Original Article

A Qualitative Evaluation of the Knowledge Levels of Nurses Regarding Informatics and Health Informatics: The Case of Atatürk Training and Research Hospital

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Abstract

Aim: to examine the information technology and information management systems use of nurses working at Ankara Atatürk Training and Research Hospital.

Method: A qualitative research with purposeful sampling method was used. 31 of 430 nurses working at Ankara Atatürk Training and Research Hospital between 15th of December 2010 and 10th of January 2011 participated in the study. Nurse Interview Form was prepared to collect data. Interviews were tape recorded, transcribed, and classified thematically. Data were analyzed through content analysis and the analysis yielded four main themes: "computer use, access, and obstacles", "use of information technology and its necessity for nurses", "health information systems", and "education for information technology".

Results: Regarding computer use level, 25.81% of the nurses said, "sufficient"; 45.18% said, "medium"; and 29.03% said, "slightly sufficient". As to the programs used, 12.90% of the nurses used "Hospital Information Management System (HIMS) and the Internet"; 74.19% used "HIMS and at least two programs"; and 6.45% used "MS Word, Excel, PowerPoint, and the Internet apart from HIMS". A great majority of the nurses think that computer use in work brings benefits. However, they think that computer use is currently limited due to lack of education, lack of computer, Internet access problems, and workload.

Recommendations: Medical establishments should firstly focus on lack of education about the use of information technology among nurses. In addition, they should urgently deal with problems such as workload, the number of computers, Internet access, and technical support. Moreover, nursing training institutions should ascertain their deficiencies and rearrange their curricula.

Key Words: Nursing, informatics, information technology, qualitative study

Introduction

Most health systems today emphasize 'best practice' in an effort to improve overall performance in terms of organizational efficiency and effectiveness (Commonwealth of Australia, 1999). Of particular interest are outcomes. This requires the optimum use of information and communication technologies (Hovenga, 1998).

Since the 1980s the role of Information and Communication Technologies (ICT) in nursing practice has been growing. For most nurses the use of ICT has received a renewed impetus through the introduction of electronic patient records and other institutional and clinical resources that require the use of the ward computer or other digital device. While it may now be true to observe that, 'it is increasingly difficult to practice modern medicine without information technologies' (Shortliffe & Perreault, 1990) the ubiquitous place of such technology within nursing is relatively new (Smedley, 2005).

The evaluation of information technology (IT) in nursing is relevant due to the rapid implementation of IT systems in healthcare. Nevertheless, such evaluation can be considered to be in its early stages. Limited insight has been developed and many relevant questions for effective design and implementation remain unanswered (Oroviogoicoechea, Elliott, & Watson, 2008).

Investment in IT is significant and, to guarantee effectiveness, evaluation is crucial. One of the main problems identified in the literature in relation to the utility of IT systems is the lack of adaptation to workflow and, therefore, IT systems not being clinically relevant, but being designed for legal or management purposes (Urquhart & Currell, 2005). Patient care should be the main aim of an IT system, it has to be clinically relevant and adapted to workflow. Healthcare organizations should consider clinicians' input to IT development or adaptation (Bostrom, et al., 2006). This approach resembles the paradigm change in evaluation of IT systems from a technical to a socio-technical approach, where users and context become key aspects in evaluation (Berg, 2001, Oroviogoicoechea & Watson, 2009).

In a communication-rich workspace such as a medical environment, it is important for communication to be executed efficiently and accurately. There is a documented need for studying and understanding communication among physicians and nurses in the clinical setting (Edwards, et al., 2009). Barriers that include poor organizational support, lack of training and the inadequate provision of ICT for nurses have been identified (Frantz, 2001) (Turner & Stavri, 2003).

In addition, the information needs of nurses tend to be neglected as new ICT systems are introduced that prioritize institutional and medical requirements. It has also been argued that in order to increase the use of ICT and the Internet amongst nurses it is necessary to ensure that 'the intellectual (thinking) aspects of nursing practice [are] valued as much as the physical (doing) aspects of nursing practice '(Estabrooks, O'Leary, Ricker, & Humphrey, 2003) In summary, existing research suggests that the integration of ICT within nursing practice demands technological, organization and professional innovations(Gosling, Westbrook, & Coiera, 2003, Mitchell, et al., 2009).

