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Nursing students' experience of using a personal digital assistant (PDA) in clinical practice — An intervention study

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SUMMARY

Background: A personal digital assistant (PDA) is a multifunctional information and communication tool allowing nursing students to keep up to date with expanding health related knowledge.
Objectives: This study was aimed at exploring nursing students' experience of using a PDA in clinical practice.
Method: In this intervention study, nursing students (n = 67) used PDAs during a period of 15 weeks, replied to questionnaires, and participated in focus group interviews.
Results: The PDA was found to support nursing students in clinical practice and to have the potential to be a useful tool with benefits for both the patients and for the students. The PDA was regarded as useful, and was presumed to imply increased confidence and time savings, and contribute to improved patient safety and quality of care.
Conclusions: With available mobile technology, nursing students would be able to access necessary information, independent of time and place. Therefore, it is important that stakeholders and educators facilitate the use of PDAs to support nursing students during their clinical practice, in order to prepare them for their future work, and to continuously improve the safety and quality of healthcare.

Introduction

The continuous increase of health related knowledge implies that nursing students (NSs) handle large amounts of information in their clinical practice as well as in their future work. The latest information is usually available on the Internet, but a desktop computer or a laptop is rarely easily available at patient bedside. Consequently, there is a need for applicable mobile devices which can provide access to accurate information. Mobile computing with increasingly capable, flexible, and powerful personal digital assistants (PDA) provides people on-the-go with access to anything that can be done on a desktop computer (Johnson et al., 2011).

Background

PDAs (i.e. mobile computing tools, handheld devices, handheld computers or smart phones) are small, portable, and convenient to use for fast data management, and enable users to accomplish tasks anywhere and anytime (Sarasohn-Kahn, 2010). Intervention studies have evaluated undergraduate NSs' use of PDAs during their clinical practice, and using a PDA is reported to increase self-confidence (Goldsworthy et al., 2006; Wu and Lai, 2009), to enhance their learning (Pattillo et al., 2007; Farrell and Rose, 2008; Koeniger-Donohue, 2008; Wu and Lai, 2009; George et al., 2010; Secco et al., 2010; Hudson and Buell, 2011), and to integrate more theories into practice (Wu and Lai, 2009). The PDA is time saving (Guillot and Pryor, 2007; Pattillo et al., 2007; Koeniger-Donohue, 2008; Wu and Lai, 2009; Secco et al., 2010), and making NSs more organized and/or efficient (Goldsworthy et al., 2006; Pattillo et al., 2007; George et al., 2010). The PDA might improve quality in nursing care and promote relatives' involvement in sharing information (Guillot and Pryor, 2007).

In summary, PDAs have been found to be supportive for NSs, enhanced learning, increased effectiveness and saved time. Although, in Sweden PDAs are rarely used in nursing practice and not in nursing education. There are numerous information and medical software applications available but few are adjusted for technical, statutory, cultural, and language country-specific conditions, and not especially developed for nursing. Thus far, desktop computers or laptops are available at wards and healthcare units. To motivate the implementation and take advantage of the fast developing technology based on new PDAs, the end users' needs and attitudes must be taken into account. Therefore, this study aimed at exploring nursing students' experience of using a PDA in clinical practice.

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Method

Study Design

In this intervention study, at a university in southern Sweden, NSs were supplied with PDAs during their clinical practice. This study was carried out during three final semesters of three consecutive undergraduate nursing degree programs. The NSs (n = 120) were provided information about the study and 67 NSs, who volunteered were randomly selected from the three final semesters, (n = 20, n = 22, n = 25) respectively, to correspond with the available number of PDAs. The NSs' clinical rotation, a total of 15 weeks, took place in non-institutional or institutional psychiatric care for children or adults, in rural district health services in sheltered accommodations or in patients' home, and in the university healthcare center run by NSs; and each rotation lasted five weeks at each location. All NSs participated in an introduction (3 h) and received the PDA together with technical training. Technical support was provided by the first author.

The PDA (a Palm TX) contained pharmaceutical and medical resources freely downloaded from the Internet. These resources included FASS (an encyclopedia with information about the medicines that have marketing authorization in Sweden), Med Calc (a medical calculator, not adjusted for Swedish nursing), guidelines/techniques for treatment (e.g. pain relief, elderly care, test instructions and reference intervals), and acts and regulations for nursing. In addition, the PDA contained the usual functions, such as a word processing program, a calculator and calendar, and one could enter and download own's notes and documents into the PDA. Patient data that may reveal the patient's identity were not allowed to be stored in the device.

