There’s An App for That:
Developing An App to Increase Provider BRCA Knowledge At The Point Of Care

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Objectives:

- Explore strategies for successful **leadership** for practice issues
- Identify **resources** that enable nurses to lead in the area of technology
- Understand the **steps** in development of an mobile health technology app
How can we improve care?
Doctor of Nursing Practice

Practice-focused doctoral degree and terminal degree for professional nursing practice
DNP Journey
Improving Care, Translating Research into Practice...Evidenced Based Care
DNP Essentials-Translation of Research into Practice

“Clinical scholarship and analytical methods for evidence-based practice: DNP graduates must be able to put research into practice.” (AACN, 2006)
“Organizational and systems leadership for quality improvement and systems thinking: DNP graduates must be knowledgeable about patients on individual, population and community levels to help create new health care delivery models.”

“Clinical prevention and population health for improving the nation’s health: DNP graduates should be able to provide risk reduction and illness prevention for patients and families as well as entire populations. “ (AACN, 2006)
“Information systems or technology and patient care technology for the improvement and transformation of health care: DNP graduates should know how to evaluate programs and information systems to best care for patients as well as to evaluate ethical and legal issues surrounding health care technology.” (AACN, 2006)
Introduction and Background
Breast and Ovarian Cancer

- Breast Cancer is the most common cancer in American women, second only to skin cancer, with approximately one in eight, or 12% of women in the United States developing invasive breast cancer during their lifetime.
- Of the women diagnosed with breast cancer each year, approximately 5-10% of the cases are attributable a BRCA mutation.
- By age 70, women with a BRCA mutation have substantially elevated risks of breast cancer (45-87%) and ovarian cancer (15-40%).

American Cancer Society, 2013
Reducing Risks

- Only women whose family history indicates an increased risk for a \textit{BRCA} mutation should be referred to genetic counseling and evaluation for \textit{BRCA} testing.
- To reduce these risks, women with a \textit{BRCA} mutation should have multidisciplinary, individualized medical evaluations.
- Identifying at-risk women who should receive these evaluations and referral to specialized services is a key function of primary care providers.

US Preventive Services Task Force, 2013
Primary Care Providers

- Primary care providers (PCPs) are important members of the health care team and are instrumental in identifying and referring those women.

- Although PCPs are important to identifying and referring appropriate women, studies have shown that PCPs lack knowledge, confidence and use in identifying women at risk.

Education for Primary Care Providers

- Educational interventions have shown positive results at increasing knowledge and confidence for PCPs and in particular web-based education has been cost-effective and feasible.

- Mobile health technology (MHT) interventions have been used to improve health care in various areas and have been used to assist health care providers with education, diagnosis, and management of patients.
Challenges of Primary Care

- Finding enough time
  - 15 minute return visit appointments
  - 30 minute new patient visits

- Government Mandates
  - Meaningful Use
  - Physician Quality Reporting Services-PQRS
  - ICD-10

- Staff Training
  - Use of medical assistants instead of nurses

(Medical Economics, 2014)
Clinical Problem

- Providers lack **knowledge** and **confidence** in assessing women’s risk for a *BRCA* mutation.
- **Time** is a factor during patient visits
Mobile Health Technology Applications or Apps

- Definition: A term used to describe internet applications that run on smartphones and other mobile devices.
- Mobile applications usually help users by connecting them to Internet services more commonly accessed on desktop or laptops.
Mobile Applications

- Not intended to replace desktop applications but to add to existing technologies for better health care
- Functionalities of applications are growing every day with new functionalities
- Work of HCP is very mobile in nature—this makes MHT very applicable to this
Are Applications Useful?

- Useful for rapid response, error prevention and data management and accessibility
- Real time clinical information at the point of care is very important for evidence based practice
- Drug reference, medical textbooks and references for disease diagnosis and medical calculator applications were reported as being most helpful (Mosa et al., 2013)
Applications cont.

