Original Article

Nurses' Status of Using Information Systems and Opinions about the Benefits to the Profession: Example of a Country

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Abstract

Background: Today, the most prominent features of the information age are science, rapid technological developments, and globalization. It is observed that the use of information and information systems in health and the related expectations have increased rapidly along with the developments in technology.
Aim: This descriptive study was conducted to determine the nurses' status of using information systems and their opinions about their reflections on the profession.
Methods: The study was conducted with 117 nurses who were working in the public hospital in a city, were not on sick leave or on their off-days during the study, and agreed to participate in the study. The data of the study were collected by using a questionnaire prepared upon the literature review.
Results: It was determined that 56.4% of the nurses included in the study were in the age group of 30-39 years, 82.1% were female, 35.0% were working in internal medicine clinics and 50.4% had 11 years or longer working time. It was also determined that 74.4% of the nurses received education about information systems, and 51.3% found their knowledge about this matter as partially sufficient.
When the nurses' status of using information systems was examined, it was determined that they mostly used patient follow-up systems (66.7%), nurse information systems (59.8%) and patient records (52.1%) and they less used the clinical communication systems (35.1%) and clinical decision support system (23.1%).
Conclusion: It was observed that the nurses closely followed up the information technologies but they did not use hospital information systems at the desired level.

Keywords: Information technologies; hospital information systems; nursing.

Introduction

Today, the most prominent features of the information age are science, rapid technological developments, and globalization (Karasar,2004). It is observed that the use of information and information systems in health and the related expectations have increased rapidly along with the developments in technology (CNİA, 2002). These developments in technology increase the possibility of providing effective and efficient service in the field of health and provide convenience in the solution of the problems experienced (Omurbek,&Altın,2009). In addition, they facilitate the work of the healthcare professionals, especially nurses and are becoming more important in reducing errors in the practice fields (CNİA,2002; Kisa,&Kaya, 2006; Ozkul et al.,2014; Bayrak Kok, 2006).

The word information means in its most common form to process, record and store the information and provide information flow by transferring information in the easiest and fastest way via technical devices. With the increase of the use of information technologies, significant changes have taken place in the roles and work processes of healthcare professionals (Bayrak Kok, 2006).

When considering that the nursing profession focuses on promoting and protecting health and preventing diseases, it is seen that nurses are an important group practicing health informatics and using scientific and technological developments in the delivery of health care (Erdogan, 2003). In this context, for proper and effective use of developing technology, the professional members having knowledge, skill, attitude and behaviors to do necessary regulations by continuously evaluating scientific, economic, social and ethical dimensions are expected to increase the quality and efficiency of healthcare provided (Ozkul et al.,2014).

Nursing information has provided benefits in accelerating the cooperation and information sharing with the healthcare professional, preventing data loss, reducing the paper workload, standardizing nursing care plans by forming a common language and improving the quality of care with the use of information technologies (Saba, Skiba, & Bickford, 2004; Erdemir, Hanoglu,& Akman, 2005; Ay, 2009; Akca Ay, 2007; Birol, 2013; Ulas Karaahmetoglu, Kacan,&Demirarslan, 2017; Mumcu et al., 2012). It is thought that it also contributes to the decision-making abilities of nurses since it eases of providing and sharing the nursing data and knowledge and accessing to information and thus, reduces the costs (Erdemir, Hanoglu,& Akman, 2005; Mumcu et al., 2012; Demirhan, & Guler, 2011; 9, Carrington,& Tiase,2013). Information systems also provide significant benefits to healthcare services in terms of reducing human errors by facilitating detection and resolution of deficiencies in treatment and care (Demirhan,&Guler, 2011; Basar et al., 2008).

There are some studies in the literature about nursing information and determining the computer usage statuses of nurses (Isık,&Akbolat, 2010; Kose, 2012; Turhan,&Kose, 2010; Top, & Gider, 2012). In the study conducted by Isık and Akpolat (2010) with 544 healthcare professionals, they determined that the employees considered themselves competent in the use of computer hardware and hospital information systems and they were mostly able to use the hospital information system modules in their departments (Isık,&Akbolat, 2010). In the study conducted by Kose(2012) to examine the nurses' status of using computer it was determined that only 32.9% of the participants were able to use computers in a good level (Kose, 2012). It was determined in another study that information competencies of 69.2% of the nurses were below average, they received the highest scores in security and confidentiality issues and they got the lowest score in tele health subject (Hwang,& Park, 2011). In another study conducted with 1539 nurses, nurses' use of electronic registration system was examined with technology acceptance model and the use of registration system was found to increase the perceived simplicity, usefulness and the knowledge in the acceptance of technology (Tbaishat,2017).

