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¹Health Management and Economics Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

²Health Information Technology Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

³Isfahan Kidney Transplantation Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

Corresponding author: Asghar Ehteshami, Academic member, Health Information Technology Research Center, Hezar-Jareeb St, Isfahan University of Medical Sciences, Isfahan, Iran. ORCID ID: <http://www.orcid.org/0000-0001-8760-8534>. Tel: +983137925152, E-mail: ehteshami@mng.mui.ac.ir.

A Contribution into Developing a Model for Prostate Cancer Self-Care Mobile Application

Pegah Zargarzadeh¹, Asghar Ehteshami², Mehrdad Mohammadi-Sichani³

ABSTRACT

Introduction: New Healthcare models are developed with the focus on the community members and towards their self-accomplishment of the healthy activities. Mobile Health, as a newbie technology, seems to be appropriate to help prostate cancer self-care. **Aim:** this study aimed to provide a comparative model of mobile application for prostate cancer care self-care for Iranians. **Material and Methods:** This is an applied mixed method study, which was conducted in three phases from 2017 to 2018 as follows: 1) searching and thematic content analyzing of prostate cancer mobile applications and their related articles to extract technical features and clinical functions; 2) selecting the common extracted features and functions to design an initial model of the application; and 3) confirming validity of the features and functions through 2 rounds of Delphi technique. **Results:** This applied model was developed for the appropriate prostate cancer self-care, with such functionalities as user training, care, diagnosis, interaction, and alerting the user. Also, some technical features of the model include settings and data sharing. **Conclusion:** The applied model of mobile application for prostate cancer has been done in compliance with requirements of Iranian health information technologists, urologists and oncologists. It seems it would be of help in self-care of patients with needed to prostate cancer care.

Keywords: Mobile Applications, Prostatic Neoplasms, Comparative Study, Self Care.

1. INTRODUCTION

Prostate cancer, as the most common cancer in men and one of the most heterogeneous cancers, accounts for about 10% of men's deaths from cancer (1, 2). In Iran, its prevalence is lower than in other countries, and it is 5.1 per 100,000 per year (3, 4). However, it is expected to increase dramatically in the future due to increased life problems and a change in lifestyle (5). Cancer causes problems such as depression, anxiety and anger for patients (6). The knowledge level of men has a positive impact on their coping with prostate cancer. Therefore, it seems that training has a positive impact on prostate cancer prevention.

Since the beginning of the twenty-first century, mobile phone use has become widespread, with users accounting for about 87% of the world's population. Now, with the communication technology development and emerging mobile health technology, it is possible to provide a variety of health services at anytime and anywhere (7). The use of smartphones and mobile applications for sharing information, communication

and training is increasing (8). So, in Iran, the mobile penetration rate is 100% and there are over 100 million smart phones throughout the country.

Some smartphone features such as small size, portability, universal accessibility, multimedia and multi-purpose performance, telecommunication nearly without any limitations of time and place, flexibility, user-friendliness, attractiveness, data storage, convenient sharing of information through wireless networks, And immediate access to a variety types of required clinical and administrative data, increases the enthusiasm of individuals to learn (especially on the web) and makes mobile health an essential tool in providing health care (9, 10). Mobile health is a promising approach to preventing and treating a variety of patients. It can improve the treatment of many millions of patients with chronic diseases by reducing costs, increasing access to health services, and improving health care (11-13).

Self-care and mobile applications literacy are the important ba-

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Figure 1. The applied model of Prostate Cancer Mobile App

sic needs of any community (14). Mobile health applications, online or offline, can lead to changes in users' health behaviors and, consequently, to improve quality of their life (15).

2. AIM

Prostate cancer needs self-care in prevention; consequently, producing of self-care application can help prevent and control the disease. Hence, this study aimed to provide a suitable comparative model for prostate cancer care self-care for Iranians.

3. MATERIAL AND METHODS

This is an applied mixed method study, which was conducted in two phases from 2017 to 2018 as follows:

1) *Identifying the technical features and the clinical functions for model of prostate cancer self-care mobile application*: this phase was conducted in two steps as followings:

a) In the first step, prostate cancer mobile applications and their related articles were searched. Then the features and the functions were extracted from 19 ap-

plications and their associated articles through thematic content analysis.

b) In the second step, the common extracted features and functions were selected and the initial model of the application designed according them.

2) *Determining the validity of the model*: To confirm the validity of the initial model, two researcher-made questionnaires were developed for the technical features and the clinical function of the model. The reliability of the technical and clinical questionnaires was conformed Cronbach's Alpha = 0.844, =0.922, respectively, and content validity of the questionnaires was confirmed. Then, the questionnaires were distributed through two rounds of Delphi technique. 20 health information technologists and 16 experts in urology and oncology filled technical and clinical questionnaires respectively, and then obtained data were analyzed through SPSS v. 16. Finally, the experts' panel decided to choose the common features with the minimum agreement of 75%.

4. RESULTS

By Thematic content analysis on 19 different models, the technical features and the clinical functions of the prostate cancer mobile application were extracted. After completing the questionnaires during two rounds of the Delphi technique, the agreement was done with the required features and functions of the application that include:

- *Clinical functions*: training, care, diagnosis, interacting with the user, and alerting the user.
- *Technical functions*: Settings, sharing data to providers, user guide, and about us.

How to perform tasks in the application is shown in Figure 1.

5. DISCUSSION

Today, regarding availability of mobile devices and its penetration as a tool in the hands of the user, Mobile health has a high potential and good economic benefits to help urologists to consult a patient at risk (16, 17, 18). Currently, unfortunately, most of prostate cancer applications are unreliable (19, 20). Therefore, in this study, we tried to provide a reliable model based on the opinion of urologists, oncologists, and health information technology experts.

Interaction with the user and alerting is the most important functions of the proposed model of the study. According to Sundberg et al, mobile health applications enhance patient participation and symptom assessment as well as communication between patients and health care providers. Alerting system of these applications leads to patient contact with providers and consequently, better patient support, so patients feel safe (21).

Diet, physical activities and lifestyle interventions play a major role in reducing the progression of disease, mortality, and overall burden of high and fatal prostate cancer (22). Healthy diet has a significant impact on prostate cancer prevention (21). Yoga also has a beneficial effect on reducing fatigue, radiotherapy strokes, erectile dysfunction, urinary incontinence and overall quality of life

in patients with prostate cancer under radiation therapy period (23). In our proposed model, useful information is provided about nutrition, physical activity and lifestyle for users.

The level of education in people is very effective in the incidence of prostate cancer (24). Self-care training leads to prevent of adverse effects of prostatic cancer (25). Knowledge of affected people about the signs, symptoms and complications of prostatic cancer can be effective and physicians and nurses can help patients to exchange needed clinical information and consequently, support them more (26). In our proposed model, there are some training materials about the signs, symptoms and complications of prostatic cancer.

Prevention is still an important strategy to reduce adverse effects and mortality of prostate cancer (27). According to Wang et al, new approaches should be developed to prevent primary and metastatic prostate cancer (28). In our proposed model, preventive care of prostate cancer through the mobile application is provided as a new supportive approach.

6. CONCLUSION

Today, using mobile health and self-care apps are increased dramatically, so it seems that developing mobile applications for self-care can have significant effects on the health of community members. The applied model of the study has been developed in compliance with requirements of Iranian health information technologists, urologists and oncologists. It seems it would be of help in self-care of patients with needed to prostate cancer care.

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