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Research

The use of medical and drug information software programs for personal digital assistants among pharmacy students in a Malaysian pharmacy school

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Abstract

Background: The use of medical and drug information software programs for Personal Digital Assistants (PDAs) is increasing. The technological advances in recent years may have prompted this increase. Many studies have been conducted in developed countries about the use of PDAs among health care professionals and medical and pharmacy students, but similar studies in developing countries are lacking.

Objectives: To explore the use of medical software programs for PDA among pharmacy students in their clinical clerkships as well as barriers and facilitators to PDA use.

Methods: A descriptive, cross-sectional, exploratory study was conducted. A 56-item face- and content-validated, self-administered, and anonymous questionnaire was distributed to the students in the third and fourth years of a pharmacy program at the International Islamic University Malaysia (IIUM).

Results: The response rate was 84.8%. The majority of respondents reported using PDAs (64.1%) and medical/drug information software programs for PDAs (61.5%). Android was the operating system used by the majority of PDAs users (87.5%), and free download websites were the most used source for these programs (93.1%). Micromedex was the most commonly used software (66.7%). PDA cost is the major barrier to use (chosen as barrier by 77.8% of the non-users).

Conclusion: Pharmacy students use medical software programs for PDAs for many clinical tasks and the devices were perceived positively by students who do not use PDAs. The acquisition of a PDA is the major determinant of medical software PDA programs use because of the availability of free versions of these software programs.

Keywords: Drug information; PDAs; Students; Malaysia; Medical apps

Introduction

Human beings have always devised new techniques to enhance their learning, store information, and retrieve information once needed. The development of Personal Digital Assistants (PDAs), also known as handheld computers, pocket computers, and palm tops, was a big leap in that direction. Improved features like upgraded memory, speed, processor ability, touchscreens of variable sizes, and internet access render them more efficient and user-friendly. The term PDA was first used by John Scully, the chief executive officer of Apple, to describe the Newton MessagePad developed in 1992.[1] A PDA can be defined as a small mobile handheld device that provides computing

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and information storage and retrieval capabilities.[2] In 2002, the Palm Treo was released. It was a phone and PDA in one unit. Along with the BlackBerry, this was the start of combining applications with a phone commonly called "smart phone." Many types of PDAs are now available, including tablets, iPads and iPods, which share portability and ability to perform computing and information storage functions. These handheld computers with improved applications are frequently used by health care professionals for immediate access to information. For instance, PDAs are generally used by doctors and pharmacists to access drug information needed at the point of care for supporting clinical decision-making.

Many studies have been conducted in developed countries about the use of PDAs among health care professionals, medical, and pharmacy students. The contribution of PDAs in pharmacy has a positive impact on patient care.[3–5] Their use in the point-of-care for conducting drug utilization reviews, assessing patients' records, retrieval of drug information, detecting drug–drug interaction, and improving medication safety through the reduction of medication errors is a notable contribution.[3,4,6–12] The use of PDAs in health care was found to improve decision-making, save time by allowing immediate access to information, help health care professionals to work faster, and improve learning for medical students.[13] Moreover, PDA use increases the documentation of clinical intervention by pharmacists and/or pharmacist residents and reduces the burden of paper notes and shadow charts in their daily routine.[4–6,11,14,15] However, barriers related to the use of PDAs such as lesser support from their organizations, interrupted technical facilities like limited or no access to internet, and lack of motivation to use them were reported by physicians.[16] A large body of literature supports the merits and demerits of PDA among health care professionals.[3–5,8–11,14–27]

In Malaysia, there has been only one study conducted among pharmacists that reported low use of electronic references in community pharmacies.[28] We could not find any studies conducted in Malaysia about the use of PDAs among pharmacists. Despite this, during our supervision of students' clinical clerkships, which are clinical case studies in teaching hospitals as a part of their experiential learning, we noticed that students of pharmacy and other health care degree programs are frequently using PDAs. As such, a study to explore the use of PDAs and barriers and facilitators to their use among pharmacy students is necessary.

The objective of the study is to explore the use of medical/drug information software programs for PDAs among pharmacy students in their clinical clerkships.

Methods

This is a descriptive cross-sectional exploratory study. The survey instrument is a 56-item questionnaire that was developed based on previously published research by McCallum and associates and Siracuse and associates with adaptation to suit the Malaysian context and pharmacy student population.[18,29] Items included questions about various issues related to the PDAs and their medical software programs use, the characteristics of the used PDAs, and barriers and facilitators for their use. The questionnaire was composed of five sections. All respondents were required to answer the demographics and preferences for learning new technologies sections. Users of medical software programs for PDAs were required to answer questions about the use of these programs and their PDAs. Non-users of these software programs were required to answer the questions about barriers and facilitators for the use of medical software programs for PDAs. The questionnaire was subjected to face and content validity by seven pharmacy academicians. Their suggestions were incorporated into the final version of the questionnaire. As the study is exempt from approval by the Ethics Committee of the International Islamic University Malaysia (IIUM), administrative approval to conduct this study was obtained. The study population consisted of all third- and fourth-year pharmacy students at the International Islamic University Malaysia as they have clerkship rotations in the teaching hospital. In total, 206 students were involved in the study. The sample size calculated by Raosoft® sample size calculator,[30] to achieve a confidence level more than 95% and margin of error less than 5% when the response distribution is 60%, is 116. The study was conducted as a classroom survey. On a day allocated for students' clinical case presentations one in the morning and one in the afternoon, one session was chosen to distribute a self-administered anonymous questionnaire to all the attending students. This was done over separate days for third- and fourth-year students. The questionnaire forms were collected at the end of the session; no incentive was offered to the participants.

Data were coded, checked, and cleaned before being entered into SPSS version 12.0.1. (SPSS Inc., Chicago, IL). Descriptive and inferential statistics were applied; categorical data are presented as percentages and frequencies. The student *t*-test was used to test the association of a number of PDA programs used with student demographics and preferences for the method of learning new technologies. The Chi-square test was used to test the correlation between the rest of responses and respondent demographics.

Fisher's exact test was used when the number of observations in more than 20% of cells is less than five. All statistical tests were two-tailed and maintained a significance level $\alpha \leq 0.05$ and a confidence interval $\geq 95\%$.

Results

Out of 206 students from year three and year four, 138 were present at the time of study; 117 students responded to the survey (response rate of 84.8%).