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#### ORIGINAL RESEARCH

# Disparate Digital Literacy Levels of Nursing Manager and Staff, Specifically in Nursing Informatics Competencies and Their Causes: A Cross-Sectional Study

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**Purpose:** The digitalization of healthcare is developing quickly. Every care provider needs to be up-to-date on this technology. The purpose of this research was to identify the digital literacy of nursing staff and nurse managers.

**Methods:** A cross-sectional study assessed nurses' digital literacy, specifically with regard to nursing informatics competencies in hospitals, primary healthcare, and clinics. The study sample included 100 nurses and 83 nurse managers. Researchers applied a modified questionnaire on nurses' informatics competencies from TIGER Nursing Informatics, with a validity range of 0.497–0.897 and a reliability value of 0.975.

**Results:** Participants showed an acceptable level of computer literacy, although their scores were below 80%. Their scores were unrelated to workplace, duration and type of technology used, or gender. Nursing informatics competencies correlated significantly with age and work experience (p = 0.001). Age correlated negatively with technical computer skills but positively with competence in the implementation of healthcare. There was a positive link with a nurse's position and education level, indicating that nurses with more education acquire higher levels of informatics competencies than those with less education. Additionally, those in higher positions tended to possess more advanced digital competence.

**Conclusion:** Nurse managers play a significant role in training nursing staff members to enhance their informatics competencies. This study's findings underscore the need to raise staff members' informatics competencies by providing additional training. **Keywords:** digital literacy, nursing informatics competencies, education, nurse, nurse manager, technology

### Introduction

The high demands on patient safety and the quality of health services require healthcare providers to stay informed about current developments in science and technology. Many health services in the era of digitalization require clinical competency as well as skills in the use of advanced digital-based instruments and equipment, such as electronic nursing documentation,<sup>1–3</sup> medical-based technological tools, and the use of robots.<sup>4,5</sup> Digital competency includes the ability to use telemedicine and participate in teleconsultations,<sup>6,7</sup> webinars, and online training.<sup>8–10</sup>

Today, the use of electronic medical records (EMR) provides documentation, patient follow-up, and communication between care providers. During the COVID-19 era, the availability of EMRs also became a means to lower transmission of disease because paper is an agent that can spread disease.<sup>11</sup> The EMR is used to document care as evidence that required activities have been carried out.<sup>12</sup> Numerous studies have confirmed that using EMRs has many benefits, such as increased compliance, accuracy, relevance, and support in decision making.<sup>1,13</sup>

While digitalization has many benefits in the health sector, there are also problems related to readiness. Its effective use requires infrastructure and a competent staff trained in the specific skills to use digital technology and to address ethical issues in its use.<sup>14,15</sup> Ensuring data security can be problematic in the era of digitalization to prevent data leaks of confidential information and the threat of loss of stored data in a server system from such causes as water damage, fire, and other disasters.<sup>16,17</sup> Data confidentiality is essential in the digital era, requiring the use of standardized security, such as backing up in local or wide area networks with safeguards against unauthorized people using personal devices to access and read confidential health data.<sup>15</sup>

Nurses are among the health workers who must keep up with new developments in technology for support services and nursing. Digital literacy is the basis for nursing informatics competency required for nursing service that uses technology.<sup>18,19</sup> The term refers to the capacity to comprehend, evaluate, and apply knowledge that we obtain via computers in a variety of formats and from a wide range of sources. Digital literacy is the capacity to use digital technologies for safe and suitable information gathering, management, understanding, integration, communication, evaluation, and initiating content for employment or for entrepreneurship. It encompasses competencies known by several other names, such as media literacy, computer literacy, information literacy, and ICT literacy.<sup>17,18</sup>

Digital literacy is a general competency that nurses must have to be able to use technology. It must be linked to the nurse's duties as a care provider. Digital literacy supports nursing informatics competency. This competency is necessary to support the provision of nursing care, and can be divided into three types: basic computer competency, information literacy, and data management literacy.<sup>20</sup>

In Indonesia, nurses' computer skills still face problems due to a lack of proficiency in using computer devices, software, and technology for care and service. Technology is still not widely used for analytical processes or as an information retrieval tool.<sup>20</sup>

Data collection was carried out through interviews with nursing administrators and activities using patient electronic documentation limited to data entry. From the standpoint of decision making, big data analysis has not yet been conducted, so the data is not yet supported for quality improvement.<sup>21,22</sup>

