

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_439_24

# Digital empowerment in nursing: A cross-sectional exploration of digital competencies in healthcare services among nurses

Dipali Dumbre, Sheela Upendra, Shital Waghmare, Betsy Sara Zacharias, Pratik Salve

## Abstract:

**BACKGROUND:** The impact of digital technology on healthcare is remarkable as it greatly enhances the quality of health services in developed and developing nations. By improving the accessibility of health information and streamlining service provision, technology plays a crucial role in advancing healthcare. The study objectives are to assess the level of digital competencies among staff nurses and to find the association of digital competencies with selected demographic variables.

**MATERIALS AND METHODS:** This cross-sectional study was done on 300 staff nurses selected by purposive sampling technique. Data collection was done using the 5-point Likert scale through an online survey. The 5-point Likert scale went from frequently (5) to never (1). To determine the factors associated with basic digital competency, a multivariable logistic regression was carried out, with a *P* value of less than 0.05 considered statistically significant. A 95% confidence interval, and a coefficient estimate were used to explain the strength of the association.

**RESULT:** Out of the 300 staff nurses who were a part of the study, all of them answered, indicating a 100% response rate. The majority of the samples were from the age group of 20–25 years (61%). The majority of respondents were female (80%). The majority of the sample had an advanced level of digital competencies (53%). According to the findings of the multivariable logistic regression model, individuals between the ages of 26–30 years, gender (male), and education were found to have a significant association with digital competency, as indicated by a level of significance below 0.005.

**CONCLUSION:** In summary, the staff nurses have advanced level of digital competency. The findings emphasize the necessity for staff nurses to strengthen their digital competency for patient care in the hospital.

## Keywords:

Digital competencies, digital empowerment, staff nurses

Symbiosis College of Nursing, Symbiosis International (Deemed University), Pune, Maharashtra, India

## Address for correspondence:

Dr. Dipali Dumbre, Symbiosis College of Nursing, Symbiosis International (Deemed University), Pune, Maharashtra, India.  
E-mail: dipalidumbre@scon.edu.in

Received: 06-03-2024  
Accepted: 03-06-2024  
Published: 31-01-2025

## Introduction

The Royal College of Nursing Congress made a momentous decision in 2016. No longer is the use of data, information, and technology solely the job of specialists. Instead, every nurse should embrace the identity of an “e-nurse,” possessing the necessary abilities to utilize technology effectively for the betterment of patients,

service users, and carers.<sup>[1]</sup> To effectively manage the healthcare needs of a growing elderly population and those with chronic non-communicable diseases, it is imperative to involve and empower patients in self-care. This can be achieved through healthcare professionals who educate patients and their families by utilizing the concept of digital health. This requires healthcare staff to be well-versed in digital health and

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Dumbre D, Upendra S, Waghmare S, Zacharias BS, Salve P. Digital empowerment in nursing: A cross-sectional exploration of digital competencies in healthcare services among nurses. J Edu Health Promot 2025;14:26.

possess the necessary skills to effectively teach patients and their families.<sup>[2]</sup> The impact of digital technology on healthcare is remarkable as it greatly enhances the quality of health services in developed and developing nations. By improving the accessibility of health information and streamlining service provision, technology plays a crucial role in advancing healthcare.<sup>[3]</sup> To accomplish this, proper training is essential to equip and enable the next generation of workers.<sup>[4]</sup> Transforming our profession through digital capabilities guarantees the utmost caliber of healthcare for citizens while also optimizing patient care and yielding advantageous results such as improved patient outcomes, enhanced staff experiences, and streamlined work processes.<sup>[5]</sup> Technology is having a major impact on all aspects of contemporary society. We have advanced from basic machinery to powerful technologies featuring artificial superintelligence.<sup>[6]</sup> Technology has transformed nursing practice, bringing significant changes to the field of human health and wellness care. With rapid advancements in technology, the nursing industry has undergone a complete makeover. This has resulted in the adoption of electronic health records, advancements in biomedical and engineering technologies, cutting-edge developments in healthcare, and the use of robotics and artificial intelligence. As a result, the nursing profession has evolved tremendously, keeping pace with modern healthcare delivery methods.<sup>[7]</sup>