Nurses must exploit information technology, especially clinical technology, to function in contemporary health care settings worldwide. Information technology has the potential to facilitate nursing care delivery by increasing time spent in direct patient care(Chaudhry, 2006) (Hoo & Parisi, 2005), improving decision making, reducing duplicate work, decreasing error (Kaushal, Shojania, & Bates, 2003) (Mekhjian & et al., 2002), and minimizing time spent on documentation(Chaudhry, 2006). The fact is that nurses in all specialties and roles must have the knowledge and skills to use information technology (Foster & Bryce, 2009) (Association, 2008). Informatics competencies are a global imperative for nurses.

Australian nurses reported on a national effort to create information technology and information management competencies for nurses (Foster & Bryce, 2009). Development methods were described at a conference in June 2009 (Foster & Bryce, 2009); however, the results are not yet available. Hart completed a systematic review of existing informatics competencies in 2008(Hart, 2008), recommending that administrators shift from competencies creation to implementing existing competencies in work settings (Staggers, Gassert, & Curran, 2002).

In 2009, nursing graduates at one U.S. institution reported moderate information technology skills with their priority educational need identified as exposure to the latest informatics systems (Fetter, 2009). Most recently, IMIA (International Medical Informatics Association) released a set of educational guidelines for informatics professionals in early 2010.

Nurses form a very significant part of the health care workforce. A very large percentage (varying from 40 to 70% for different kind of hospitals, see e.g. of acute hospital budgets are consumed by nursing services and it is increasingly difficult to meet nursing workforce demands (Sermeus &

Goossens, 2000) (Australian Institute of Health and Welfare, 2004). Specific nursing informatics projects exist (e.g. the EU-funded Wisecare project which established Workflow Information Systems for European Nursing Care) (Sermeus, Kearney, Kinnunen, Goossens, & Miller, 2000). However, most 'health' projects focus on medicine and neglect nursing needs. For example, in the USA, a National Health Information Network (formerly: Infrastructure) is being developed (Harris, Chute, Harvell, & Moore, 2003).

While this approach is comprehensive from a medical point of view, it does not yet sufficiently cover nursing needs. In Turkey, on the other hand, e-health projects of the Ministry of Health aim to make an effective use of the advantages provided by information and communication technologies in the delivery of healthcare services. In this context, it becomes very clear that nurses have a significant role in health informatics.

More generally, nurses increasingly use information technology (IT), and some also deploy, research or develop health care IT. Consequently, they need to be adequately educated for their roles in health informatics. For these reasons, Garde and friends developed a questionnaire to survey nurses on the preferred knowledge/skills set for health informatics professionals to ascertain their individual perceptions of needs and priorities.

Thus, they can ensure their remain relevant and current in the content and delivery of such education and training and simultaneously provide the foundation for the development of comprehensive health informatics education (Garde, Harrison, & Hovenga, 2005).

Method

Selection of the Participants

Purposeful sampling method was employed in the study. The aim here is to create a relatively smaller sample and reflect the diversity of individuals who may be a party to the problem in this sample at the highest level (Yıldırım & Şimşek, 2008). To this end, an attempt was made to provide diversity on the basis of unit/department, position in establishment, total working years, working order, educational status, age, gender, and marital status. In this regard, 31 of 430 nurses working at Ankara Atatürk Training and Research Hospital between the 15th of December 2010 and the 10th of January 2011 participated in the study.

Data Collection

Data were collected via semi-structured interview technique, which is a qualitative research method. In this technique, the researcher prepares the interview form containing the questions s/he intends to ask beforehand. However, s/he may affect the course of the interview and enable the interviewee to explicate and elaborate on his/her responses by asking additional questions or sub-questions to him/her (Türnüklü, 2000). In this regard, the Nurse Interview Form was prepared and finalized based on expert opinions. In addition, a pre-interview was conducted to evaluate the form. This form consists of demographic characteristics and 23 questions prepared in accordance with the purpose. Since the interviews would last 30 to 40 minutes in average, interview hours were planned before in order not to affect the working processes of the nurses negatively. Prior to the start of the interviews, preliminary information was given, and permission was obtained from the nurses for tape recording. Available rooms in the clinic were used to ensure confidentiality. The nurses gave sincere responses during the interviews. The interviews were tape recorded via a tape-recorder. In general, the interviewer did not go beyond the determined questions, but asked clarifying questions when required.

