

# The Attitudes of Nurses Working in Surgical Clinics Toward Health Information Technology Usage: Descriptive Cross-Sectional Study

## Cerrahi Kliniklerde Çalışan Hemşirelerin Sağlıkta Teknoloji Kullanımına Yönelik Tutumları: Tanımlayıcı Kesitsel Araştırma

<sup>1</sup> Hatice Esra ÇETKİN<sup>a</sup>, <sup>2</sup> İkbâl ÇAVDAR<sup>b</sup>

<sup>a</sup>İstanbul University-Cerrahpaşa Institute of Graduate Studies, Department of Surgical Diseases Nursing, İstanbul, Türkiye

<sup>b</sup>Atlas University Faculty of Health Science, Department of Nursing, İstanbul, Türkiye

**ABSTRACT Objective:** The aim of this study was to evaluate the attitudes and affecting factors of surgical nurses towards health information technology usage. **Material and Methods:** This descriptive cross-sectional study was carried out with a total of 250 nurses working in surgical units. In this study, as a result of the literature review, the “personal information form” created by the researcher and the “Health-care Technology Assessment Attitude Scale of Health Personnel Scale (HTAASHPS)” were used. **Results:** The mean age of the surgical nurses who participated in the study was 34.44±7.46. According to the results, 87.2% of nurses participated to study were female and 12.8% of them were male. Sixty percent (60%) of participants worked at the university hospital and 40% of participants worked at the state hospital. The mean total HTAASHPS score of nurses was determined as 4.06±0.41. The mean values of “scope”, “awareness” and “benefit” dimensions of scale were detected as 4.11±0.60; 4.23±0.52 and 3.94±0.44, respectively. The total HTAASHPS score of male nurses was higher than female nurses ( $p<0.05$ ). The total HTAASHPS score of nurses working at the state hospital was significantly higher than nurses working at the university hospital ( $p<0.05$ ). The total HTAASHPS scores of nurses with occupational experience of 1-5 years and 5-10 years were also significantly higher than nurses with occupational experience over 10 years. **Conclusion:** In this study, the main demographic factors affecting the nurses’ attitudes positively were detected as; being male, working at the state hospital, and having less occupational experience. It is thought that the data obtained from this study will contribute to the improved strategies that will increase the compliance of surgical nurses with health information technology.

**Keywords:** Attitude of health personnel; information technology; nurses; surgery

**ÖZET Amaç:** Bu çalışmada, cerrahi hemşirelerinin sağlık bilgi teknolojilerine yönelik tutumlarının ve etkileyen faktörlerin değerlendirilmesi amaçlandı. **Gereç ve Yöntemler:** Tanımlayıcı kesitsel tipteki bu çalışma, cerrahi birimlerde çalışan toplam 250 hemşire ile gerçekleştirildi. Çalışma için literatür taraması sonucu araştırmacı tarafından oluşturulan “kişisel bilgi formu” ve “Sağlık Personeli Sağlık Teknolojileri Değerlendirme Tutum Ölçeği (SPSTDTÖ)” kullanıldı. **Bulgular:** Çalışmaya katılan cerrahi hemşirelerinin yaş ortalaması 34,44±7,46 idi. Elde edilen sonuçlara göre çalışmaya katılan hemşirelerin %87,2’si kadın, %12,8’i ise erkek idi. Katılımcıların %60’ı üniversite hastanesinde, %40’ı ise devlet hastanesinde çalışıyordu. Hemşirelerin ortalama toplam SPSTDTÖ puanı 4,06±0,41 olarak belirlendi. Ölçeğin “kapsam”, “farkındalık” ve “fayda” boyutlarının ortalama değerleri sırasıyla 4,11±0,60; 4,23±0,52 ve 3,94±0,44 olarak saptandı. Erkek hemşirelerin toplam SPSTDTÖ puanı, kadın hemşirelere kıyasla daha yüksekti ( $p<0,05$ ). Devlet hastanesinde çalışan hemşirelerin toplam SPSTDTÖ puanı, üniversite hastanesinde çalışanlara kıyasla daha yüksek bulundu ( $p<0,05$ ). Meslek tecrübesi “1-5 yıl” ve “5-10 yıl” olan hemşirelerin toplam SPSTDTÖ puanı, meslek tecrübesi 10 yıldan fazla olan hemşirelere kıyasla anlamlı düzeyde daha yüksek idi ( $p<0,05$ ). **Sonuç:** Bu çalışmada, cerrahi hemşirelerinin tutumlarını olumlu etkileyen başlıca demografik faktörler; erkek olma, devlet hastanesinde çalışma ve daha az mesleki tecrübeye sahip olma olarak belirlendi. Bu çalışmadan elde edilen verilerin, cerrahi hemşirelerinin sağlık bilgi teknolojilerine uyumunu artıracak stratejilerin geliştirilmesine katkı sağlayacağı düşünülmektedir.

