)=0.23$] and ease of information-seeking [M: 3.97 and SD: 1.39 for web-based search, and M: 4.08 and SD: 0.48 for text messaging system; $t(15)=0.23$]. Cohen's effect size value suggested low practical significance for these dependent variables ($d=0.11$ for perceived easiness, $d=0.19$ for perceived usefulness).

On the other hand, individuals in the text messaging system condition (M: 4.06, SD: 0.57) gave a slightly higher score on system usability compared to participants in the web-based search condition (M: 4.37, SD: 0.37), although the difference was not statistically significant [$t(14)=1.21$]. However, Cohen's effect size value ($d=0.61$) suggested medium practical significance. In addition, screen or keyboard visibility (i.e. physical difficulty) was tested. Regardless of the condition, participants reported a minimal level of difficulty with viewing the screen or keyboard, and no significant difference was found between cell phone (M: 1.91, SD: 0.89) and computer (M: 1.56, SD: 1.91); $t(18)=0.87$.

Community-Based Field Study Results

A total of 10 subjects participated in the field study. Over the 2-week study duration, the subjects were sent 12 multipart messages (22 total) and, afterward, asked a total of 37 questions. Participants also sent a few other types of responses, which were not counted. (One subject sent 12 questions per week, one sent approximately three questions per week, and two sent approximately two questions per week.) Three participants did not ask questions but acknowledged texts sent by the system, usually with a

Table 4. *Results of tasks in the cell phone condition*

Task ID	Minimum time (sec)	Maximum time (sec)	Mean time/task attempted (min)	No. of participants with correct answer*
1	47	561	3.862	10/14
2	92	965	5.349	8/14
3	162	949	5.414	9/13
4	82	542	4.554	11/12
5	62	320	3.55	6/7
6	228	546	5.1	3/5
7	197	197	3.283	0/1
8	101	193	2.45	2/2
9	--	--	--	--
10	--	--	--	--
11	--	--	--	--

**This column heading indicates the number of participants who provided the correct answers divided by the number of people who attempted the task. No participants attempted tasks 9, 10 and 11.*

quick reply such as "OK" or "thanks" but sometimes with a longer comment. All but one participant had a cell phone service plan that included unlimited text messages.

All questions from the participants were factual in nature and distinct. With regard to the range of topics, 32 of the 37 questions (86.5%) following the outgoing prostate-related messages also were prostate-related (e.g. questions about prostate function, cancer prevention, screening or treatment). Other topics were raised, each health-related and factual in nature, but generally complex. For example, the nurse was asked about: the time needed to benefit from smoking cessation, the role of drinking water in weight loss, how often one can donate blood, and the values corresponding to a healthy blood pressure.

The average score of perceived answerability of the system (questions sent from user's own phone to a nurse via standard text messaging) was 4.61 (SD: 0.33), with 5 being the highest possible score. Participants also reported the system to be easy to use for information-seeking (M: 3.89; SD: 0.47). Assessments of the usability of the system were somewhat favorable (M: 3.26; SD: 0.52) and interest in future use was very high (M: 4.58; SD: 0.36), suggesting great potential for a cell phone-based system to be used as a health information distributor.

Furthermore, findings suggest a text messaging intervention could facilitate health communication. A majority of participants (75%) agreed or strongly agreed they had "come up with more questions to discuss with [their] doctor or other health providers" since joining the intervention, and 100% agreed or strongly agreed they "felt more prepared to see [their] doctor or other health providers." The intervention also helped promote active learning; half of the participants reported searching for more health information and 75% reported paying more attention to health information since the intervention.

Discussion

The purpose of this multipart study was to observe the information-seeking behaviors of men at risk for prostate cancer, especially among low-income African-American men. Obtaining information through text messaging, the researchers conjectured, could offer the target population a low-cost and convenient means to obtain information deemed usable and appealing.

Overall, the results of the written survey suggest low-income African-American men tend to have greater access to, and familiarity with, cell phones compared to the Internet. Most participants had a cell phone, and more than half reported using text messaging with some regularity. By contrast, only 35% of participants reported having Internet access at home, and more than half had rarely or never used the Internet. Participants also indicated they were significantly more confident using a cell phone than using the Internet and that they would prefer to get health information through text messaging rather than over the Internet.

