




Digital Nursing Technology to Achieve Job Satisfaction: A Systematic Review

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Abstract

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BACKGROUND: Technological advances are needed to provide nursing care for patients, however, there are still different perceptions of nurses in accepting its application in health care. This is because the use of these technologies can affect job satisfaction of nurses.

AIM: This study aims to identify the digital technology in nursing and its effect on nurses' job satisfaction.

METHODS: This study used a systematic review method, where the articles are obtained on scientific databases such as PubMed, PubMed Central, Science Direct, Scopus, and Web of Sciences, that were published from 2019 to 2021. Meanwhile, the preferred reporting items were analyzed using Systematic Reviews and Meta-Analyses.

RESULTS: Out of the 312 articles that were screened and checked, only 17 fulfill the eligibility criteria. The result showed that six articles were perceived as positive on the use of technology by nurses, six articles were positive and negative, and five articles were all negative. Furthermore, there were ten articles on technology information and communication, five on sensor technology, one article on the use of sensors and technology information, and another one article on technology.

CONCLUSION: Nurses have a positive response because technology makes the completion of work easier, maintains patient safety where job satisfaction is affected, however, negative perceptions are the basis for solving the problems. Therefore, support from their leaders is required to motivate and create nurses' awareness of technology to achieve patient safety goals and centered care.

Introduction

Health care has changed rapidly with the introduction of Health Information Technology (HIT) [1], [2], such as the use of Electronic Health Record (EHR) and different Electronic Health (E-Health) devices that have positively influenced the daily practice of health professionals and the way of delivery. It is generally assumed that HIT increases the safety and quality of health care and also reduces morbidity and mortality [3].

In the 21st century, nurses faced the challenges of exhibiting competent information technology skills. Nursing informatics and the use of information technology are essential components that support modern nurses' jobs. However, there are limited studies that provide comprehensive data on the impact of Information and Communication Technologies (ICTs) on nursing care [4]. Previous studies showed that nurses perceive ICTs positively because of improvements in accuracy, patient safety, and ease of access [5].

Previous study on the negative perceptions of the impacts of technology showed that nurses usually

prioritize the troubleshooting of equipment due to device malfunctions that interrupted health care [6]. According to Kiekkas *et al.*, nurses sometimes felt that technology increased stress and moved the focal point away from patients [7]. However, most of the job problems are due to excessive workload based on the work-related and situation-specific syndrome, which is usually characterized by emotional exhaustion and depersonalization that reduces work efficiency [8].

Dyrbye *et al.* also stated that burnout lowers job performance among nurses [9], patient satisfaction [10], incomplete health care [11], and poorer outcomes such as higher mortality rates [12]. Therefore, efforts to improve burnout needs to focus on context-specific work system factors since it is associated with inefficient work progress, excessive workloads, inadequate rewards and staffing, values conflicts, and a poor working environment [9], [13], [14]. Similarly, an increase in the use and dependence on technology for nursing produced the largest professional healthcare workforce. This showed that more literature review needs to be carried out to explore some studies in digital nursing technology and its impact on burnout to achieve job satisfaction.

Methods

Study design

This study used a systematic review method, where the articles were obtained on the scientific databases, namely PubMed, PubMed Central, Science Direct, Scopus, and Web of Sciences, that were published from 2019 to 2021. The analysis of the Preferred Reporting Items was carried out for Systematic Reviews and Meta-Analyses (PRISMA). Meanwhile, ethical considerations such as respecting principles based on The Belmont Report which consists of beneficence, respect for human dignity, and justice have been conducted and approved by the ethical committee, Faculty of Nursing University, Indonesia (N0:215/UN2.F12.D1.2.1/PPM.00.02/2021).