**Anahtar Kelimeler:** Sağlık personelinin tutumu; bilgi teknolojisi; hemşireler; cerrahi

**Correspondence:** Hatice Esra ÇETKİN

İstanbul University-Cerrahpaşa Institute of Graduate Studies, Department of Surgical Diseases Nursing, İstanbul, Türkiye

E-mail: cetkinesra@gmail.com



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Health information technology (HIT) describes the computerized system applications to access healthcare information used by front-line healthcare providers, nurses, physicians, medical researchers, patients, insurance companies, and various government agencies. There are various technological product outputs of HIT commonly used in healthcare. The commonly used HIT tools are defined as; electronic health record (EHR) systems, mobile health technology, cloud-based services, medical devices, tele-monitoring tools, assistant and sensor technologies, EHRs, and other information technology applications.<sup>1,2</sup>

The HIT increases the efficient communication between healthcare providers by automating the collection, use, and storage of patient information in a digital form. HIT helps health professionals to use the information for different purposes such as reducing medical malpractice, adverse events, and medical costs; and increasing healthcare quality, safety of medical care, and health information accessibility.<sup>3</sup> The HIT increases healthcare quality by improving the information process of patients, increasing guidelines compliance, supporting diagnostic tests and clinical decisions, facilitating care coordination, optimizing clinical workflow, and providing clinical notifications, alerts, and warnings.<sup>4,5</sup> The HIT can be used to decrease the frequency of medication errors and adverse drug events.<sup>6,7</sup> Because of all these benefits of HIT, national health information systems have been established by the governments of many developed countries.<sup>8</sup> In Türkiye, a national health information action plan was established in 2003 to increase patient satisfaction by efficiently using resources in health and improving quality and continuity of care.<sup>9</sup>

In addition to its effect on general healthcare organizations, HIT systems also have a wide range of uses in nursing care protocols.<sup>7</sup> The commonly used HIT systems in nursing applications are electronic health and medical records, computer-supported order entry, barcode systems, and clinical decision-support systems.<sup>10</sup> Nurses routinely use the HIT in their daily patient care and as a result, many beneficial effects have been reported on the nursing process. It is reported that HIT systems increase the

nurse's workflow process productivity by reducing the time which is spent on documentation.<sup>11</sup> In addition, HIT improves communication, care coordination, and time management. HIT also develops patients' comfort and quality of life and improves the satisfaction, competencies, and skills of nurses.<sup>12</sup>

Similar to general nursing care, new skills associated with the application of technology have also become important elements in the practice and continued development of surgical nursing.<sup>13</sup> Surgical nurses positively embrace the impact of health technology on their professional development. The surgical nurses think that technology introduces new options in care and makes clinical practice simpler, easier, and in some cases more accurate. Technology assists in providing surgical nursing attributes needed for the development of nursing as a profession.<sup>13</sup> Therefore, evaluating HIT in surgical nurses who have intense interaction with health technology will contribute to the development of professional practices.

The general attitudes of nurses toward HIT are positive.<sup>8</sup> The positive attitudes of nurses towards HIT facilitate successful and sustainable system implementations. The main factors affecting nurses' HIT adoption are reported as cultural, socio-organizational, and demographic. The nurses' awareness status and competencies also affect the HIT adoption process.<sup>14,15</sup> Despite many clear benefits of HIT in healthcare; underutilization, reluctance, and insufficient adoption of nurses towards HIT usage have been reported.<sup>16-18</sup> Therefore, HIT evaluation has been an inevitable necessity for achieving system efficiency, effectiveness, and satisfaction.<sup>19</sup> The evaluation of attitudes and affecting factors of nurses will also help to improve strategies for nurses' utilizing and adaptation to this technology efficiently. In this study, it is aimed to evaluate the attitudes and affecting factors of surgical nurses towards HIT usage.

## MATERIAL AND METHODS

### STUDY DESIGN

This descriptive cross-sectional study was carried out in the period of January-April 2023 with a total of 250 nurses that were working in surgical units (clin-

ical service/surgical intensive care/operating room) at University Hospital and State Hospital in Edirne, Türkiye. There is one university hospital and one state hospital located in the province of Edirne where health services related to surgical diseases are provided. The information was obtained from hospitals regarding the number of nurses working in surgical units before the study. Accordingly, it was determined that a total of 250 nurses, 150 in the university hospital and 100 in the state hospital, were working in surgical units. It was aimed to reach all 250 participants (n=250) working in surgical units that constitute the population of this study, and all of the participants were reached.

