

## Factors associated with the utilization and the acceptance of Hospital Information Systems from Health Care Providers' Perspectives

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### **Abstract**

**Background:** The adoption of Hospital Information Systems (HIS) is crucial for keeping up with technological advancements in daily life, especially in the healthcare sector, to improve the quality of care for patients. A deep understanding of the factors that influence the acceptance of these systems can greatly aid healthcare providers (HCPs) in successfully and effectively implementing them. **Aim:** To explore factors associated with the utilization and acceptance of Hospital Information Systems from healthcare providers' perspectives. **Settings:** The study was carried out in The Alexandria Urology Hospital. **Subjects:** All health care providers who are working in the previously mentioned setting. Subjects were divided into categories based on their job titles (Nursing staff, technical staff, Physicians, Pharmacist). **Tool:** Hospital information system utilization and acceptance questionnaire **Results:** The study showed that there was a statistically positive significant correlation between The Acceptance and The Utilization of HIS ( $r=0.740$ ,  $p=0.000$ ). Also, statistically positive significant relationships between all dimensions of The Utilization and The Acceptance of HIS). **Conclusion:** The mean score of utilization and acceptance of HIS By domains, indicates a relatively high level among HCPs which explains that the highest mean score is related to the Perceived usefulness domain while the lowest mean score is related to the Organizational factors domain. **Recommendations:** Improving the organizational structure in the hospital in terms of continuous training and guidance to HCPs on the optimal use of the system and providing all operating requirements.

**Keywords:** Hospital information systems (HIS), Affecting factors, utilization, acceptance, Health care providers.

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### **Introduction:**

Recently, Hospital information systems (HIS) have been regarded as a crucial component of support for medical and nursing care service operations due to the quick growth of electronic medical records and the requirement for inter-organizational information (Gholampour et al., 2020).

The Health Information System is a hospital's socio-technical subsystem that encompasses all information processing systems, incorporating those for outpatients, emergencies, inpatients, nurses, laboratory

testing, medical examinations, reporting, and material management. This also includes the technical and human actors who are involved in these roles and manage information (Beglaryan et al., 2017).

Applying and implementing these systems improves clinical procedures and healthcare quality, lowers healthcare expenses, and raises patient and provider satisfaction (Li et al., 2022). The ultimate purpose of HIS is to promote effective and efficient decision-making to raise the caliber

of data and, as a result, improve healthcare services (Ebnehoseini et al., 2019). Given this importance, it is essential to investigate factors associated with the utilization and the acceptance of HIS from HCPs Perspectives.

Handayani et al. (2018) proposed an adapted version of the Technology Acceptance Model (TAM), which integrates two primary factors: perceived usefulness (PU) and perceived ease of use (PEOU). Furthermore, this model introduces additional variables to better comprehend the external factors influencing technology acceptance among users, encompassing three dimensions: human actors, technology, and organizations. These dimensions play an essential role in determining the success of implementing HIS.

Perceived usefulness pertains to the extent to which individuals believe that using a specific technology will enhance their productivity (Gomer et al., 2020).

Perceived Ease of Use (PEOU) is defined as "the extent to which an individual feels that utilizing a specific system would require no effort," and "the degree to which a person believes that using technology would be free from effort" (Almaiah et al., 2022).

Human actors refer to the confidence derived from users' experiences with the HIS, encompassing factors such as compatibility with work processes, expectations of information security, users' self-efficacy with the HIS, and social influence (Alipour et al., 2019; Beglaryan et al., 2017).

The technological dimension includes factors related to the capabilities of the HIS, requiring evaluation and measurement processes to improve the system's quality, as well as information quality to enhance customer satisfaction

and user acceptance (Handayani et al., 2017).

The organizational dimension includes factors associated with organizational issues, such as management support or leadership for HIS planning and implementation, facilitating conditions, and user involvement in HIS communication, design, implementation, and training processes, all of which influence the acceptance of HIS (Handayani et al., 2017).

**Significance of the study:** Conducting this study holds significant importance in the realm of healthcare technology. It sheds light on the crucial factors that impact healthcare providers' interaction with these systems. By understanding the perspectives of healthcare providers, this study can uncover insights into the challenges, facilitators, and barriers that influence the effective utilization and acceptance of HIS in clinical practice. Moreover, it can provide valuable knowledge for healthcare organizations and system developers, guiding them in tailoring HIS to better align with the needs and workflows of healthcare providers. This can make healthcare delivery more efficient, improve patient care, and advance healthcare technology and systems overall.