Considering the ethics of using technology in service is a high priority, focusing not only on the technology but also on prioritizing patient care.<sup>15,23</sup> This is consistent with Concept 5.0, in which prioritizing coexists between technology and humans. Locsin pointed out that technology is a caring nurse who makes health maintenance increasingly effective, faster, and more caring for patients.<sup>24</sup> Ethical regulation of the use of patient data—namely, respecting users' rights, using data wisely and correctly, documenting the data obtained from assessments not based on perception, and data manipulation—is crucial. Several situations transmitted recently on social media have shown the significance of healthcare's responsibility to safeguard the confidentiality of patients, as evidenced by the publication of photos of patients on social media, staff members using personal phones when on duty, and revealing the condition of patients without their permission.<sup>25,26</sup>

Various aspects of technology usage by nurses are influenced by the nursing manager's role. The managerial element in nursing is essential in planning and accommodating changes in the digitalization age. Hariyati et al, 2018 discovered that staff nurses expect support from nursing management. When there is a major change, such as migrating from paper-based to computer-based nursing documents, leaders must demonstrate and give clear directions on implementing the new system.<sup>27</sup>

In the post-covid period, research was conducted on improving digital literacy in one hospital using the ADDIE model approach. The results showed that there was an increase in ethical competence, but in several other aspects, there was no change. This research also emphasizes the important role of nurse managers in improving digital literacy competencies.<sup>26</sup> The role of manager in supervising and monitoring the use of digitalization is key. Head nurses must be competent in digital implementation, and leaders must reward progress exhibited in changing from conventional to digital record keeping. Nurse management must have digitalization competencies to direct and oversee the delivery of care and services.<sup>18,26</sup>

Informatics competency strengthens the skills needed to conduct a literature search in reputable journals, which can enhance nurses' professional development. Responsibilities such as scheduling nurses, managing logistics, planning

professional development, calculating work load, and conducting performance evaluations are all greatly benefited if a manager is capable of operating a basic spreadsheet program.<sup>28</sup>

Globalization is driving the need for digital literacy, motivating healthcare facilities in many developing nations to use EMRs and digital health monitoring. Regulations regarding the adoption of EMRs in all health services have been in place in Indonesia since 2023. Numerous procedures are still incomplete, making it difficult to prepare for the transition from traditional to electronic systems. Research by Hariyati et al has recommended increasing the role of nurse managers.<sup>27</sup> However, limited information is currently available about informatics competencies of nurse managers and staff, which is necessary to pursue this issue further.

This study's research questions are:

- 1. What is the current level of digital literacy of nurse managers, especially in nursing informatics?
- 2. Is there a distinction in digital literacy between staff nurses and nurse managers?
- 3. What factors influence nursing informatics competencies?

### Methods

This study is a cross-sectional investigation of nurses' digital literacy, specifically their informatics competency. The study sample included 83 nurse managers and 100 staff nurses. Participants were selected based on purposive sampling with the following inclusion criteria: nurse managers and staff nurses who can operate a computer and are actively working in hospitals, clinics, and primary healthcare. They voluntarily expressed their willingness to fill in a questionnaire (electronic form) that was delivered to candidates. The questionnaire was based on TIGER Nursing Informatics<sup>29</sup> and adapted for this study. Respondents were from various regions of Indonesia—Jakarta, Depok, Bogor, Bekasi, Tangerang, Lampung, Pangkal Pinang, Manado, Ambon, and Makassar.

Digital literacy is the awareness and ability of individuals to appropriately use digital tools and equipment. Previous research has reported that as informatics skills increase, digital literacy will also increase.<sup>30</sup> This research focuses on nurses' informatics competencies, which is the part of digital literacy that deals with the ability to use digital patient data wisely and apply knowledge gathered via computers in various formats and from various sources.

Twenty-nine questions were categorized into seven themes—basic computer literacy, digitalization used in healthcare services, information literacy, ethics in digital implementation, digitalization for patient education, innovation literacy, and digital tasks for daily living.30 Basic computer literacy consists of familiarity with spreadsheets, presentations, searching, downloading, and safe storage as well as general computer use. Information literacy covers policies, data use, boundaries, and constructive openness. Ethics questions cover security, privacy, and appropriate use of social media. Innovation literacy is understanding how data becomes useful information for analysis, retrieval decision making, and innovative improvements. The validity of the questionnaire is in the range of 0.497–0.897, while its reliability value is 0.975.