This study mainly aimed to determine the level of attitudes of surgical nurses towards using health information technologies. It was also questioned which factors could affect nurses' HIT levels. The hypotheses of this study were identified as;

- There is no relationship between the demographic characteristics of the participants and their HIT attitude levels.

- There is a relationship between the demographic characteristics of the participants and their HIT attitude levels.

- There is no relationship between participants' technological tool usage characteristics and their HIT attitude levels.

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## ETHICS APPROVAL

Ethics committee approval for the study was obtained from the Trakya University Non-Invasive Scientific Researches Ethical Committee (date: October 31, 2022; number: 2022/366). Additionally, the written consent of all nurses who participated in the study was also obtained. The study was carried out by the ethical standards established in the Declaration of Helsinki.

## DATA COLLECTION TOOLS

Data were collected using a "data collection form" and "Healthcare Technology Assessment Attitude

Scale of Health Personnel Scale (HTAASHPS)". The data collection form consisted of 14 questions investigating nurses' characteristics (age, sex, marital status, education, working department, occupational experience, the total number of years worked in the surgical clinic), and examining the nurses' technological device usage time, effective usage status, opinions about HIT information level, previously received any training status and following states about technological innovations in surgical nursing practices.

The attitudes of surgical nurses toward HIT were evaluated by the "HTAASHPS". The scale was developed by Kuşcu et al. to evaluate the attitudes of health workers toward health technologies in Türkiye.<sup>20</sup> The scale consists of 23 items and 3 dimensions as "scope", "awareness" and "benefit". The "scope" dimension consists of 4 items (the items between 1 and 4), the "awareness" dimension consists of 7 items (the items between 5 and 11), and the "benefit" dimension consists of 12 items (the items between 12 and 23). The responses for each item are scored as 1 for "strongly disagree", 2 points for "disagree", 3 points for "undecided", 4 points for "agree" and 5 points for "strongly agree". It is stated that the level of health technology assessment is low when the mean answers to the item get closer to 1, and the level of health technology assessment is high when the mean answers to the item get closer to 5.<sup>19</sup> They reported the Cronbach alpha value of the scale was 0.959 and the Cronbach alpha values of the scale's dimensions were between 0.80-1.00.<sup>20</sup> The data of the study were collected from surgical nurses using a face-to-face data collection technique. It took the participants 5-10 minutes to fill in the data collection tools.

## DATA ANALYSIS

After obtaining percentages and frequencies, data were analyzed using the SPSS (SPSS for Windows, version 22.0, Armonk, NY, USA). Means and standard deviations were provided for the nominal data, while frequencies and percentages were provided for the categorical data. Student's t-test was used to compare the numerical data of 2 groups. Analysis of variance and Least Significant Difference multiple

comparison tests were used for comparison in more than 2 groups.  $p < 0.05$  was accepted as the level of statistical significance.

## RESULTS

A total of 250 nurses who worked in surgical clinics (clinical services, operating room, surgical intensive care) participated in this study. The mean age of the surgical nurses was  $34.44 \pm 7.46$  (minimum: 23-maximum: 51); 218 (87.2%) were females and 32 (12.8%) were males. The demographic and descriptive characteristics of participants were presented in Table 1.

The distribution of the answers given to questions about technological device usage time, effective usage status, HIT information level, received training status, and technological innovations following state were presented in Table 2.

The mean total HTAASHPS score was  $4.06 \pm 0.41$ . The mean values of "scope", "awareness" and "benefit" dimensions of scale were detected as  $4.11 \pm 0.60$ ;  $4.23 \pm 0.52$  and  $3.94 \pm 0.44$ , respectively. The means and standard deviations of statements in the HTAASHPS were presented in Table 3.

The difference between demographic characteristics and, HTAASHPS score and dimensions were evaluated. There was a statistical difference between gender and total HTAASHPS, "scope", and "benefit" dimension scores ( $p < 0.05$ ). There was a statistical difference between marital status and the "benefit" dimension. The "benefit" dimension score of single nurses was significantly higher than married nurses ( $p < 0.05$ ). The total HTAASHPS and all dimensions' scores of nurses working at state hospitals were significantly higher than nurses working at university hospitals ( $p < 0.05$ ) (Table 4).