Analysis

Data were analyzed through content analysis, which is a qualitative analysis technique. Based on audit trail aimed at increasing validity and reliability in qualitative research, all steps of peer review were implemented (Twycross & Shields, 2005). The tape recorded data were transcribed. Firstly sub-themes and then main themes were obtained through content analysis of the transcriptions. The acquired results were compared with the original texts obtained from the participants. The reasons for the comments made and the obtained data were reviewed by the researchers who were specialized in their fields and worked in different fields. Data type and amount were studied by the specialized and non-specialized researchers.

Results

This section presents the demographic characteristics of the participants. Then domains determined though data analysis are addressed under four main titles: "computer use, access, and obstacles", "use of information technology and its necessity for nurses", "health information systems", and "education for information technology". The demographic characteristics of the nurses participating in the study are indicated in Table 1. Participants are given numbers from 1 to 31.

Computer Use, Access, and Obstacles

In response to the question asking computer use level, 25.81% of the nurses said, "sufficient"; 45.18% said, "medium"; and 29.03% said, "slightly sufficient".

Table 1.   Demographic Characteristics

Nurse	Age	Gender	Marital status	Educational status	Unit/department	Position in establishment	Total working years	Working order
1	36	Female	Married	Bachelor's degree	Polyclinics	Polyclinic nurse	18	Daytime working
2	31	Female	Married	Vocational school of	Surgery	Department nurse	10	Shift
3	21	Female	Single	Vocational school of	Internal diseases	Department nurse	1.5	Shift
4	41	Female	Married	Associate degree	Internal diseases	Responsible department	22	Daytime working
5	29	Female	Single	Vocational school of	Internal diseases	Department nurse	12	Shift
6	33	Female	Married	Associate degree	Surgery	Responsible department	16	Daytime working
7	34	Female	Married	Associate degree	Surgery	Responsible department	7	Daytime working
8	35	Female	Married	Associate degree	Chemotherapy unit	Responsible department	14	Daytime working
9	42	Female	Single	Bachelor's degree	Surgery	Department nurse	24	Daytime working
10	40	Female	Married	Associate degree	Internal diseases	Responsible department	20	Daytime working
11	36	Female	Married	Bachelor's degree	Surgery	Responsible department	17	Daytime working
12	33	Female	Married	Bachelor's degree	Internal diseases	Responsible department	10	Daytime working
13	31	Male	Married	Vocational school of	Intensive care	Responsible department	13	Daytime working
14	36	Female	Married	Associate degree	Internal diseases	Department nurse	18	Daytime working
15	30	Female	Married	Associate degree	Surgery	Department nurse	9	Shift
16	33	Female	Married	Associate degree	Training	In-service training nurse	15	Daytime working

17	32	Female	Married	Associate degree	Surgery	Department nurse	13	Shift
18	33	Female	Married	Bachelor's degree	Internal diseases	Responsible department	13	Daytime working
19	28	Female	Married	Bachelor's degree	Surgery	Department nurse	7	Shift
20	38	Female	Single	Associate degree	Surgery	Department nurse	20	Shift
21	34	Female	Married	Associate degree	Quality unit	Quality unit nurse	15	Daytime working
22	37	Female	Single	Associate degree	Internal diseases	Responsible department	20	Daytime working
23	23	Female	Single	Vocational school of	Emergency	Department nurse	4,5	Daytime working
24	34	Female	Married	Associate degree	Home care	Home care	8	Daytime working
25	35	Female	Married	Bachelor's degree	Head nursing	Deputy head nurse	10	Daytime working
26	32	Male	Single	Associate degree	Intensive care	Department nurse	3.5	Shift
27	31	Male	Single	Vocational school of	Surgery	Department nurse	15	Shift
28	32	Male	Married	Vocational school of health	Emergency	Department nurse	14	Daytime working
29	34	Female	Married	Associate degree	Internal diseases	Department nurse	15	Daytime working
30	35	Female	Married	Associate degree	Surgery	Department nurse	15	Shift
31	35	Female	Single	Associate degree	Infection control nursing	Infection control nurse	17	Daytime working

As to the programs used, 12.90% of the nurses used "Hospital Information Management System (HIMS) and the Internet"; 74.19% used "HIMS and at least two programs"; and 6.45% used "MS Word, Excel, PowerPoint, and the Internet apart from HIMS".