The data collected were extracted from the Google form survey and entered in IBM SPSS for further processing. For the following research variables, which included personal characteristics and digital literacy, descriptive statistics were determined, such as frequency, percentages, means, and standard deviations. Data gathered regarding the relationship between personal traits and nursing informatics competency were used for the Pearson correlation test. To determine differences in competency between nurse staff and nurse managers, independent *t*-test analyses were conducted. Results of p < 0.05 were considered significant.

The study was approved by the Faculty of Nursing Universitas Indonesia (No. KET-153/UN2.F12.D1.2.1/PPM.00.02/ 2023).<sup>31</sup> Respondents were fully informed of the purpose of the study, its benefits in enhancing digital literacy, the measures taken to protect the anonymity of their data, and their right to withdraw from the research at any time. To safeguard the respondents' identity and privacy, all information collected was anonymous.<sup>32</sup>

### Results

The current informatics competency of nursing staff and managers was investigated to determine their strengths and weaknesses.<sup>33</sup> The results of this phase can provide input for mitigation measures to enhance digital literacy in Indonesia

and other countries that introduce new systems, such as EMRs. Converting conventional medical records to electronic medical records is a major challenge that must be managed.

Table 1 details respondents' characteristics, showing that the majority were women who possess a bachelor's degree and work in hospitals as a nursing care provider/nursing staff.

Table 2 reflects the characteristics of the respondents involved in research. Their average length of work experience was about 10 years, and their average daily use of a cell phone or other technology was 8.81 hours.

Table 3 presents an overview of the informatics competencies of nurses and nurse managers. Implementation of measures to enhance ethics literacy was 81.5% of the total value, while implementation of measures to enhance literacy in patient services was 64%, and patient education was 75.9%. Other categories, such as innovation development, information literacy, basic computer competence, and literacy on computer use for daily tasks, were below 70%.

Table 4 shows no significant relationship between gender and nursing informatics competency, although men tended to score higher in all aspects of nursing informatics competencies, including general computer skills, information literacy, and computer use in ethics, care services, patient education, daily tasks, and digital innovation development.

Table 5 reports a non-significant difference according to position. Staff nurses tended to have higher average competency scores than team coordinators, and administrators and managers tended to have higher average competencies than nurses, although the differences were not statistically significant. Education level (academic degree attained) exhibited significant differences. Furthermore, Table 5 shows that nurses who work in hospitals had better-than-

Variables	Frequency	Present
Gender		
• Man	23	12.6
• Female	160	87.4
Education		
Vocational	60	32.8
Bachelor	113	61.7
Master in Nursing	4	2.2
Non-Nursing Master	6	3.3
Position		
Nurse Care Providers/staff	100	54.6
Nurse leaders		
Primary Nurse/Nurse Coordinator	72	39.3
Head Nurse	5	2.7
Nurse Manager (Middle or Top Level)	6	3.3
Health Care Services		
Hospital	170	92.9
Primary Health Care	9	4.9
Clinic	4	2.2

 Table I Characteristics Type Gender, Education, Position and Place Working (N:183)

 Table 2 Characteristics Age and Years Job Experience of Nurse (N:183)

Variables	Mean/SD	Min-Max	CI 95%
Years Old	33.63/6.8	21–53	32.59–34.65
Work Experiences	9.9/7.04	>1-29	8.87-10.99
Hours/day using HP	8.81/6.02	>1-10	7.9–9.72

Variables	Mean/ (%of Total)	Std Dev	Min-Max	CI 95%
Computer Basic Literacy	108.7/(68%)	20.9	55–180	105.6-111.9
Digitalization for Care Services	44.5/(64%)	9.44	21-75	43-45.9
Information Literacy	34.1/(70%)	6.68	18–55	33.08–35.1
Digital Ethics and Literacy	12.2/(81.5%)	2.55	7–20	11.84–12.6
Digitalization for Patient Education	15.2/(75.9%)	2.98	8–25	14.74–15.6
Innovation Literacy	42.7/(66%)	7.79	22–70	41.54–43.9
Digital for daily living	36.2/(67%)	7.11	15–60	35–37

Table 3 Digital Literacy, Specifically for Nursing Informatics Competencies (N:183)

Table 4 Correlation	Between Gend	ler and Digitalizat	ion Literacy, Specifica	ally for Nursing	Informatics C	Competencies
(N:183)						

Gender	A B		A B C		D E		1		F					
	Mean	р	Mean	р	Mean	р	Mean	р	Mean	р	Mean	р	Mean	р
Man Female	121.3 109.3	0.20	37.22 34.38	0.43	49.9 44.7	0.18	17.1 15.3	0.32	46.6 42.9	0.18	13.5 12.3	0.13	40.35 36.39	0.11

Notes: A: Basic Computer B: Information literacy C: digitalization Literacy for care service D: digitalisation Literacy for education E: digitalisation Literacy for innovation and development F: Ethic digitalization literacy G: Literacy for daily tasks.