Search strategy

The search equations used were “Nurses’ perception in using digital technology” OR “digital sensor” AND “increasing early detection deteriorate on patients” OR “to detection healthcare-associated infections” OR “advantages of nursing” OR “nursing benefits” AND “Using Digital Technology” OR “digital sensors” AND “detection Device Associated Infections, An Issue of Infectious Disease Clinics” AND “Job Satisfaction of Nurses” OR “Nurses Satisfaction.”

Selection of studies

The inclusion criteria in this study were nurses, nurse job satisfaction or satisfaction, early detection in preventing patient deterioration, healthcare professionals, monitoring of vital signs, technology in nursing, digital technology, digital sensors, nurses’ perceptions of the use of technology positively or negatively, awareness in the use of technology, and the workload in the use of technology. Furthermore, an extraction process was carried out on 17 full-text articles for eligibility assessment.

Results

Type of studies

After assessing the 312 articles and 11 duplicates through the PRISMA process, two articles were removed from the selected 19 articles. This is because they are related to monitoring the development of technology use and not on nurses who apply technology, therefore, only 17 articles were used in this study (Figure 1). Moreover, this study is based on nurses’ satisfaction in the use of digital technology such as digital sensors and computer information.

Effects of Using Digital Technology in Achieving Nurse Job Satisfaction

In this study, the results showed that there are still differences in achieving nurses’ job satisfaction in the application of digital technology. Out of 17 articles, it was discovered that the use of technology has an overall positive impact on nurses, some have a positive or negative impact. Meanwhile, other articles stated that technology has a negative influence in providing services to patients directly or using remote applications (Table 1).

Furthermore, six articles were discovered to have a positive impact, where the use of digital technology is perceived positively and provides benefits for nurses by improving the relationship or nurse-patient interactions [15], [16]. Although communication technology is not yet fully accurate, it has the potential to manage and empower the long-term health conditions of patients and healthcare professionals [15]. Similarly, nurses show a positive attitude towards the use of health technology, where the use of technological devices provides opportunities for better health care [17], Nurses also realize that providing care for patients through technology is a form of caring competence [18].

According to other studies, technologies such as sensors have the effectiveness of continuously monitoring vital signs that can be used to improve clinical outcomes in the inpatient setting [16]. Redeker also stated that the use of electronic sensors for nurses is applicable for collecting, recording, transmitting data in real-time, remote monitoring, self-monitoring, and communication between health professionals and patients [15]. Furthermore, some studies supported technology positively, where almost all nurses as Directors of Nursing or team leaders have experience in using Digital Nursing Technologies, specifically with information and communication technology (ICT). This makes task completion easier with better healthcare, reduced physical burden, and mental stress, and also includes nurses in the development and testing of digital technology [19]. Technology has a positive view because it saves time when information about patients is needed and increases efficiency [19], [20]. Fadel *et al.* also stated that technology increases nurses’ job satisfaction and reduces documentation [20].

Moreover, six articles were perceived as positive and negative by nurses, where the use of electronic devices in the patient’s bed makes nurses spend longer time providing various care to patients. They also simultaneously document bedside care, however, many nurses were not satisfied due to duplication of work and increased workload. In addition, they also recorded injuries related to posture and duration of time required to complete electronic forms on bedside touch screens, and negative comments contradicted by observational data [21]. Similarly, the statement by Leenan *et al.* that there is still dissatisfaction in the use of electronic devices such as alarms due to