The HTAASHPS scores (and dimensions' scores) were compared according to education level, working unit, occupational experience (year), and Surgical clinic experience (year) (Table 5). The "benefit" scores of the Bachelor's group were significantly higher than the "High school + associate bachelor's" group ( $p = 0.015$ ). The "benefit" scores of nurses working in "clinical service" were significantly higher than the nurses working in "operating room" ( $p = 0.025$ ). In addition, a significant difference was detected between the "operating room" and "surgical intensive care" groups. The "benefit" dimension scores of the "surgical intensive care" group were sig-

**TABLE 1:** The demographic and descriptive characteristics of surgical nurses (n=250).

Characteristics		n	%
Gender	Female	218	87.2
	Male	32	12.8
Marital status	Married	159	63.6
	Single	91	36.4
Education	High school + associate bachelor's	56	22.4
	Bachelor's	177	70.8
	Postgraduate	17	6.8
Working institution	University hospital	150	60
	State hospital	100	40
Working unit	Clinical service	134	53.6
	Operating room	63	25.2
	Surgical intensive care	53	21.2
Occupational experience (year)	1-5	69	27.6
	5-10	49	19.6
	>10	132	52.8
Surgical clinic experience (year)	1-5	108	43.2
	5-10	57	22.8
	>10	85	34.0

**TABLE 2:** The distribution of the answers given to questions about health information technology usage characteristics (n=250).

The questions about health information technology usage characteristics		n	%
How many hours do you use technological tools (smartphone, computer, tablet, etc.) in a day? (Hour)	0-3	110	44.0
	> 3	140	56.0
Did you receive any training on the use of health technologies in surgical nursing practices?	Yes	36	14.4
	No	214	85.6
What is your knowledge level about the use of health technologies in surgical nursing practices?	Sufficient	41	16.4
	Insufficient	75	30.0
	Partially sufficient	134	53.6
Do you use technological tools (smartphone, computer, tablet, etc.) effectively in your daily life?	Yes	167	66.8
	No	17	6.8
	Partially	66	26.4
Do you follow the innovations regularly provided by technology in surgical nursing practices?	Yes	32	12.8
	No	114	45.6
	Partially	104	41.6
Do you benefit enough from health technology in surgical nursing practices?	Yes	27	10.8
	No	108	43.2
	Partially	115	46.0
Do you think that the use of health technology in surgical nursing practices will become widespread in the future?	Yes	204	81.6
	No	21	8.4
	Partially	25	10.0

**TABLE 3:** The mean and SDs of statements in the healthcare technology assessment attitude scale of health personnel.

No.	Statements	$\bar{X}$	SD
1	Health technologies have an administrative dimension	3.86	0.79
2	Health technologies have a financial dimension	4.19	0.68
3	Health technologies have a technical dimension	4.18	0.68
4	Health technologies have a medical dimension	4.22	0.68
5	Health technologies require the professional use and application	4.17	0.67
6	Health technologies require the professional technical maintenance/repair	4.23	0.67
7	The use of health technologies increases the success of professionals	4.22	0.70
8	Health technologies enable professionals to work more effectively and to be more successful	4.19	0.67
9	Health technologies save time for professionals	4.30	0.66
10	Health technologies increase the performance of professionals	4.19	0.71
11	Health technologies should be used consciously	4.34	0.72
12	The use of health technologies includes health-related skill technology	4.14	0.72
13	Health technologies include health-related audit technology	4.12	0.69
14	Health technologies include the pharmaceutical technology	3.93	0.69
15	Health technologies provide health-related safety	3.92	0.77
16	Health technologies provide transparent information	3.80	0.79
17	Health technologies provide clinical effectiveness	3.94	0.77
18	Health technologies reduce the length of stay in hospital	3.79	0.83
19	Health technologies have the stakeholders	3.86	0.85
20	Health technologies facilitate ethical decisions about health	3.76	0.88
21	Health technologies enable to make the organization	3.97	0.70
22	Health technologies facilitate the coordination	3.88	0.77
23	Health technologies help evidence-based medicine practice	4.11	0.68

\*Evaluation of answers given to Likert-type statements (5-Strongly agree, 4-Agree, 3-Undecided, 2-Disagree, 1-Strongly disagree); SD: Standard deviation.