The main theme "computer use, access, and obstacles" had the following sub-themes:

"the benefits of computer use in work";

"place of computer use for work purposes; purposes and causes of computer use at home for work purposes";

"factors constraining computer use"; and

"receiving technical support".

The benefits of computer use in work

The nurses think that the most important benefits of computer use in work are facilitating their work and saving time. Computers are also considered important for accessing the information, providing complete and correct documents, and preventing mistakes. Additionally, while two nurses think that it makes economic contribution, two nurses think that it brings no benefit.

"We save both time and labor." (28) "Recording information allows archiving and accessing it. In this way, data loss is prevented." (6)

"It prevents mistaking patients. This is because; the Republic of Turkey identity number, patient file number, birth date, and birth year are all separately kept in computer. Thus, possibility of mistaking is minimized." (9)

Place of computer use for work purposes; purposes and causes of computer use at home for work purposes

The nurses mostly use computer for work purposes in their workplace. However, some nurses use it at home for training, research, data entry, and calculation because of lack of time, workload, limited number of computers, and limitedness of the Internet. Some statements of the nurses are as follows:

"We regularly use computer for our works in our workplace every day. I use computer for my work only in our workplace." (21)

"... we enter data at home, too. If a presentation must be prepared for a meeting, I sometimes use computer at home due to limitedness of time in the workplace. This is because; it is easier to use it at home with an open mind." (31)

Factors constraining computer use

The statements of the nurses indicate that main factors constraining computer use are lack of training, lack of computer or old computers, and limited Internet access. Another important reason is workload. On the other hand, some nurses think that there is no constraining factor.

"Lack of computer, lack of training, workload." (6)

"I really have some colleagues who do not know how to use computer. Nurses may be provided with basic computer training. Problems may be experienced as computers are old. Computers are not compatible with programs." (17)

"However, if there are not sufficient employees and there is workload, we may not have time to work on computer. When we have something to do on computer or when we have to do research, we may not use computer before we finish our daily works." (8)

Receiving technical support

The nurses mostly said that they received enough technical support. However, some nurses noted that they had problems because of lack of material, lack of personnel, or lack of training among employees. In addition, some nurses mentioned that support provided at night and weekends involved more problems in comparison to the support provided during the daytime.

Use of Information Technology and Its Necessity for Nurses

The main theme "use of information technology and its necessity for nurses" had the following sub-themes: "intended uses of information technology in nursing functions; recommended usage areas of information technology"; "necessity of having skill of using information technology for nurses"; "the importance of using information technology for nurses; reasons for not being good at using information technology; steps to be taken for generalizing the use of information technology".

Intended uses of information technology in nursing functions; recommended usage areas of information technology

Though the nurses mostly use information technology for clinical purposes, it is also used for research, patient management, communication, management, and training purposes. Use for clinical purposes involves request, medicine and examination follow-up, etc. while use for patient management purposes involves reaching patient details such as hospitalization status, treatment status, and diet program.

Some nurses stated recordkeeping, making statistical calculations, and in-house correspondence as intended uses. One of the clinic nurses said that they did not use it for purposes other than printing barcodes and following results and that the responsible nurse used it for demanding materials.

Most of the nurses noted that nursing records that were currently kept on paper could be kept on computer. Some of the nurses said that usage of HIMS (Hospital Information Management System) should be increased based on relevant functions. Some nurses recommended using for training and communication purposes. Additionally, one nurse recommended using triage system while another nurse recommended using a system allowing monitoring nursing processes and approaches among all hospitals.