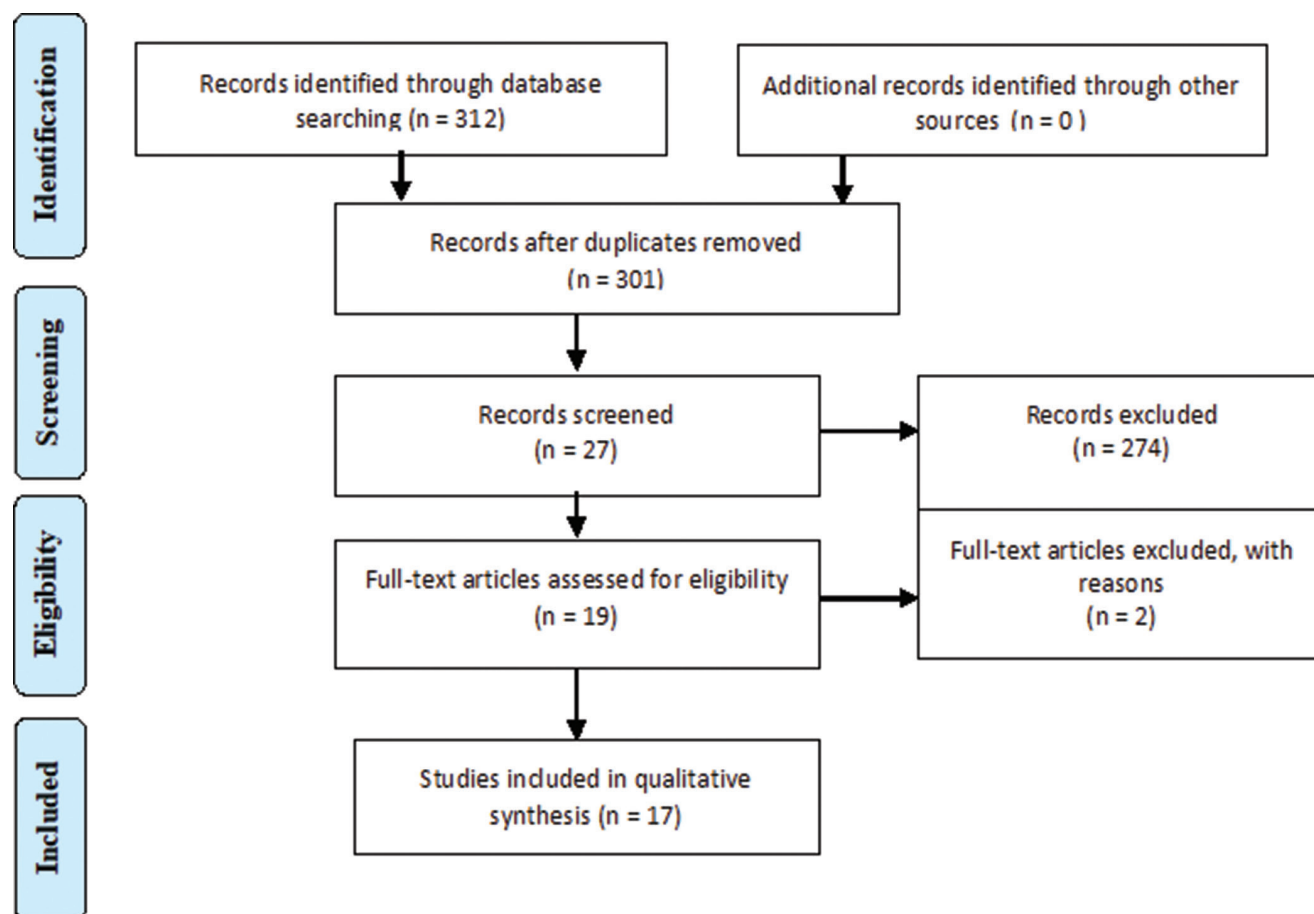


Figure 1: Preferred reporting items was carried out for systematic reviews and meta-analyses analysis

system malfunctions, alarm frequency and dissonance with nurse measurements [22], and also found the low acceptance in the implementation of information systems, lack of training and support as inhibiting factors [23], [24]. However, positive perceptions are found in the use of management information systems and alarms, where electronic systems are very useful and easy to be used by nurses since they are efficient in storing patient data [22], [23].

