

***Utilizing Technology to Promote Cancer Prevention***

**08/05/2019**

**NCT03810053**

Title: Utilizing Technology to Promote Cancer Prevention  
PI: Mayumi Nakagawa, MD, PhD  
Site: University of Arkansas for Medical Sciences

**Study Title:** *Utilizing Technology to Promote Cancer Prevention*

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## **Background and Rationale**

The cancer incidences are similar between Arkansas and the United States (US) population, but cancer-associated mortality in Arkansas is considerably higher in comparison to the US averages. This poses a huge burden on the public health as well as the healthcare system. In comparison to the US population, Arkansans are 14% more likely to die from cancer. With regards to cervical cancer, Arkansans are 30% more likely to be diagnosed, and 48% more likely to face cervical cancer-associated mortality. For lung cancer, there are 24% more diagnoses and 35% more mortality; 6% and 21% more for colorectal cancer; and 10% LESS and 4% more for breast cancer, respectively (Arkansas Cancer Facts & Figures 2017). While there are many reasons that can explain cancer health disparity between Arkansas and the US population, some obvious reasons are underutilization of recommended cancer prevention and early detection measures mentioned above and a relatively higher tobacco smoking rate. We will be targeting cervical, breast, colorectal and lung cancers with a focus on reducing cancer incidence and mortality rates amongst Arkansas residents and thereby mitigating cancer disparities in Arkansas.

## **Specific Aims/Objectives**

The goal of the program is to develop a health application for cell phones or an online module which will be disseminated among Arkansans to encourage them to take actions to reduce their chance of developing cancer. This is a pilot study to test the mobile app/online module with a small group of volunteers residing in Arkansas who are registered in ARResearch. They will also be asked to provide feedback. The application or the didactic module would encourage and assist age- and gender-eligible participants to follow a healthier lifestyle and adopt cancer preventative and early detection measures. Eventually, in the future, the project will be open to all Arkansas residents with a long-term focus on reducing cancer incidence and mortality rates amongst Arkansas residents and thereby mitigating cancer disparities in Arkansas.

## **Study Design and Procedures**

The application or the online module will play a short didactic explainer video that will provide information about cancers and benefits of uptake of cancer prevention and early detection measures. It is currently unknown which method will be used, the online module or the application for the purpose. However, all the study participants will be subjected to only one method (once the method have been finalized and created). The video content will engulf information about cervical, breast, colorectal and lung cancer prevention and early detection. After the video, the application or the module will capture information on gender, age, smoking status, body mass index and positive cancer history in family. Watching the video and answering the questions will take approximately 5 minutes. The study participants will download the application on their

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personal cell phones and the data collected will be linked to identifying information in case they choose to receive the compensation and opt for the 6-month follow-up. Based on the responses provided, and the age and the gender, the participants will be provided with a list of cancer prevention and early detection measure(s). In addition to providing their feedback online, they will have an option to call (501-526-5891) or e-mail (CancerPrevention.uams.edu) to provide additional input.

A subset of the study participants from ARResearch (only those who have agreed for the 6-month follow-up) will be asked if they are willing to be contacted by the study staff after  $6 \pm 1$  months (from the date of enrollment in the study) to enquire if they received/adopted the screening measures(s) that were suggested based on their age, gender and family history. They will be asked whether it is OK to call and/or e-mail them for more information to better describe barriers to obtaining cancer prevention and screening measures. Mailing address, e-mail address, and phone number will be requested for the purpose of processing payment.

The participants will be provided with a compensation in the form of gift card(s) for their initial participation in the amount of \$40. They may also be eligible for 6-month follow-up which will provide an additional \$40 gift card in compensation. Name, mailing address, e-mail address, and phone numbers will be collected to process the compensation, which will be mailed. Downloading the application or clicking on the link directing to the online module will serve an informed consent process and also as a permission to contact them in the future for processing payments electronically and follow-up for the respective and eligible participants. The online cancer prevention module (Appendix 1), feedback questions (Appendix 2), and 6-month follow-up questions (Appendix 3) are listed in the appendix section.

