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# Women's Cancer Screening Decision Aid

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for Arabic-Speaking Women



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CERTIFICATE OF APPROVAL

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This is to certify that the Master's Capstone Project of

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*“Women's Cancer Screening Decision Aid  
for Arabic-Speaking Women”*

Has been approved

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Karen Eden, Ph.D.

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## Acknowledgements

I would like to express my sincere thanks to my mentor Professor Dr. Karen Eden. You have been an incredible mentor for me. Your door has always been open whenever I looked-for guidance in this project and many other topics.

I would also like to thank Professor Dr. Bill Hersh, the department chair and Dr. Vishnu Mohan, the program director of the clinical informatics fellowship program for their extraordinary support and mentorship throughout my clinical informatics endeavor.

I would specially thank Ms. Andrea Ilg, Ms. Diane Doctor, Ms. Lynne Schwabe, Ms. Lauren Ludwig, Ms. Monica Garlough, and my other colleagues for their outstanding support.

A special thanks to my parents for the magnificent help, words cannot express how grateful I am. I would also like to thank my beloved wife, Hanadi, for supporting me through life, school, and work. To my adorable son, Suliman, thank you for cheering me up every day.

## Abstract

### Introduction

Women's cancer preventive care programs face several challenges around the world. In addition to the socio-economic challenges, non-English speaking women sometimes lack access to educational materials that could guide their prevention decision-making process. This project presents a prototype decision tool and discusses the feasibility and presumed benefits from implementing a cancer screening decision aid for Arabic-speaking women. The project also provides a possible evaluation of the tool.

### Background

Arabic is the 5th most spoken language around the world, and several Arabic countries are becoming the primary source of immigrants around the world. Many organizations started initiatives to improve the well-being of different ethnicities. There have been a few Arabic specific initiatives in the United States, Europe, and Australia. Although the gender digital divide is present globally, technology, specifically mobile phones use is drastically increasing in use by women. Such technology could be leveraged to impact the decision-making process on some occasions, including the decision to seek preventive care such as cancer screening.

## Materials and methods

The Technology Assessment in Medicine framework was the framework selected for this project. I chose to use the American Cancer Society guidelines for this project since these resources are frequently used in developing cancer screening guidelines and practice recommendations, and they are available in Arabic and English. Adobe® XD was used as the prototyping tool, I also designed a future evaluation (survey of users) to assess the tools usability and perceived value. The survey included the System Usability Scale (SUS) and the Preparation for Decision Making Scale (PDMS).

## Conclusion

There is a significant need to provide non-English speaking patients, including Arabic-speaking consumers with knowledge enhancing tools to facilitate the decision-making process with regards to women's cancer screening. This project provides a prototype tool and future evaluation of the tool.

## Introduction

Gender-based health care disparities are evident around the world but become more apparent in resource-limited areas such as the developing countries and countries with low to medium-income populations. Many women-specific problems such as cervical cancer and high maternal mortality rates are considered as a major threat to global health.(1)

Many factors have been found to contribute to the present status, such as the above-mentioned gender-based health care disparities, and other socioeconomic factors that influence decision making. Technology can be utilized to mitigate some of these health care issues through many aspects and using mobile health applications to promote health specifically via knowledge dissemination is a great example of a use case for technology to tackle a global health issue.(2, 3)

In this paper, we will discuss the socioeconomic challenges that influence the decision-making process related to women's cancer screening. Additionally, we will evaluate the design and use of a mobile-based preventive care tool that is designed specifically for Arabic-speaking women.

## Background

### Arabic Language Global Distribution

Arabic is the fifth most spoken language in the world,(4) with around 422 million speakers estimated in 2018. It is the official language of about twenty countries in the Middle East and North Africa. Additionally, it is spoken by many people in Central Asia, Iran, Turkey, and sub Saharan Africa.(5)