Based on the results of other studies, the use of ViSi Mobile (VM) and HealthPatch mostly has a positive effect on nurses or health workers for continuous and early monitoring of vital signs for quick intervention. However, there are also negative effects due to battery resistance, irrelevant or false alarms that make nurses get tired and increase workload due to excess data [25]. It was shown that the use of smartphones can improve technical competence, work performance, nurse-patient relationships, have all information about patients, save time between fulfilling care to patients, and electronic documentation, including for patient safety in medication errors. The negative perception is related to technological interference, causing a scheduled downtime and the difficulty in the use of smartphones in elderly patients [26]. Moreover, other conditions also affect nurses' job satisfaction, specifically when technology has a negative impact.

In this study, five articles were perceived as negative, and one of them is from HIT application which stated that HIT used by nurses is not user-friendly, time-consuming, and unsupportive in daily professional practice. It also showed that HIT is stressful, unpleasant, lacks knowledge, gets inadequate training, therefore, nurses feel incompetent, delay, or avoid using HIT [27]. In addition, the use of technology can decrease due to unclear communication between nurses and the development team in designing tools for detection such as falls and urinary tract infections, which changes the workflow of nursing care over time. This also means that not all nurses who use smartphones get an alarm text and have the time to check incoming email [28]. The application of HER in nurses is currently still in low acceptance due to fatigue caused by the excessive use of technology [29]. The negative results were discovered in other articles, where nurses are not ready for a digital future and do not feel that as leaders in digital technology decision-making through the use of cellphones and the internet and cannot facilitate digital literacy or professionalism models [30]. It was also discovered that the use of Patient Accessible Electronic Health Records (PAEHR) Technology has great advantages, however, it affects the nurses' working environment. This creates new problems and concerns that they cannot answer patient questions because nurses act as contacts. Since the first factor

Table 1: Digital nursing technology to achieve job satisfaction: A systematic review

