

Nursing Intern Students' Perception of Digital Competency, and Teamwork Communication

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ABSTRACT

Background: Digital competency is essential for nursing intern students because it helps them effectively use technology in learning and professional practice. It also improves communication, problem-solving. Career sustainability refers to the ability to maintain long-term professional growth and stability. Therefore, improving digital competency can support career sustainability among nursing intern students. **The aim of this study** was to examine interplay between digital competency, and career sustainability among nursing intern students. **Methods:** Research design: A descriptive correlational design was used. **Setting:** This study was conducted at Zagazig University Hospitals. **Study subjects:** A convenience sample of 700 Nursing Intern students were included from the above-mentioned setting was the participants of the study. **Tools of data collection:** Two tools were used to conduct the study, Digital Competency Questionnaire, and Career sustainability scale. **Results:** In the light of main study results; it was found that more than half of nursing intern students (53.1%& 67.6%) had a high perception level of digital competency and career sustainability. **Conclusion:** there was statistically significant and direct correlation between digital competency and nursing intern students' career sustainability.

Recommendation: integrating digital competency training into nursing curricula, and encouraging interns' continuous support and career development initiatives for promoting career sustainability.

Keywords: Digital Competency, Career Sustainability, Nursing Intern students

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INTRODUCTION

The rapid digital transformation in healthcare systems has significantly changed the nature of healthcare education and clinical practice. Healthcare organizations increasingly depend on digital technologies such as electronic health records, telemedicine, mobile health applications, and online communication systems to improve the quality and safety of patient care. Consequently, nursing education institutions are expected to prepare intern students who are capable of effectively utilizing digital technologies in different healthcare settings [1].

Digital competency refers to the ability to confidently, critically, and ethically use digital technologies for communication, information management, problem solving, and professional development. It includes various dimensions such as digital knowledge, technical skills, critical thinking, information literacy, communication abilities, and positive attitudes toward technology use [2].

In recent years, the integration of digital technologies into healthcare services has accelerated due to the increasing complexity of healthcare delivery and the growing demand for efficient patient management systems. Nursing intern students are frequently exposed to digital platforms during clinical training, including electronic documentation systems, virtual learning environments, and digital communication tools [3].

Digital competency also contributes to improving clinical decision-making among intern students. The ability to search for reliable online information, analyze digital data, and apply evidence-based practices enables students to make informed clinical judgments. Furthermore, digital technologies support continuous learning by providing access to online educational resources, virtual simulations, and professional development programs [4].

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Career sustainability has recently gained increasing attention as an important factor influencing the long-term success and stability of healthcare professionals. Career sustainability refers to the ability of individuals to maintain continuous employability, professional growth, adaptability, and job satisfaction throughout their careers. For nursing intern students, career sustainability is considered essential because they are entering a rapidly changing healthcare environment characterized by technological advancements, workforce challenges, and increasing professional demands [5].

The relationship between digital competency and career sustainability is particularly important among nursing intern students because they represent the future healthcare workforce. Educational institutions play a vital role in developing students' digital competencies through integrating digital literacy training, simulation technologies, online learning platforms, and technology-based clinical education into nursing curricula. Supporting students in developing these competencies can contribute to preparing a resilient and adaptable workforce capable of sustaining professional success in technologically advanced healthcare systems [6].

Despite the recognized importance of digital competency and career sustainability, some intern students may still experience difficulties in adapting to rapidly evolving digital healthcare environments due to limited technological skills, inadequate training opportunities, or insufficient institutional support. Therefore, assessing the relationship between digital competency and career sustainability among intern students is essential for identifying educational needs and developing effective strategies that enhance students' professional preparedness, technological adaptability, and long-term career success in the healthcare field [7].

Significance of the study

The growing integration of digital technologies into healthcare systems has made digital competency and effective teamwork communication essential skills for healthcare professionals, particularly for nurse interns who are at the beginning of their careers.

