Derleme/ Review

THE REFLECTION OF HEALTHCARE INFORMATICS SYSTEMS ON NURSING PRACTICES

SAĞLIK BİLİŞİM SİSTEMLERİNİN HEMŞİRELİK UYGULAMALARINA YANSIMASI

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Abstract

Nursing is an applied science. Technology influences and determines practices. Accordingly, it is necessary to know how information technologies affect nursing, and how they might change nursing practices, reduce nursing workload and affect information systems. By using computers, nurses can provide a more individualized nursing care, and they can train and give counseling to healthy or diseased individuals. Moreover, patient records are used by all members of the healthcare team as tools of communication, training, identification, research, legal documentation, supervision and control. It is important to record nursing care both legally and professionally. Computer-based informatics systems help to document nursing care practices in healthcare settings and clinical centers. In this context, it is necessary to know information and communication technologies influencing nursing practices. This review was conducted to evaluate the research studies examining the use of healthcare informatics systems and their effects on nursing practices and to identify the types of research studies needed in this field.

Key words: Information technologies, healthcare informatics systems, nursing ınformatics.

Özet

Hemşirelik uygulamalı bir disiplindir. Teknoloji, uygulamaları etkilemekte ve belirlemektedir. Buna bağlı olarak bilişim teknolojisinin hemşirelik üzerine etkisi bilinmeli ve hemşirelik uygulamalarını nasıl değiştirebileceği, hemşirelik is yükünü nasıl azaltacağı, bilişim sistemlerini nasıl etkileyeceğinin bilinmesi gerekir. Hemşireler bilgisayar kullanarak daha fazla bireyselleştirilmiş hemşirelik bakımı verebilir, sağlıklı/hasta bireyin eğitim ve danışmanlığını yapabilirler. Ayrıca, tutulan kayıtlar sağlık ekibinin tüm üyeleri tarafından; iletişim, eğitim, tanımlama, araştırma, kanuni belge, denetim ve kontrol aracı olarak kullanılmaktadır. Hem kanuni hem de mesleki olarak hemşirelik bakımını kayıt altına almak önemlidir. Bilgisayara dayalı bilişim sistemleri, sağlık bakım ortamlarında ve klinik merkezlerde, hemşirelik bakım uygulamalarını belgelemeyi sağlarlar. Bu bağlamda hemşirelik uygulamalarını etkileyen bilişim ve iletişim teknolojilerinin bilinmesi gerekmektedir. Bu derleme; sağlık bilişim sistemlerinin hemşirelik uygulamalarında kullanımı ve etkilerini inceleyen araştırmaları değerlendirmek ve bu alanda ne tür araştırmalara gereksinim olduğunu ortaya koymak amacıyla yapılmıştır.

Anahtar kelimeler: Bilgi sistemleri, sağlık bilgi sistemleri, hemşirelik bilişimi.

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INTRODUCTION

Personal and professional lives are shaped under the pressure of change in today's world where scientific and technological changes are so fast that knowledge has become a means of power and that communication has become a necessity (1-3) Benefiting from technology to adapt to these developments and changes improves members of institutions and professions powerfully and independently. The production of something using technology and information is called informatics. Informatics has many functions such as processing, storage and transfer of information by means of technical tools in the fastest and easiest way. The use of information with the help of electronic tools has brought out the term information technology. Information technology is defined as the tools used in the production, processing, storage and transfer of information, and the effect of these tools on the decision-making process and other processes in an organization (4, 5).

In recent years, the number of studies conducted in the field of training and practice around the world has risen rapidly within the scope of nursing informatics. It has been found in these studies that the use of healthcare informatics systems enhances communication among healthcare professionals, develops multidisciplinary coordination and reduces paperwork (6, 7). For all these reasons, there is a need for nurses who can use information technologies to make evidence-based decisions in professional healthcare services. The visibility and quality of nursing practices — which have great importance in healthcare services — can be enhanced if nurses have the knowledge, skills and critical thinking skills about information technologies and integrate them into nursing knowledge (8, 9). In this context, it is necessary to know information and communication technologies influencing nursing practices. This review was conducted to evaluate the research studies examining the use and effects of healthcare informatics systems in nursing practices and to identify the types of research studies needed in this field.

Healthcare Informatics

Healthcare services has not fallen behind on meeting with informatics, while the development of information technologies has begun to enable the transfer of information to large masses rapidly and accurately (10). Using information and communication

technologies, and therefore healthcare information, is of great importance to enhance the efficiency and productivity levels of healthcare services, to improve the quality of the service, and to maintain personal and professional development (11). According to WHO, healthcare informatics is a combination of methods, techniques, and equipment that can make a significant contribution to the resolution of a health problem together with its users. In healthcare informatics, diseases can be accurately diagnosed, treated and rehabilitated in a short period time by using the techniques made possible through certain equipment (12, 13). For example, the laser technology used in a diverse range of places in the modern world has a great significance in the healthcare sector. Laser is commonly used in laparoscopic surgeries. Today, infertility problems, which are growing, can be diagnosed and treated quite successfully through laparoscopy. Torn eye retinas can be painlessly and rapidly treated by using laser beams. Tumors in various parts of the body can be treated using the laser technology. Cavity preparation, dental bleaching, and dental soft and hard tissue operations in restorative dental treatment can be carried out quickly and seamlessly with the help of lasers. On the other hand, information and communication technologies not only provide extra time to their users, but also allow storing data and performed operations in a secure way (6, 14). Information technologies used in the healthcare sector are called healthcare informatics systems (HIS) and are examined in two categories in general: Diagnosis–Treatment Systems (DTS) and Clinical Information Systems (CIS). DTS consist of imaging and laboratory diagnostic systems — that support diagnosis and treatment — and other applications. CIS are systems that collect, store, and make use of clinical information related to patients (15). Writing new software computers in clinics has facilitated the practical implementation of clinical information systems in hospitals. In recent years, research has shown that healthcare informatics systems can reduce medication errors, improve compliance with clinical practice guidelines and enhance the presentation of preventive healthcare services, and therefore, has the potential ability to improve health outcomes of patients. Moreover, it has been stated that healthcare information technologies improve the quality by improving surveillance of diseases (16, 17).