### ***Aims of the Study***

This study aims to: Explore factors associated with the utilization and the acceptance of Hospital Information Systems from healthcare providers' perspectives.

### ***Research Question***

What are the factors that associated with the utilization and the acceptance of Hospital Information Systems from health care providers' perspectives?

### ***Materials and Method***

#### ***Materials***

**Design:** An exploratory descriptive research design was used to conduct this study.

**Settings:** This study was conducted in The Alexandria Urology Hospital. It contains 75 beds in five separate wards. In addition to different sections such as a radiology department, a blood bank, an indoor and outdoor pharmacy, and the lab. This setting was selected because it applies all HIS modules.

**Subjects:** All health care providers working in the previously mentioned setting (N=156). The subjects were divided into categories based on their job titles Nursing staff (76), Technical staff (10), Physicians (47), Pharmacist (23).

### **Study tool:**

**Hospital information system utilization and acceptance questionnaire.** This tool was developed by Handayani et al. (2017), and it was adapted by the researcher in this study to assess healthcare providers' utilization of hospital information systems. **It consists of two parts:**

**Part I:** The participants' personal and work-related data: included their age, sex, marital status, level of education, Years of experience in the working hospital, Previous training on HIS, Previous work in a hospital with HIS, Prefer HIS, Employment status and Working shift.

**Part II:** It contained 44 questions for the evaluation of HIS acceptance by HCPs based on six dimensions namely, *Perceived usefulness* (n=4), *Perceived ease of use* (n=4), *Human factors* including four variables namely, compatibility (n=3), information security (n=4), self-efficacy (n=3), and social influence (n=3). *Technological factors* include Two variables namely, information quality (n=4), and system quality (n=4). *Organizational factors* include top management support (n=4), participation of end-users in the HIS implementation process (n=4) and facilitating conditions (n=3). *HIS*

*acceptance*; (n=4). For each question, a five-point Likert scale ranges from 1 = very low to 5 = very high) was used to rate each sub-factor independently. A mean score of  $\geq 3.75$  is considered as desirable HIS acceptance, a mean score of 3-3.75 is considered as relatively desirable HIS acceptance, a mean score of 1.5-3 is considered as a relative failure HIS acceptance, and  $< 1.5$  out of 5 was considered as undesirable HIS acceptance.

### **Method:**

Approval from the Research Ethics Committee (REC) of The Faculty of Nursing Alexandria University was obtained before conducting the study (permission no. 2202-7-42, IRB00013620(9/19/2025)). An official approval from hospital management to conduct this study was obtained after explaining the aim of the study. The study tool was tested for content validity by five experts in the field of the study. The necessary modifications were done accordingly. A pilot study was carried out on 10% (N=16) of the study subjects to test the research tools' clarity and applicability, no modifications were done, and the subject was included in the study. The reliability of the tool was tested using Cronbach's Alpha test. The reliability coefficient was 0.851 indicating the tool is acceptable. Data were collected from the study subjects through a hand-delivered questionnaire by the researcher after explaining the purpose of the study during the period from 1-30/5/2023.

### **Ethical consideration:**

Written informed consent was obtained from the study subjects after explaining the aim of the study and confidentiality of data was maintained. The anonymity of the study participants was kept, and the subjects were participating in the study voluntarily and had the right to withdraw at any time from the study.

### **Statistical analysis:**

The collected data were coded and entered in a special format to be suitable for computer feeding.

- Following data entry, a checking and verification process was carried out to avoid any errors.

- Data were analyzed using the statistical package for social science SPSS (version 25). The following statistical analysis measures were used:

- Descriptive statistical measures, which included: numbers, percentages, and averages (Minimum, Maximum, Arithmetic mean (X), Standard deviation (SD)

- Statistical analysis tests, which included: Chi square, student T test and ANOVA test.

### **Results:**

**Table (1)** shows the distribution of the studied Health Care Providers according to personal and work-related characteristics. Regarding HCPs' age, it ranged from 20.0 up to 50.0 years with a mean of  $(30.52 \pm 7.539)$ . Moreover, more than half percent (51.9%) of the HCPs in age group from 20 years to less than 30 years

In terms of sex, 61.5% of the study subjects were males, while 38.5% were females. Regarding their marital status, 47.4% of healthcare professionals (HCPs) were married, and 1.3% were widowed.