Equally career sustainability is increasingly important for intern students because it reflects their ability to maintain long-term career growth, adaptability, and professional well-being in dynamic work settings. Therefore, enhancing digital competency among intern students can positively contribute to career sustainability by supporting continuous learning, employability, and professional development [8]. Possessing strong digital competency skills increases self-confidence, improves adaptability, and enhances engagement in clinical environments, thereby reducing the likelihood of burnout and career dropout. Furthermore, these skills support continuous learning and professional development, which are essential for sustaining a long and fulfilling nursing career. Thereby, the aim of this study was to assess nursing intern students' perception of digital competency, and career sustainability at Zagazig University Hospitals.

Aim of the Study

The aim of this study was to assess nursing intern students' perception of digital competency, and career sustainability at Zagazig University Hospitals.

Research objectives

- 1-Determine digital competency level as perceived by nursing intern students at Zagazig University Hospitals.
- 2-Assess career sustainability level as perceived by nursing intern students at Zagazig University Hospitals.
- 3-Investigate the relation between digital competency, and nursing intern's career sustainability at Zagazig University Hospitals.

Research Questions

1. What is the level of digital competency as perceived by nursing intern students at Zagazig University Hospitals?
2. What is the level of career sustainability as perceived by nursing intern students at Zagazig University Hospitals?
3. What is the relation between digital competency and nursing intern's career sustainability at Zagazig University Hospitals?

Subjects and Methods

Research-design

A descriptive correlational research design was applied.

Setting

The study was conducted at Zagazig university hospitals (academic hospitals), which include two sectors (emergency sector and El -Salam sector) involving nine teaching hospitals. The total bed capacity of the hospitals is 2034 beds.

Study Subjects

inclusion criteria,

All nursing intern students at Zagazig University Hospitals from academic year 2024/2025, and, passed at least six months in training area.

Participants:

A convenient sample from all nursing intern students at Zagazig University Hospitals from academic year 2024/2025, and, passed at least six months in training area. The Sample of the study subjects was composed of 700 nursing intern students were participated based on their accessibility, availability, and willingness to participate, rather than through random selection [9].

Tools of data collection: Two tools were used to conduct the study

Tool I: Digital Competency Questionnaire: consists of two parts as follows:

Part I: nursing intern students' personal characteristics, as age, gender, place of residence, enrollment in college is considered a basic desire and hospital name.

Part II: Digital Competency Questionnaire, to assess nursing intern students' perception level regarding digital competency. This tool was adopted from [10]. It includes 26 items categorized under three domains namely; "Digital Competency Knowledge" (4 items), "Digital Competency Skill" (8 items), and finally 'Digital Competency Attitude' domain (14 items). E.g "Digital technologies will make my day-to-day work easier".

Scoring System:

Responses of nursing intern students to digital competency questionnaire were measured on three points Likert scale as follows (1 Disagree, 2 Neutral, and 3 Agree). The scores of each domain were summed and the total divided by numbers of items total scores ranged from (26-78). These scores were converted into percentage score according to [11]. The total perception level of digital competency among nurse interns considerate:

- Low if the score less than 50%
- Moderate if the score ranges from 50% to 75%
- High if the score more than 75% to 100%

Tool II: Career Sustainability scale:

This scale adopted from [12] to assess the level of career sustainability from nursing intern students' perspective. It includes 12 items categorized under four domains each one involves three items, which are namely “; resourcefulness”, “flexibility”, “regeneration” and finally “ integration” domain. E.g ‘I feel that my work is aligned with my personal values’.

Scoring system:

Responses of nursing intern students to career sustainability scale were measured on three points Likert scale as follows (1 disagree, ,2 Neutral, 3 Agree). The scores of each domain were summed and the total divided by numbers of items the total scores ranged from (12-36) these scores were converted into percentage score according to [11]. The total perception level of career sustainability among nurse interns:

- Low if the score less than 50%
- Moderate if the score ranges from 50% to 75%
- High if the score more than 75% to 100%

Tools validity and reliability

Study tools were originally developed in English and then translated into Arabic. The consistency between the English and Arabic versions was ascertained and presented to a panel of five experts specialized in nursing administration at the Faculty of Nursing, Zagazig University to examine face and content validity. The reliability of the questionnaire was measured through Cronbach's Alpha coefficient for assessing its internal consistency, and it was as the following; digital competency (0.961), and career sustainability (0.965).