Results of the controlled observational study demonstrate the text messaging question-answering system was accepted by participants, with most indicating the system answered their questions, was easy to use, and was a favorable tool for information-seeking. Many participants also reported they would consider using the text messaging system in the future if they had concerns about prostate cancer. Participants in both conditions completed approximately half the tasks and retrieved successful answers about 70% of the time. While simple questions were more efficiently answered by the text messaging system, questions with high complexity in the hypothetical scenarios seem to be better served by a web-based search.

Posttest results demonstrated a web-based search was not significantly different from the text messaging system in terms of perceived answerability, usefulness and usability. Although the data failed to indicate any statistically significant differences in subjective measures in the controlled observational study, we feel the potential of text message-based interventions should not be underestimated for several reasons. First, the study inevitably possesses a small sample size because the target population is characterized as hard-to-reach. As hypothesis testing is sensitive to sample size, readers should consider the possibility of Type II error. In fact, the effect-size test, which is less sensitive to sample size, suggested with a moderate effect size that the text messaging system was perceived to have better usability compared to a web-based search. Second, participants in the controlled study were not allowed to use their own phones; rather, cell phones were provided by the researchers in a standard manner. It is possible participants experienced more difficulties using unfamiliar phones compared to unfamiliar computers. In the community-based study, where participants could use their own phone, participants reported better user experiences and higher satisfaction. Third, our automated text messaging system is still in the improvement process based on the user-experience data collected from this study. We hope that further improvements of the system would help provide better answerability and usability.

The community-based study supports our belief that two-way text messaging for answering questions related to health would be beneficial for many and did not reveal any information requests that would be inappropriate for a health department. As we noted, all questions were factual in nature. Also, cost of text messaging did not seem to be a factor. Nearly all study participants had cell phone service that included unlimited messaging; we compensated the one participant who did not.

The limitations of the study must be acknowledged. Due to problems with cell phone latency during the controlled observational study, individuals in the text messaging system condition were not able to complete as many tasks (although in both cases the median number of tasks completed was the same: 5). Also, texted questions that did not match the pilot system's limited grammar, but were otherwise reasonable, resulted in a lower percentage of correct answers for many questions compared to the web-based search condition, although the overall rates were similar. For more complex tasks, it also sometimes took longer for subjects to think of an appropriate question than to issue a general web-based query and conduct a search, making the web a more effective resource for them.

In many cases, the differences between the values of subjective measures in the two conditions were insignificant. The small sample size of the controlled observational study may have suppressed the effect size of some results. For example, participants in the text messaging system condition rated the system usability higher than participants in the web-based search condition, but usability scores were not significantly different between the two conditions. However, Cohen's effect size value for usability suggested medium practical significance. This finding leads the researchers to conclude that a larger sample size may produce results of greater significance.

The size of the community-based study was small; further investigations are needed with a larger sample. It is possible that some participants might have felt self-conscious knowing they were corresponding with a person. An automated system, especially one that could offer a list of suggested questions, might help.

Despite the limitations, this study, in conjunction with earlier experiments,[3,4] supports future research examining on a greater scale the use of text messaging to augment services in low-income areas for a diverse set of health conditions across a broad range of ages. We recruited participants at venues typical of local public health outreach initiatives and received much interest in participating in our studies. Moreover, participant interest did not seem to be specific to prostate cancer screening, suggesting that information about other public health topics, such as high blood pressure screening, could be provided effectively in a similar manner.

Conclusions

This paper discusses a series of experiments designed to assess whether text messaging-based question-answering would be likely to achieve the promise of being able to provide low-cost access to factual health information to a broad audience. The overall study combines a variety of methods in both structured and unstructured community settings. Our findings suggest that a two-way text messaging system has great potential to promote health communication and health information distribution. We believe more investigations should be focused on this area to provide a more tailored system that will further benefit the low-income community.

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Conflicts of Interest

None.

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