Development and Validation of Mobile App among Student Nurses

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Abstract

The rapid growth of mobile technologies has been made but with some limitations. The present “Nchemoapp” is developed for student nurses on chemotherapy, focusing in the South Asian context. There is a need for mHealth apps in oncology nursing for student nurses as well as staff nurses. Training should be given about chemotherapy efficacy in order to improve the attitude about chemotherapy among the student nurses as well as staff nurses.

Keywords: Student nurses, Chemotherapy, Nchemoapp, South Asia

Introduction

The number of smartphone users is growing rapidly, including among healthcare professionals. There has been development of many medical applications for smartphones.¹ Health professionals as well as patients are widely using the medical applications. The use of smartphones is getting more attention in healthcare day by day.² Mobile technologies are a useful platform for the delivery of health behavior interventions.³ Mobile learning is increasingly popular among medical students and should be leveraged in promoting access and quality of medical education.⁴

Mobile Apps

Mobile apps are add-on software for handheld devices, such as smartphones and personal digital assistants (PDA). Mobile apps leverage at least one of the device’s technical features: communications interfaces (Wi-Fi, WiBro/mobile WiMAX, GSM/EDGE, and Bluetooth), audio and video processors, camera, sensors or GPS module.⁵

Advances in mobile technology have enabled a wide range of applications to be developed that can be used by people on the move. As these devices are designed to enable users to use them while mobile, the impact that the use of these devices has on the mobility of the user is a critical factor to the success or failure of the application.⁶

A systematic review was done on mobile applications in oncology: is it possible for patients and healthcare professionals to easily identify relevant tools among 539 applications related to oncology in France. The result showed lack of information about healthcare professionals’ involvement in the development process since only 36.5% of applications mentioned an obvious scientific validation. Most apps were free (72.2%) and without explicit support by the industry (94.2%). The study thus concluded that there is a need to enforce independent review of mhealth applications in oncology.⁷

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Method
Development

After content validation through the Delphi technique, “Nchemoapp” was developed based on the Android Operating System (AOS) along with various modifications during the development period. The application does not need internet connection once downloaded to the device.

“Nchemoapp”: An Innovation for Nursing Students

• The app includes instructions for the students before using it.
• After some topics, there is ‘revision questions’ button.
• The application has tables and pictures and the pictures can be zoomed. Tables representation are in such a way that the student can read text in mobile device.
• The application has evaluative test of knowledge questions and practice questions. During the evaluative test, students are not able to access the content of chemotherapy.
• The application shows a random ID and asks for unlocking password. The evaluative test remains locked until the student enters correct password provided by the researcher. The evaluation tests can only be accessed only after the entry of code number and password.
• There is a different app for unlock application. The unlock application generates the password when the random ID displayed to student is entered. The password generated only works for the device that is displaying the specific random ID.
• The application gives the scoring of both knowledge and practice questions. The test submits itself in 30 minutes. The application displays correct answer with rationales of the evaluative knowledge and practice questions.

Sections in “Nchemoapp”

Sections in “Nchemoapp” are divided into three parts. The sections included in the Nchemoapp are as follows:

Part: A

Evaluative Knowledge Questions: This part consists of 20 multiple-choice questions regarding chemotherapy, with four options for each question. Each question has a score of one mark. Maximum score is twenty (20) and minimum is zero (0). The incorrect answer shows the rationale of the answer.

Part: B

Evaluative Practice Questions: This part consists of 10 Yes/No questions regarding chemotherapy; each question has a score of one mark. Maximum score is ten (10) and minimum is zero (0). The incorrect answer shows the rationale of the answer.

Part: C

Content on Chemotherapy: This part consists of content of chemotherapy under 14 subtopics with 20 revision questions. The subtopics included in the “Nchemoapp” are as follows:

• Introduction
• Definition
• Goals of chemotherapy treatment
• Therapeutic strategies of chemotherapy
• Pharmacodynamics of chemotherapy (working of chemotherapeutic drugs)
• Classification of chemotherapeutic drugs
• Contraindications of chemotherapy
• General guidelines for administration of chemotherapeutic drugs
• Safe handling of chemotherapeutic drugs
  a. Preparation guidelines
  b. Drug administration guidelines
  c. Disposal of supplies and unused drugs
  d. Management of cytotoxic spill and extravasation
• Most important precautions for preventing errors in chemotherapy administration
• Hypersensitivity reaction and its management
• Side effects of chemotherapy with their management
• Discharge planning of chemotherapeutic patients
• Special precautions for health professionals to minimize their exposure while mixing, administering or handling chemotherapeutic drugs
Images on the Functioning of Nchemoapp

App name and icon seen in phone

Home screen of app

App for generating key i.e. password for the pin

Showing of knowledge questions with time 20 minutes

Knowledge Questions overview
Showing the correct answer of practice question

Showing rationale for the wrong answer for practice question

Sub topics for reading matter

Showing the reading matter for the sub topic introduction

INTRODUCTION
The word chemotherapy comes from two words, chemical and therapy. It literally means drug treatment. In practice it usually refers to cytotoxic agents used to systematically kill cancer cells (chemo means chemical, therapy means treatment, cytotoxic means toxic to cells/ cell death). It is the major treatment modality used for cancer treatment.
Results
The result showed majority of the students i.e. 99% had average knowledge score on chemotherapy during pretest while all of them i.e. 100% had good knowledge score during posttest on chemotherapy during pretest while all of them i.e. 100% had good practice score during posttest on chemotherapy.

Conclusion
Student nurses can use mobile app “Nchemoapp” to...
gain knowledge on chemotherapy. Result has shown improved knowledge and practice score after the mobile app intervention among the student nurses.

**Conflict of Interest:** None

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