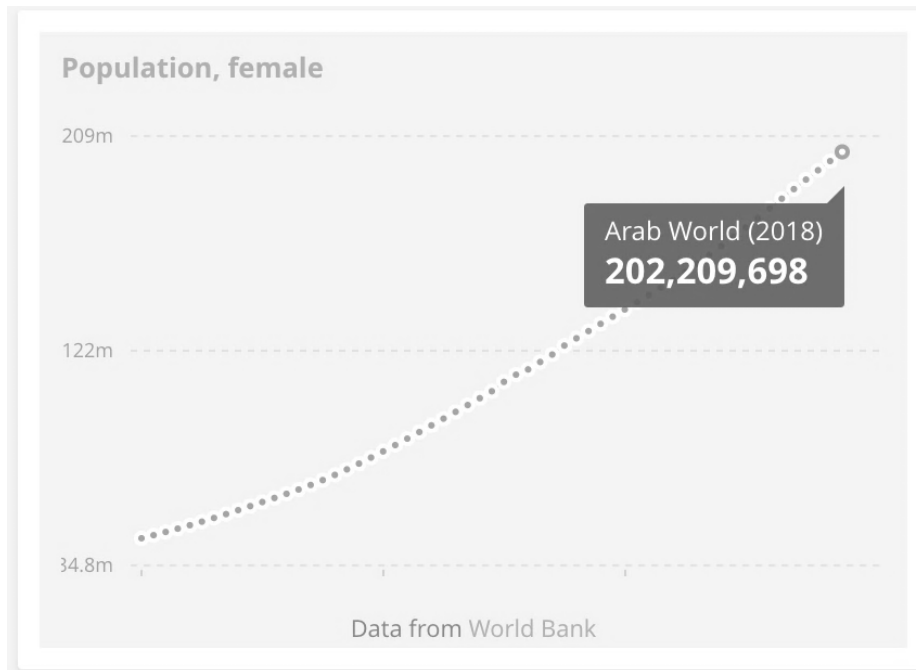
Supplying health care resources and educational materials in Arabic are increasingly gaining focus from public health leaders around the world, especially in the United States, Australia, and the European countries.

This is mostly because of the current influx of immigrants from the Arab world because of many conflicts among Arab countries. There has been an influx of migrants who speak Arabic.(5) Syria, Iraq, Sudan, and Somalia became the primary sources of migrants globally. In 2018, It was estimated that 9 million people migrated from Arab countries to different destinations globally .(6)

Children, youth, adult, and the elderly population are all affected by these crises, and each group requires focused attention to their unique health needs.

The World Bank estimated the number of women in the Arab world in 2018 to be over 202 million (Figure 1) and to represent 49% of the population.(7)





**FIGURE 1 POPULATION, FEMALE IN THE ARAB WORLD FROM THE WORLD BANK (7)**

## Digital Divide

The Gender divide in technology can be defined as "gender differences in resources and capabilities to access and effectively utilize ICTs [information and communication technologies ]within and between countries, regions, sectors, and socio-economic groups".(8) It has several dimensions, such as the access to technology and the ability to use the internet.(9) Globally, the digital gender divide is noticeable in various degrees, it can be as low as 3 % as in countries like Germany, in the other hand it could reach 45% as in some sub-Saharan countries.(10) In the United States, where there is a high technology penetration, the digital divide can be between various groups in term of the developments of skills that allow for a proper use of technology. Some ethnic and racial minorities

face greater challenges in this matter due to language barriers, absence of relevant materials, cultural beliefs, and other socioeconomic factors. (10-12)

In the Arab world, a 2010 study showed that women's access to mobile technology is increasing -- about 76 million women have access to mobile phones (out of an estimated 165 million).(13)

### Decision Making Issues

In the Arab world, the entire family may be heavily involved in the decision-making process on health-related decisions such as the use of contraception or seeking medical care.(14) Although the status quo is complex and related to various socioeconomic factors, there are a few strategies to tackle this problem.

According to the WHO, empowering women through education has been found to increase the autonomy of women in making decisions in the Middle East (2)

Mobile apps have been used to help to disseminate knowledge across many aspects, including health care, examples of such use include information specific for stroke, dermatology, and cancer.(3) The use of a health app to foster women's empowerment and support preventative care via knowledge dissemination will be evaluated as a potential solution to the current gender-based health care disparities that is more obvious minorities.

## Women Preventive Care

Preventative care in general is defined as “measures—including medications, procedures, devices, tests, education, and counseling—shown to improve well-being, and/or decrease the likelihood or delay the onset of a targeted disease or condition.” While Women’s health-focused preventive care specifically focuses on screening for cervical cancer, breast cancer & sexually transmitted infections, contraceptive education, pregnancy, and counseling, it also provides education related to interpersonal and domestic violence. (15)

The U.S. Preventive Services Task Force, The Office of Disease Prevention and Health Promotion (ODPHP) and The Women Preventive Service Initiative have initiatives in place to ensure that women receive this care. These initiatives include consumer-focused information to explain when and why to do each preventive test.