In the ever-evolving landscape of technology, nurses are now equipped with advanced tools and resources to seamlessly carry out their responsibilities and deliver exceptional care to patients. Over the span of three decades, the nursing field has undergone a significant transformation, marked by ground-breaking advancements such as robotically assisted surgeries that have the potential to revolutionize the traditional roles of surgeons and nurses in the operating room.<sup>[2]</sup>

To effectively care for the aging population and increasing number of patients with chronic non-communicable diseases, healthcare professionals must utilize effective strategies. Patient empowerment and involvement in self-care are crucial components in managing care, and healthcare personnel play a vital role in educating patients and their families. To effectively educate patients on digital health concepts and skills, healthcare professionals must be knowledgeable and possess the necessary skills.<sup>[8]</sup> Having the knowledge and skills to learn, understand, and use health information to make informed choices about one's health is referred to as health literacy (HL).<sup>[9]</sup> Individuals with low HL are at a significantly increased risk of a prolonged hospital stay, as well as a heightened likelihood of mortality by more than 50%.<sup>[10]</sup> These findings emphasize the importance of implementing healthcare information

systems in all medical facilities as they have been proven to enhance the overall quality of healthcare provided to patients.<sup>[11]</sup> Hence, it is imperative that healthcare practitioners possess the skills to effectively utilize and manage information technology. The utilization of digital health technology plays a vital role in enhancing patient well-being and facilitating healthcare delivery. This entails the collection, exchange, and examination of health data through various digital means such as information and communication technologies.<sup>[12]</sup>

Technology is constantly elevating our day-to-day experiences and connections. The healthcare world has seen significant improvements in patient care and safety thanks to technological advancements. However, to fully utilize technology in therapy, a certain level of digital literacy (DL) is required. In short, DL is the ability to confidently navigate and utilize digital tools for researching, organizing, comprehending, and producing information.<sup>[13]</sup> Nurses who possess advanced digital skills are well-prepared to apply their expertise in various job settings. The utilization of electronic charts and EMRs in bedside care is a prime illustration of the expanding role of digital technology, which has demonstrated positive effects on the delivery of high-quality patient care.<sup>[14]</sup>

For nurses to effectively utilize technology at the bedside, it is imperative that they possess a certain level of DL. This essential skill can be honed through educational programs, continuous professional development opportunities, and readily available technical support on site.<sup>[15]</sup> Due to its connection to the social factors influencing health, HL has gained significant focus as a relatively new concept in health promotion.<sup>[16]</sup> HL is an empowerment strategy that gives people the ability to take charge of their health, own up to their actions, and find the information they need.<sup>[17]</sup> The key responsibility of patients and healthcare providers in maintaining good health is to have convenient access to reliable information. This contributes to successful communication between healthcare experts and patients, which is evident in the ever-evolving digitalization of the healthcare industry, as a result of the rapid advancement of health technology.<sup>[18]</sup> The negative effects of low HL among nurses have been documented as HL has a significant impact on learning, remembering, and applying health information as well as patient outcomes.<sup>[19]</sup>

Nursing has been identified as the field with the most significant gaps in knowledge, skill, and awareness related to HL. As a part of a larger project aiming to improve patient care, we investigated the DL of staff nurses in Indian multispecialty hospitals. Our study highlights the current level of DL among these nurses and contributes to the development of a comprehensive

framework for incorporating DL in the healthcare setting. This research is a crucial step toward ensuring safe and high-quality care for patients.