**TABLE 4:** The comparisons between demographic characteristics and HTAASHPS scores.

	Gender		t value	p value
	Female	Male		
Scope	4.07±0.60	4.39±0.51	-2.866	<b>0.005*</b>
Awareness	4.22±0.52	4.28±0.47	-0.588	0.557
Benefit	3.91±0.43	4.15±0.46	-2.794	<b>0.003*</b>
Total HTAASHPS	4.03±0.42	4.23±0.41	-2.523	<b>0.012*</b>
Marital status				
	Married	Single		
Scope	4.12±0.61	4.10±0.58	0.249	0.803
Awareness	4.20±0.52	4.27±0.51	-1.017	0.310
Benefit	3.89±0.44	4.03±0.44	-2.401	<b>0.017*</b>
Total HTAASHPS	4.02±0.41	4.12±0.40	-1.749	0.081
Working institution				
	University hospital	State hospital		
Scope	4.04±0.61	4.22±0.57	-2.331	<b>0.021*</b>
Awareness	4.16±0.53	4.34±0.48	-2.738	<b>0.007*</b>
Benefit	3.89±0.39	4.01±0.50	-2.028	<b>0.044*</b>
Total HTAASHPS	4.00±0.40	4.14±0.42	-2.785	<b>0.006*</b>

\*p<0.05; the nominal data represented as mean and standard deviation; HTAASHPS: Healthcare Technology Assessment Attitude Scale of Health Personnel Scale.

nificantly higher than the “operating room” group (p=0.048). There was statistical significance in “awareness”, “benefit” and “total HTAASHPS” scores between occupational experience groups. The “awareness” scores of nurses who have occupational experience were “1-5 years” were significantly higher than nurses who have occupational experience over 10 years (p=0.026). The “benefit” scores of nurses who have occupational experience were “1-5 years” and “5-10 years” were significantly higher than nurses who have occupational experience over 10 years (p=0.001, significance value for both groups). The “total HTAASHPS” scores of groups “1-5 years” and “5-10 years” were also significantly higher than the “>10 years” group (p=0.001 and p=0.01, respectively). The only “benefit” scores of nurses who have surgical experience of “1-5 years” were significantly higher than nurses who have surgical experience over 10 years (p=0.02). There was not any statistical significance was detected between other surgical experience groups (p>0.05).

The knowledge level about the use of health technologies in surgical nursing practices and total HTAASHPS score were compared. The “total HTAASHPS” scores of nurses who answered to

knowledge level question as “sufficient” were significantly higher than “insufficient” (p=0.003). The “total HTAASHPS” score of the “partially sufficient” group was also significantly higher than the “insufficient” group (p=0.017). The follow-up status of innovations regularly in surgical nursing practices and “total HTAASHPS” scores were compared. The total scores of the nurse group that answered to question as “yes” were significantly higher than the groups that answered as “no” and “partially” (p=0.001, and p=0.002, respectively). There was no statistical significance was detected between the answers given to other questions about HIT usage characteristics and “total HTAASHPS” scores (p>0.05).

## DISCUSSION

In recent years, the use of HIT has become widespread in nursing practices in parallel with general developments in technology. It is reported that nurses must have positive attitudes toward HIT outputs for successful and sustainable HIT system implementations.<sup>8</sup> On the other hand, there are studies showing nurses’ insufficient and ineffective adoption of HIT systems.<sup>18,21</sup> Therefore, studies have been performed for determining factors influencing nurses’

**TABLE 5:** The comparison of HTAASHPS scores according to education level, working unit, occupational and surgical clinic experience (year).

	Education			F	p value
	High school + associate bachelor's	Bachelor's	Postgraduate		
Scope	4.06±0.09	4.12±0.04	4.25±0.14	0.645	0.526
Awareness	4.22±0.07	4.22±0.03	4.31±0.11	0.235	0.791
Benefit	3.80±0.05 <sup>a</sup>	3.99±0.03 <sup>a</sup>	3.90±0.09	4.092	<b>0.018*</b>
Total HTAASHPS	3.97±0.05	4.08±0.03	4.08±0.09	1.637	0.197
Working unit					
	Clinical service	Operation room	Surgical Intensive Care	F	p value
Scope	4.15±0.55	4.08±0.06	4.05±0.08	0.652	0.522
Awareness	4.24±0.04	4.11±0.06	4.31±0.07	2.327	0.100
Benefit	3.98±0.04 <sup>a</sup>	3.80±0.04 <sup>a,b</sup>	4.00±0.06 <sup>b</sup>	4.032	<b>0.019*</b>
Total HTAASHPS	4.09±0.03	3.95±0.04	4.10±0.05	3.037	0.050
Occupational experience (year)					
	1-5	5-10	>10	F	p value
Scope	4.16±0.07	4.07±0.99	4.10±0.04	0.364	0.695
Awareness	4.34±0.05 <sup>a</sup>	4.33±0.08	4.14±0.04 <sup>a</sup>	4.529	<b>0.012*</b>
Benefit	4.15±0.05 <sup>a</sup>	4.06±0.05 <sup>b</sup>	3.79±0.03 <sup>a,b</sup>	19.683	<b>0.000*</b>
Total HTAASHPS	4.20±0.05 <sup>a</sup>	4.14±0.06 <sup>b</sup>	3.95±0.03 <sup>a,b</sup>	10.508	<b>0.000*</b>
Surgical clinic experience (year)					
	1-5	5-10	>10	F	p value
Scope	4.10±0.06	3.98±0.07	4.22±0.05	2.723	0.068
Awareness	4.27±0.05	4.13±0.06	4.24±0.04	1.365	0.257
Benefit	4.05±0.04 <sup>a</sup>	3.98±0.05	3.84±0.04 <sup>a</sup>	6.343	<b>0.002*</b>
Total HTAASHPS	4.12±0.04	3.98±0.05	4.03±0.03	2.629	0.074