Author/Year/Topic	Study Desain	Setting	Sample	Measurement	Results
Gance-Cleveland <i>et al.</i> , (2020) Aurora, Pennsylvania, Amherst. Use of theory to guide development and application of sensor technologies in Nursing. https://doi.org/10.1016/j.outlook.2020.04.007	The development of the theory	Presentations at the Council for the Advancement of Nursing Science 2019 Advanced Methods Conference on Expanding Science of Sensor Technology in Study.	Three nurse scientists	Paradigm and a study by nurse scientists on the sensor technology used for health services.	Based on the statements of several scientists in the world who discussed the limits of nurses' involvement in sensor technology, it was discovered that nurses have the opportunity to provide health services. The relationship between nurse and patient is affectionate through technology, however, it is not used during interaction. Since nurses are scientists, they can explain the development, implementation, and evaluation of using technology based on theories.
Redeker, (2020) West Haven Sensor technology for nursing study. https://doi.org/10.1016/j.outlook.2020.03.009	The review reports	Presentation from the Expanding Science of Sensor Technology in Nursing Study Conference presented by the Council for Advancement of Nursing Science in 2019	Nurses	Nurses' perception	The collection, recording, and transmission of data can generate real-time data through electronic sensors, where they are processed through remote monitoring, self-monitoring, and communication between healthcare professionals and patients. Sensor technology is also useful for the analysis and interpretation of data.
Weenk <i>et al.</i> , (2020) Netherlands Continuous Monitoring of Vital Signs in the General Ward Using Wearable Devices: Randomized Controlled Trial. doi: 10.2196/15471	Randomized controlled trial	Hospital	20 nurses 60 patients, 3 physician assistants, and 6 medical doctors	This study aims to identify positive and negative effects as well as barriers and facilitators for the use of two wearable devices.	The study used two sensor devices called ViSi Mobile (VM) and Health Patch (HP) in form of sensor devices for vital sign monitoring that are sent by using a mobile phone to send vital sign data to mobile devices through Bluetooth. The results obtained some positive perceptions, namely the use of sensor devices to continuously monitor vital signs, early detection for quick intervention, save time, reduce the length of stay at hospital, workload, have a feeling of security for patients. The negative perceptions were discovered due to continuous monitoring of data or excess information, conditions in the room such as the ICU, hence, the alarms/sensors installed led to disruption of time quality due to false-positive alarms, irrelevant, and fatigue (leading to false-positive alarms). However, the use of the device cannot detect pain.
Seibert <i>et al.</i> , (2020) Germany Application of digital technologies in nursing practice: Results of a mixed methods study on nurses' experiences, needs, and perspectives. https://doi.org/10.1016/j.zefq.2020.10.010	An explanatory sequential mixed methods design	In healthcare environment	1,335 Director of Nursing through an online survey and 14 Director of Nursing through Focus Group (FGs).	Explore nurses' perspectives and experiences.	The results showed that 95% of nursing directors have experience and perception in digital nursing technology such as information and communication technology. Therefore, through the use of technology, the tasks become easier, time-efficient, and improve nursing quality. It is rare to obtain a negative perception of technology, making it to overcome the problem of mental stress and physical burden. This is because negative effects or concerns are becoming less. The results of the FGs showed that nurses needed technology for participatory development and were involved in the development and testing of digital technology.
Mather <i>et al.</i> , (2019) Australia Nurses as Stakeholders in the Adoption of Mobile Technology in Australian Health Care Environments: Interview Study. doi: 10.2196/1427	Descriptive qualitative	In healthcare	Six representatives from professional nursing organizations, seven national organizations, and 52 members from the National Coalition of Nursing and Midwifery Organizations. Data obtained through semistructured, interviews, e-mail, telephone.	This study explored the use of technology in nursing services.	The study focused on nurses as stakeholders, moreover, the contributing factors include actions, work-around, concerns, experiences, attitudes, and influences that impact thinking about access and use of technology. Also, nurses are not ready to provide digital health services in the future. This is because nurses have not realized that they are the front-line leaders in decision-making. In addition, they are also cannot facilitate digital literacy or professionalism models.
Bail <i>et al.</i> , (2020) Australia Implementation pilot of a novel electronic bedside nursing chart: a mixed-methods case study. https://doi.org/10.1071/AH18231	A pilot study with a descriptive and explanatory case study approach	Hospital	Nurses with 600 beds and 550.000 people	This study was to understand and investigate the implementation of novel bed electronics and the factors influencing the impact of nurse applications and workflows	The result showed that since the installation of the novel electronic in the patient's bed, the implementation of missed-care to patients has decreased, and the average time spent at the bedside increases from 21 to 28 minutes for 1 hour. In a qualitative study, it was discovered that there are (1) inconsistent expectations, (2) decision conflicts between managers and nurses, and (3) workflow effects (digital interface ergonomic settings). The study also applied the effects of technology to support nursing, shared understanding of the purpose of technology, and the scope of the project in nursing care.
Melnick <i>et al.</i> , (2021) USA The association between perceived electronic health record usability and professional burnout among US nurses. doi: 10.1093/jamia/ocab059	A cross-sectional survey of a random sample	Hospital	8638 nurses had completed the survey	This study measured nurse-Perceived Electronic Health Records (EHR) usability of technology and evaluated professional burnout of nurses.	Nurses' perception about the use of Health Electronic Record (HER) based on the SUS assessment score is still in low marginal acceptance, which is 24%, due to fatigue. HER usability was measured with the System Usability Scale (SUS, range 0–100).

(Contd...)