Regarding their level of education, more than half (53.2%) of them had bachelor's degrees, while more than one-tenth (11.5%) had Technical Institute diploma education. The remainder had master's degrees and doctorate degrees (18.6% and 9.6%, respectively).

In terms of HCPs' years of experience, 78.8% of them had 5 years or more of experience, while around one-fifth (21.2%) had less than 5 years of experience. When it comes to previous training on HIS, more than three-quarters (82.1%) of HCPs

had received training, while less than one-fifth (17.9%) had not. It was also noted that more than half (56.4%) of HCPs have previous work experience in a hospital with a HIS. Concerning HCPs who prefer HIS, about three-quarters (74.4%) of them prefer HIS.

According to the working status, more than two-fifths (48.7%) of HCPs were nurses, while more than one-quarter (30.1%) of them were physicians. Additionally, more than three-quarters (82.1%) of HCPs worked full-time.

**Table (2)** demonstrates the distribution of the studied healthcare providers according to the mean score of utilization and acceptance of HIS (By domains). It was shown that the total of utilization and acceptance of HIS mean percent score was 77.18%, indicating a relatively high level of utilization and acceptance among HCPs. While the mean score of the level of acceptance of HIS was  $3.838 \pm 0.966$  with a mean percent score of 76.76%. On the other hand, the total mean score of the utilization of HIS is  $3.861 \pm 0.559$  with a mean percent score of 77.22%.

About the utilization domains, the perceived usefulness, human factors, and perceived ease of use had the highest mean percent score (83.20%, 77.72%, and 76.72%), consequently while the organizational factors had the lowest mean percent score (75.58%)

**Table (3)** demonstrates the correlation matrix of utilization & acceptance of HIS. It revealed a statistically positive significant correlation between the acceptance and the utilization of HIS ( $r=0.740$ ,  $p=0.000$ ). Also, statistically positive significant relationships between all dimensions of the utilization and the acceptance of HIS ( $r=0.448$ ,  $P=0.000$  /  $r=0.561$ ,  $P=0.000$  /  $r=0.674$ ,  $P=0.000$  /  $r=0.674$ ,  $P=0.000$  /  $r=0.536$ ,  $P=0.000$  /  $r=0.740$ ,  $P=0.000$ ).

**Table (4)** presents the relationship between the studied HCPs' mean scores of utilization & acceptance of HIS and their personal and work-related characteristics. It shows that there was a statistically significant relationship between utilization and acceptance of HIS and HCPs age ( $F=3.254$ ,  $P=0.014$ ). Those aged  $\geq 50$  years had the highest mean score of utilization and acceptance of HIS ( $4.189 \pm 0.728$ ) in comparison to those aged  $30 > 40$  years had the lowest mean score ( $3.679 \pm 0.568$ ). Moreover, it was found a statistically significant relationship between HCPs' level of education and utilization and acceptance of HIS ( $F= 8.546$ ,  $P=0.000$ ) Also, it was found that HCPs who had secondary school had the highest mean score of utilization and acceptance of HIS ( $4.278 \pm 0.618$ ) in comparison to those had doctorate had the lowest mean score ( $3.259 \pm 0.452$ ).

Furthermore, there was a statistically significant relationship between the previous work in a hospital with HIS and the utilization and acceptance of HIS ( $t=38.078$ ,  $P=0.000$ ) HCPs with Previous work in a hospital with HIS had the highest utilization and acceptance mean score of HIS ( $4.084 \pm 0.514$ ) in comparison to those without Previous work in a hospital with HIS had lowest utilization and acceptance mean score ( $3.567 \pm 0.523$ ).

Also, the study findings show a statistically significant relationship between HCPs' preference for HIS, utilization and acceptance of HIS ( $P=0.000$ ). The highest mean was related to HCPs who prefer HIS in comparison to those who don't prefer HIS had a low mean score.

Furthermore, the result revealed a statistically significant relationship between working status and utilization and acceptance of HIS ( $F=8.578$ ,  $P=0.000$ ). Pharmacists as one of the HCPs had the highest mean score of utilization  
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and acceptance of HIS ( $4.208 \pm 0.373$ ) while, physicians had the lowest mean score ( $3.562 \pm 0.596$ ).