## **Study Population**

We will obtain names, contact information, and preferred method of being contacted from ARResearch. As volunteers with any research interests can benefit from cancer prevention and early detection recommendations, all ARResearch volunteers would be eligible. As per TRI, they are all  $\geq 18$  years old. They will receive communication soliciting participating via e-mail or letter depending on the preference provided to ARResearch. For those who chose to be contacted by phone, the initial contact will be made by phone. A study staff will ask for an e-mail address or mailing address for the purposes of sending the solicitation. Up to 300 people can participate in this study.

### Inclusion Criteria

- Any ARResearch volunteer.
- 18 years or older in age.
- Have access to a personal cell phone and/or computer

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### Exclusion Criteria

- Unable to give an informed consent.

### **Risks and Benefits**

All participants will have the right to withdraw their consent and reject their voluntary participation at any time during the study without any penalty. The health application or the online module will be collecting names, e-mails and contact information to process compensations with the permissions of the participants. All the participants will be assigned and referred by a participant ID and all identifying information will remain confidential will only limited access to the study staff and it will not be disclosed or published anywhere. While only study staff will have access to the identifying information, a possibility of breach cannot be ruled out.

There are no anticipated risks for the participants but it can potentially prove beneficial to the study participants since it will encourage the adoption of a healthier lifestyle and/or uptake of cancer prevention and early detection screening measures. The video will provide the participants with knowledge about the importance of cancer prevention and early detection measure(s) and the questions will provide with a to-do action list for relevant cancer prevention and early detection measure(s).

### **Data Handling and Recordkeeping**

Data will be stored on a password-secured UAMS server with only authorized personnel having limited access to the information. All data will be in the form of electronic files while any hard copies of source documents will be store in double-locked cabinets on UAMS campus. All data will be retained, and ultimately destroyed as per the UAMS policy. All the participants will be assigned and referred by a participant ID and all identifying information will remain confidential will only limited access to the study staff and it will not be disclosed or published anywhere. While only study staff will have access to the identifying information, a possibility of breach cannot be ruled out.

### **Data Analysis**

Basic descriptive statistics will be used to summarize the data. The effectiveness of the online module will be assessed by asking whether the participants learned anything new, and whether they've identified interventions they have not yet adopted. If HPV vaccination, mammography, Pap smear, low-dose compute tomography (LDCT) and/or colorectal cancer screening was(were) identified as measure(s) the individual has not yet adapted, a 6-month follow-up questionnaire will be forwarded to assess progress if the participant agreed to participate in the 6-month follow-up survey.

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## **Future directions**

We intend to take this initiative further to increase cancer awareness and reduce cancer health disparity by seeking extramural funding in the future to develop similar applications or similar online modules which will be open for all Arkansas residents. Applications or modules will be submitted to organizations that support development of newer programs for promoting cancer prevention and early detection such as the National Cancer Institute (R01 and/or R21), American Cancer Society, and American Association for Cancer Research. In particular, investigators plan to prepare an application responding to PAR-18-639: Innovative Approaches to Studying Cancer Communication in the New Media Environment (R21- Clinical Trial Optional) or to PAR-18-638: Innovative Approaches to Studying Cancer Communication in the New Media Environment (R01 Clinical Trial Optional).

## **Ethical Considerations**

This study will be conducted in accordance with all applicable government regulations and UAMS research policies and procedures. This protocol and any amendments will be submitted and approved by the UAMS Institutional Review Board (IRB) to conduct the study. A waiver of documentation of consent is requested since there will be no in-person contact between the respondents and the study staff. Voluntarily downloading the application or accessing the online module will serve as the informed consent process.

## **Dissemination of Data**

Results of this study may be used for presentations, posters, or publications. The publications will not contain any identifiable information that could be linked to any participants.

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**References:**

1. Arkansas Cancer Facts and Figures 2017. Arkansas Department of Health.

## **Appendix 1: Online Cancer Prevention Module**

### **Animation Video Script**

*No one* wants cancer.... so, what is it exactly and how can you prevent it?