- Medical Calculator applications (BMI, BSA)
- Literature Search Applications
- General Healthcare Applications’
  - Handheld computer smoking intervention tool
  - AHRQ–Agency for Healthcare Research and Quality Application
Tool To Be Used at the Point of Care
Updated Recommendation-USPSTF
BRCA Risk Assessment and Genetic Testing(2013)

- Included five different screening tools for primary care providers
  - Ontario Family History Assessment Tool or FHAT
  - Manchester Scoring
  - Referral Screening Tool-B-RST-Computer Based-Desk top
  - Pedigree Assessment Tool or PAT
  - FHS-7
Screening Tools for Primary Care

- Manchester Scoring
- Pedigree Assessment Tool or PAT
- Referral Scoring
- FHS–7
- Ontario Family History Assessment Tool or FHAT
<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast and ovarian cancer</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>10</td>
</tr>
<tr>
<td>Sibling</td>
<td>7</td>
</tr>
<tr>
<td>Second/third-degree relative</td>
<td>6</td>
</tr>
<tr>
<td>Breast cancer relative</td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>4</td>
</tr>
<tr>
<td>Sibling</td>
<td>3</td>
</tr>
<tr>
<td>Second/third-degree relative</td>
<td>2</td>
</tr>
<tr>
<td>Male relative (add to above)</td>
<td>2</td>
</tr>
<tr>
<td>Breast cancer characteristics</td>
<td></td>
</tr>
<tr>
<td>Onset at age 20–29 y</td>
<td>6</td>
</tr>
<tr>
<td>Onset at age 30–39 y</td>
<td>4</td>
</tr>
<tr>
<td>Onset at age 40–49 y</td>
<td>2</td>
</tr>
<tr>
<td>Premenopausal/perimenopausal</td>
<td>2</td>
</tr>
<tr>
<td>Bilateral/multifocal</td>
<td>3</td>
</tr>
<tr>
<td>Ovarian cancer relative</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>7</td>
</tr>
<tr>
<td>Sibling</td>
<td>4</td>
</tr>
<tr>
<td>Second/third-degree relative</td>
<td>3</td>
</tr>
<tr>
<td>Age at ovarian cancer onset</td>
<td></td>
</tr>
<tr>
<td>&lt;40 y</td>
<td>6</td>
</tr>
<tr>
<td>40–59 y</td>
<td>4</td>
</tr>
<tr>
<td>60 y</td>
<td>2</td>
</tr>
<tr>
<td>Age at prostate cancer onset</td>
<td></td>
</tr>
<tr>
<td>&lt;50 y</td>
<td>1</td>
</tr>
<tr>
<td>≥50 y</td>
<td></td>
</tr>
<tr>
<td>Age at colon cancer onset</td>
<td>&lt;50 y</td>
</tr>
<tr>
<td>&gt;50 y</td>
<td></td>
</tr>
<tr>
<td>Family total</td>
<td></td>
</tr>
<tr>
<td>Referral</td>
<td>≥10</td>
</tr>
</tbody>
</table>

1 From reference 14.
2 Referral with a score of ≥10 corresponds to doubling of lifetime risk for breast cancer (22%).
Mobile Health Technology App for Assessing BRCA Risk
Purpose

- **Purpose:** Quality improvement project to increase provider *BRCA* knowledge and confidence.
- **Objective:** To develop a *useful* and *satisfactory* mobile health technology application (MHT) for use by providers to *increase* *BRCA* knowledge and confidence utilizing the Ontario Family History Assessment Tool.

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This entry was posted in a non-profit on October 9, 2012.

Ann Arbor Give Camp 2012
Steps to development and testing of MHT application

Develop evidence-based content for MHT application utilizing the Ontario Family Health History Assessment Tool (FHAT)\(^4\)

Consult with genetics specialist at MDCH

Collaborate with IT company to create smartphone/table application

Secure grant through Mid-MI Affiliate of Susan G. Komen for the Cure

Develop pretest and posttests, two patient scenarios and confidence and satisfaction surveys

Secure technology equipment for testing and location for evaluation.

Application completed –beta testing with four providers

Revisions made after input from beta-testing

Evaluate with 39 NP conference voluntary participants (38 NPs, 1 Student NP)
IRB Exempt. Convenience sample.
Evaluation

- Evaluate the knowledge, skills, and confidence of PCPs with use of the application in the clinical setting.
- Evaluate the utility, feasibility, and satisfaction with use of the application in the clinical setting.
40 year old female in good health is in the clinic to see her primary care provider. She asks about BRCA testing. Her family history is as follows:

• Sister with ovarian cancer at age 45
• Paternal Aunt with history of breast and ovarian cancer
• Mother with a history of bilateral breast cancer diagnosed at age 45
Participants demonstrated increased knowledge from pre-test to post-test after use of the MHT application with mean score improvement of almost one.
Increase Provider Confidence

✓ Increase Provider Confidence: Participants demonstrated satisfactory confidence after use of the application with 66% of participants agreeing or strongly agreeing that they felt confident after use of the application.