Also, the table revealed a statistically significant relationship between working shift and utilization and acceptance of HIS ( $t=8.243$ ,  $P=0.005$ ) so that is the HCPs who work full-time had the highest utilization and acceptance mean score of HIS ( $3.919 \pm 0.568$ ) in comparison to those who work apart time had the lowest utilization and acceptance mean score of HIS ( $3.582 \pm 0.542$ ).

### **Discussion:**

Hospital Information Systems (HIS) are the backbone of modern healthcare delivery, encompassing a comprehensive suite of software and hardware designed to manage the clinical, administrative, and financial aspects of a hospital's operations. These systems facilitate the efficient flow of information across various departments, enabling healthcare professionals to access patient records, schedule appointments, manage inventory, and streamline billing processes. As the healthcare landscape continues to evolve, HIS plays a crucial role in enhancing patient care, promoting operational efficiency, and ensuring compliance with regulatory requirements. With the integration of advanced technologies such as electronic health records, telemedicine, and data analytics, HIS is at the forefront of transforming healthcare delivery and improving patient outcomes (Abuelela & Elwazzir, 2022) ,( Alipour et al., 2019), (Ebnehoseini et al., 2019).

The study found that HCPs have a high level of acceptance and utilization of the Health Information System (HIS). This is likely because they believe that the system will save their time and effort, support their work and development, and facilitate their work difficulties. The study also revealed that HCPs believe that using the system will enhance their job performance. The study

assessed five dimensions of the HIS: perceived usefulness, perceived ease of use, human factors, technological factors, and organizational factors. The dimension with the highest score was perceived usefulness, while the lowest score was related to organizational factors.

The findings are in line with the research conducted by Alipour et al. (2016), Nadri et al. (2018), Alipour et al. (2019), and Rochmah et al. (2020) who discovered that the perceived usefulness received the highest mean score in the utilization of HIS, while, organizational factors received the lowest mean score. Additionally, Ahlan and Ahmad (2014) established that perceived usefulness significantly influenced the attitude and intention to use HIS

In contrast, the findings of this study differ from those of Kamaludin and Kamaludin (2017), who found that the perceived ease of use received the highest mean percent score in the utilization of HIS, while the perceived usefulness received the lowest mean percent score. In addition, there are differences with studies conducted by Ologeanu-Taddei et al. (2015) and Ibrahim et al. (2016), which showed lower mean scores of perceived usefulness, the differences within the research population may account for the discrepancy.

The study findings revealed a statistically positive significant correlation between the acceptance and the utilization of HIS, and statistically positive significant relationships between all dimensions of the utilization and the acceptance of HIS.

From the researcher's point of view, this result highlights the importance of acceptance in driving the utilization of HIS, suggesting that efforts to enhance user acceptance could lead to improved system usage and effectiveness. However, the present study results align with those of Alipour et al. (2019), who found a statistically positive and significant correlation between acceptance and

utilization of HIS. Also, statistically positive significant relationships between all dimensions of The Utilization and The Acceptance of HIS.

In contrast, the findings of this study differed from those of Kamaludin and Kamaludin (2017), who discovered a significantly negative beta coefficient indicating that perceived usefulness negatively affects system usage. They suggested that this observation provides insight into management's initial concerns about the lack of acceptance and usage, which motivated the current study.

Regarding the relationship between the studied healthcare providers' mean scores of utilization & acceptances of HIS and their personal and work-related characteristics, The findings indicate a statistically significant relationship between the age of HCPs and the utilization and acceptance of HIS. Specifically, HCPs aged 50 years or older exhibited the highest mean score for the utilization and acceptance of HIS in comparison to their counterparts aged between 30 and 40 years. This suggests that older HCPs may demonstrate a greater propensity to utilize and embrace HIS compared to their younger counterparts. The observed age-related differences in HIS utilization and acceptance underscore the importance of considering age-related factors in the implementation and optimization of healthcare information systems. This result was supported by Giuse and Kuhn (2003).

Additionally, a statistically significant relationship was found between the level of education of HCPs, their utilization of HIS, and their acceptance of HIS. Specifically, and unexpectedly, HCPs with a secondary school education demonstrated the highest average scores for the utilization and acceptance of HIS, while those with a doctorate exhibited the lowest average scores. This indicates that there is an inverse relationship between the level of education and the utilization and acceptance of HIS among HCPs.