Cancer is abnormal, uncontrolled cell growth that can start in different areas of the body.

The growth is caused by changes in your genes that are inherited or from chemicals and viruses.

Once it starts, cancer can spread and grow in other parts of the body... causing pain, loss of normal function, or even death.

Only certain kinds of cancer can be prevented, and everyone's chances of getting it are different.

But there are things you can do *right* now, before cancer becomes a problem.

Screenings like a **mammography**, **pap smear**, or a **colorectal cancer screening** can help doctors find signs of cancer early.

Getting an HPV vaccination helps your body produce a substance that stops HPV if you're ever exposed.

Losing weight and quitting smoking can help too.

To find out what *you* can do to lower your risk, answer the following questions.

### **Questions**

1. What is your sex?
  - a. Male
  - b. Female
  - c. Neither
  
2. What is your age (enter a whole number)?
  
3. Have you ever smoked?
  - a. Yes (Go to question 4)
  - b. No (Go to question 8)

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4. Do you currently smoke?

- a. Yes (Go to question 6)
- b. No (Go to question 5)

5. When did you quit smoking?

- a. Less than or about 15 years ago
- b. More than 15 years ago

6. How many packs per day do you smoke or did you smoke?

0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,  $\geq 20$

7. How many years have you or did you smoke?

<1, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49,  $\geq 50$

8. What is your weight, in pounds?

9. What is your height, in feet and inches?

10. (Women only) Has your mother, any of your sisters, or any of your daughters had breast cancer?

- a. Yes
- b. No

11. Has anyone in your family ever had colon or rectal cancer?

- a. Yes
- b. No

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[List of action items for cancer prevention and early detection will appear here possibly including...]

- These actions are recommended for you:
- HPV vaccination (need 2 to 3 doses)
- Mammography every 2 years
- Pap smear every 3 or 5 years (if with HPV testing)
- Colorectal cancer screening (every 1 to 10 years depending on method)
- Low-dose computed tomography (LDCT), every year
- Stop smoking
- Lose weight

12. Did this list help you learn about any actions you did not know about?

- a. Yes (If yes, which one: HPV vaccination, mammography, Pap smear, colorectal cancer screening, low-dose computed tomography (LDCT), stop smoking, lose weight)
- b. No

13. Did this list help you learn about any actions you have not taken yet?

- a. Yes (If yes, which one: HPV vaccination, mammography, Pap smear, colorectal cancer screening, low-dose computed tomography (LDCT), stop smoking, lose weight)
- b. No

14. [If Yes for question 13 and showed willingness to receive HPV vaccination, mammography, Pap smear, colorectal cancer screening or low-dose computed tomography] Can we contact you in about 6 months to see whether you were able to take action (s)? If we are able to re-contact you, you'll receive \$40 worth of gift card(s) as a compensation for participating in the 6-month follow-up survey.

- a. Yes
- b. No

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Thank you for answering the survey. Since you have completed the survey and if you are willing to provide feedback, you will be eligible for \$40 worth of gift card(s). Please provide more information below if you wish to proceed:

15. Contact information

1. Name: Free text
2. E-mail address: Free text
3. Phone number: Free text

16. Race

- (a) American Indian or Alaska Native
- (b) Asian
- (c) Native Hawaiian or Other Pacific Islander
- (d) Black or African American
- (e) White
- (f) More than one race
- (g) Don't know

17. Ethnicity

- (a) Non-Hispanic or Latino
- (b) Hispanic or Latino
- (c) Don't know

18. How confident are you filling out medical forms by yourself?

- (a) Not at all
- (b) A little bit
- (c) Somewhat
- (d) Quite a bit
- (e) Extremely

## Appendix 2: Feedback Questions

1. I liked the animation video.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
  
2. The animation video was entertaining.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
  
3. I learned something new from the animation video.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
  
4. After watching the video, I felt encouraged to take actions towards reducing my chances of suffering from cancer.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree

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5. After watching the video, I felt encouraged to tell others about cancer prevention and early detection.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
6. The questions following the video were easy to answer.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
7. I found the list of recommendations to prevent cancer helpful for me personally.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree
8. I would recommend this cancer prevention module to my friends and family through social media.
  - a. Strongly agree
  - b. Agree
  - c. Neutral
  - d. Disagree
  - e. Strongly disagree

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9. Which social media would you use (choose all that apply).