Position		А		В		с		D		E		F		G	
		Mean- dif.	Ρ												
Nurse	Head of Team	9.4	0.03	2.77	0.05	4.18	0.03	1.28	0.44	2.98	0.09	1.06	0.05	3.00	0.42
Care providers	Head Nurse	-20.04	0.24	-5.89	0.35	-8.47	0.31	-3.16	0.15	-6.69	0.38	-2.63	0.17	-6.7	0.24
	Nurse manager	-17.8	0.28	-4.82	0.54	-7.3	0.40	-2.16	0.57	-7.39	0.16	-1.89	0.49	-6.67	0.16
Education	·	А		В		с		D		E		F		G	
		Mean- dif.	Ρ												
Diploma	Bachelor Nurse	-9.93	0.03	-3.49	0.01	-4.38	0.03	-1.03	0.26	-3.87	0.02	-1.18	0.04	-3.19	0.04
	Nurse Master	-11.5	1.0	-4.48	1.0	-6.05	I	-0.46	I	4.09	I	-1.08	I	-3.61	I
	Non Nurse Masters	-19.1	0.25	-6.56	0.15	-9.63	0.07	-1.88	I	-8.08	0.11	-2.17	0.34	-6.2	0.29
Institutions	·	А		В		с		D		E		F		G	
		Mean- dif.	Ρ	Mean- dif.	Р										
Hospital	Primary Health Care	3.7	I	1.1	I	1.83	I	0.42	I	0.91	I	0.52	I	0.94	I
	Clinic	4.1	I	2.08	I	2.5	I	0.77	I	2.71	I	-0.52	I	0.45	I

 Table 5 Mean Differences of Digital Literacy Specifically for Nursing Informatics Competencies Between Position, Education and Institution

Notes: A: Basic Computer B: Information literacy C: digitalization Literacy for care service D: digitalization Literacy for education E: digitalization Literacy for innovation and development F: Ethic digitalization literacy G: Literacy for daily living.

	Α		A B			C D			E				G	
	R	р	R	р	R	р	R	р	R	р	R	р	R	р
Age	-0.15	0.04	0.66	0.00	0.98	0.00	0.95	0.00	0.97	0.00	0.95	0.00	0.98	0.00
Experiences Hours	-0.017 -0.05	0.05 0.05	-0.37 -0.04	0.00 0.63	-0.14 -0.017	0.05 0.02	-0.016 0.02	0.03 0.02	-0.16 -0.06	0.07 0.03	-0.016 -0.19	0.03 0.01	-0.13 -0.15	0.09 0.04

**Table 6** Correlation Between Age, Job Experiences, Hours Using Technology, and Digitalization Literacy, Specifically for

 Nursing Informatics Competencies (N:183)

Notes: A: Basic Computer B: Information literacy C: digitalization Literacy for care service D: digitalization Literacy for education E: digitalization Literacy for innovation and development F: Ethic digitalization literacy G: Literacy for daily living.

average informatics competencies compared to those who work in community health centers and clinics, although the differences were not significant.

Table 6 demonstrates that age is significantly related to all competency variables, with strong correlations. In technical computer competence, the relationship is negative, which means that being older corresponds to lower computer technical skills. The other variables were positive, meaning that greater age was related to better competencies. The majority's length of work experience was significantly related to competencies, but the correlation was low. The use of personal phones and technology was significantly related to computer skills and literacy in education, innovation, and the use of computers for daily tasks.

### Discussion

### Nurses' Digital Literacy, Specifically Nursing Informatics Competencies

The average age of the respondents was 34 years with seven years of work experience. Their average daily use of technology was 8.8 hours. Digital literacy in computer basics was below 70%, while information literacy was within the range of sufficient (70%). A mastery of basic computer skills is indispensable in the digital era. Using software for word processing, presentations, and spreadsheets is essential for all nurses. Calculating fluid infusions, medication dosages, and fluid balances immediately is greatly facilitated if nurses have spreadsheet skills.<sup>34–37</sup> Nurse managers should master spreadsheets for staff scheduling, unit cost planning, and logistics.<sup>38,39</sup> Numerous routine tasks required in the provision of high-quality service can be analyzed and decisions can be supported by managers capable of converting data into information.<sup>28,39</sup>