From the researcher's point of view, the inverse relationship between education level and the utilization and acceptance of HIS among healthcare providers can be explained by factors such as technological familiarity, perceived complexity, training opportunities, cultural influences, resource allocation, and motivation. Addressing these barriers through targeted training and support can help improve HIS acceptance and utilization across all educational levels. The findings emphasize the need to consider the impact of educational backgrounds when implementing and optimizing HIS within healthcare settings. Also, further research and exploration into the reasons behind these educational disparities in HIS utilization and acceptance may provide valuable insights for healthcare management and system implementation strategies.

The findings emphasize the need to consider the impact of educational backgrounds when implementing and optimizing HIS within healthcare settings. Further research and exploration into the reasons behind these educational disparities in HIS utilization and acceptance may provide valuable insights for healthcare management and system implementation strategies.

Moreover, the study found a statistically significant correlation between HCPs who had previous experience working in a hospital with HIS and their utilization and acceptance of HIS. HCPs with previous hospital HIS experience demonstrated the highest mean scores for HIS utilization and acceptance, while those without such experience showed the lowest mean scores. This indicates a strong association between prior hospital HIS experience and the demonstrated utilization and acceptance of HIS among HCPs. whereas prior exposure and familiarity with hospital HIS may lead to a more seamless adoption and integration of HIS into the daily workflows of HCPs. Moreover, HCPs with previous hospital HIS experience are likely to be more comfortable

with the system, understand its benefits, and recognize its potential to enhance their work processes.

On the other hand, HCPs without such experience may face a steeper learning curve and may be less inclined to fully utilize and accept the HIS due to unfamiliarity and potential apprehensions.

Alipour et al. (2019) underscored the importance of recognizing the impact of prior experience and exposure to HIS in healthcare settings. They also highlight the potential benefits of targeted training and support for HCPs without previous hospital HIS experience to bridge the gap and facilitate greater utilization and acceptance of HIS across diverse healthcare professional backgrounds.

Also, the study findings reveal a statistically significant relationship between HCPs preference for HIS, the utilization, and the acceptance of HIS ( $P=0.000$ ). The highest mean score was associated with HCPs who prefer HIS, while those who do not prefer HIS had a lower mean score. This result could be attributed to the fact that HCPs who prefer HIS are more likely to actively utilize and embrace the system than those who do not prefer it.

The preference for HIS may reflect a positive attitude towards technology integration in healthcare practices, leading to a greater willingness to engage with and utilize HIS. Conversely, the lower mean scores among HCPs who do not prefer HIS may indicate a potential reluctance or resistance to fully utilize and accept the system. In this concern, Ibrahim et al. (2016) emphasized the importance of understanding and addressing HCPs preferences and attitudes towards HIS in the implementation and optimization of HIS. It highlights the need for targeted strategies to engage and support HCPs in embracing HIS, considering their individual preferences and attitudes towards technology in healthcare settings.

Additionally, the study found a strong correlation between working status and the use of HIS ( $P=0.000$ ). Pharmacists, among HCPs, had the highest average score for HIS utilization and acceptance, while physicians had the lowest average score. This result could be attributed to the fact that the working status of HCPs, specifically the distinction between pharmacists and physicians, plays a pivotal role in influencing their utilization and acceptance of HIS. With their unique role in medication management and patient care, pharmacists may have a greater reliance on HIS for tasks such as medication dispensing, drug interaction checks, and patient counseling, leading to a higher level of engagement with the system. On the other hand, physicians, while they also utilize HIS, may have different workflows and priorities, potentially impacting their utilization and acceptance of HIS to a lesser extent.

In this context, Handayani et al. (2018) emphasized the importance of recognizing HCPs diverse roles and responsibilities in the context of HIS utilization. They highlight the need for tailored strategies and support mechanisms to address the specific needs and workflows of different HCPs groups, ultimately aiming to optimize the utilization and acceptance of HIS across various professional roles within healthcare settings.

The result of the present study goes in the same line with Nadri et al. (2018) Who found statistically positive significant relationships between employment status and utilization of HIS.

Regarding working shift, the findings revealed a statistically significant relationship between working shift and utilization and acceptance of HIS ( $t=8.243$ ,  $P=0.005$ ), that The HCPs who work full-time had the highest utilization and acceptance mean score of HIS in comparison to those who work apart time had the lowest utilization and acceptance mean score of HIS. This could be attributed to several reasons. Firstly, full-time nurses typically have more consistent

exposure to HIS, allowing them to become more familiar and comfortable with the technology. This regular interaction fosters a deeper understanding of the system's functionalities, leading to increased confidence in using it effectively.