Table 1: (Continued)

Author/Year/Topic	Study Design	Setting	Sample	Measurement	Results
Fadel <i>et al.</i> , (2020). Benghazi City An Evaluation of the Attitudes of Healthcare Nurses Towards New Technologies. https://doi.org/10.1145/3410352.3410731	A cross-sectional descriptive study	Healthcare facilities	Nurses in healthcare facilities.	This study evaluated nurses' attitudes towards the use of new technologies in nursing practice.	The results showed that nurses have limitations in recognizing computer technology information in the workplace. It also assumed that using new technology is needed to increase job satisfaction, save time, and they also have a positive response to technology. This showed that technology can assist in monitoring patient conditions, real-time, communication systems, point of care technology.
Jahnke <i>et al.</i> , (2021) The United States. Social practices of nurse care coordination using sensor technologies- Challenges with an alert system adoption in assisted living communities for older adults. https://doi.org/10.1016/j.ijnss.2021.05.011	A qualitative study	Social practice	Nursing staff and social workers as users, through five user interviews and focus groups with six system developers.	This study analyzed the gap between creators' intention and the users' implementation (nursing staff and social workers) of an alert system in assisted living communities.	The use of sensor technology becomes a clinical workflow that changes, subsequently, a mismatch is discovered between nurse care coordination, social practices, and technology application. The study discovered that (1) nurses set common goals, (2) the communication rhythm of nurses and the development team needs to be established in an integrated manner to facilitate conversation, explain the differences in workflow, and social practices when using sensor technology, (3) a checklist for new employees needs to be prepared, and (4) improved experience. The staff stated that technology sensors or alerts have benefits for the early detection of diseases, specifically urinary tract infections.
Iqbal <i>et al.</i> , (2021) London Implementation of Wearable Sensors and Digital Alerting Systems in Secondary Care: Protocol for a Real-World Prospective Study Evaluating Clinical Outcomes. doi: 10.2196/26240	A descriptive and cross-sectional study	Emergency room, intensive care, service department	200 nurses	This study was conducted to explore the use of health technologies by nurses and their thoughts on technology.	Nurses show a positive attitude towards the use of health technology. Some factors such as gender, level of education, experience, and age gap affect the application of technology. Technology can improve the quality of care and provide convenience, however, almost all nurses stated to pay attention and provide protection to patients who were installed with technological devices to avoid the side effects of these devices. Furthermore, technology can record, store, share, and manage information.
De Leeuw <i>et al.</i> , (2020) Netherlands Identification of Factors Influencing the Adoption of Health Information Technology by Nurses Who Are Digitally Lagging: In-Depth Interview Study.	Face-to-face semi-structured interviews	Inpatient	Data were gathered through interviews	This study explored the experiences and needs of nurses with technology.	Nurses used electronic devices and digital systems, including electronic health records. However, the technology used for digital sensors/alerts is perceived negatively due to several factors such as unfriendly users, time-consuming that does not support practice, unpleasant, stressful, and annoying. Meanwhile, in a working environment, the use of health information technology discovered some incompetence, which prevented the use of Health Information Technology (HIT).
Burkoski <i>et al.</i> , (2019) Toronto, ON. Experiences of Nurses Working in a Fully Digital Hospital: A Phenomenological Study.	Phenomenological methodology	8 Nurses	Data were gathered through in-depth semi-structured interviews.	The study was to achieve a deeper understanding of the experiences of nurses.	The nurses' positive experiences in using technology include their contribution to training, education, knowledge, and practice related to technical competence. However, a negative perception of technology was related to glitches and scheduled downtimes. The six thematic categories were safety, time, teamwork, technology, failures, patient responses, and adapting.
Moll and Cajander, (2020) Sweden On Patient Accessible Electronic Health Records and the Experienced Effect on the Work Environment of Nurses. doi: 10.3233/SHTI200316	The study reports on preliminary	Five Nurses	Data were gathered through an interview study.	The study was to determine the experience of nurses when Patient Accessible Electronic Health Records (PAEHR) was Introduced.	The results showed that 1) the nurses receive more questions from patients after PAEHR has been introduced, 2) they have changed their documentation practices, and 3) the log list functionality has made nurses feel questioned. Nurses were also worried about possible negative effects on patients and their work. Similarly, they have a positive perception of PAEHR process and do not feel a threat of violence. However, the existence of the online log list still has an impact on actions taken by nurses.
Bisrat <i>et al.</i> , (2021) Ethiopia Implementation challenges and perception of care providers on Electronic Medical Records at St. Paul's and Ayder Hospitals, Ethiopia. https://doi.org/10.1186/s12911-021-01670-z	A cross sectional study design with quantitative and qualitative methods	Hospital	240 health care providers. An interview was conducted with a total of 10 persons. The majority of the respondents were nurses.	This study to assess the status of the EMR system, identify challenges, facilitators and barriers, while at the same time examine the perception of health care providers at Ayder and St. Paul's Bisrat <i>et al.</i> teaching hospitals.	The results showed that mostly nurses have a positive perception that the system showed the favorable perceptions, especially on the ease of system, and also the interest of service providers that involved in the design, implementation, and system stages. The negative perception were low user acceptance, poor project management, poor ICT infrastructure, lack of training, and major challenges to the system implementation.
Leenen <i>et al.</i> , (2021) The Netherlands and UK Feasibility of continuous monitoring of vital signs in surgical patients on a general ward: an observational cohort study. doi: 10.1136/bmjopen-2020-042735	Observational cohort study.	Tertiary teaching hospital.	Nurses and patient	To determine feasibility, in terms of acceptability and system fidelity, of continuous vital signs monitoring on a general ward.	The results showed that the positive and negative perspectives of nurses regarding vital sign monitoring in the nursing ward. It is useful, easy to use but difficult to be learnt, and dissatisfied for nurses. For instance, sometimes they receiving alarms from all patients on the nursing ward, too annoying, often without clear picture of breathing and heart rate, and frequency of alarm malfunctions.