Beyond EMR implementation, basic computer literacy is imperative for inputting, integrating, storing, searching, and using data in effective communication. The rules governing the use of EMRs are mandatory. Nurses must recognize their features and understand how the data must be documented and analyzed to support decisions for patient care and decisions relating to education and knowledge expansion.<sup>27,29,40</sup> From the standpoint of staff nurses, basic computer literacy is required to use EMRs appropriately for searching, collecting, and integrating data that will be used to make clinical decisions.<sup>41,42</sup>

Digitalization is also vital to support health service implementation. In addition to documentation, many nursing activities use advanced electronic tools, such as consultations via telenursing and educating patients and their families. Digital literacy in care services (64%) was still within the range of adequate competence, whereas digitalization for patient education was 75%. Nevertheless, by international standards, efforts should be made to enhance aspects of digital literacy that fall below 80%. The aim of the international recommendation framework for core areas of nursing competency in health informatics was to provide a grid that encompasses knowledge, competencies, professional roles, priorities, and practical experience.<sup>43</sup>

The conventional approach was that patient education is conducted via leaflets. Now video-based<sup>44,45</sup> and virtual reality<sup>46</sup> media are used. Virtual reality technology helps patients understand the health information being imparted, which speeds up its adaptation and prepares them for discharge.<sup>47,48</sup> With regard to digital literacy, patient education scored 76%, which is ranked as sufficient. The use of digital-based education cannot be separated from innovation

literacy. In this research, innovation literacy was still below 70%. Innovation literacy refers to the ability to develop innovation in nursing with the help of technology. Innovation development competence was under 70%. This is possibly because the main task of nursing is care delivery. Following the participants in developing communities is important because it will support service and care nursing. Joining in community digital innovation is known to develop impactful positive peer power toward enhancing digital literacy.<sup>49–52</sup>

Competence in information literacy on research scored 70%. Information literacy refers to elements of data security, the handling of information, and understanding the underlying regulations of health digitalization. This study found ethics components related to the proper use of data and social media to be 80%. However, an ethical nurse must prioritize care over focusing only on technology.<sup>24</sup> Data confidentiality has become a widely discussed issue.<sup>15,23,25</sup> Previous research has stated that unchecked openness violates professional ethics; healthcare workers and organizations must respect patient data and use them only in service to health.<sup>27,29</sup>

Many previous studies have underscored the benefits of digital technology. Undeniably, electronic documentation makes communication easier and more sustainable, and it avoids frequent misinterpretations caused by illegible handwriting.<sup>1</sup> The use of robots can support auxiliary activities, although by no means eliminating the importance of the human touch of nurses. Using technology in health services requires the interaction of professional skills with digital competence.<sup>53</sup>

Technology is useful in many aspects of life but only if everyone understands its appropriate uses. Digital technology can be applied not only to health services but also to nurses' daily activities. A sophisticated application can make schedules, create reminders, analyze lab results, and even provide entertainment to reduce stress.<sup>50–53</sup> Competency in the use of technology to support daily life was below 70%. This may have been caused by the burden of high workloads, which do not allow enough time to explore useful features.

### Gender, Age, Place of Employment, and Length of Time Spent Using a Mobile Phone

With regard to nursing informatics competencies, previous studies have found no significant correlation between gender and any sub-variables of digital literacy. When comparing nurse competencies by gender, men tended to have higher scores. Discussions on this topic point to evidence showing that men predominate in the fields of engineering, computing, and invention.<sup>54</sup> However, as women make up the majority of nurses worldwide, developing communities through group sharing and other means will facilitate the improvement of informatics competency.

Age is a crucial factor in basic computer literacy, ethics, service utilization, day-to-day living, and innovation development. Basic computer literacy and age have a negative relationship. This is important because as computer technology advances, so do the increasingly sophisticated abilities that go along with it. Regarding digital competency, those who have specialized in natural sciences warrant further research because these applications are used in services. Age and digital literacy, specifically for nursing informatics competencies, have a strong relationship with patient education, implementation services, innovation, ethics, and daily use. This indicates that older people will become more literate; nevertheless, there is a negative correlation between employment experience and literacy. These results are consistent with a recent study that found that age influences digital literacy.<sup>55,56</sup>

Place of work and nurses' informatics competencies were significantly correlated. According to this research, nurses who work in clinics or community health centers are less competent than nurses who work in hospitals. This can be applied to Indonesia, given that hospitals are often more highly developed due to linked service demands and the availability of power sources.<sup>56</sup> As an illustration, the development of electronic medical records has advanced further in hospitals than in community health centers or clinics.<sup>57</sup> The widespread use of mobile phones and electronic devices is correlated with digital literacy, but the trend is negative. This shows that use at work remains low, perhaps due to the demands of nurse activities for direct patient care.