\*p<0.05; Means in each row having the same subscript letters are significantly different at p<0.05; the nominal data represented as mean and standard deviation, HTAASHPS: Healthcare Technology Assessment Attitude Scale of Health Personnel Scale.

opinions about HIT required for health managers to plan sufficient adoption between HIT and nursing practices.<sup>8</sup> In these studies, different HIT assessment tools and questionnaires have been used for determining the HIT attitude and knowledge level of nurses.<sup>7,11,22</sup> In this study, the attitudes of surgical nurses towards HIT usage were evaluated by the HTAASHPS.

In this study, the healthcare technology attitude levels of surgical nurses were quite high (4.06±0.41). It was seen that the high attitude levels were also valid for the “scope”, “awareness” and “benefit” dimensions. In the literature, similar to our results, nurses have positive attitudes toward HIT systems. Lee examined the nurses’ attitudes toward a computerized nursing care plan system by using a questionnaire prepared by the researcher.<sup>23</sup> It is found that the general attitudes of nurses toward computerized nursing care plans were positive. The positive attitude levels of nurses were affected by the

advantages of some properties of computerized systems such as saving paper and easy-to-read format.<sup>8,23</sup> Kaya evaluated the nurses’ attitude state toward computers in healthcare.<sup>16</sup> In the study, 32.8% of nurses had positive opinions toward computers. Most of the nurses who participated in the study felt comfortable using applications and were aware of the usefulness of computers.<sup>16</sup> Similar to nurses working in general health care, nurses working in perioperative departments also had positive attitudes toward EHRs.<sup>24</sup> It is reported that most of the perioperative nurses (79.2%) thought that computer use was beneficial in nursing practice. In addition, 80.8% of perioperative nurses thought that using an EHR system would lead to improved patient care.<sup>24</sup> Salameh et al. examined the nurses’ acceptance and attitudes toward an electronic health information system in Palestinian. The data of the study was achieved by using a researcher-designed Likert-type questionnaire. The nurses working at

government hospitals had positive attitudes toward information systems.<sup>25</sup> Sinha and Joy, evaluated the knowledge and attitudes of nurses towards the use of information systems used in nursing practices. They found that more than 70% of nurses had good computer skills and knowledge of information systems.<sup>26</sup>

On the other hand, the demographic characteristics affecting HIT usage attitudes should be evaluated for nurses' utilizing technology-based nursing practice programs. In a study performed on nurses, working duration (full/part-time), gender, computer usage experience, and level of education did not affect nurses' attitudes toward technology positively. However, the ages of 30 to 39 and >60, affected nurses' attitudes positively.<sup>27</sup> Kaya, reported that higher education level and computer usage duration had a positive effect on nurses' computer usage in healthcare.<sup>16</sup> In addition; it is stated that being single, working at a university hospital, being an instructor, and previously getting computer education were the factors that positively affected nurses' attitudes toward computers in healthcare. However, nursing experience duration was not a positive factor in computer usage in healthcare.<sup>16</sup> Joseph et al. reported that gender, nationality, education levels, and computer usage duration were statistically significant predictors of attitudes toward computer-based health information systems.<sup>28</sup> In this study; being male, working at the state hospital, and having less occupational experience were statistically significant factors for higher total HIT attitude scale scores. However, it was detected that nurses' attitude levels were not affected by previously achieved education status. Considering these demographic factors while establishing the infrastructure of health information technologies can provide a more effective system design.

It is reported that the nurses who received additional computer education felt more comfortable learning a new technological system.<sup>8</sup> In our study, the rate of nurses who received training on the use of health technologies was quite low (14.4%). However, there was no statistical significance was detected between the previously received HIT education status and attitude levels. The disadvantage of the low train-

ing status of nurses could be compensated by personal technology usage skills.