Nursing Informatics

The rapid progress of information technologies in the healthcare sector has created new roles for nurses and caused

them to use the concepts of technology and healthcare information together to manage and process information (18, 19). Nursing informatics has emerged from the combination of nursing science with computer science and information science (20). It is ensured through nursing informatics that information is accessed, and data are obtained, used, recorded and stored to solve clinical problems of patients quickly and efficiently. Thus, nursing informatics is an important contributor to nursing profession by enhancing the quality of nursing and healthcare (21, 22). Nursing documentation systems, nursing clinical decision support systems, patient monitoring and observation systems, warning devices and call systems, patient follow-up and tracking systems, tele-nursing, and simulations with advanced technology are the informatics systems that are utilized in nursing; and these systems enhance patient safety, patient satisfaction, quality of care and health services, and data availability (7, 20, 23). Nursing informatics systems can be used in all areas of nursing with the opportunity to present contemporary and evidence-based healthcare in nursing.

Information technologies in nursing are used:

- in clinical applications to collect patient data; to diagnose patients; to identify healthcare needs; to plan, implement and evaluate healthcare; and to share data with other healthcare professionals;
- in nursing management to plan budgeting, to prepare shift schedules, to control and supervise personnel, to evaluate performance, and to create statistical data;
- in the clinical management to establish clinical control systems, to exercise risk management, to carry out evidence-based practices, and to record patient data;
- in nursing education to prepare, implement and evaluate curricula; to offer in-service and post-graduate training and distance education; and to accomplish presentations, conferences, e-mails and web pages through media tools;
- in nursing research to access the Internet, web-based information, and on-line databases (6, 7, 12).

Reflection of Healthcare Informatics Systems on Nursing Practices in the World

Today, with the fast spread of technology, the use of informatics systems has become a necessity in the healthcare sector as it is in every field. Studies have revealed countless benefits of the informatics systems used in the healthcare sector, as well (14, 21, 24). Vito et al. (2017) has argued that entering data into computers has caused a positive effect on

nursing practices and made a difference in solutions of problems through electronic records of drug management in terms of relational, contextual and cognitive areas, and workflow (14). Hessels et al. (2016) have reported that advanced information systems are effective in reducing the length of stay in the hospital and reducing hospital readmissions (11). Wei-Lan et al. (2013) have stated that nursing informatics facilitates and speeds up patient care, prevents errors, and saves time, but the lack of computer knowledge causes problems (25). Filipova (2013) has stated that electronic healthcare records are useful as they facilitate access to clinical data and allow checking the quality of patient care but require a certain budget to setup the necessary hardware(26). Ammenwerth et al. (2011) has found that the monitor, which is one of the healthcare informatics systems, is a useful tool and increases the quality of information processing in nursing(12). Whittaker et al. (2009) reported that there were still difficulties in using a recording system due to insufficient computer use, despite the fact that paper usage was reduced, intra-team communication was increased and time was saved with the use of computers (27). Alquraini et al. (2007) reported that although nurses were satisfied with the use of healthcare informatics systems, age, educational level and the level of computer use were effective in the extent to which the informatics systems were used (28).

Reflection of Healthcare Informatics Systems on Nursing Practices in Turkey

Informatics systems — with their ability to offer contemporary and evidence-based healthcare in nursing — have begun to be used rapidly in Turkey as they have done in the world. Studies have shown that Turkish nurses are interested in using informatics systems and use them in nursing care as much as possible (13, 29-31). Sayar et al. (2016) have found that the use of computers, which is the primary way of using informatics systems, facilitates doing work in nursing practices(32). Dikmen et al. (2015) carried out observations in their study, and based on their observations, they found that using a computer-aided nursing system constituted an evidence base for nursing services, provided effective communication within the healthcare team, saved nurses time in patient care, reduced workload and similar positive results (33). Işık and Akbolat (2010) have found that health professionals think that the use of information technologies is important for the department they work in, and that they are more capable of using the modules of hospital information systems in their own departments(34) . Değirmen et al. (2007) have found that arranging the content of

computer education and medical informatics education, increasing the number of in-service training programs, and raising staff awareness about the benefits and necessity of education increase the use of computers, thereby reducing workload and saving time (35).

CONCLUSION

Advancements in information technologies in the healthcare sector has created new roles for nurses and caused them to use the concepts of technology and healthcare information together to manage and process information. Today, nurses experience a need to combine nursing practices and nursing informatics. It is ensured through nursing informatics that information is accessed, and data are obtained, used, recorded and stored to solve clinical problems of patients quickly and efficiently. Thus, nursing informatics is an important contributor to nursing profession by enhancing the quality of nursing and healthcare. Nursing documentation systems, nursing clinical decision support systems, patient monitoring and observation systems, warning devices and call systems, patient follow-up and tracking systems, tele-nursing, and simulations with advanced technology are the informatics systems that are utilized in nursing; and these systems enhance patient safety, patient satisfaction, quality of care and health services, and data available. In light of this information, a need for inclusion of nursing informatics courses in the nursing education curriculum emerges in order to train nurses to be equipped with the ability to follow the advancing technology and reflect their acquired knowledge in their professional practices. It is also recommended to offer in-service training programs for nurses working in the field, explaining the benefits of informatics systems to nursing care.

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