In today when the information systems in health are rapidly spreading, the studies in the literature have revealed that there is a need for nurses who can make evidence-based decisions by using information technologies for professional healthcare. Improving the information competency of nurses requires determining the status of using information technologies. This study was conducted in order to determine the nurses' status of using information systems and their opinions on its reflections of the profession.

Methods

This descriptive study was conducted in order to determine the nurses' status of using information systems and their opinions of its reflections on the profession.

Sample and Data collection: The study was conducted with 117 nurses who were working in a public hospital located in a city, were not on sick leave or on their off-days during the study, and agreed to participate in the study (180). The data of the study were collected with a questionnaire prepared by the researcher upon the related literature review (Kisa,& Kaya, 2006; Saba, Skiba,& Bcikford, 2004; Ulas Karaahmetoglu, Kacan Softa,& Demirarslan, 2017; Basar et al., 2008; Kose, 2012). The questionnaire consisted of 10 questions including sociodemographic characteristics of the nurses and 7 questions which were 3-point Likert type including questions about their status of using the

information systems and their contributions to the profession. Likert-type questions were prepared as “I am using”, “I am not using”, “I am partially using” and “I agree”, “I disagree”, and “I partially agree”. The questionnaires were given to the nurses by going to the clinics at appropriate hours and collected after waiting them to be filled.

Ethical condideration: The study was conducted in accordance with the principles of Helsinki declaration in 2008 (World Medical Associations Declaration of Helsinki.2008). The Ethics Committee approval was obtained from Nigde University, Ethics Committee of Social and Human Sciences. In addition, nurses were informed verbally and in writing and their consent was received. Prior to conducting the main part of the study, a pilot was conducted with five nurses, and these nurses were not included in the main study.

Statistical analysis: The data were evaluated in the SPSS 22.0 statistical packaged program. Descriptive statistics containing number and percentage distribution and chi-square tests were used to assess the data. In the statistical assessment, the value of $p<0.05$ was accepted as significant.

Results

In the study, it was determined that 56.4% of the nurses were in the age group of 30-39 years (mean age of 33.35±7.08), 82.1% were female, 78.6% were married, 54.6% had a bachelor’s degree, 35.0% were working in the internal clinics, 50.4% had a working duration of 11 years and more and 81.2% were working for 40-48 hours in a week. 74.4% of the nurses expressed that they received training about the hospital information and automation systems, 60.2% received this training through the in-service training, and 51.3% stated that their knowledge about the hospital automation and information systems was partially sufficient (Table 1).

Table 1. Socio-demographic characteristics and information status about hospital automation and informatics systems of nurses *(n=117)*

Features	n	%
Age		
20-29	35	29.9
30-39	66	56.4
40 age and above	16	13.7
Gender		
Female	96	82.1
Male	21	17.9
Marital status		
Married	92	78.6
Single	25	21.4
Graduated school		
High school	12	10.3
Associate Degree	36	30.8
Undergraduate	64	54.6
Master's Degree	5	4.3
Working service		
Internal clinic	41	35.0
Surgical clinic	20	17.1
Pediatrics clinic	8	6.8
Emergency	13	11.1
Intensive care	22	18.8
Other (Polyclinic, administrative unit)	13	11.2
Working time		
1-5 year	34	29.1

6-10 year	24	20.5
11 years and above	59	50.4
Weekly working hours		
40-48 hour	95	81.2
49-56 hour	11	9.4
57 hours and above	11	9.4
Training status on informatics and automation systems		
Yes	87	74.4
No	30	25.6
Training place		
Formal education	19	21.6
Seminar	9	10.2
Course	7	8.0
In-service training	53	60.2
Information status of hospital informatics and automation systems		
Sufficient	29	24.8
partially sufficient	60	51.3
Insufficient	28	23.9

Table 2. Usage situaiton of nurses' informatics technologies and systems *(n=117)*