Additionally, full-time nurses often experience a more stable work environment, which can enhance their ability to integrate HIS into their daily routines. They are likely to encounter fewer interruptions and have more opportunities to engage with the system during their shifts, compared to part-time nurses who may work irregular hours and have less continuity in their roles.

Moreover, full-time employment often comes with more comprehensive training and support from healthcare organizations, which can further facilitate the adoption of HIS. These nurses may receive ongoing education and resources that help them navigate the system efficiently, whereas part-time nurses might miss out on such training due to their limited hours. In this concern, Ball, et al., (2011). emphasized that the commitment to full-time work may also correlate with a stronger professional identity and investment in the organization, motivating these nurses to embrace HIS as a tool that enhances patient care and operational efficiency. In contrast, part-time nurses, who may have other commitments or work in multiple settings, might not prioritize HIS utilization to the same extent.

## **Conclusion**

According to the findings of the current study, it can be concluded that the overall utilization and acceptance of HIS were at a desirable level. The average score for utilization and acceptance of HIS across different domains indicates a relatively high level among HCPs. This is further explained by the highest mean score being attributed to the perceived usefulness domain, while the lowest mean score is associated with the organization factors domain. Additionally, there is a statistically significant positive correlation between the acceptance and the utilization of HIS, as well as among all



dimensions of the utilization and acceptance of HIS.

### **Recommendations**

*In line with the findings of the study, the following recommendations are made:*

#### **A. Hospital administrator:**

1. Provision of adequate infrastructure support to facilitate the efficient utilization of the system across diverse healthcare settings and provider roles.
2. Setting standards for HIS utilization and enforcing compliance to ensure that the system is effectively leveraged across healthcare settings
3. Equip healthcare providers with the knowledge and understanding necessary to effectively engage with HIS through conducting comprehensive training sessions for all HCPs, including department heads, to familiarize them with HIS., elucidate the significance of its use, and demonstrate the impact of its utilization on healthcare delivery and patient outcomes.
4. Introduce incentive rewards for healthcare providers who demonstrate proficient and effective utilization of the HIS.

#### **B. Managers/leaders**

1. Managers and leaders should serve as exemplars in their interactions with the HIS, actively demonstrating the effective use and integration of the system into their daily workflows.
2. Take proactive steps to identify the nature and severity of problems related to HIS utilization and acceptance among HCPs Subsequently, develop comprehensive action plans to address these issues and alleviate workloads, ensuring a conducive environment for effective system engagement and utilization.
3. Providing timely and supportive guidance can contribute to a more

cohesive and informed approach to system utilization among HCPs.

4. Regular monitoring of system utilization and the submission of daily reports to the hospital director to maintain transparency and accountability in the effective use of the system.

#### **C. Recommendations for further studies**

- Need more research to investigate other factors related to the acceptance and utilization of hospital information systems from Health Care Providers' Perspectives.
- Conduct a study on the impact of utilizing HIS on Quality of care, Patient safety, and HCPs satisfaction.

**Table (1): Distribution of the studied Health Care Providers according to personal and work-related characteristics:**

Health Care Providers' characteristics	Total (N=156)	
	No.	%
<b>Age (years)</b>		
▪ 20-	81	51.9
▪ 30-	60	38.5
▪ 40-	11	7.1
▪ ≥50	4	2.6
Min- Max	20.0-74.0	Mean ± SD
		30.52 ± 7.539
<b>Sex</b>		
▪ Male	96	61.5
▪ Female	60	38.5
<b>Marital status</b>		
▪ Single	73	46.8
▪ Married	74	47.4
▪ Divorced	7	4.5
▪ Widowed	2	1.3
<b>Level of education</b>		
▪ Secondary school	11	7.1
▪ Technical Institute diploma	18	11.5
▪ Bachelor degree	83	53.2
▪ Master degree	29	18.6
▪ Doctorate degree	15	9.6
<b>Years of experience in the working hospital</b>		
▪ <5	33	21.2
▪ ≥5	123	78.8
<b>Previous training on HIS</b>		
▪ No	28	17.9
▪ Yes	128	82.1
<b>Previous work in a hospital with HIS</b>		
▪ No	68	43.6
▪ Yes	88	56.4
<b>Prefer HIS</b>		
▪ No	40	25.6
▪ Yes	116	74.4
<b>Employment status</b>		
▪ Nurses	76	48.7
▪ Technician	10	6.4
▪ Pharmacist	23	14.7
▪ Physician	47	30.1
<b>Working shift</b>		
▪ Full time	128	82.1
▪ Part time	28	17.9