"We generally use computer for keeping and reaching particular records of patients. In addition, in every unit, it is used in monthly statistical works or for replying the correspondence. There is in-house correspondence. It may be used for this purpose." (28)

"Doctor's demands may be sent over the computer, and we may check our nursing observations, time, etc. over it. In this way, there will not be need for paper anymore. Handheld computers may be used next to patients, too."(9)

"Information technology may be used for communication purposes. For example, when we transfer the patients in our department to other departments or when we have patients in other departments, I can send messages explaining the situation of patients just like the epicrisis written by doctors. In this way, I do not lose time by trying to establish communication by phone." (17)

Necessity of having skill of using information technology for nurses

All the nurses stated that they should have the skill of using information technology. Most nurses said that they should definitely have the skill of using it. The nurses generally consider the skill of using information technology a necessity of our age. Some nurses said again that they needed training to use information technology.

"Yes, absolutely. We are now in technology age. Everything is in the computer environment. Access to information has increased a lot..." (18)

"Nurses must definitely have it. Indeed, being a nurse means dynamism. I think a nurse must be good at information technology in the first place because nursing is a profession which requires

being very active, following innovations continuously, and generating solutions"(21).

The importance of using information technology for nurses; reasons for not being good at using information technology; steps to be taken for generalizing the use of information technology

The nurses regard having the skill of using information technology as a necessity for both their profession and their career and consider it important in that it makes their work easier and provides advantages. The view of a nurse on this subject is as follows:

"I think it is a big advantage. It would be more beneficial if we had learned it much earlier and more comprehensively. It will definitely provide advantages." (15)

Some nurses emphasize that those nurses who can use information technology well are preferred more. In addition, two nurses stated that using information technology provides individuals with a sense of confidence. On the other hand, one of the nurses does not consider using computer well an advantage, but thinks it will only contribute to personal development.

Although the nurses attach importance to using information technology, all the nurses except for one said that they were not good at using it. They mostly attributed it to lack of training. Some nurses, on the other hand, said that lack of interest in computer among their colleagues was influential on this situation.

According to the nurses, problems about computers, packages, and workload are also prominent. Some other problems stated by the nurses are lack of institutional support, unclear job descriptions, lack of nurse, and keeping the same records both on paper and on computer.

"Lack of foundation… The use of information technology has been actively used in healthcare system in the last 5 years. It is used without enough attention and importance attached to it. Getting and putting the computer somewhere is not enough. If they give computers to employees, they should train them, too." (27)

"...does everybody equally use technology at the desired level now? No." (10)

".. .I think we lack knowledge. Other problems are workload, lack of computer, and lack of time." (6)

A great majority of the nurses recommend training to generalize the use of information technology. Some nurses think that ease of use and advantages of computers should be explained in such

trainings. Some other recommendations of the nurses are providing institutional support along with training, providing spaces for nurses in HIMS program, and increasing the number of computers and the Internet access. While two nurses recommended using computer rather than paper works, one nurse stated that there should be an association of nurses. Another nurse noted that the job descriptions of nurses should be clarified. There were also nurses saying that nurses should be willing to use computer.

Some views of the nurses are given below.

"Establishments should provide training on this subject. This is because; we have to spend a lot of time to receive personal training. Training may be provided by allocating at least one or two hours during working hours. Establishments should provide support on this subject." (12)

"Training may be provided. How it can make things easier may be explained. Our spaces and authorities in HIMS may be increased." (2)

"I think individual solution is curiosity and effort. Institutional solution, on the other hand, is understanding and incorporation of employees in the system." (27)

Health Information Systems

The main theme "health information systems" had the following sub-themes:

"HIMS modules used; having difficulty in using HIMS; information about information technology systems";

"national electronic health record initiatives and their place in health care services"; and "information on e-health works".

Hims modules used; having difficulty in using hims; information about information technology systems

The nurses mostly use HIMS in clinic-, polyclinic-, and material-related processes. Most nurses said that they experienced problems while using it. However, more than half of them stated that problems were not serious. In general, the problems expressed by the nurses are as follows: the program is too slow; the program is opening too slowly; the structure and/or functionality of the program are not enough; the program causes loss of time. Moreover, the nurses noted that partial information on the use of the program was provided through training meetings, phone, or the system.