	I use		I don't use		Partially using	
	n	**%**	**n**	**%**	**n**	**%**
İnformatics technologies						
Internet usage	92	78.6	3	2.6	22	18.8
Office programs (Word, excel, powerpoint etc.)	56	47.9	27	23.1	34	29.0
Hospital Automation Systems	70	59.8	15	12.8	32	27.4
Nursing informatics systems						
Electronic patient record	61	52.1	44	37.6	12	10.3
Patient follow-up systems	78	66.7	29	24.8	10	8.5
Entry of request and treatment results	81	69.2	23	19.7	13	11.1
Clinical communication systems	41	35.1	50	42.7	26	22.2
Clinical decision support systems	27	23.1	59	50.4	31	26.5
Nursing information systems	70	59.8	24	20.5	23	19.7

Table 3. Nurses' opinions about the benefits the informatics systems to the profession

Phrases	**Agree**		**Disagree**		**Partly Agree**	
	n	%	n	%	n	%
Enhance the quality of care	64	54.7	29	24.8	24	20.5
Improving the decision making ability of the nurse	69	59.0	28	23.9	20	17.1

Increasing the independent functions in nursing care	61	52.1	25	21.4	31	26.5
Providing scientific information	78	66.7	13	11.1	26	22.2
Access to the information quickly and cheaply	111	94.9	2	1.7	4	3.4
Providing individual-specific and holistic approach	62	53.0	22	18.8	33	28.2
Developing nurses' knowledge and practices	87	74.4	12	10.2	18	15.4
Follow-up the innovations	108	92.3	2	1.7	7	6.0
Providing communication and cooperation with other health disciplines	77	65.8	18	15.4	22	18.8
Providing legal and ethical documentation	97	82.9	5	4.3	15	12.8
Decrease time, cost and labor	78	66.7	14	12.0	25	21.3

Table 4. Some features and nursing information systems using cases of nurses

Features	I use		Partially using		I don't use		*p*
	n	%	n	%	n	%	
Gender							
Female	63	65.6	26	27.1	7	7.3	***0.000***
Male	7	33.3	6	28.6	8	38.1	
Working service							
Internal	31	75.6	7	17.1	3	7.3	
Surgical	5	25.0	10	50.0	5	25.0	
Pediatrics	7	87.5	1	12.5	0	0	***0.014***
Emergency	4	30.8	6	46.2	3	23.1	
Intensive care	15	68.2	5	22.7	2	9.1	
Polyclinic	2	50.0	2	50.0	0	0	
Administrative unit	6	66.7	1	11.1	2	22.2	
Training status on informatics and automation systems							***0.001***
Yes	60	69.0	20	23.0	7	8.0	
No	10	33.3	12	40.0	8	26.7	
Personal computer usage status							
I use	53	67.9	16	20.5	9	11.5	***0.002***
Partially using	9	39.1	13	56.5	1	4.3	
I don't use	8	50.0	3	18.8	5	31.3	

Table 5. Some features of nurses and purposes of using informatics systems

Purpose	Features	Agree		Partly Agree		Disagree		*p*
		n	%	n	%	n	%	
Enhance quality	**Working time**							***0.008***
	1-5 year	30	88.2	4	11.8	0	0	
	6-10 year	18	75.0	4	16.7	2	8.3	
	11 years and above	58	98.3	0	0	1	1.7	
Access to the information quickly and cheaply	**Training status on informatics and automation systems**							***0.026***
	Yes	85	97.7	2	2.3	0	0	
	No	26	86.7	2	6.7	2	6.7	
Increase efficiency	**Training status on informatics and automation systems**							***0.043***
	Yes	79	90.8	7	8.0	1	1.1	
	No	23	76.7	4	13.3	3	10.0	
Follow-up the innovations	**Training status on informatics and automation systems**							***0.016***
	Yes	80	92.0	7	8.0	0	0	
	No	28	93.3	0	0	2	6.7	

When the nurses' status of using information technologies and systems was examined, it was found that 78.6% were using internet, 59.8% were using hospital automation systems, and 47.9% were using office programs.

The nurses stated that they used the information systems for patient records (52.1%), patient follow-up systems (66.7%), the entry of request and treatment results (69.2%), clinical communication systems (35.1%), clinical decision support system (23.1%), and nursing information systems (59.8%) (Table 2).

About the benefits provided by the information systems to the profession, the nurses stated that they enhanced the quality of care (54.7%), improved the decision making ability of the nurse (59.0%), increased the independent functions in nursing care (52.1%), provided scientific information (66.7%), allowed fast and cheap access to the information (94.9%), provided individual-specific and holistic approach (53.0%), developed knowledge and practices of nurses (74.4%), provided the opportunity to follow-up the innovations (92.3%), provided communication and cooperation with other health disciplines (65.8%), provided legal and ethical documentation (82.9%), and provided the opportunity to decrease time, cost, and labor (66.7%) (Table 3).

