

Development of digital technology-based nursing service innovation in the pandemic era

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Abstract

Optimizing health services during the pandemic is something that hospitals must do in order to keep improving service quality. This community service aims to educate nurses on how to use digital technology-based nursing services in the pandemic. Health education is provided through webinars, as a method of implementing this community service program. The majority of webinar participants (60%) had sufficient knowledge based on the results of the pretest. Following the presentation of the material, it can be concluded that there has been an increase in knowledge, with 182 participants (90%) having excellent knowledge. Nursing services are benefiting from digital innovation not only in terms of workforce management, but also in terms of changing the way care is delivered. Nurses are crucial in the adoption of digital tools and information technology to improve patient care.

Keywords: Nursing services; Digital technology; Real time monitor sensors; Covid-19

Pengembangan inovasi pelayanan keperawatan berbasis teknologi digital di era pandemi

Abstrak

Optimalisasi pelayanan kesehatan di masa pandemi merupakan hal yang harus dilakukan oleh rumah sakit guna tetap meningkatkan mutu pelayanan. Pengabdian masyarakat ini bertujuan untuk memberikan edukasi kepada perawat mengenai pelayanan keperawatan berbasis teknologi digital yang dapat digunakan di masa pandemi. Metode pelaksanaan kegiatan pengabdian masyarakat ini adalah pendidikan kesehatan yang diberikan melalui webinar yang diselenggarakan secara online. Berdasarkan hasil pre-test, mayoritas peserta webinar (60%) memiliki pengetahuan yang cukup. Setelah pemberian materi, dapat disimpulkan adanya peningkatan pengetahuan dimana 182 peserta (90%) memiliki pengetahuan yang baik. Inovasi digital dalam pelayanan keperawatan tidak hanya berpengaruh dalam manajemen tenaga kerja, tetapi juga sebagai dasar untuk mengubah cara pemberian perawatan. Perawat memainkan peranan penting dalam implementasi sarana digital dan informatika untuk meningkatkan perawatan pasien.

Kata Kunci: Pelayanan keperawatan; Teknologi digital; Real time monitor sensors; Covid-19

1. Introduction

Optimizing healthcare services during a pandemic is crucial for hospitals to maintain service quality. However, efforts to maintain quality without adequate infrastructure and resource support can lead to problems. One significant issue is the high incidence of COVID-19 among healthcare workers (Olesen et al., 2020). This can be attributed to the absence of strict standards in Infection Prevention and Control (IPC) for COVID-19 within hospitals, as well as challenges in managing ward layouts. The arrangement and functionality of COVID-19 patient care spaces require an integrated system between care processes and monitoring (Zanardo et al., 2020). This community service activity aimed to educate nurses on digital technology-based nursing services that can be utilized during a pandemic.

The World Health Organization (WHO) data indicates that healthcare workers accounted for 14% of all COVID-19 cases (Rathnayake et al., 2021). In some countries, COVID-19 infections among healthcare workers reached 35% of total cases (Bohlken et al., 2020; Liu et al., 2020). In Indonesia, as of January 2021, 647 healthcare workers had died due to COVID-19 infection, including 289 doctors, 221 nurses, 84 midwives, 27 dentists, 15 laboratory staff, and 11 pharmacists. This figure represents one of the three highest rates of COVID-19 cases among healthcare workers in Asia (Setiawan & Nurwati, 2020).

COVID-19 exposure in healthcare workers is influenced by the characteristics of the virus, which has a particle size of 80-160 nanometers. These particles are transmitted through microscopic airborne particles and aerosol droplets. Droplets and small particles in a wide spectrum can form during coughing, sneezing, and even speaking or breathing. Most of the droplets produced will fall and land on objects in the surrounding area, where they can persist for hours or even two to three days (Kim et al., 2020). Furthermore, the high incidence of COVID-19 among healthcare workers is also caused by medical procedures such as tracheal intubation, non-invasive ventilation, tracheostomy, and cardiopulmonary resuscitation (Daryai et al., 2020).

One strategy to reduce COVID-19 cases among healthcare workers is to use digital technology in providing nursing services to patients. Digital technology can be used to monitor room temperature and humidity in patient isolation rooms (Shahrvini et al., 2021). Monitoring can also be integrated with other parameters, such as air temperature and pressure. This monitoring can be performed remotely via Internet of Things (IoT) based access. This is expected to improve services for COVID-19 patients, especially those treated in isolation rooms.

2. Method

The method for implementing this community service activity was health education provided through an online webinar. The speakers at this webinar were the community service team members with expertise in critical care, the Head of Nursing from Universitas Airlangga Hospital, and the Head of Nursing from Haji Surabaya Hospital. The webinar's theme was "Development of Digital Technology-Based Nursing Service Innovation in the Era of the COVID-19 Pandemic". The materials presented at the webinar, held on Friday, November 26, 2021, included nursing service management and

real-time monitoring of IoTs-based sensors in nursing. The community service participants were nurses and nursing students from various regions in Indonesia. The success of the health education was assessed by administering pre-tests and post-tests to participants before and after the material presentation via Google Forms.