The aim of this study was to assess the level of digital competencies among staff nurses and find the association of digital competencies with selected demographic variables

## Materials and Methods

### Study design and setting

This study used a descriptive cross-sectional design. A survey was carried out online between November 2023 and January 2024 by using Google Forms.

### Study participants and sampling

Samples for the present study were staff nurses working in multispecialty hospitals. The non-probability purposive sampling technique was used to choose the samples. Thought to have a 95% confidence level, an 80% proportion (based on the literature assessment), and a 5% degree of accuracy, the sample size was predicted to be 320. Taking into account a 20% non-response rate, we contacted 350 people. The participants received a brief description of the study's purpose and assessment. Out of them, 310 answered the survey. The research sample size decreased to 300 after 10 responses with missing data were eliminated.

### Data collection tool and technique

A survey was carried out online between November 2023 and January 2024 by using Google Forms. Participants received the questionnaire via both public and private social media channels, along with information on their voluntary involvement in the study. The demographic information of the staff nurses was analyzed using descriptive statistics. To determine any potential correlations between basic digital competency and other variables, a multivariable logistic regression was employed with a significance level of  $P < 0.05$ .

### Ethical consideration

Approved by the institutional research committee (IRC), We obtained informed consent from each participant.

### Outcome and outcome measure

Digital competency/literacy was the outcome variable, and it was assessed using 13 items that were broken down into five main categories.<sup>[20]</sup> Every item was scored on a 5-point Likert scale that went from frequently (5) to never (1). The first element was perusing and sifting through digital content while receiving medical care. Understanding the participants' degree of competency requires an understanding of information processing, which primarily focuses on a person's capacity to utilize

digital devices to search for, locate, evaluate, sort, store, and retrieve information. Utilizing electronic health records for accurate and efficient patient information retrieval and documentation constituted the second component. This pertains to a person's capacity to enter, read, comprehend, print, and record patient-related data via digital services. It also entails modifying the settings according to the user's interests. Conversely, communication refers to the capacity of an individual to share, communicate, and engage with others through digital devices and networks. Through this competency, patients can also receive health education. It covers local area networks and the internet. Assessing a person's ability to make judgments for a patient's care while utilizing digital gadgets is the main goal of decision-making. Making decisions also involves assessing when an individual gives up when problems arise or turns to digital solutions. The final element was safety, which evaluates the measures people take to safeguard their personal health and their equipment from physical or cyberattacks. We updated the European Commission's digital competency framework to create a Google Form-based questionnaire that we used for this study to measure digital proficiency.<sup>[21]</sup>

The competency level score was arranged as follows: the score range was 13–25, with developing digital competencies receiving the lowest score. Developing digital competencies came next, scoring between 26 and 39, with proficient digital competencies scores of 40–52 and advanced level digital competencies scores of 53–65.

### Quality control and analysis methods

Participants in the investigation received thorough training on appropriate approaches and handling of data. Throughout the data collection process, the 300 samples were closely monitored. Once collected, the data were carefully checked for accuracy and completeness before being loaded into the Statistical Package for Social Science for further analysis. The demographic information of the staff nurses was analyzed using descriptive statistics. To determine any potential correlations between basic digital competency and other variables, a multivariable logistic regression was employed with a significance level of  $P < 0.05$ . The strength of the relationship was elucidated using the correlation coefficient and 95% confidence interval (CI).

## Results

All 300 staff nurses who were part of the study responded to the request to participate, or 100% of them. The age range of 20–25 years old accounted for 61% of the sample, which was the largest group of participants in this study. This suggests that the demographic composition of the nursing workforce under examination is comparatively

younger. Individuals in the 26–30 age range made up 25% of the sample; those in the 31–35 and 36 years and older age ranges made up 6% and 8% of the sample, respectively [Table 1].

In the study population, the gender distribution was noticeably skewed, with a higher number of girls (80%) than males (20%). This is consistent with a global trend in which women have historically dominated the nursing profession. The participants' educational backgrounds provide a varied representation. With 52% of the sample holding a B.Sc. in Nursing, this was found to be the most common educational qualification among the participants.