Several mobile health applications have been designed at least in part using the Arabic language and aim to target some aspects of women’s health preventative care. Examples include Nabta™ health, which is an ovulation tracker, a multi-language pregnancy tracker apps (Pregnancy Tracker – BabyCenter) and a bilingual Swedish -Arabic antenatal care tool aiming to provide support for Arab speaking women in Sweden.


The image shows a screenshot of the 'myhealthfinder' web tool. At the top, there is a logo with an apple icon and the text 'myhealthfinder'. Below the logo, the text reads: 'See which preventive services you or a loved one may need this year.' There are three input fields: 'Age:' with the value '40' entered; 'Sex:' with radio buttons for 'Female' (selected), 'Male', and a checkbox for 'Pregnant?'. At the bottom of the form is a dark button labeled 'Get Results'.

Figure 2 my health finder tool  
<https://healthfinder.gov/>

## Materials & methods

### Technology Assessment Framework

We used the Technology Assessment In Medicine (TAM) framework by Littenberg that has been used in other projects.(16-18) In this model, assessment has been dissected into the five hierarchical levels (Table 1). The ability of technology to be successful at one level does not guarantee the success at another level. Below is how we utilized Littenberg technology assessment framework to evaluate the use of a mobile based tool to facilitate women’s preventive care decisions.

**TABLE 1 TECHNOLOGY ASSESSMENT IN MEDICINE FRAMEWORK**

Technology assessment framework	Women’s Health App Project
Scientific Plausibility	Does it make sense to build?
Technical Feasibility	Can it be built?
Intermediate Outcomes	Does it facilitate access to knowledge?
Patient Outcomes	Will it improve patients ability to make decisions about women’s preventive care
Social Outcomes	Will it increase awareness related to women’s health preventive care?

The first two levels of the technology assessment framework were completed using literature review and by reviewing currently available mobile health applications while the outcome aspects of the technology assessment framework can be evaluated in the future, through multiple surveys before and after the App deployment.

## Establishing an Evidence-Based Pathway

Cancer screening recommendations are relatively similar across most platforms, and to alleviate the risk of translation errors, we used the Arabic version of the American Cancer Society cancer Screening guidelines as a reference. The American Cancer Society (See Appendix 1) provides information about cancer screening, prevention, risks, and tests in 13 languages Including Arabic and English. (19) These recommendations are frequently reviewed in generated evidence-based guidelines for cancer screening practices.(20, 21)

## Design of the Decision Aid

To design the prototype of this tool, Adobe® XD has been used as a design tool.

We followed the strategies for developing health literate apps by the National Academy of Medicine. (22) This report states the following strategies:

- Learn About Your Users
- Write Actionable Content
- Display Content Clearly
- Organize and Simplify
- Engage Users
- Evaluate and Revise Your Site (22)

During the design phase, I incorporated the feedback that I received from a few women who spoke Arabic, English, or both. These comments facilitated color selection, the use of lists vs. checklists for the age selection screen, Also, whether

we gather the three elements of information (age, pregnancy, and smoking status) in one screen or three consecutive screens.

