Chapter 10

PEDIATRIC NURSING USE OF HEALTH INFORMATION SYSTEMS

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INTRODUCTION

Considering the increasing innovations in recently developing technology, tecnological changes have gained strategic importance in each branch of science, particulary in health science (Aksoy, 2012). There is a digitalization process under the name of "Transformation in Health" in the world and in our country. Digitalization in health is used for many purposes such as ensuring the well-being of patients and health professionals, and facilitating their needs for health services (Çoban, 2019). It is also important for the pediatric nurse who cared for the child born into digital technology to use digital technology to increase the quality of care of the child and to adapt to treatment (Konukbay et al., 2020; İşsever et al., 2021). In this literature-based review, health information systems used in the digitalization environment of pediatric nurses during the care process are discussed and it is aimed to provide evidence-based knowledge and awareness of pediatric nurses.

INFORMATION SYSTEMS IN HEALTH IN PEDIATRIC NURSING

Information Technology (IT) is a technology that helps to access, store and share new information produced by processing information in a fast, effective, recorded and stored manner (Özdemir and Dulkadir, 2017). The use of IT has also increased in the field of health. These are called Health Information Systems (SBS). The aim of SBS can be listed as increasing quality and efficiency, reducing cost, ensuring more effective decision making, reducing patient waiting times, and preventing the loss of patient files (Bal and Akgemci, 2011; Göktaş et al., 2017). SBS has great potential in leveraging clinical data on improving health outcomes. In

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the field of pediatrics, SBS is an innovative approach in increasing the quality and efficiency of diagnosis, treatment, prevention and care by using science and technology in the development of child's health (Johnson and Kim, 2008).

Infants and children are at higher risk than adults because they have different care needs and sensitivities than adults. The American Academy of Pediatrics recognizes the role of SBS in improving the safety and quality of pediatric patient-centered care (Madhavan et al., 2011). However, despite the growing need for evidence-based health information systems that improve the quality and safety of care in the field of pediatrics, their number is quite limited.

Health information systems adapted to the needs of children and pediatric health care providers can help reduce risk by reducing the likelihood of error (Lehmann et al., 2015). In pediatric care, health information systems can be used in the follow-up of immunization and growth (Patterson et al., 2013). In addition, the importance of developing SBSs in terms of ensuring the calculation of the gestational age of infants, using child-specific weight, height measurements, providing adolescent privacy where mother-infant connection information is entered, supporting the strengthening of child protection services, and the presence of pediatric laboratory values in information systems is emphasized (Lehman et al., 2015). In a qualitative study conducted by Asan et al. (2017) with 55 nurses in order to evaluate the use of a new health information technology applied in the pediatric intensive care unit, it was found that the technology was very useful for nurses to access fast information in emergencies.

It is important to realize and adopt the importance of health information systems in inpatient settings in order to ensure the safety of the patients to whom children receive care. The awareness of health professionals on this issue should be increased. It is predicted that the use of health information systems in pediatric nursing will significantly increase the quality of care and reduce morbidity.

NURSE INFORMATION SYSTEM IN PEDIATRIC NURSING

Nursing information systems focus on the processing and management of nursing data. In nursing, information systems are used in three areas: clinical practices, management services and education (Mutluay and Özdemir, 2014). Nursing information systems are used in clinical practice for patient evaluation, monitoring, preparation of care plans, delivery and evaluation of care. In addition, it has many functions in management services, such as making budgets, preparing shift schedules, controlling and evaluating nurses (Ammenwerth et al., 2011), and

preparing, implementing and evaluating training programs (Mutluay and Özdemir, 2014). In a study conducted by Zhou et al. (2022) with 20 pediatric nurses in order to examine the effect of a standard e-handover system on the quality and efficiency of pediatric nursing handover, it was found that the system minimized the deficiencies and inaccuracies during information transfer and simultaneously increased the quality of the nurses by increasing the work efficiency. It is known that the use of nursing information system in pediatric nursing will optimize the nursing process, increase the performance efficiency of nurses, and reduce medical record loss, error and supervision problems (Cao and Zhu, 2020).