With 20% of the participants holding the second most prevalent qualification, General Nursing and Midwifery (G.N.M.). Closely behind, with 27% of participants possessing this advanced degree, was M.Sc. Nursing, indicating a noteworthy percentage of highly educated persons in the research. The participants' years of experience distribution showed that there is a wide range of experience levels among nurses. Those with 1–5 years of experience made up the largest category (46% of the sample).

This implies that a significant percentage of the study's very early-career nurses. Forty percent of participants had less than a year of experience, suggesting that there are a significant number of recently graduated nurses in the workforce. A lesser but noticeable presence of individuals with 5.1–10 years (9%) and more than 15 years (5%) of experience was also revealed by the distribution, indicating a mix of mid-career and seasoned professionals.

Overall, the sociodemographic makeup of the nursing workforce was diverse, with a higher representation of women and individuals with advanced levels of education. In addition, the workforce is skewed toward a younger age, indicating a dynamic and evolving participant pool. This is further emphasized by the varying levels of experience within the group, ranging from seasoned veterans to newly-started careers. These demographic statistics lay the foundation for a more nuanced evaluation of digital proficiencies within the various specialties of nursing.

Moreover, the findings demonstrate that a significant portion of participants, 33%, had a strong grasp of the Emerging digital competency area. However, the majority, 67%, exhibited lower levels of proficiency. This highlights the need for tailored support and education to help these individuals improve their digital tool proficiency. The moderate degree of variability, with a standard deviation of 0.707, suggests that there is not

a clear consensus among participants' scores in this category. Overall, the mean competency score of 1.5 indicates a general tendency toward lower digital skill levels.

Out of the participants categorized as "Developing," 47% displayed a low level of competency while 53% displayed excellent competency. This category reflects a progressive journey of honing skills, with a relatively balanced mix of high and low levels of proficiency. With a standard deviation of 1.41, there was a moderate amount of variation in competency scores, while the mean score of 19 suggests a moderate level of proficiency within this category.

Nearly half of the participants (49%) in the "Proficient" category demonstrated a lower level of competency, while the remaining 51% showed a higher level. This suggests that this category is made up of individuals with varying levels of digital proficiency. The average competency score for this category, 103, suggests a generally higher level of overall competence. The standard deviation of 4.24 highlights the varied competency ratings of participants, showing the diversity within this category in terms of skill level.

In the "Advanced" category, we can see that nearly half of the participants (47%) demonstrated low competency while the majority (53%) exhibited good ability. It is worth noting that these individuals are highly skilled in technology. Interestingly, there was a modest level of fluctuation in scores, as shown by the standard deviation of 2.12. However, with an average competency score of 26.5, our participants in this category showcased a higher level of proficiency [Table 2].

In summary, the breakdown of competencies among our survey participants highlights the vast array of digital skill sets present within the group. We see the potential for focused training in the Emerging and Developing categories, while the Proficient and Advanced groups demonstrated a significant portion of our nursing staff excelling in digital proficiency. Examining the mean scores and standard deviations offers valuable information on competency levels and variation within each category. This allows us to develop personalized approaches for improving digital competencies among our entire nursing staff [Graph 1].

According to the findings of the multivariable regression model, individuals between the ages of 26 and 30 years were found to have a significant association with digital competency, as indicated by a level of significance below 0.005. Similarly, gender (male) and education were also significantly associated with digital competency, with *P* values below 0.005. These results highlight the



**Table 1: Sociodemographic characteristics of participants  $n=300$** 

Sociodemographic Characteristics	Frequency (f)	Percentage (%)
Age in years		
20–25	183	61%
26–30	75	25%
31–35	19	6%
36 and above	23	8%
Gender		
Male	61	200%
Female	239	80%
Education		
G.N.M	61	20%
B.Sc. Nursing	155	52%
M.Sc. Nursing	81	27%
Ph.D. Nursing	3	1%
Year of experience		
Less than 1 year	118	40%
1–5 years	139	46%
5.1–10 years	28	9%
More than 15 years	15	5%