(Contd...)

Table 1: (Continued)

Author/Year/Topic	Study Design	Setting	Sample	Measurement	Results
Ngugi et al., (2021) Kenya Users' perception on factors contributing to Electronic Medical Records systems use: A focus group discussion study in healthcare facilities setting in Kenya Philomena. https://doi.org/10.1186/s12911-021-01737-x	Focus group discussions study	Hospital	20 healthcare professionals, including of nurses	This study was to explore end users' perceptions and experiences on factors facilitating and hindering EMRs use in healthcare facilities	Users' perception that EMR systems is easiness of use and learning of the system complemented, efficiency in patient data management, responsive Information Technology (IT) and collegial support, and user training. The identified barriers included: frequent power blackouts, inadequate computers, lack of continuous training and delayed IT support.
Nakano et al., (2021) Japan Perceptions of nurse managers and staff nurses regarding Technological Competency as Caring in Nursing theory in general hospitals in Japan. https://doi.org/10.33546/bnj.1767	A cross-sectional survey design	General hospital	Nurse manager and staff nurses	This study aimed to determine managers' and staff nurses' perceptions regarding the Technological Competency as Caring in Nursing (TCCN) theory	This study showed that nurses' aware that technology as caring. The nurse managers were more aware of providing care using technology, and recognizing the patient needs through technology.

is with patients, limiting nurses to documenting medical records has led to inaccurate dissemination of important information [31].

Various Types of Technology Applied by Nurses

This study discovered that there were 10 articles on ICT in nursing services such as the use of EHR [23], [24], [29]. It also includes HIT, ICT or implementing E-Health, and PAEHR [27], [19], [26], [20], [31], implementation of a novel electronic bedside nursing chart [21], while digital technology is also related to technology [30].

There are 5 articles on the use of sensors, that stated sensor technology in nursing needs to be developed as a tool for intelligence, innovation, and the use of the Internet of things (IoT) to improve health services and studies [17], [15]. Sensor is also a digital alert system that implemented in wards to detect or monitor vital signs of patients [16], [22]. Sensors can also be implemented as a warning system in the living community for adults groups to assist nurses in providing health services [28]. Meanwhile, there are also other articles related to the use of sensors and information technology [25]. There is also article related to the use of technology in general [18].