NURSE CLINICAL DECISION SUPPORT SYSTEMS IN PEDIATRIC NURSING

Clinical Decision Support Systems (CPSS) are software applications that provide support for the reasons for the clinical picture of the patient by healthcare professionals (Çiriş-Yildiz et al., 2020). CPSS are systems developed for diagnostic management, drug and prescription control, stimulation, and reminder (Wasylewicz et al., 2020). For example, if the nurse uses a drug that should not be used on the patient, the system comes into play and warns (Mutluay and Özdemir 2014). This system aims to increase the quality of care in nursing practices with evidence-based information (Padden et al., 2019). However, there is a need for a CPSS in which the nursing process is detailed. In the mixed-method study conducted by Aldekhyyel et al. (2018) to evaluate the parental and nurse perspectives of CPSS associated with pediatric pain management in the hospital, it was stated that 90% of the parents were satisfied with the system, supported the timely intervention of nurses in the pain of their children and facilitated access to non-pharmacological methods. 50% of the nurses reported that they were satisfied with this system. Reynolds et al. (2019) found that nurses did not use this device in their study conducted to evaluate the effect of the handheld decision support device in the pediatric and neonatal intensive care unit. In conclusion, Reynolds et al. suggested that nurses should determine the incentive strategies for using these devices. In another study, they used a clinical decision support system to prevent possible errors related to drugs prescribed to outpatient pediatric patients. When 39.754 pediatric prescriptions were examined in the system, it was found that there were 4.66% drug dose errors (Tan et al., 2022). Therefore, it is known that pediatric diagnosis and clinical decision support systems in treatment care will reduce drug errors, strengthen the quality of care, and reduce mortality and morbidity by increasing quality and trust in care (Haylett, 2017). It may be suggested

to plan strategic studies to increase the use of clinical decision support systems by the pediatric nurse.

E-HEALTH IN PEDIATRIC NURSING

According to Word Health Organization (WHO), E-Health is "the safe and cost-effective use of information and communication technologies to support health and health-related areas, including health care, health surveillance, health literature, and health education" (WHO, 2010). With e-health, it is aimed to expand the access of health professionals, to increase quality and service efficiency, to provide evidence-based service, to train health professionals, and to be ethical and equal in behavior and practices (Mair et al., 2012; Yardan and Kiremit, 2018). The Ministry of Health in Turkey has opened an E-Health portal, E-Pulse (Ministry of Health, 2003). Through this portal, individuals can be informed and contacted about who their family doctor is; they can make an appointment with the central hospital appointment system and access their own medical records. In this service, nurses working in the family health center can monitor the follow-up of their pregnant women, the growth, development and immunization status of children, and access statistics (Yücel, 2010; Bostan ve Kabukcuoğlu., 2022). Arnold et al. (2012), in their study examining the application of Automatic Live E-Health Intervention Tracking System, which is a school-based, computer-aided, web-based follow-up program for children with asthma, observed that there was a significant improvement in physical health score, decreased wheezing episodes, decreased average visits to doctors and clinics thanks to this program. In a randomized controlled study by Güven et al. (2020), in which they examined the effectiveness of a web-based E-Health education program for young people with epilepsy and their parents, it was found that young people with epilepsy were looking for the most information about epilepsy on their website. It was found that there was an increase in the pre-test and post-test scores, epilepsy knowledge test score and disease-specific attitude scale scores of young people with epilepsy after the training program, and a significant decrease in the Parental Anxiety Scale for Seizures while the parents' Epilepsy Knowledge Test showed an increase.

Providing education on the internet within the scope of E-Health has become an important source of information for children and parents. Daghan et al. (2022), in their study planned to determine the factors affecting the E-Health literacy of adolescents, found that the E-Health literacy of adolescents was quite low. In addition, it has been determined that there are deficiencies in the knowledge and

skills of adolescents on how to reach quality E-Health literacy. In the study, it was suggested that nurses should provide training on E-Health literacy and that E-Health literacy should be integrated into the school health education curriculum. E-Health applications play a key role in monitoring health in pediatric health care services (growth-development, immunization, health education, etc.). The pediatric nurse should be encouraged to use E-Health practices and their awareness of their benefits should be increased.