**Table (2): Distribution of the studied health care providers according to the mean score of utilization and acceptance of HIS (By domains):**

Items	Min -Max	Mean ± SD	Mean Percent Score	Rank
<b>A. Utilization of HIS</b>	<b>2.73-5.00</b>	<b>3.861±0.559</b>	<b>77.22%</b>	
<b>1. Perceived usefulness</b>	<b>2.25-5.00</b>	<b>4.160±0.623</b>	<b>83.20%</b>	<b>A</b>
<b>2. Perceived ease of use</b>	<b>1.25-5.00</b>	<b>3.836±0.850</b>	<b>76.72%</b>	<b>C</b>
<b>3. Human factors</b>	<b>2.46-5.00</b>	<b>3.886±0.617</b>	<b>77.72%</b>	<b>B</b>
• Compatibility	1.33-5.00	3.696±0.906	73.92%	d
• Information security	1.00-5.00	3.912±0.835	78.24%	b
• Self-efficacy	2.00-5.00	4.058±0.664	81.16%	a
• Social influence	1.33-5.00	3.867±0.814	77.40%	c
<b>4. Technological factors</b>	<b>1.13-5.00</b>	<b>3.797±0.792</b>	<b>75.94%</b>	<b>D</b>
• Information quality	1.00-5.00	3.801±0.865	76.02%	a
• System quality	1.00-5.00	3.793±0.907	75.86%	b
<b>5. Organizational factors</b>	<b>2.00-5.00</b>	<b>3.779±0.654</b>	<b>75.58%</b>	<b>E</b>
• Top management support	1.25-5.00	3.804±0.776	76.08%	b
• Participation end user	1.50-5.00	3.848±0.769	76.96%	a
• Facilitation conditions	1.00-5.00	3.652±0.953	73.04%	c
<b>B. HIS acceptance</b>	<b>1.25-5.00</b>	<b>3.838±0.966</b>	<b>76.76%</b>	
<b>Of overall Utilization &amp; Acceptance</b>	<b>2.70-5.00</b>	<b>3.859±0.577</b>	<b>77.18%</b>	

**Table (3) : Correlation matrix of utilization & acceptance of HIS.**

		Perceived usefulness	Perceived Ease of use	Human factor	Technological factors	Organization factors	Utilization of HIS	Acceptance of HIS
Perceived usefulness	r							
	P							
Perceived ease of use	r	<b>0.551</b>						
	P	<b>0.000*</b>						
Human factor	r	<b>0.471</b>	<b>0.603</b>					
	P	<b>0.000*</b>	<b>0.000*</b>					
Technological factor	r	<b>0.477</b>	<b>0.560</b>	<b>0.738</b>				
	P	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>				
Organization factor	r	<b>0.398</b>	<b>0.461</b>	<b>0.579</b>	<b>0.523</b>			
	P	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>			
Utilization of HIS	r	<b>0.627</b>	<b>0.736</b>	<b>0.898</b>	<b>0.854</b>	<b>0.791</b>		
	P	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>		
Acceptance of HIS	r	<b>0.448</b>	<b>0.561</b>	<b>0.674</b>	<b>0.674</b>	<b>0.536</b>	<b>0.740</b>	
	P	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	
Total utilization & acceptance of HIS	r	<b>0.621</b>	<b>0.735</b>	<b>0.894</b>	<b>0.856</b>	<b>0.780</b>	<b>0.995</b>	<b>0.805</b>
	P	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>	<b>0.000*</b>

r = Pearson correlation \* Significant p at  $\leq 0.05$  r  $\geq 0.9$  very high correlation r 0.7- $<0.9$  high correlation r 0.5- $<0.7$  moderate correlation r  $< 0.5$  low correlation

**Table (4): Relationship between the studied health care providers' mean scores of utilization & acceptance of HIS and their demographic characteristics:**