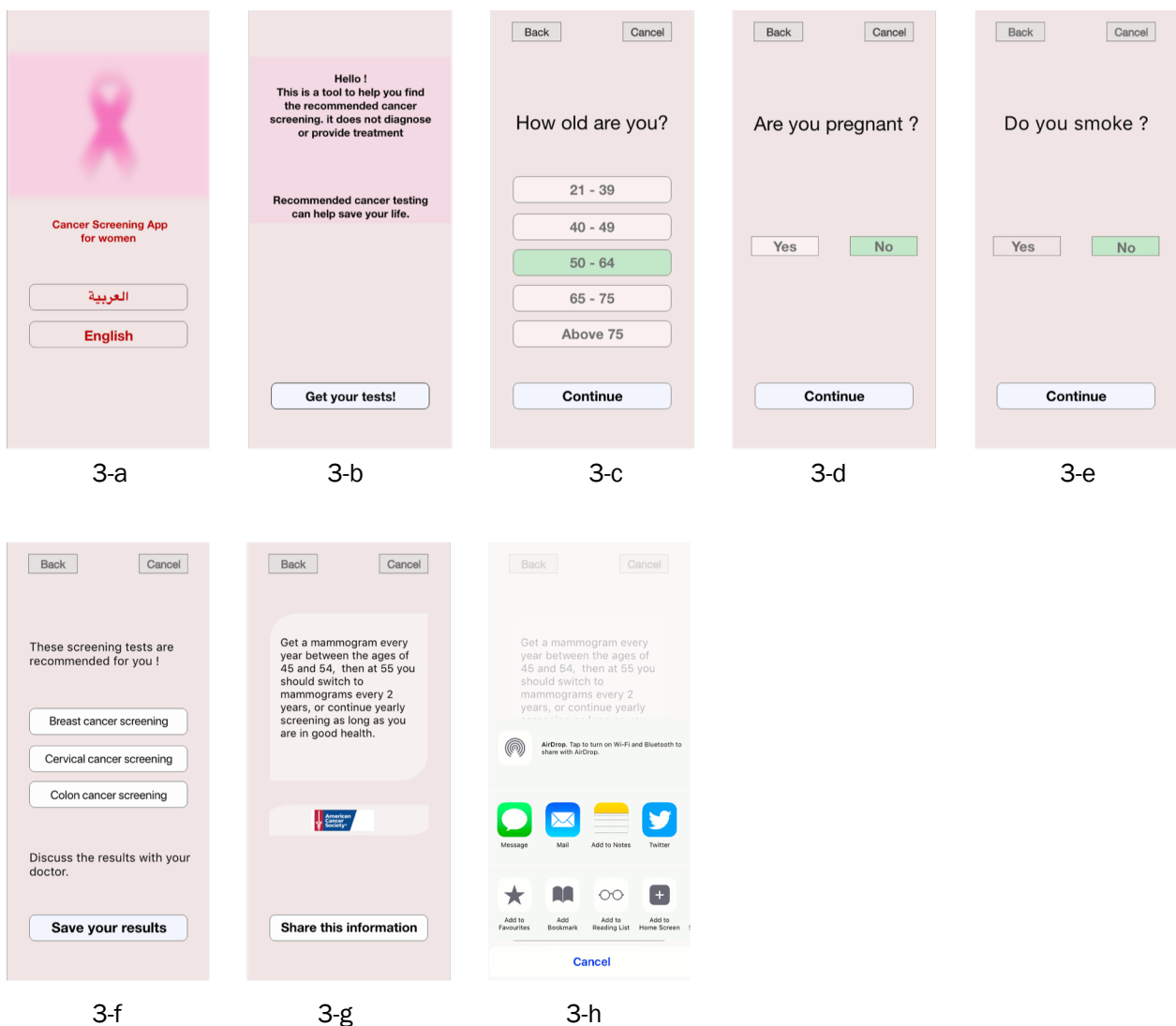
## Review of Prototype App

This prototype's screens can be divided into three different layers; the 1st layer includes the home screen (3-a), and the general disclaimer screen (3-b). During this first interaction with the app, the consumer will be prompted to select the language of choice, read the disclaimer, and start the actual engagement with the tool by clicking on "Get you tests!" button.

The second phase includes three screens where the user will be asked to answer three questions, about age, smoking, and pregnancy status. The tool contains logic related to age, smoking, and pregnancy status so that users get customized feedback. Users will have to click on a button to move to the next question, navigate back to the earlier question, or cancel the session and restart at the home screen (3-c, 3-d, 3-e).

The last part of this tool includes the recommendation list screen (3-f), where the consumer will see a list of the cancer screening tests that are recommended based on her answers. In order to encourage users to take action based on these results, this screen also includes the following statement "Discuss the results with your doctor." Consumers can also save a copy of the list to share with their provider; such a copy must not include any personal health information identifiers. Additionally, consumers can click on any of the screening tests to navigate to the

“more information” screen, to read the recommendation statement, and find links to trusted online resources on the language of choice. Trusted online resources includes those resources that are offered by national health agencies such as the CDC National Prevention Information Network, and the National Library of Medicine HealthReach initiative or a local resource such as the Arab health Initiative by the Immigrant Health and Cancer Disparities (IHCD) in New York.