TELE-NURSING IN PEDIATRIC NURSING

Tele-nursing is the use of technology to ensure that the care of patients with chronic or special needs, who are difficult to access to health services, is more regular and comfortable, and to maintain the care and follow-up of the patient after discharge (Keskin and Özhelvacı, 2021). The American Nurses Association (ANA) sees tele-nursing in nursing care and follow-up not as a specialized area separate from nursing, but as an area in which the telecommunication network and technologies are integrated into nursing (ANA, 2001). For tele-nursing programs, Erdemir et al. (2009) mentioned the necessity of establishing terminology and classification systems and nurses' competence. In tele-nursing, internet, e-mail, smart phones, printer, photocopying device, fax, video conferencing system, cardiac rhythm, glycometer, saturation probe, digital blood pressure instruments, spirometer (Respiratory Function Device), home type mechanical ventilators, digital ophthalmoscope, electronic stethoscope, digital camera, teletransmission (Digital transmission system), digital oil analyzer are devices connected to the internet network (Ersoy et al., 2015). Providing cost-effectiveness of tele-nursing, early detection of the patient's symptoms, reducing unplanned home visits, reducing morbidity, reducing the workload of the nurse, increasing satisfaction between patient and nurses (Pazar et al., 2015).

Looking at the tele-nursing studies conducted in the field of pediatrics, Uscher-Pines et al. (2022) gave breastfeeding training to 1617 parents through the telelactation program in their study to investigate the use and acceptability of telelactation. Parents found that the training given by telelactation was as good as the face-to-face breastfeeding training. In another study, Patel et al. (2022) found that infants in the neonatal intensive care unit (NICU) during the covid-19 pandemic were a useful tool for parents in this period of visit restrictions in order to evaluate the effect of infant imaging system use. Sarin-Gulian et al. (2021) developed a Tele-Training program for NICU nurses in Armenia. Tele-Training includes prenatal conditions, intrapartum complications, neonatal evaluation, thermoreg-

ulation and renal functions. After the training was applied to 13 nurses, a questionnaire containing 10-15 information questions was applied as a pre-test and post-test. In addition, their satisfaction with Tele-Training was measured. As a result, a statistically significant difference was found in the pre-test and post-test scores of the nurses in the study. The nurses found that they stated that the information they obtained in the training program was valuable. Tele-education is an important achievement to train and ensure the competence of the pediatric nurse who has just started the profession. In their study, Tsimicalis et al. (2011) aimed to strengthen care by developing evidence-based, tele-application guidelines for nurses on symptom management in pediatric oncology. However, only the development process of the guide is included in the study. In the study conducted by Auerbach et al. (2021) to explain the application experiences and feedbacks of a Tele-Simulation program for the training of healthcare professionals working in pediatric emergency departments working in rural areas, 8 case training was given for 12 months. It was found that pediatric nurses, who are among the health professionals, stated that their clinical skills improved. In a study by Bagayoko et al. (2017) aiming to contribute to the improvement of maternal and neonatal health through telemedicine program, it was found that this program significantly improved maternal and child health. In the study of Mohamed and Mahmoud (2021) examining the effect of tele-nursing intervention on mothers' postoperative care knowledge with 60 children and parents, it was found that there was a positive significant difference in parents' knowledge. It is important to apply tele-nursing intervention to children and parents to facilitate their communication with their physician and nurses whenever they need.

CONCLUSION

As a result, pediatric health care environments empowered by digital tools are a safe strategy in providing quality care to the child. Therefore, it can be thought that the fact that pediatric nurses have informatics competencies in health will be a facilitating factor in ensuring safe patient care. There is a need for further studies on the use of health information systems in the field of pediatric nursing, which provides one-to-one care to the child.

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