<table>
<thead>
<tr>
<th>Statement of confidence</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident in my abilities to appropriately identify women at risk for a BRCA mutation</td>
<td>5.6% n=2</td>
<td>61.1% n=22</td>
<td>19.4% n=7</td>
<td>13.9% n=5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel confident in my personal knowledge of genetics and BRCA mutation</td>
<td>8.3% n=3</td>
<td>30.6% n=11</td>
<td>38.9% n=14</td>
<td>19.4% N=7</td>
<td></td>
<td>3.58% (0.797)</td>
</tr>
</tbody>
</table>
Provider: Satisfaction Usefulness

✓ Participants evaluated use of the tablet on a 5-point Likert scale. The use of the MHT met the objectives with an overall positive evaluation.

<table>
<thead>
<tr>
<th>Questions of clinical utility</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>M=(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The risk of cancer in patients who have a BRCA mutation or positive genetic test is not clear</td>
<td>2.8% n=3</td>
<td>30.6% n=11</td>
<td>38.9% n=14</td>
<td>19.4% n=7</td>
<td>2.8% n=1</td>
<td>2.52% (1.213)</td>
</tr>
<tr>
<td>Clear guidelines or strategies are not available for managing patients who have BRCA mutations</td>
<td>2.9% n=1</td>
<td>17.1% n=6</td>
<td>17.1% n=6</td>
<td>45.7% n=16</td>
<td>17.1% n=6</td>
<td>2.42% (1.049)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Satisfaction with use of the MHT Application</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>M=(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>This application was easy to use</td>
<td>27.8% n=10</td>
<td>52.8% n=19</td>
<td>16.7% n=6</td>
<td>2.8% n=1</td>
<td></td>
<td>4.05% (0.742)</td>
</tr>
<tr>
<td>This application will be useful for me in my clinical practice</td>
<td>16.7% n=6</td>
<td>41.7% n=15</td>
<td>33.3% n=12</td>
<td>8.3% n=3</td>
<td></td>
<td>3.66 (0.849)</td>
</tr>
<tr>
<td>This application increased my knowledge of appropriate risk assessment</td>
<td>33.3% n=12</td>
<td>50.0% n=18</td>
<td>16.7% n=6</td>
<td></td>
<td></td>
<td>4.16% (0.867)</td>
</tr>
<tr>
<td>This application increased my confidence in appropriately assessing BRCA mutation risk among my patients</td>
<td>22.2% n=8</td>
<td>58.3% n=21</td>
<td>19.4% n=7</td>
<td></td>
<td></td>
<td>4.02% (0.644)</td>
</tr>
</tbody>
</table>
Outcomes of Project with Measures

- Development of mobile health technology application utilizing FHAT recommended by the USPSTF
- Increase in provider BRCA knowledge demonstrated using pre-test and post-test results comparison paired t-test
- Increase in provider confidence after use of the application using Likert sale
- Useful and satisfactory app measured using Likert scale
Providers lack knowledge and confidence in assessing women’s BRCA risk.

Point of care MHT educational resources for providers may be helpful in increasing knowledge and confidence.

Providers own and use tablets and smartphones as resources in providing care and find them to be useful.

Providers who identify women at risk and refer appropriately will improve care for women.
Apple-292 downloads/37 countries
Averaging one download a day

- Argentina
- Australia
- Barbados
- Brazil
- Canada
- Chile
- China
- Colombia
- Costa Rica
- Denmark
- France
- Germany
- Guatemala
- Hungary
- Israel
- Italy
- Japan
- Kuwait
- Mexico
- Netherlands
- New Zealand
- Nicaragua
- Norway
- Portugal
- Romania
- Russia
- Saudi Arabia
- Switzerland
- Taiwan
- Tunisia
- Turkey
- United Kingdom
- United States
- Uruguay
- Venezuela
Platforms

- iPhone – 75%
- iPad – 20%
- Desktop and iPod touch – 5%
Limitations

- Evaluation of the app done in a simulated environment with case scenarios
- Tested on nurse practitioner cohort only.
Future Plans

- Disseminate app through various methods including presentations at NP conferences, physician residency programs, NP and medical student presentations.
- Develop other apps to provide resources for providers for other genetic conditions such as Lynch syndrome.
Conclusions

- An app used at the point of care can be effective method to increasing provider knowledge in assessing women for risk of BRCA mutation.
- Use of an app is satisfactory to nurse practitioners in assessment women at risk for a BRCA mutation.
- Testing of the MHT app in the clinical setting may be helpful in further evaluation of its’ use.
- The potential impact of this project may include improved knowledge in other areas of genetic risk assessment.
Questions?
thank you