**FIGURE 3** PROTOTYPE SCREENS IN ENGLISH (SEE APPENDIX FOR THESE SAME SCREENS IN ARABIC)

## Future Evaluation

To evaluate the app in a future study, a survey was designed to measure two aspects; first, the perceived benefit to users as a decision aid tool. The System Usability Scale (SUS) could be used to assess the tool's usability(23). For the value of this decision aid, the Preparation for Decision Making Scale (PDMS) could be used(24). For both cases, respondents must select a choice out of 5 responses (of agreement for the System Usability Scale; and of frequency for other tool). A space for unstructured feedback is also provided to capture the consumers' valuable comments.

(See Appendix 2).

## Discussion

This paper focused in evaluating the existing gap in providing preventive care for non-English speaking patients, with an emphasis in assessing the case of delivering cancer screening activities to Arabic speaking women. The fact that a handful of countries from the Arab world represent the major source of immigrants globally led to the increased attention to deploy Arabic-focused health initiatives around the world.



Such information can be used to generate consumer facing solutions that could ease knowledge transmission and tackle the language barriers that some patients face.

With the massive technology penetration worldwide, mobile Apps and web-based tool can be used to open many closed doors and tackle a few cultural obstacles that affect the care-seeking attitude and the decision-making process. The Technology Assessment in Medicine Framework provides a methodological approach to the feasibility of similar technology empowered consumer tools. To measure how successful is our proposed tool, the Preparation for Decision Making Scale can be used. The well-known System Usability Scale is an acceptable method to test the usability of this type of app.

## Conclusion

This paper aims to review the current need for a consumer facing Arabic tool that links female consumers with the latest recommendation for cancer screening. It focused on the specific restriction that faces non-English speaking Arabic women from various aspects including the cultural backgrounds and how technology can help in mitigating these issues. The paper also suggests the use of the TAM framework to pre-design assessment and the SUS, PDMS scales to assess the usability and impact, respectively. To facilitate proper utilization of technology to provide language specific tools; collaboration between existing initiatives, future projects and other stakeholders should be achieved.

# Appendix 1



## Get your tests!

Recommended cancer testing can help save your life.  
Ask your doctor or nurse about these tests.

Recommended Tests for Men and Women at Average Risk				
21 to 29 Years	30 to 39 Years	40 to 49 Years	50+ Years	GLOSSARY
<b>Colorectal Cancer Testing*</b> Find out if you are at high risk for colon or rectal cancer. If not, then no test is needed at this time.		<b>Colorectal Cancer Testing*</b> Start testing at age 45. Several types of tests can be used. Talk with a health care provider about which tests are best for you. No matter which test you choose, the most important thing is to get tested.		<b>Colorectal Cancer Testing</b> These tests can help prevent colorectal cancer or find it early when it may be easier to treat.
Recommended Screening Tests for Men				
<b>Prostate Cancer Testing</b> No test is needed at this time.	<b>Prostate Cancer Testing</b> Starting at age 45, African American men and men with close family members who had prostate cancer before age 65 should discuss the pros and cons of testing with a health care provider.		<b>Prostate Cancer Testing</b> Talk with a health care provider about the pros and cons of testing to decide if testing is right for you. If you decide to be tested, you should have a PSA blood test with or without a digital rectal exam.	<b>Prostate Cancer Testing</b> Levels of prostate-specific antigen (PSA) in the blood may be higher in men with prostate cancer, as well as other conditions.
Recommended Screening Tests for Women				
<b>Breast Cancer Testing*</b> Find out if you are at high risk for breast cancer. If not, testing is not needed at this time.  Tell your doctor or nurse right away if you notice any changes in the way your breasts look or feel.	<b>Breast Cancer Testing*</b> Women ages 40-44 should have the choice to start breast cancer screening with yearly mammograms. Starting at age 45, get a mammogram every year.		<b>Breast Cancer Testing*</b> Get a mammogram every year between the ages of 45 and 54, then at 55 you should switch to mammograms every 2 years, or continue yearly screening as long as you are in good health.	<b>Mammogram</b> A screening mammogram is an x-ray that is used to help look for signs of breast cancer in women who don't have any breast symptoms or problems.
<b>Cervical Cancer Testing</b> Screening should be done every 3 years with a Pap test.	<b>Cervical Cancer Testing</b> Women ages 30-65 should get a Pap test and an HPV test every 5 years, or get a Pap test every 3 years. Women 66 and older who have had normal Pap tests on a regular basis can stop testing. Women who have had a serious cervical pre-cancer should be tested for at least 20 years after the diagnosis.		<b>Pap Test (Cervical Cancer Testing)</b> The Pap test checks for cell changes or abnormal cells in the cervix. <b>HPV Test (Cervical Cancer Testing)</b> The human papillomavirus (HPV) test checks for the virus and can be done at the same time as the Pap test.	
Lung Cancer Screening Recommendations for Men and Women at High Risk				
			<b>Lung Cancer Testing.</b> A yearly low-dose CT scan may benefit you if you are a current or former smoker ages 55-74 and in fairly good health.	<b>Lung Cancer Testing</b> People who smoke or used to smoke are at higher risk for lung cancer. Talk to a healthcare provider about your risk for lung cancer and getting tested.
Insurance typically covers prevention and screening services. Please check to confirm your specific health care benefits.				