Field work description

The data collection phase took 3 months from the 1st of June to the end of August, 2025. The preparatory phase starts by printing questionnaire forms. The data collection phase of this study was executed from 5-10 nursing intern per day /six days per weeks, each nursing intern was met individually, got a full explanation about the aim of the study and was invited to participate.

Nursing intern students who gave his/her verbal informed consent to participate was handed the self- administered questionnaire and was instructed during the filling which took about from 20 to 45 minutes, then, the researcher checked each questionnaire sheet to ensure the completion of all information to avoid any missing data.

Pilot study:

A pilot study was carried out on 10 % of study subjects (70 nursing intern students) to test tools' feasibility, practicability. Participants took 20 to 45 minutes to finish

the questionnaire. Notably, participants in the pilot study were excluded from the main study sample.

Administrative and ethical considerations:

Official permissions were obtained from the dean of the Faculty of Nursing, Zagazig University, and approval to conduct the study by ethics committee, (Code: M.D.ZU.NUR/269/12/6/2025). Then, a letter containing the aim of the study was directed from the Faculty of Nursing to the medical and nursing administration of the Zagazig University Hospitals requesting their approval and cooperation for data collection. Participation was voluntary, and confidentiality of the data was assured.

Statistical analysis

IBM SPSS Statistics 23.0 was used to examine the data. Qualitative data are displayed as percentages and frequencies, whereas quantitative data are displayed as mean $\pm$ SD, median, and range. Chi-square was used to compare categorical variables. Stronger correlations were indicated by values closer to ± 1 in Pearson's correlation, which evaluated links between variables. Relationships between dependent and independent variables were investigated using multiple linear regression, which reported β and R^2 . A p-value of less than 0.05 was regarded as significant.

Results:

Table 1 shows personal characteristics of nursing intern students. It is clear from this table that, slightly more than half of nursing intern students (55%) were less than 23 years old. In addition, more than half of them (64.9%, & 61%) were female and lived in rural areas respectively. According to marital status, less than half of nursing intern students (45.6%) were single, and about three quarter of them (77.7%, & 73.9%) were enrolled in college based on their own desire, and had enough monthly income respectively. Figure 1, shows that, more than half of nursing intern students (53.1%) had a high perception level regarding digital competency, while only (6.4%) of them had a low perception level.

Table 2, shows that, (43.4%) of nursing intern students had a high perception level regarding attitude domain of digital competency, while (40%) of them had a moderate perception level regarding knowledge domain, as well (36.1%) of them had a low perception level regarding skill domain.

Figure 2, shows that, more than half of nursing intern students (67.6%) had a high perception level regarding career sustainability, while (7.4%) of them had a low perception level.

Table 3, shows that, (72.1%, & 70.7%) of nursing intern students had a high perception level regarding integration and flexibility domain of career sustainability, while only (9.7%) of them had a low perception level regarding regeneration domain.

Table 4, shows that, there is a high statistically significant positive correlation between digital competency and career sustainability of nursing intern students ($r=0.683$ & 0.619 , P value at 0.0001).

Table 5, shows that, multivariate regression analysis illustrating factors influencing career sustainability among nursing intern students. The model was statistically

significant ($f = 1074.243$, $p < .028$), explaining 75.4% ($r^2 = .754$) of the variance in nursing intern students' career sustainability levels, where results revealed that digital competency ($\beta = 0.069$, $p < 0.000$) had a significant positive effect on career sustainability.

Table (1): Frequency and percentage distribution of personal/job characteristics of nursing intern students (n=700).

		Frequency	Percent
Age	<23 years	385	55.0
	≥23years	315	45.0
23.14±13.82			
Gender	Male	246	35.1
	Female	454	64.9
Residence	Urban	273	39.0
	Rural	427	61.0
Monthly income	Enough	517	73.9
	Not enough:	183	26.1
Enrollment in college	Own desire:	544	77.7
	Without desire:	156	22.3
Marital status	Married	301	43.0
	Single	319	45.6

Table (2): Distribution of digital competency domains as perceived by nursing intern students (n=700).