When some characteristics of the nurses and their status of using the nursing information systems were examined, it was determined that 65.6% of those using hospital information systems were female, 87.5% of those working in the pediatric clinic were using these systems, 69.0% of those who received training before were using these systems, 67.9% of those using personal computers were using information systems and the difference between them was statistically

significant ($p<0.05$) (Table 4). No statistically significant difference was found between the nurses' status of using the nursing information systems and their age, marital status, income level, graduated school, time in the enhanced the quality had a working duration of 11 years and more (98.3%), almost all of those thinking that it allowed to access information fast and cheap received the training on information systems (97.7%), 90.8% of those thinking that it increased efficiency received the training on information systems and 93.3% of those thinking that it allows to follow the innovations did not receive the training on information systems and the difference in these groups was statistically significant ($p<0.05$) (Table 5).

Discussion

Nowadays, the use of information technologies in providing quality care with the development of technology and its reflections on nursing practices are remarkable (Erdogan, 2003; Ay, 2009; Kose, 2012). There is a need for professional nurses with sufficient and qualified knowledge to use information technologies effectively in order to include information technologies having such contribution to the health care systems in nursing profession (Ulas Karaahmetoglu, Kacan Softa & Demirarslan, 2017; Kose, 2012; Kardas Ozdemir & Karakaya, 2017; Kaya et al., 2008; Tekin,& Kaya, 2003; Kacan Softa, Akduran & Akyazı, 2014; Zayim, Akcan & Metres, 2006). In this study, it was aimed to determine the nurses' status of the use of information systems and their opinions about its benefits to the profession.

In the present study, 74.4% of the nurses stated that they received training about information and automation systems, 60.2% received this training through in-service training, and 51.3% found their knowledge about information systems partially adequate. It was revealed in the study conducted by Isık and Akpolat (2010) with 544 healthcare professionals that 81.8% of the healthcare professionals received training about information systems and they received this training mostly through in-service training (64.3%) and seminars (22.7%), which was similar to the present study (Isık & Akbolat, 2010). In other studies in the literature; Hwang and Park (2011) determined that 64.7% of the nurses received the training about information, 35.6% of them received this training during formal education and 59.2% of them received the training through in-service training (Hwang & Park, 2011). In another study, nurses stated that although they were interested in computer technology, the computer trainings they received during their professional lives were not enough and needed computers while performing their nursing functions (85.8%) (Basar et al., 2008). This suggests that although nurses receive training on computer use during their basic education, they are not competent in computer use and they meet this through in-service trainings about the systems used in the work environment.

In the present study, it was determined that 59.8% of the nurses used hospital automation systems and 47.9% of them used office programs. It was determined in the study by Erdemir et al. (2005) that 75.6% of the nurses knew the program located in the current automation system of the hospital and used at least one or more of the office programs (Microsoft Word 53.3%, excel 37.8%, power point 35.6%)(Erdemir, Hanoglu & Akman, 2005). It was reported in the study by Isık and Akpolat (2010) that nurses considered themselves competent in office programs (61.8%), operating systems (61.2%), and computer hardware (59.2%) (Isık & Akbolat, 2010). It was reported in another study that the nurses used information technologies mostly at work during the day (61.7%) (Kardas Ozdemir.& Krakaya, 2017); another study reported that nurses had low rate of using electronic information recording systems and 59.0% of the nurses thought that they were not integrated into the workflow of hospital information systems (Top & Gider, 2012). The present study shows similarities with the literature. It is thought that with the increasing use of information technologies in the society, the tendency of the nurses to obtain information to overcome their deficiencies in the use of technology and in their education will increase.

In the present study, 78.6% of the nurses were determined to use internet. The results reporting that 68.9% of the nurses used internet reported in the study by Erdemir et al. (2005); that 78.9% of the nurses used internet and 70.2% of those using internet used internet for professional subjects in the study by Kaya et al. (2008); that 72.0% can access internet and 46.0% used internet every day in the study by Fogel (2002) are similar to results of the present studyn(Erdemir, Hanoglu,& Akman, 2005; Kaya, Asti & Kaya, 2008; Fogel, 2002). It was reported in the study by Cragg et al. (2003) that 17.0% of the nurses used the internet and 55.0% of the internet users had access to the internet from their workplace (Cragg et al.,2003).