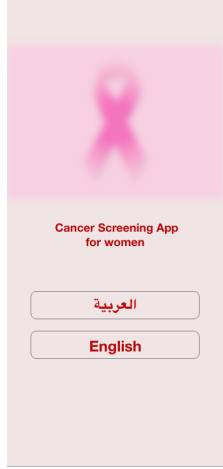
**Be sure to tell your doctor or nurse if you have had any type of cancer or if your mother, father, brother, sister, or children have had cancer.**

\* You may need to begin testing for colorectal cancer or breast cancer earlier or be tested more often if you are more likely than other people to have these cancers. Talk to your doctor about this.

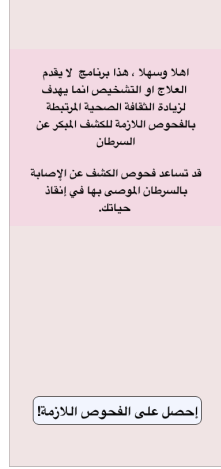
cancer.org | 1.800.227.2345

LANGUAGE  
©2018, American Cancer Society, Inc. No. 085226

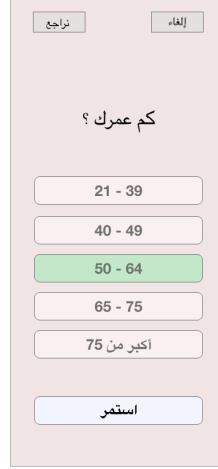
## Appendix 2



4-a



4-b



4-c



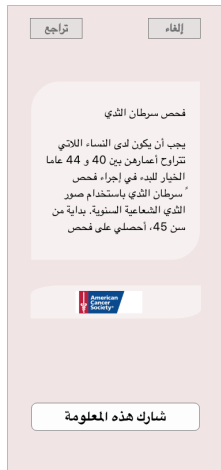
4-d



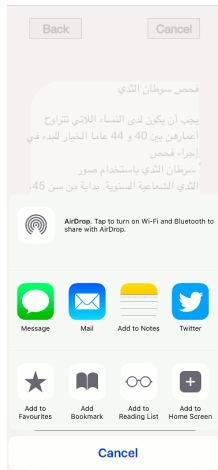
4-e



4-f



4-g



4-h

## Appendix 3

8/30/2019

Qualtrics Survey Software

### Hello

For each of the following statements, mark one choice that best describes your reactions to the App

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I think that I would like to use this system frequently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the App unnecessarily complex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I thought the App was easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think that I would need the support of a technical person to be able to use this App	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the various functions in this App were well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I thought there was too much inconsistency in this App.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would imagine that most people would learn to use this App very quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found the App very cumbersome to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt very confident using the App.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I needed to learn a lot of things before I could get going with App.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please show your opinion of the [educational material] by circling the number to show how much you agree with each statement .

**Did this educational material . . .**

	Not at all	A little	A moderate amount	A lot	A great deal
Help you recognize that a decision needs to be made?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepare you to make a better decision?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help you think about the pros and cons of each option?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help you think about which pros and cons are most important?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help you know that the decision depends on what matters most to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help you organize your own thoughts about the decision?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help you think about how involved you want to be in this decision?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Help you identify questions you want to ask your doctor?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepare you to talk to your doctor about what matters most to you?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepare you for a follow-up visit with your doctor?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please share with us your feedback

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