Digital Competency Domains	High		Moderate		Low	
	N	%	N	%	N	%
Digital Knowledge	259	37	280	40	161	23
Digital Skill	232	33.1	215	30.7	253	36.1
Digital Attitude	304	43.4	203	29	193	27.6

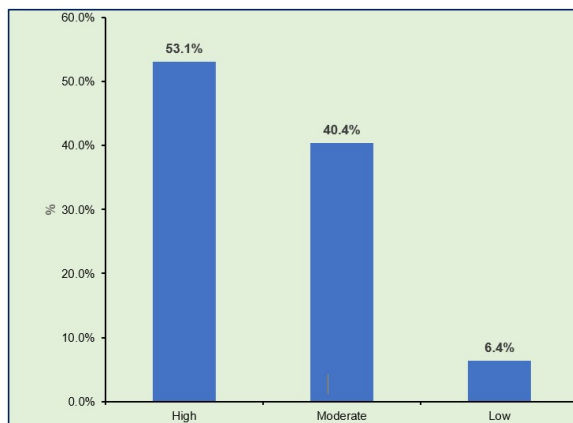


Figure 1: Total level of nursing intern students' perception regarding digital competency (n=700).

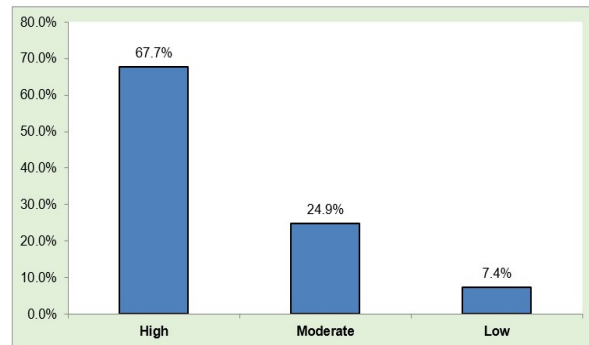


Figure 2: Total levels of nursing intern students' perception regarding career sustainability (n=700).

Table (3): Total level of nursing intern students' perception regarding career sustainability domains (n=700).

Career Sustainability Domains	Low		Moderate		High	
	N	%	N	%	N	%
Resourcefulness	61	8.7	147	21.0	492	70.3
Flexibility	68	9.7	137	19.6	495	70.7
Regeneration	68	9.7	146	20.9	486	69.4
Integration	68	9.7	127	18.1	505	72.1

Table (4): Correlation matrix between digital competency, and career sustainability among nursing intern students(n=700).

Variables	Digital competency	
	R	P
Digital competency score	1.000	-----
Career sustainability	.619**	0.0001

Table (5): Multivariate linear regression analysis of factor affecting career sustainability as perceived by nursing intern students (n=700)

	Unstandardized Coefficients		Standardized Coefficients	t.	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	0.239	0.050		4.783	.000	0.141	0.337
Digital competency	0.069	0.031	0.068	2.207	.028	0.008	0.130
ANOVA	F	df	Adjusted R ²	R	R Square		
	1074.243	2	0.754	0.869	0.755		

a. Dependent Variable: Career sustainability. Predictor: Digital competency

Discussion

The transition from academic learning to clinical practice is a critical stage for nurse interns. Digital competency and teamwork communication are essential for career sustainability, as they support effective use of technology, collaboration with healthcare teams, and professional development. Together, these competencies enhance adaptability, continuous learning, and long-term success in healthcare settings [13].

Concerning total perception levels of digital competency, the finding of present study indicated that more than half of nursing intern students had a high perception level regarding digital competency, this finding could be due to frequent exposure to health information technologies during their academic preparation and clinical training, Such as electronic health records, online learning platforms, and simulation labs enhances their confidence and technical skills.