**Table 2: Levels of digital competency**

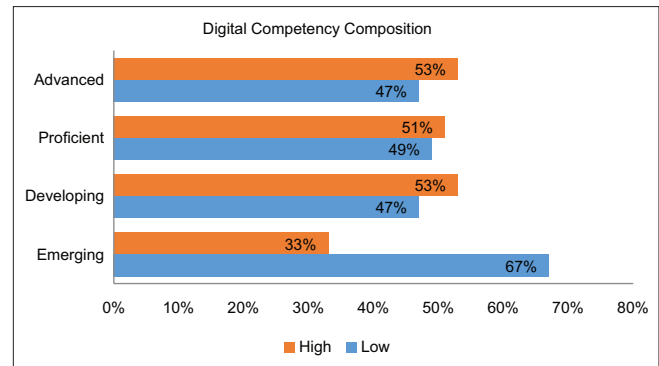
Levels	Low Freq	%	High Freq	%	Mean	Standard Deviation
Emerging	13	67%	25	33%	1.5	0.707
Developing	26	47%	39	53%	19	1.41
Proficient	40	49%	52	51%	103	4.24
Advanced	53	47%	65	53%	26.5	2.12

**Table 3: Multivariate regression analysis**

Variables	Coefficient Estimate	95%CI		P
		Lower	Upper	
Age in years				
20–25	–1.443	0.244	3.483	0.2056
26–30	–0.082	0.658	4.767	0.0021*
31–35	–1.564	0.077	0.566	0.9039
36 and above				
Gender				
Male	0.66	0.50	0.88	0.004*
Female				
Education				
G.N.M	0.400	1.098	2.266	0.026*
B.Sc. Nursing	1.903	1.210	3.191	0.029*
M.Sc. Nursing	0.031	0.671	1.586	0.887
Ph.D. Nursing				
Years of Experience				
Less than 1 year	0.1738	0.2908	0.1905	0.6783
1–5 years	0.9556	0.2564	9.2116	0.8484
5.1–10 years	0.9535	0.1108	0.3561	0.2972
More than 15 years				

\*It indicated that the level of significance is less than 0.005

importance of considering various demographic factors when investigating the factors that influence digital competency among nurses [Table 3].

**Graph 1: Level of digital competencies among staff nurses.**

## Discussion

According to the current study's level of digital competency, 67% of participants in the Emerging category of digital competency showed low competency levels and 33% showed high competency. Of the participants in the Developing category, 47% exhibited low competency and 53% high competency. About half of the participants (49%) in the Proficient category showed low competency, and the remaining 51% showed high competency. Of the participants in the Advanced category, 47% showed low competency and 53% showed high competency.

The research findings presented below, which focused on healthcare workers, support the findings. It reveals that these workers improved their operational skills (83.9%), privacy protection (89.7%), navigation skills (81.7%), and information searching (80.6%) scores overall and were regarded as highly desirable in these areas. In addition, their performance in adding content (78.1%), assessing data reliability (64.8%), and determining data relevance (68.2%) of the total score indicated a desirable level.<sup>[22]</sup>

A recent study conducted at a teaching and referral hospital aimed to determine the DL level and its influencing factors among medical professionals. Out of the 411 participants, the majority (51.8%) were found to possess sufficient DL skills, as characterized by a confident use of digital technology. The factors associated with a higher level of DL included access to digital devices and technology, prior training in digital skills, holding a master's degree, and exhibiting a positive attitude toward digital health technology.<sup>[23]</sup>

Considering the relationship, the study's conclusions imply that staff nurses employed by multispecialty hospitals possess strong digital competencies for problem-solving, safety, and communication when utilizing digital devices. The participants' overall level of digital competency was influenced by statistically significant factors related to age, gender, and qualification.