Data Collection

The NSs answered a questionnaire before and after their clinical practice, and they were interviewed in focus groups after the post-questionnaire.

The questionnaires were developed for this study. The pre-questionnaire included demographic characteristics and questions concerning the NSs' experience of having access to information and various tools in clinical practice prior to the study (Table 1). The post-questionnaire included four-point-scaled (Table 2), dichotomized (Table 3), and open-ended questions (Table 4), inspired from our previous research (accepted).

The NSs (n = 39), from the first two semesters, were divided into seven focus groups (Kitzinger, 1995), and were interviewed at the university by two of the authors (PJ and GN). The interviews lasting 30–50 min, were recorded, and transcribed verbatim. The interviews began by asking 'If you have a PDA when starting to work as a nurse, what information and functions should the PDA contain to be as useful as possible in your work?', followed by probing questions, e.g. 'In what situations?', 'What are the advantages and disadvantages?' and 'Can you explain further?'

Data Analysis

Descriptive statistics were applied. The data were analyzed using Statistical Package for the Social Sciences (SPSS) version 18.0 for Windows (SPSS Inc., Chicago, IL). The results from the four-point-scales (Totally disagree = 1; Partly disagree = 2; Partly agree = 3; Totally agree = 4) and the dichotomized questions are presented in the text as 'disagree' (grades 1–2/No) and 'agree' (grades 3–4/Yes); in tables, frequencies (n), median (possible variation = 1–4), and total score for each question (possible variation = 58–232) are presented. The open-ended answers were sorted according to convenient categories emerging from the focus group interviews. Three NSs did not respond (all three from the second semester) and six post-questionnaires were excluded because of internal missing data, yielding a response rate of 87% (n = 58).

Table 1
Nursing students' (n = 58) demographic data.

Age, mean (SD)	27.3 (7.2)
Range, year	21–50
Gender, n (%)	
Male	13 (22)
Female	45 (78)
Estimated computer skills level, n (%)[a]	
Very good	6 (10)
Fairly good	29 (51)
Intermediate	21 (37)
Fairly poor	1 (2)
Very poor	0 (0)
Used a PDA prior to this study, n (%)	
Yes	1 (2)
No	57 (98)
Worked in healthcare before the undergraduate nursing degree programs began, n (%)[a]	
Yes	41 (72)
No	16 (28)
Do you feel that there is sufficient information available to perform your duties in a satisfying way? n (%)	
Always	1 (2)
Frequently	46 (79)
Occasionally	11 (19)
Never	0 (0)
Do you feel that the handling of your personal notes is reliable? n (%)	
Yes	28 (48)
No	30 (52)
Do you feel secure in the manner you carry out calculations of medicines? n (%)[a]	
Yes	42 (74)
No	15 (26)

Note:
PDA = personal digital assistant.
[a] Missing participant (n = 1).

The data from the focus group interviews were analyzed by content analysis method (Berg, 2007) by the first author. The data were read and reread to gain an overall understanding of the content. The next step was entailed identifying meaning units and grouping them into categories; finally, the meaning units were coded and organized into subcategories (Table 5). During the analysis process, the categories were refined by moving back and forth between the text

Table 2
The nursing students' (n = 58) experience of using a PDA in clinical practice from the four-point-scales.

	Totally disagree (n)	Partly disagree (n)	Partly agree (n)	Totally agree (n)	md	Total score[a]
1. The PDA is useful in my clinical practice.	2	10	39	7	3	167
2. The PDA gives me a higher degree of confidence in my clinical practice.	2	11	33	12	3	171
3. The PDA might help to increase the quality of care.	0	11	38	9	3	172
4. The PDA might help to increase patient safety.	0	14	34	10	3	170
5. The PDA might help to save time.	4	18	27	9	3	157
6. The PDA makes it easier to manage my own notes.	5	15	29	9	3	158
7. The PDA makes it easier to carry out calculations of medicines.	3	16	27	12	3	164

Note:
PDA = personal digital assistant.
Totally disagree = 1; Partly disagree = 2; Partly agree = 3; Totally agree = 4.
md = median (possible variation = 1–4).
[a] Total score for each question = 58–232.