"We can enter material processes. We can enter clinic and polyclinic operations. We can use many

sub-steps of these modules such as seeing patients' list." (6)

"I think HIMS is a too slow program...(25)

"Sometimes modules are changing, undergoing revision. We're having trouble in the adaptation stage in such cases. Other than that, we do not have much trouble. We communicate by phone if we have trouble. They are helping us."(9)

National electronic health record initiatives and their place in health care services

The nurses gave a wide variety of responses to the question about national electronic health record initiatives and their place in health care services.

Most of the nurses think that these initiatives will facilitate reaching the information and reduce unnecessary examinations. Some other views of the nurses on this subject are as follows: they will reduce mistakes; they will provide establishments with cost advantages; they will prevent patients from suffering from duplicate work; they will prevent labor loss; they will accelerate work; they will increase the security of hospitals; they will make health statistics possible; they will provide nurses with convenience in diagnosis; they will allow keeping information for a long time; they will provide the Ministry of Health with capability to audit and monitor; and they are important for the vision and mission of the Ministry of Health.

The nurses think that these initiatives have a lot of advantages. Three nurses stressed that information security infrastructure should be provided while two nurses highlighted that they should work in an integrated way with other governmental institutions.

Information on e-health works

A great majority of the nurses said that they did not have enough information on e-health works. The most known project was seen to be "Family Practice Information System".

Some nurses also mentioned "Health net", "Central Hospital Appointment System", "The Ministry of Health Communication Center", "Telemedicine", and "Human Resources Management System (HRMS)."

Education for Information Technology

Most of the nurses noted that they had received information technology training during their nursing education, but it had been inadequate. Many nurses said that they had learned to use computer by themselves. Some nurses emphasized that there was an inconsistency between training received at school and professional life. Some

nurses, however, received no training on this subject.

The nurses stated that they would not be able to receive training due to lack of time even if they wanted to do. Irregular working hours, financial problems, lack of interest, and family-related reasons prevent them from undergoing training.

"Above all, time! I have had no financial trouble, but I think the establishment should support. There should be institutional support." (12)

"I sometimes have constraints because my working hours are changeable." (19)

The nurses said that if they could receive training, they could save time and labor in their work; mistakes would decrease; records would be kept correctly; and sense of self-confidence would increase.

"Access to information would increase. We would save time. It would contribute to the personal development of nurses." (20)

"It would allow providing proper data for the national electronic health records that are intended to be implemented in the future. A true path to the purpose would be followed." (17)

Some nurses noted that they wanted to receive information technology training and expected institutional support for that. The question, "Would you like to receive health informatics education in a university?" was addressed to the nurses. It was observed that most of the nurses were not aware of such education. The nurses who were informed on this subject found health informatics education necessary and good.

"Health informatics will have a particular position in medical establishments. It is not satisfactory now, but it will have a different dimension in the future. It is a very good department." (19)

"I have not heard of health information graduate study … I think it may be very beneficial for both my profession and health care services." (20)

Discussion

Today, health organization in Turkey is going through a very serious change and regeneration process. That has gained momentum with e-health process and become a driving force for nurses to use information and communication technologies effectively. The present study provided comprehensive and in-depth information about nurses' use of information technology and aimed to investigate the problems experienced by them and make positive contributions to the process.

A great majority of the nurses participating in the study think that use of computer in work-related activities brings benefits. The nurses use information technology for demanding materials, following up medicine and examinations, learning diet programs as well as hospitalization and treatment statuses, monitoring patients, keeping records, researching, making statistical calculations, communicating, and so on. Moreover, all the nurses consider having the skill of using information technology a necessity.

However, according to the nurses, they do not have this skill enough because of lack of training, lack of computer, Internet access problems, and workload. Gül et al. (2004) concluded that nurses cannot use technology enough because of lack of computer and Internet access in clinics and lack of knowledge(Gül & Teke Gençtürk, 2004). Lee carried out a qualitative study in 2005 and determined that nurses get behind in care plans or work overtime because of lack of computer (Lee, 2005).