3. Results and Discussion

The webinar on “Development of Digital Technology-Based Nursing Service Innovation in the Era of the COVID-19 Pandemic” was attended by 202 students and nurses (Figure 1). The student participants came from Universitas Airlangga, Universitas Kediri, Universitas Muhammadiyah Lamongan, Universitas Muhammadiyah Surabaya, Universitas Nahdlatul Ulama Surabaya, Universitas Sahid Surakarta, Universitas Sam Ratulangi, Universitas Sari Mulia Banjarmasin, Universitas Karya Husada, IIK Bhakti Kediri, Poltekkes Kemenkes Malang, STIKES Indramayu, Stikes Cendekia Utama Kudus, Stikes Centama Kudus, Stikes BHM Madiun, and ITKes Wiyata Husada Samarinda. The hospital nurses who participated in the webinar included those from Darmo Hospital Surabaya, K3 Clinic PT. PHC Surabaya, Premier Hospital, RSAL dr. Ramelan Surabaya, RSUD Bangil, RSUD Buleleng, RSUD dr. Koesma Tuban, RSUD Ngimbang, and RSUD Dr. Soetomo Surabaya.

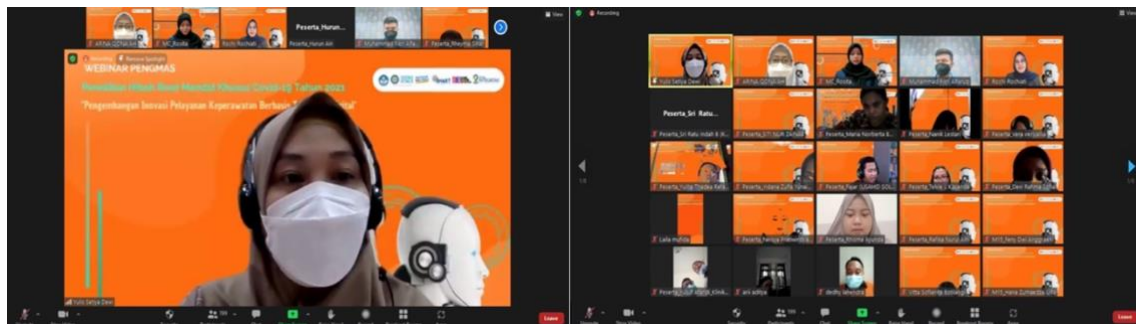


Figure 1. Webinar on digital technology-based nursing service innovation

Participants who attended the webinar were asked to complete pre-tests and post-tests to determine their initial knowledge and evaluate their understanding of the webinar material. Based on the pre-test results, most webinar participants (60%) had sufficient knowledge, 27% had good knowledge, and 13% had insufficient knowledge of digital technology-based nursing services. After the material was presented, participants were asked to complete a post-test. Based on the post-test results, 182 participants (90%) had good knowledge, 17 participants (8%) had sufficient knowledge, and 3 participants (2%) still had insufficient knowledge.

The development of digital technology influences all aspects of life, including healthcare services, especially nursing services. This includes increased use of artificial intelligence (AI) and robotic systems for monitoring patient conditions, and increased reliance on telehealth and other virtual care models, particularly in response to the COVID-19 pandemic.

Although substantial progress continues to be made to date, challenges in the use of digital nursing technology remain. One concern is that nurses may not be able to keep pace with rapid changes in digital technology and its impact on society. This can limit the potential benefits that exist in its implementation into nursing practice and patient

care services. This challenge must be addressed by nurses by accelerating the process of digitally transforming services, so that they can respond to the complex global challenges currently facing health systems and society.

The community service carried out is one way to increase knowledge and provide an overview of how nurses can contribute to utilizing technology in services. Research results show that nursing must accelerate the transformation to digitally delivered services by investing in education, research, and innovative technology practices. Nurses must increase their skills in data science and other digital health topics to ensure that emerging technologies such as AI are developed appropriately and safely for nursing practice and patient care. Nursing must invest in and lead the development of digital health and collaborate with others to develop and deliver the digital tools that patients and communities need. Nurses must champion technology in all areas of professional practice, create leadership opportunities in digital health, and inform health policy (Booth et al., 2021).

Examples of technology use show how digital technology has benefited nursing practice and education (Krick et al., 2019). For example, telehealth programs where nurses provide daily monitoring, coaching, and triage for patients with multiple chronic diseases have helped reduce emergency room admissions; mobile devices, especially smartphones and health apps, allow nurses to offer remote advice on pain management to adolescent cancer patients (Jibb et al., 2017, 2020) and complement aspects of nursing education by providing innovative pedagogical solutions for content delivery and distance learning opportunities (Buchanan et al., 2020; Chuang et al., 2018).

Service innovation also needs to be socialized, especially in management settings. This is related to the implementation of innovations that require policies for several units in the hospital and the management process. The use of IoTs in monitoring COVID-19 patient rooms allows nurses to monitor in real-time using devices, both room devices and personal devices. This effort is encouraged to prevent the development of infections in the COVID-19 room. One example is that uncontrolled air humidity can increase the accumulation of bacteria in the room.

The use of real-time monitoring tools can facilitate the work of nurses by providing periodic reports on the environmental conditions of patient care rooms. Nurses can focus on providing care to patients. The role and support of management are essential because this innovation can continue to develop by continuously adjusting to the circumstances and situations in the hospital.

4. Conclusion

Digital innovation in nursing services not only has an impact on workforce management but also serves as a basis for changing the way care is provided. Nurses play an important role in the implementation of digital and informatics tools to improve patient care, especially in the COVID-19 environment, where the quality of digital care delivery has become at the forefront of healthcare and is under greater scrutiny than ever before.

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