Web-based Information Management System for Prostate Cancer Education and Resources for Couples (PERC)

Yingqiu Zhou  Advisor: Javed Mostafa  Mentor: Lixin Song (School of Nursing)

Abstract
Prostate Cancer Education and Resources for Couples (PERC) is a couple-centered web-based symptom management program. It was developed by nurses, physicians, a psychologist, a media specialist, web designers, and programmers from UNC School of nursing and UNC cancer care. The research involves patient recruitment, target identification, questionnaires, intervention, project management and data analysis. The aim of the project is to develop a supporting web-based information management system to track progress of the research study, collecting information and processing data for analysis. With the implementation of open source packages, a web-based information management system was designed and coded. By using this platform, researchers successfully collected all the necessary information and used them for their pilot studies.

Introduction
According to the data from CDC, by the year of 2012, there were 20.1 million noninstitutionalized adults (8.5%) who had been diagnosed with different types of cancers in the United States. Therefore, there are huge demands for cancer information from patients, their families and friends, clinicians, policy makers and the whole society. Web is an important source for cancer information. Patients seeking information through web tend to have more knowledge about cancer treatment, survival rates and better cope with cancer.

PERC, Prostate Cancer Education & Resources for Couples, is a couple-focused, mobile-based symptom self management program. It is an internet-based intervention and guided by an adapted Stress and Coping theoretical framework. The website includes 10 educational modules, forum, other resources and a tool box. It contains a patient portal and a partner portal, and integrates healthy behaviors into couple-focused, tailored mobile health intervention, as well as different social support from various sources.

The pilot studies collected the information on website usage and survey results for analysis. To facilitate the data collection and analysis, an information management system was developed to support the process.

Learning Objectives
1. Applying the knowledge on database, web programming and data management to the project.
2. Developing research and technical skills with clinical related data and following privacy policies.
3. Developing communication skills and coordinating with clinicians, IT personal and statisticians.

Methods
The project contains two parts, patient information management and survey management. The development process includes user needs analysis, timeline and technical stack design, local development and migration to webserver for usage. Additional modifications and updates were performed according to the feedback from users.

Results
An open source based information and survey management system was developed with user-friendly interfaces. Different user groups have different privileges to create forms, modify databases, backup data or create/modify entries and perform analysis. The system was successfully implemented on a windows server, collected necessary data for research studies.

Conclusion
The researchers conducted their pilot behavior studies with prostate patients and their partners regarding on the mHealth intervention by PERC program.

Future Directions
1. Increase accessibility
Currently the system is restricted to local accessibility (IP address specified) due to security restriction by using university’s web server. In the large scale study, patients and partners should be able to access to the surveys for convenient data collection.

2. Allow scalability
The pilot study was small scale and the analysis manually input the patients’ information to the system. However, it may be not very practical when involving a few thousands of patients. The system should be compatible with database import to accommodate large scale information.

3. The system needs to support advanced queries for analysis.
Set up automatic alerts. For example, the system is able to set up reminders during study process for information collection and survey completions.

4. Optimize the design and content of the system by users’ requests.

REFERENCES
Database Design and Relational Theory, Publisher: O'Reilly Media, April 2012
Improving Couples’ Quality of Life Through a Web-Based Prostate Cancer Education Intervention, ONF 2015, 42(2), 183-192
New Challenges in Communication with Cancer Patients, 2013

Acknowledgement
Carolina Health Informatics Program, UNC School of Information and Library Science, UNC School of Nursing, UNC Lineberger Comprehensive Cancer Center