The study revealed that there were minimal differences in DL and its aspects among nurse administrators and practitioners, except for the utilization of digital media creation software. Similarly, no significant variations were identified in overall DL and its individual components between nurses in clinical and non-clinical roles, except for their usage of digital media creation and word processing programs. Surprisingly, the results also indicated that DL decreased with an increase in years of experience.<sup>[24]</sup>

Furthermore, a recent cross-sectional survey focused on healthcare providers' digital competency in a low-income country. The study revealed that variables such as gender, education level, profession type, monthly income, and years of experience have a significant impact on digital competency among healthcare providers in this specific setting. Interestingly, the results also highlighted that nurses have a higher digital competency level compared to medical laboratory professionals and pharmacists. Moreover, those with a higher monthly income and more years of experience tended to have lower levels of digital competency.<sup>[25]</sup>

### Limitation

- Sample size and representation: There may be restrictions on the study's ability to use a representative sample. The results might not be applicable to the larger nursing community if the sample size is too small or if it is not sufficiently diverse.
- Self-report bias: Self-report bias may be present in the information gathered from surveys or self-assessment instruments. The results could be inaccurate if participants overestimate or underestimate their digital competencies.
- Restricted scope of digital competencies: The study may concentrate on a particular set of digital competencies pertinent to healthcare services, thereby omitting other crucial technologies or skills that nurses actually utilize in their work.

### Recommendation

- Conduct longitudinal studies to monitor the evolution of nurses' digital competencies over time. A more thorough grasp of the growth and development of digital skills in the nursing workforce would be possible with this method.
- Mixed-method research methodology: Integrate quantitative surveys with qualitative techniques such as focus groups and interviews to learn more about how nurses use digital technologies and what influences their digital competencies.
- Use a variety of sampling techniques to guarantee that the sample of nurses is representative of different healthcare settings, specializations, regions, and levels of experience.

- Measurement tool validation: Verify the validity and reliability of the tools used to measure digital competencies to ascertain that nurses are proficient in using digital technologies.

### Conclusion

This study provides valuable insights into the digital competencies of nurses, offering a comprehensive understanding of the factors that impact their proficiency in the digital sphere. Our results highlight the significance of customized educational programs that take into account gender and individual educational backgrounds to enhance the digital skills of nurses. Although age and years of experience may not be decisive factors, it is crucial to continually work toward equipping nurses of all demographics with the necessary skills to effectively utilize digital technologies in the dynamic healthcare landscape. By contributing to the ongoing discussion on digital empowerment in nursing, this study lays a solid foundation for targeted interventions.

### Acknowledgment

I would want to express my gratitude to every research participant who so kindly contributed their time and energy to this project. Additionally, to the Symbiosis College of Nursing Library librarians for helping me locate the relevant study materials.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

1. Royal College of Nursing. The UK Nursing Labour Market Review 2018. RCN; 2018.
2. Holt KA, Overgaard D, Engel LV, Kayser L. Health literacy, digital literacy and eHealth literacy in Danish nursing students at entry and graduate level: A cross sectional study. *BMC Nurs* 2020;19:22.
3. Tran Ngoc C, Bigirimana N, Muneene D, Bataringaya JE, Barango P, Eskandar H, et al. Conclusions of the digital health hub of the transform Africa summit (2018): Strong government leadership and public-private-partnerships are key prerequisites for sustainable scale up of digital health in Africa. *BMC Proc* 2018;12:17.
4. Dykes S, Chu CH. Now more than ever, nurses need to be involved in technology design: Lessons from the COVID-19 pandemic. *J Clin Nurs* 2021;30:25-8.
5. Booth RG, Strudwick G, McBride S, O'Connor S, Solano López AL. How the nursing profession should adapt for a digital future. *Br Med J* 2021;373:1190.
6. Barrat J. Our Final Invention: Artificial Intelligence and the End of the Human Era by James Barrat. St. Martin's Griffin Press 2013. p. 267.
7. Criss CN, Gadepalli SK. Sponsoring surgeons: An investigation on the influence of the da Vinci robot. *Am J Surg* 2018;216:84-7.
8. Joveini H, Rohban A, Askarian P, Maheri M, Hashemian M. Health