Adequate theoretical and/or practical information system training should be included in clinical nursing practices before the advanced information system and nurse adoption process. The parameters such as gender, working institution, and professional experience should be considered more in the health information systems education planning process. In this study, it was found that female nurses had lower HIT attitude scores. Therefore, the gender factor should be considered when organizing health technology training. Additionally, it was determined that nurses working in state hospitals had higher HTAASHPS scores. The fact that the periodic in-service training given to nurses in the state hospital is at certain standards and is systematically updated may have caused the scores of the nurses working in the state hospital to be higher. It was determined that surgical nurses with more than 10 years of occupational experience had lower HTAASHPS scores. As time in the profession progresses, nurses' HIT attitude levels of surgical nurses who have worked for more than 10 years may have decreased due to the decline in motivation to follow technological developments. For this reason, the professional working duration of surgical nurses should also be taken into account in the development of training programs related to HIT.

## CONCLUSION

Using HIT systems has become a central feature of healthcare organizations. Nurses' attitudes toward HIT working in surgical clinics play an important role in providing effective surgical healthcare. The surgical nurses' attitudes toward HIT were positive in the present study. The technological tools' effective usage rate in their daily life was quite high. However, the rate of previously received training status about the use of health technology was low. The main demographic factors affecting the nurses' attitudes positively were detected as being male, working at the state hospital, and having less occupational experience. However, it was detected that nurses' attitude levels were not affected by previously achieved HIT education status. The data obtained from this study



may contribute to the improved strategies that will increase the compliance of surgical nurses with HIT.

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### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### Authorship Contributions