This finding is in agreement with the study carried out by Noeman, Mostafa & Elksas [14], in Egypt, and revealed that nursing intern students had a high perception level regarding digital competency.

Conversely, this finding is contradicted with study that carried out by Ma et al. [15], in Europe, and found that, most of participant had moderate levels of digital competence, particularly in areas related to data security, digital communication, and critical evaluation of online health information.

As regard distribution digital competency domains, the findings of present study indicated that less than half of nursing intern students had a high perception level regarding attitude domain, may be due to limited hands-on experience with digital health technologies, insufficient training programs focusing on digital skills, and inadequate integration of digital tools within clinical education.

This finding is in agreement with the study carried out by Abou Hashish & Alnajjar [16], in Saudi Arabia, and found that the high perception level of nursing intern students regarding digital competency was related to attitude domain of digital competency, and Dallora et al. [17], in Sweden, and found that nurse interns reported relatively high levels of positive attitude toward technology.

As regard total perception levels of career sustainability, more than half of nursing intern students had a high perception level regarding career sustainability, this may be due to, during the internship period, nurse interns are exposed to real clinical environments that help them understand professional responsibilities and long-term career expectations.

These findings are in agreement with the study carried out by El-Bahnasawy, Al Hadid & Fayed [18], in Egypt, and found that nursing intern students had positive attitudes toward their future career planning and professional development, indicating a high level of perception regarding their future career sustainability.

Conversely, these findings are in disagreement with the previous study carried out by Kotp et al. [19], in Egypt, and

found that nurse interns had only a moderate perception of their career sustainability.

As regard distribution career sustainability domains, the finding of the present study revealed that highest perception level of nursing intern students regarding career sustainability was related to integration domain, followed by flexibility, these findings may be due to nursing intern students who experience effective integration into healthcare teams often gain a strong sense of belonging and professional identity, which positively influences their perception of long-term career viability.

These findings are in agreement with the study carried out by Su et al. [20], in China, and found that nursing intern students can perceive strong perception toward integration followed by the profession which considered a domain of career sustainability.

Conversely, these findings are in disagreement with the previous study carried out by Tu et al. [21], in China, and found that low perception level of nursing intern students regarding career sustainability was related to Integration domain.

As regard correlation between digital competency, and career sustainability of nursing intern students. It's clear from this table that, there is a high statistically significant positive correlation between digital competency and career sustainability of nursing intern students. Additionally, interns with strong digital competency perceive themselves as more adaptable and prepared for future career challenges, thereby enhancing their sense of career sustainability.

The finding was consistent with the result of the study of Zhang et al. [22], in China, and found that the positive impact of digital competency on nurses' career sustainability at both the individual and organizational levels .Also, a study conducted by Ismail et al. [23], in Egypt, and found that a significant positive correlation among digital nurse' competencies, and patient safety.

As regard Multivariate linear regression analysis of career sustainability among the studied nursing intern students, the current study revealed that digital competency had significant positive effects on career sustainability. This may be due to when students had strong digital skills, this can facilitate access to up-to-date medical knowledge and evidence-based practice resources, and stay current with evolving healthcare standards.

The finding was consistent with the result of the study of Ibrahim, et al. [24], in Egypt, and found that digital competency significantly and positively influences career sustainability-related outcomes.

Conclusion

The study findings indicated that digital competency was significantly and positively associated with career sustainability among the study participants, suggesting that digital competency may play an important role in enhancing interns' career sustainability.

Recommendations

- Formally integrating digital competency into nursing curricula.
- Aligning education with current healthcare labor market demands.

- Ensuring the availability of adequate digital hospitals' infrastructure.
- Encouraging nursing intern students to engage in self-directed learning through online courses, and digital platforms.

Authors' contributions

A.M.K.A; developed the research, provided an explanation, collected information, produced the first manuscript. N.M.A.M; made significant contributions to the goal and research hypothesis, introduction, review of the study's significance, debate. H.S.M; review study finding, discussion, conclusion, and recommendations and offered critical feedback on the text. H.A.E.M.A; participated in

every phase of the research process, and publication. All authors revised and approved the final manuscript.

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Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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