### Education Factors in Nurses and Their Relationship with Digital Literacy

When comparing diploma nurses to bachelor's and master's degree holders, the mean difference is higher. Education is related to all aspects of life, including basic computer literacy, digital ethics, ethical use of technology, and application use in services. Education will affect the carrying out and implementation of services.<sup>20,55</sup>

Education relates directly to the quality of performance, and education is required in making appropriate decisions. Education is also needed to improve work performance, so continuing to improve education is imperative. Some previous studies found that the digital literacy of nurses was influenced by the level of education. Greater efforts are required to increase the level of education to ensure adequate competence in digital literacy.<sup>29,56,58,59</sup>

# Differences in Digital Literacy, Especially in Nursing Informatics Competencies, in Nurse Managers and Nurse Staff

This research identified differences in competence between staff nurses, coordinator teams, head nurses, and nurse managers. Nurse managers tended to score better than staff nurses, so nurse managers must serve as role models in new system implementation. The manager's function as a nurse is crucial in guiding behavior when using technology.<sup>3</sup> Implementing supervision can ensure that all staff members are aware of the importance of protecting patient confidentiality and using reliable data for support services, education, decision-making, and innovative development.<sup>60,61</sup> According to earlier research, an administrative manager's interpersonal, informational, and decision-making functions are crucial in implementation management.<sup>27,58,62</sup> When discussing how leaders should behave in the context of digital services, the leadership framework is helpful. Although digitalization has completely changed the nature of leadership, nurse leaders' education and training have not always kept pace with these rapid changes.<sup>63</sup>

# Limitations

This research was initial research to explore digital literacy, specifically regarding nurses' informatics competencies. The majority of respondents were nurse practitioners, and their positions and locations were not symmetrical. This research also has limitations because it does not use probability sampling so it cannot be generalized to conditions in a country, but it can use a general description of computer informatics competence in managers and nursing staff. This research can serve as initial data on the current situation of digital literacy and can become a basis for its development. Recommendations for further research are that the sample can use survey models and probability sampling.

## Conclusion

Digital literacy is the capacity to use digital technologies for safe and suitable information gathering, management, understanding, integration, communication, evaluation, and creation of content for employment and entrepreneurship. The majority of nurses' digital literacy, specifically their nursing informatics competencies, was at an adequate level. There were no connections between digital literacy and workplace, duration of the use of mobile phones and other electronic technology, or gender and digital literacy. Age and job experience correlated significantly with digital literacy. Age exhibited a positive correlation with digital literacy in service implementation but negatively with technical computer literacy. Nurses' job position and education had a positive correlation—those with higher education and position had better digital literacy. Nurse management has a big role to play in developing digital literacy. This research recommends augmenting the level of education to support digital literacy of the nursing staff. Educational development in general must focus on improving digital literacy. Nursing informatics competency must always be supervised by nursing managers so that it achieves the desired level of improved patient care.

# **Data Sharing Statement**

Fig share. Dataset. https://doi.org/10.6084/m9.figshare.26021863.v1

This project contains the following extended data: ethical approval.

Fig share. Dataset. https://doi.org/10.6084/m9.figshare.26021632.v1

This project contains the following extended data: Quantitative Digital Literacy.

Fig share. Dataset. https://doi.org/10.6084/m9.figshare.26021590.v1

This project contains the following extended data: Inform Concern for digital literacy Quantitative.

### **Ethical Statement**

The Ethics Committee of the Faculty of Nursing, Universitas Indonesia, gave its approval and the study was carried out in accordance with the Ethical principles (Number: KET-153/UN2.F12.D1.2.1/PPM.00.02/2023). Written informed permission was acquired from every research participant. The paper does not contain any personal information about the participants.

### Acknowledgment

Thank to all respondent, and Thank to Faculty of Nursing Universitas Indonesia and Directorate of Research Universitas Indonesia for research support.

# **Author Contributions**

All authors participated in the drafting, revising, or critical review of the article; they gave final approval of the version to be published; they agreed on the journal to which the article has been submitted; and they all made a significant contribution to the work reported, whether that be in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas.

# Disclosure

The authors declare no conflicts of interest related to the publication of this manuscript.

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