*All authors contributed equally while this study preparing.*

## REFERENCES

1. Laal M. Terms for health information technology. *AWER Procedia Inf Comput Sci*. 2020;12(2):229-34. [https://www.researchgate.net/publication/236216530\\_Terms\\_for\\_health\\_information\\_technology](https://www.researchgate.net/publication/236216530_Terms_for_health_information_technology)
2. Hemmat M, Ayatollahi H, Maleki MR, Saghaei F. Future Research in Health Information Technology: A Review. *Perspect Health Inf Manag*. 2017;14(Winter):1b. PMID: 28566991; PMCID: PMC5430110.
3. Kim HY, Lee J. Effects of health information technology on malpractice insurance premiums. *Healthc Inform Res*. 2015;21(2):118-24. Erratum in: *Healthc Inform Res*. 2015;21(3):209. PMID: 25995964; PMCID: PMC4434060.
4. Parente ST, McCullough JS. Health information technology and patient safety: evidence from panel data. *Health Aff (Millwood)*. 2009;28(2):357-60. PMID: 19275990.
5. Alotaibi YK, Federico F. The impact of health information technology on patient safety. *Saudi Med J*. 2017;38(12):1173-80. PMID: 29209664; PMCID: PMC5787626.
6. Kaushal R, Shojania KG, Bates DW. Effects of computerized physician order entry and clinical decision support systems on medication safety: a systematic review. *Arch Intern Med*. 2003;163(12):1409-16. PMID: 12824090.
7. Moore EC, Tolley CL, Bates DW, Slight SP. A systematic review of the impact of health information technology on nurses' time. *J Am Med Inform Assoc*. 2020;27(5):798-807. PMID: 32159770; PMCID: PMC7309250.
8. Huryk LA. Factors influencing nurses' attitudes towards healthcare information technology. *J Nurs Manag*. 2010;18(5):606-12. PMID: 20636510.
9. T.C. Sağlık Bakanlığı. [Erişim tarihi: 14 Mart 2022]. Türkiye sağlık bilgi sistemi eylem planı. Bilgi işlem daire başkanlığı. 2004 Erişim linki: <https://ekutuphane.saglik.gov.tr/Yayin/404>.
10. Staggers N, Weir C, Phansalkar S. Patient safety and health information technology: role of the electronic health record. Hughes RG, ed. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. 1st ed. Rockville (MD): Agency for Healthcare Research and Quality; 2008. Verilen bölüm başlığı ve bölüm yazarları için sayfa aralığı belirtilmelidir.
11. Poissant L, Pereira J, Tamblyn R, Kawasumi Y. The impact of electronic health records on time efficiency of physicians and nurses: a systematic review. *J Am Med Inform Assoc*. 2005;12(5):505-16. PMID: 15905487; PMCID: PMC1205599.
12. Rouleau G, Gagnon MP, Côté J, Payne-Gagnon J, Hudson E, Dubois CA. Impact of Information and Communication Technologies on Nursing Care: Results of an Overview of Systematic Reviews. *J Med Internet Res*. 2017;19(4):e122. PMID: 28442454; PMCID: PMC5424122.
13. Barnard A, Gerber R. Understanding technology in contemporary surgical nursing: a phenomenographic examination. *Nurs Inq*. 1999;6(3):157-66. PMID: 10795269.
14. Ash JS, Sittig DF, Dykstra R, Campbell E, Guappone K. The unintended consequences of computerized provider order entry: findings from a mixed methods exploration. *Int J Med Inform*. 2009;78 Suppl 1(Suppl 1):S69-76. PMID: 18786852; PMCID: PMC2683676.
15. Kahouei M, Babamohamadi H. Factors affecting information technology acceptance in clinical settings from nurses' perspective. *J Payavard Salamat*. 2020;13(7):262-77. [https://payavard.tums.ac.ir/browse.php?a\\_id=5108&sid=1&slc\\_lang=en](https://payavard.tums.ac.ir/browse.php?a_id=5108&sid=1&slc_lang=en)
16. Kaya N. Factors affecting nurses' attitudes toward computers in healthcare. *Comput Inform Nurs*. 2011;29(2):121-9. PMID: 20975539.
17. Kipturgo MK, Kivuti-Bitok LW, Karani AK, Muiva MM. Attitudes of nursing staff towards computerisation: a case of two hospitals in Nairobi, Kenya. *BMC Med Inform Decis Mak*. 2014;14:35. PMID: 24774008; PMCID: PMC4045038.
18. Farokhzadian J, Khajouei R, Hasman A, Ahmadian L. Nurses' experiences and viewpoints about the benefits of adopting information technology in health care: a qualitative study in Iran. *BMC Med Inform Decis Mak*. 2020;20(1):240. PMID: 32958042; PMCID: PMC7507818.
19. Yen PY, Bakken S. Review of health information technology usability study methodologies. *J Am Med Inform Assoc*. 2012;19(3):413-22. PMID: 21828224; PMCID: PMC3341772.
20. Kuşcu FN, Yılmaz FÖ, Karatepe HK. Sağlık Personeli Sağlık Teknolojileri Değerlendirme Tutum Ölçeği (SPSTDÖ): Metodolojik bir çalışma [Health Personnel Health Technologies Assessment Attitude Scale (HPHTAAS): A methodological study]. *JAVStudies*. 2022;8(1):56-65. [https://javstudies.com/?mod=makale\\_tr\\_ozet&makale\\_id=57319](https://javstudies.com/?mod=makale_tr_ozet&makale_id=57319)
21. Ifinedo P. The moderating effects of demographic and individual characteristics on nurses' acceptance of information systems: A Canadian study. *Int J Med Inform*. 2016;87:27-35. PMID: 26806709.
22. Rababah JA, Al-Hammouri MM, Ta'an WF. A study of the relationship between nurses' experience, structural empowerment, and attitudes toward computer use. *Int J Nurs Sci*. 2021;8(4):439-43. PMID: 34631994; PMCID: PMC8488848.
23. Lee TT. Nurses' adoption of technology: application of Rogers' innovation-diffusion model. *Appl Nurs Res*. 2004;17(4):231-8. PMID: 15573331.
24. Yontz LS, Zinn JL, Schumacher EJ. Perioperative nurses' attitudes toward the electronic health record. *J Perianesth Nurs*. 2015;30(1):23-32. PMID: 25616883.
25. Salameh B, Eddy LL, Batran A, Hijaz A, Jaser S. Nurses' Attitudes Toward the Use of an Electronic Health Information System in a Developing Country. *SAGE Open Nurs*. 2019;5:2377960819843711. PMID: 33415233; PMCID: PMC7774452.
26. Sinha RK, Joy J. Nurses' knowledge of and attitude to nursing information systems. *Br J Nurs*. 2022;31(12):648-54. PMID: 35736843.
27. Dillon TW, Blankenship R, Crews T Jr. Nursing attitudes and images of electronic patient record systems. *Comput Inform Nurs*. 2005;23(3):139-45. PMID: 15900171.
28. Joseph M, Inayat S, Hussain M, Afzal M. Factors influencing nurses' attitudes towards information technology in nursing practice. *Eur Acad Res*. 2019;3(3):1751-6. [https://www.researchgate.net/publication/333843416\\_Factors\\_Influencing\\_Nurses'\\_Attitudes\\_towards\\_Information\\_Technology\\_in\\_Nursing\\_Practice](https://www.researchgate.net/publication/333843416_Factors_Influencing_Nurses'_Attitudes_towards_Information_Technology_in_Nursing_Practice)