Discussion

The continuous development in technology has become an important need in providing services and needs for nurses. Based on this study, there are still gaps in the implementation of technology among nurses due to its impact on job satisfaction. Meanwhile, job satisfaction is a positive feeling of employees about themselves and their duties, which gives happiness or enjoyment at work [32], [33]. Bolli and Pusterla stated that there are four aspects in technology development that affect staff job satisfaction, namely the aspects of change in time use, new activities, access to information, communication tools [34]. Similarly, the

digitalization of technology has a positive effect on job satisfaction due to increased staff autonomy, flexible forms of work, productivity, and also create interaction with colleagues and supervisors [34]. Previous study by Fadel et al. also stated that technology increased nurse job satisfaction [20].

This is supported by study on the positive impact of technology, where the development in technology improved nurse-patient interaction [35], [36]. Therefore, nurses become more productive and experienced in overcoming distance barriers to communication [35]. The use of technological devices provides convenience [36], moreover, devices such as sensors also have positive benefits by monitoring the patient's vital signs continuously [16], and transmitting data in real-time as well as remote monitoring [15]. The results of other studies that support technology through ICT facilitate task completion, quality of care, reduce the physical burden and mental stress [19], and save nurses time in seeking information about patients [19], [20].

Previous results showed that there are still negative effects for nurses, where study on HIT applications discovered that nurses were unfriendly, unsupportive in daily professional practice, stressful, and unpleasant [27]. This is in line with study by Melnick et al., where the use of EHR in nurses is currently in low acceptance due to fatigue caused by excessive use of technology [29]. Some searches from the results of these studies still found gaps between nurses in applying technology so that nurses' job dissatisfaction was still found which was influenced by various factors.

Meanwhile, it was discovered that there are still differences in the results of the study related to various technology implementations. Based on study on job satisfaction and technology, nurses were more inclined to innovation, inclusiveness, willingness, and more satisfied with their duties when empowered by leaders [37]. Out of 144 articles, leadership characteristics and cohesion was discovered helpful for leaders to determine organizational strategies and create sustainable innovation [38]. In addition, the caring leaders will encourage their staff's emotional feelings

in dealing with situations in work environment so they have positive impact, improve innovation, creativity, and give influence on staff that create trust [39], therefore, innovative leaders are needed by nurses to achieve job satisfaction.

Innovation in an organization that is effectively managed can provide job satisfaction and improve service quality. Currently, the demand for digital technology continues to increase, therefore, various products, processes, markets, and innovations have the potential to improve performance [40]. The results of other studies on job satisfaction showed that there is an innovative and motivating relationship with organizational performance, where an increase in achievement can also increase effectiveness, efficiency, productivity, and competitiveness in the digital era [41]. In nursing, digital technology is intended to support healthcare that is Accepted, Effective, and Efficient [42]. This showed that innovations such as digital technology in nursing are important because they improve performance and job satisfaction that influence acceptance of the use of technology.

Limitations

The limitation of systematic review for researchers is rarely to find the recent published articles related to nurse job satisfaction in the using of technology, especially in implementation of digital sensors for inpatients. Another limitation is that a combination of various databases is still needed to get more optimal results, that is why the further studies are needed.

Conclusion

The nurses have a positive response because technology makes the completion of work easier, maintains patient safety where it can affect job satisfaction, while negative perceptions are the basis for solving problems. Therefore, support from their leader is needed to motivate and create nurses' awareness of technology to achieve the patient safety goals, centered care, and job satisfaction.

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Authors' Contributions

Setyowati contributed to the study, design, data analysis, manuscript writing.

Hanny Handiyani contributed to the study, data collection, data analysis, manuscript writing.

Raldi Artono Koestoer contributed to the study, data analysis, manuscript writing.

Diah Arruum contributed to the study through data collection and manuscript writing.

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