- a. Facebook
- b. Twitter
- c. Instagram
- d. Snap Chat
- e. Other
  - i. Specify [free text]

10. Do you work and/or study in a healthcare field?

- a. Yes
- b. No

11. What is your highest level of education?

- a. Less than high school
- b. Finished high school/GED
- c. Less than college
- d. Finished college
- e. More than college

12. Which would be the most desirable compensation/prize for doing the online cancer prevention module when the module is widely disseminated to the general public?

Please note as a participant in this pilot study through ARResearch, you will receive a \$40 gift card for doing the module and providing a feedback.

- a. A chance to win a \$500 gift card
- b. A chance to win an iPad
- c. A chance to win 2 Razorbacks football tickets
- d. Other
  - i. Specify [free text]

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13. Which would be the most desirable compensation/prize for the 6-month follow-up when the module is widely disseminated to the general public? (as a participant from ARResearch you will be eligible to receive a \$40 gift card if you decide to sign up).

- a. \$10 gift card for each participant
- b. A chance to win \$500 gift card
- c. A chance to win an iPad
- d. A chance to win 2 Razorbacks football tickets
- e. Other
  - i. Specify [free text]

14. If you have any additional suggestions to improve this program, please write here [free text].

You can also send an e-mail to [CancerPrevention@uams.edu](mailto:CancerPrevention@uams.edu) or call 501-526-5891 to provide feedback.

15. Contact information for processing payment

- a. Name: Free text
- b. Address: Free text
- c. E-mail address: Free text
- d. Phone number: Free text

### **Appendix 3: 6-month follow-up questions**

Only question(s) about cancer prevention measure(s) found not to be up to date in the original survey would be asked.

#### **1. HPV vaccination**

a. Were you able to receive at least one dose of HPV vaccination?

i. Yes

1. If yes, where did you get it?

a. Doctor's office

b. Arkansas Department of Health

c. Pharmacy

d. Other [specify]

ii. No

1. If no, did you make any attempt?

a. Yes

i. What happened? [free text]

b. No

#### **2. Mammography**

a. Were you able to get a mammography?

i. Yes

1. If yes, where did you get it?

a. Doctor's office

b. Mammovan

c. Other [specify]

ii. No

1. If no, did you make any attempt?

a. Yes

i. What happened? [free text]

b. No

### **3. Pap smear**

- a. Were you able to get a Pap smear?
  - i. Yes
    1. If yes, where did you get it?
      - a. Doctor's office
      - b. Arkansas Department of Health
      - c. Mammovan
      - d. Other [specify]
    - ii. No
      1. If no, did you make any attempt?
        - a. Yes
          - i. What happened? [free text]
        - b. No

### **4. Colorectal cancer screening**

- a. Were you able to get any of the colorectal cancer screening tests?
  - i. Yes
    1. If yes, which test did you get?
      - a. Colonoscopy
      - b. Colonography/Sigmoidoscopy
      - c. FIT test
      - d. Other [specify]
    2. If yes, where did you get it?
      - a. Doctor's office
      - b. Gastroenterology center
      - c. Hospital
      - d. Other [specify]

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ii. No

1. If no, did you make any attempt?

a. Yes

i. What happened? [free text]

b. No

**5. Lung cancer screening (Low-dose computed tomography)**

a. Were you able to get a low-dose computed tomography?

i. Yes

1. If yes, where did you get it?

a. Hospital/Healthcare institution

b. Other [specify]

ii. No

1. If no, did you make any attempt?

a. Yes

i. What happened? [free text]

b. No

6. Is it OK to call and/or e-mail you for more information?

a. Yes (fill out contact information below)

b. No

7. Please provide current contact information for processing your payment

a. Name: Free text

b. Address: Free text

c. E-mail address: Free text

d. Phone number: Free text