- literacy and its associated demographic factors in 18–65-year-old, literate adults in Bardaskan. Iran J Educ Health Promot 2019;8:244.
9. Pooryaghob M, Abdollahi F, Mobadery T, Shabanha NH, Bajalan Z. Assesse the health literacy in multiple sclerosis patients. J Health Lit 2018;2:266-74.
10. Mutiar A, MKep ES. Digital media literacy level among nurses in urban area of Indonesia. Int Public Health J 2021;13:213–8.
11. Turakhia MP, Desai SA, Harrington RA. The outlook of digital health for cardiovascular medicine: Challenges but also extraordinary opportunities. JAMA Cardiol 2016;1:743–4.
12. Khosrow-Pour M. Dictionary of Information Science and Technology. 2<sup>nd</sup> ed. Hershey, Pennsylvania: IGI Global; 2013.
13. Wei-Lan XM, Li-Qun YM, Hong-Yu Z. Nursing informatics in clinical practice in china. Comput Inform Nurs 2013;31:214-8.
14. Chang CP, Lee TT, Liu CH, Mills ME. Nurses’ experiences of an initial and reimplemented electronic health record use. Comput Inform Nurs 2016;34:183-90.
15. Nutbeam D, Levin-Zamir D, Rowlands G. Health literacy in context. Int J Environ Res Public Health 2018;15:2657.
16. Stormacq C, Wosinski J, Boillat E, Van den Broucke S. Effects of health literacy interventions on health-related outcomes in socioeconomically disadvantaged adults living in the community: A systematic review. JBI Evid Synth 2020;18:1389-469.
17. Alipour J, Payandeh A. Assessing the level of digital health literacy among healthcare workers of teaching hospitals in the southeast of Iran. Inform Med Unlocked. 2022;29:100868.
18. Meppelink CS, Smit EG, Franssen ML, Diviani N. “I was rightabout vaccination”: Confirmation bias and health literacy in online health information seeking. J Health Commun 2019;24:129-40.
19. Wittenberg E, Ferrell B, Kanter E, Buller H. Health literacy: Exploring nursing challenges to providing support and understanding. Clin J Oncol Nurs 2018;22:53-61.
20. Hökkä M, Melender H-L, Lehto JT, Kaakinen P. Palliative nursing competencies required for different levels of palliative care provision: A qualitative analysis of health care professionals’ perspectives. J Palliat Med 2021;24:1516-24.
21. A.J. European Digital Competence Framework for Citizens (DigComp). Available from: <https://ec.europa.eu/social/main.jsp?langId=en and catId=1315> and 2019.
22. Alipour J, Payandeh A. Assessing the level of digital health literacy among healthcare workers of teaching hospitals in the southeast of Iran. Inform Med Unlocked 2022;9:100868.
23. Tegegne MD, Tilahun B, Mamuye A, Kerie H, Nurhussien F, Zemen E, *et al.* Digital literacy level and associated factors among health professionals in a referral and teaching hospital: An implication for future digital health systems implementation. Front Public Health 2023;11:1130894.
24. Pituksung A, Poyen J, Namthep J, Chimchalong R, Panyawong T, Rerkmongkol W, *et al.* Digital literacy among nurses working in a University Hospital. J Thai Nurse Midwife Counc 2023;38:38-4.
25. Shiferaw KB, Tilahun BC, Endehabtu BF. Healthcare providers’ digital competency: A cross-sectional survey in a low-income country setting. BMC Health Serv Res 2020;20:1021.