Development of a Smartphone Application for Evidence-Based Practice Guideline Education Program

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Abstract. The purpose is to develop smartphone application contents for the evidence-based guidelines education program and to evaluate the satisfaction for this application. In order to develop, we installed the Java SE Development Kit (JDK) 7, and then installed the Android SDK 4.1.2. We have developed the education content, quiz, guideline recommendation for postoperative management. As a result of the satisfaction items, the mean score of ‘This application is helpful to perform drug dosage calculation’ was 3.75. However, ‘I satisfy this application’ was low as 3.08.

Keywords: Nursing Informatics, Guideline, Education

1 Introduction

Recently, the efficiency, cost-effectiveness and quality of the healthcare system have been evaluated, and the importance of evidence-based practices has been increasingly emphasized [1]. The evidence-based practices allow nurses to provide high quality nursing, thus potentially improving the quality of nursing services. Various efforts are underway to apply these practices [2]. The evidence-based guidelines are developed by identifying, evaluating, and integrating a variety of evidence in a form that medical personnel can use to apply research easily to clinical practice [3]. Since the importance of evidence-based practices has emerged [4-5] many research institutions have developed evidence-based guidelines by assessing the evidence and then working to distribute the information [6-8].

Due to the recent popularization of smartphones, use of mobile phone applications in place of computers with Internet access has expanded. Many health-related applications have been developed for education and therapeutic purposes, to allow users to take advantage of healthcare without the constraints of time and place. Due to their effectiveness, medical apps are expected to expand from 1.6% to 36.8% of
available apps by 2015 [9]. Medical apps allow greater utilization of healthcare information technology not only for patients, but also for healthcare professionals. In this study, we evaluate evidence-based guidelines for surgical management of patients in the form of a smartphone app. This study developed evidence-based guidelines regarding surgical patient management and analyzed the change in the degree of user. The specific objectives were as follows:
1) To develop a smartphone application for evidence-based nursing practice guidelines for surgical patient management.
2) To assess satisfaction with education, achievement of learning goals by using the smartphone application.

2 Methods

2.1 Study Design

This study used a secondary analysis study to develop and evaluate applying smartphone application for promoting the use of evidence-based practice guidelines.

2.2 Setting and Sample

The study was conducted over five months from August to December 2014. Subjects included 60 nurses who managed laparoscopic surgery for patients in obstetrics and gynecology.

2.3 Ethical Considerations

All procedures were approved by the Institutional Review Board of the university hospital with which the author was affiliated. It was clearly stated in the written consent form that participation was voluntary and that subjects could withdraw from the study at any time. Subjects provided written informed consent after listening to a description of the study purpose and methods of ethical protection of research subjects.

2.4 Measurement

In terms of reactions to the program, utilizing frequency was calculated based on the average number who participated, hours connected for the quiz, number of times recorded programs were accessed on the administrator screen, connection time, and the number of quizzes completed. In order to investigate satisfaction with the program, we used four items from Nguyen’s [10] Satisfaction Questionnaire-8 (CSQ-8). Each
item was measured on a 5-point Likert scale, with high scores indicating high satisfaction. The reliability of the tool (Cronbach’s alpha) was .92.

3 Results

This study was carried out as part of a user needs analysis, and the design, development, and testing of a common process, in compliance with the Agile development methodology by Beck and Kent.

3.1 User Needs Analysis

First, a learner and environmental analysis was performed to develop the evidence-based nursing practice guidelines application. With respect to the learner, we reviewed problems and demands of 27 nurses using a Web-based evidence-based nursing practice guidelines application developed for surgery patients in 2011. All 27 nurses were not be able to directly check for recommendations of the web-based evidence-based nursing clinical practice guidelines in the field, as it was cumbersome to use the Internet. Nurses also complained of restrictions in terms of having to carry around training materials for recommendations for each of the interventions separately. Thus, the development of an app allowed them to take advantage of educational content more easily, compared to traditional evidence-based nursing practice educational materials.

3.2 System Design

The site configuration maps and storyboards for the system design phase were prepared, and then modified and supplemented in each category according to the user requirements analysis. The initial screen of the application obtained consent from the user of the learning program. Next, a list was presented with basic and practical learning objectives. Basic learning objectives included six items pertaining to evidence-based nursing practice guidelines and evidence-based nursing educational content: the definition of evidence-based nursing, background and necessity, evolution, stages of evidence-based nursing, evidence-based nursing theories and models, evidence-based nursing cases, evidence-based nursing practice guidelines, development process, and practical applications, it is able to see the pain, nausea, vomiting, and temperature management guideline information.

3.3 System Development

The advantages of the Android platform are that developers can access it freely, regardless of the capabilities of the terminal at the time of development and deployment, and it can be commercialized in a variety of formats.
The development environment was based on Android, because of the noted benefits. First, we installed the Java SE Development Kit (JDK) 7, and then installed the Android SDK 4.1.2. In addition, the Android Eclipse Plug-in was installed for Android SDK 4.1.2. Finally, we ran the Eclipse to set up the Android SDK to Android 4.1.2.

Evidence-based nursing practice education guideline recommendations were investigated in terms of the effect of applying Web-based evidence-based guidelines developed in 2011. We not only reviewed current literature (evidence-based nursing textbooks, evidence-based nursing programs of study, and domestic and international research papers), but also assessed understanding and knowledge of evidence-based nursing practice among nurses in clinical practice, and the use of evidence-based nursing practice guidelines.

4 Conclusion

In this study, we developed a program that allowed the application of guidelines in accordance with need for nurses and technology development. The application was developed to apply easily in clinical setting by adding guideline, and respondents were provided with education material so that they could apply in nursing intervention for surgical patients who complained postoperative discomfort.

The overall goal was to increase the use of evidence-based nursing practice guidelines among nurses. Increased achievement of learning objectives, practical applicability, and practical benefits in terms of nursing management of nausea and vomiting were noted; however, there were no differences in practical benefits of the application. A plan to encourage participation must be instituted in order to improve application of the evidence-based nursing practice guidelines. The following are proposed based on the results of this research. First, additional studies with larger sample sizes could be conducted to improve generalizability of the results. Second, the regular curriculum and educational application could be combined and long-term effects evaluated. Third, based on this application, could be developed that is linked to the hospital’s information system and is directly usable in clinical practice.

References

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