When the nurses' status of using information systems in the present study was examined, it was observed that they used the information systems mostly for entry of the request and treatment results (69.2%), patient follow-up systems (66.7%) and nurse information systems (59.8%); whereas, they used clinical communication systems (35.1%) and clinical decision support systems (23.1%) less. It was reported in the study by Isık and Akbolat (2010) that nurses used mostly patient record admission-counseling module (65.6%) and outpatient module (59.7%) among the information system modules(Isık,& Akbolat, 2010). There is no other study in the literature that examines the nurses' status of using information systems. However, it is observed that nurses do not use information systems effectively except for patient-related systems. This is thought to be associated with the lack of awareness of the nurses on efficiency of patient-focused systems among the information systems.

In the present study, when the nurses' status of using information systems were compared with some of their characteristics, it was determined that those who were female, working in the pediatric clinic and received the training on information and automation systems before used information systems more. In a study conducted on the behaviors of using health information system, it was reported that 51.0% of the nurses used computer and there was a statistically significant difference between those who were female and had a bachelor's degree and the behaviors of using computer-based health information system in terms of gender and educational status (Alquraini, 2007). The present study is similar to the literature. Receiving training not only provides an effective use of these systems but also raises awareness about its importance as it is used, thus draws attention about the investigation and use of other systems.

In the present study, when the nurses' purposes of using information technologies were compared with some of their characteristics, it was determined that the nurses who received the training on professional working duration and information systems had higher awareness about enhancing quality, accessing information fast and cheaply, increasing efficiency and following up the innovations. Isık and Akbolat (2010) reported in their study that there was a statistically significant difference between all the statements of the purpose of using information systems and the status of receiving training about information systems(Isık,& Akbolat, 2010). The reason for this statistical difference can be explained by the related training received by a major part of healthcare professionals. Therefore, organizing trainings about the information technologies and hospital information and automation systems with the help of continuous education methods in order to provide the development of employees in parallel with changing and developing technology is important for the continuity and efficiency of the service. The fact that those who are in the profession for a long time are more knowledgeable and qualified about information systems can explain their more effective use of information systems owing to their easy integration to the information systems with their experiences and their easy adaptation to the workflow in the hospital environment.

When the nurses' opinions about the benefits provided by the information systems to the profession were examined, similar to the present study Isık and Akbolat (2010) found in their study that nurses' use of hospital information systems was beneficial for easing the communication between employees, supporting the quality management and reducing the costs (Isık & Akbolat, 2010). It was determined in the present study that 74.4% of the nurses thought that the use of information systems would improve the nursing practices by improving nurses' knowledge and practices and 66.7% thought that it would provide scientific knowledge to our profession. In the study conducted by Softa et al.(2014) with nurses, 60.0% of the participants considered that information technologies should be used in the nursing practices and assessments and the advances in information technologies have brought new roles to the profession; on the other hand, this rate was stated to be 52.9% in the studies by Turhan and Kose(2010); Kacan Softa, Akduran & Akyazı, (2014). There are studies in the literature indicating that the use of information systems by the healthcare professionals and especially nurses brings a professional approach to the profession and enhances the quality of care (Erdemir, Hanoglu & Akman, 2005; Li-Qiong, Xiao-Ying & Ji-Yan, 2018; He M & Hu, 2012; Fadia, 2009). It has been stated in other studies in the literature that nurses think that the use of information technologies will be beneficial for many fields in the nursing profession, which is similar to the present study (Kaya, Astı & Kaya, 2008; Kacan Softa, Akduran & Akyazı, 2014; Li-Qiong, Xiao-

Ying & Ji-Yan, 2018; He M & Hu, 2012; Fadia, 2009).

Limitations of the study: Research in the Central Anatolia region of Turkey, was carried out in one of the national average, reflecting the culture. During the study, those who were authorized and not registered in the institution could not be included. The questionnaire was prepared according to many literature, but it is not a general scale.

Conclusion: It was observed that nurses closely followed information technologies but they did not use hospital information systems at the desired level. In order to gain these qualifications, primarily new practical curricula for nursing information systems should be created by raising awareness of nurses about the benefits of the use of information technology during their vocational training, and nurses' knowledge and skills to use information systems in in-service training programs in the institutions should be supported. It is also recommended to use advanced information systems such as tele-nursing, and the use of bed-side computer and extend the programs for nursing practices.

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