Since nurses were not incorporated in decision-making mechanisms regarding the selection and use of information systems or technology until quite recently, old systems in hospitals did not meet nursing needs (Ball, Hannah, Newbold, & Doughlas, 2000). The nurses participating in the present study think that nursing records that are kept on paper may be kept on computer and that nursing records are not included in HIMS completely. According to Ay, as the forms used in hospitals cannot be transferred to computer environment, computers cannot be used to the purpose; however, computer systems used in a lot of health care establishments have brought about a revolution in patients' records and nursing reports (Ay, 2009).

The present study also focused on health information systems and works related to e-health process in Turkey. All of the nurses participating in the study attach importance to national electronic health record initiatives and consider them necessary. It can be said that these systems may be used for health care services very efficiently if necessary infrastructure and information security are provided. On the other hand, almost half of the nurses have limited or no knowledge about e-health works. That shows that a change is needed in the promotion of health information technology initiatives.

A great majority of the nurses participating in the present study (80.65%) said that providing training would generalize the use of information technology. Erdemir et al. (2005) found out that 86.7% of nurses need training on computer use.

It is clear that the findings of these two studies are similar. In addition, the findings of the present study indicate that most nurses cannot receive training because of lack of time though they want to do, and irregular working hours, financial problems, lack of interest, and family-related reasons are other factors preventing them from receiving training. That lays an important responsibility on medical establishments.

Though the nurses have self-confidence in computer use to a certain degree, there is no success in evidence-based practices due to lack of training and support. Even if training is provided by employers to solve this problem, it will not be possible for nurses to make use of this training until workload and time allocation problems are solved. It is also recommended that management include nurses in decision-making processes about the adoption of computer use by nurses(Hegney, et al., 2006).

While Hegney et al. (2006) detected quite high self-confidence in computer use among nurses, the nurses participating in the present study did not have so much self-confidence. However, whether or not nurses are self-confident, lack of training is the most important factor constraining computer use among nurses in both studies. Workload and some other problems also prevent the solution of problems.

Moreover, it is noteworthy that though they underwent information technology training during their nursing education, most nurses participating in the present study found information technology training inadequate, made mention of need for training at every opportunity, and noted that there is an inconsistency between education and professional life. Aştı et al. (2008) determined that 63.7% of the nurses working in a university hospital found computer training they had received in various courses or during formal education inadequate (Kaya, Astı, Kaya, & Kaçar, 2008). Jehoda (2009) aimed to realize the current situation of the integration of informatics into basic nursing curriculum, so reviewed research-based articles published in English through electronic databases, and ascertained that information and computer literacy is of critical importance for the future of nursing, and nursing programs should integrate complex informatics with competency content in their curricula in order to prepare nurses for the future (Jehoda, 2009).

It is really frustrating that when the question, "Would you like to receive health informatics education in a university?" was addressed to the nurses, it was seen that most of the nurses were not aware of this training. However, it is promising that the nurses who were informed on this subject deemed health informatics training necessary and good.

It is an important finding for the development of nursing informatics in Turkey that some participants stated that they would like to receive education in this field. According to Ball et al. (2000), nurses of new millennium who will reinforce their traditional positions at the center of patient care will play a key role in using health informatics and presenting and interpreting information. As population increases and health care becomes evidence-based, nursing informatics will continue to be the meeting point of care and technology and take us to the "better health for all" vision of the World Health Organization (Ball, Hannah, Newbold, & Doughlas, 2000).

When the nurses' information technology use, the problems they encounter, and their solution suggestions for such problems are considered based on the findings of the present study, it is clearly seen that they need serious support on the use of this technology.

Medical establishments should firstly focus on lack of training and urgently deal with problems such as workload, the number of computers, Internet access, and technical support. In addition, nurse training institutions should rearrange their curricula by determining appropriate subjects about the use of information technology as well as deficiencies in this matter. Beyond all these, nurses should not be behind the times as stated by themselves and should be willing to improve themselves.

It is not enough to equip medical establishments with new technologies in order to provide proper health care service. In addition, necessary support should be provided for health professionals to understand and use these technologies effectively.

This is a pilot study. This subject should be addressed in other training and research hospitals and university hospitals, too. Appropriate steps on the use of information technology by nurses may be taken only in this way.

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