Health care providers' characteristics	Utilization & Acceptance of HIS	Test of Significance
	Mean $\pm$ S. D	
<b>Age (years)</b>		
• 20-	3.941 $\pm$ 0.533	F=3.254 P=0.014*
• 30-	3.679 $\pm$ 0.568	
• 40-	4.177 $\pm$ 0.676	
• $\geq 50$	4.189 $\pm$ 0.728	
<b>Sex</b>		
• Male	3.845 $\pm$ 0.605	t=0.142 P=0.707
• Female	3.881 $\pm$ 0.532	
<b>Marital status</b>		
• Single	3.915 $\pm$ 0.557	F=0.917 P=0.434
• Married	3.824 $\pm$ 0.583	
• Divorced	3.584 $\pm$ 0.658	
• Widowed	4.034 $\pm$ 0.851	
<b>Level of education</b>		
• Secondary school	4.278 $\pm$ 0.618	F= 8.546 P=0.000*
• Technical Institute diploma	3.757 $\pm$ 0.501	
• Bachelor degree	3.996 $\pm$ 0.516	
• Master degree	3.709 $\pm$ 0.572	
• Doctorate degree	3.259 $\pm$ 0.452	
<b>Years of experience in the working hospital</b>		
• $<5$	3.893 $\pm$ 0.493	t=0.141 P=0.708
• $\geq 5$	3.850 $\pm$ 0.598	
<b>Previous training on HIS</b>		
• No	3.683 $\pm$ 0.559	t=3.238 P=0.074
• Yes	3.897 $\pm$ 0.575	
<b>Previous work in a hospital with HIS</b>		
• No	3.567 $\pm$ 0.523	t=38.078 P=0.000*
• Yes	4.084 $\pm$ 0.514	
<b>Prefer HIS</b>		
• No	3.554 $\pm$ 0.479	t=16.492 P=0.000*
• Yes	3.964 $\pm$ 0.571	
<b>Working status</b>		
• Nurses	3.915 $\pm$ 0.550	F=8.578 P=0.000*
• Technician	4.027 $\pm$ 0.457	
• Pharmacist	4.208 $\pm$ 0.373	
• Physician	3.562 $\pm$ 0.596	
<b>Working shift</b>		
• Full time	3.919 $\pm$ 0.568	t=8.243 P=0.005*
• Part time	3.582 $\pm$ 0.542	

F = ANOVA test t = Student T Test \* Statistically significant at  $p \leq 0.05$

## References

- Abuelela, M. H., & Elwazzir, N. F. (2022). Implementation of hospital information system in research institute of ophthalmology, (Ministry of Higher Education and Scientific Research), Giza, Egypt. A situation analysis study. *The Egyptian Journal of Community Medicine*, 42(2), 123-130. <https://doi.org/10.21608/ejcm.2020.29447.1094>.
- Ahlan, A. R., & Ahmad, B. I. (2014). User acceptance of health information technology (HIT) in developing countries: A conceptual model. *Procedia Technology*, 16, 1287-1296. <https://doi.org/10.1016/j.protcy.2014.10.145>.
- Alipour, J., Mehdipour, Y., & Karimi, A. (2019). Factors affecting acceptance of hospital information systems in public hospitals of Zahedan University of Medical Sciences: A cross-sectional study. *Journal of Medicine and Life*, 12(4), 403. <https://doi.org/10.25122/jml-2019-0064>.
- Alipour, J., Safari Lafti, S., Askari Majdabadi, H., Yazdiyani, A., & Valinejadi, A. (2016). Factors affecting hospital information system acceptance by caregivers of educational hospitals based on technology acceptance model (TAM): A study in Iran. *Iioab Journal*, 119-123.
- Almaiah, M. A., Alhumaid, K., Aldhuhoori, A., Alnazzawi, N., Aburayya, A., Alfaisal, R., Salloum, S. A., Lutfi, A., Al Mulhem, A., Alkhdour, T., Awad, A. B., & Shehab, R. (2022). Factors affecting the adoption of digital information technologies in higher education: An empirical study. *Electronics*, 11(21), 3572. <https://doi.org/10.3390/electronics11213572>.
- Ball, M. J., Douglas, J. V., Walker, P. H., DuLong, D., Gugerty, B., Hannah, K. J., ... & Troseth, M. R. (Eds.). (2011). *Nursing informatics: Where technology and caring meet*. Springer Science & Business Media.
- Beglaryan, M., Petrosyan, V., & Bunker, E. (2017). Development of a tripolar model of technology acceptance: Hospital-based physicians' perspective on EHR. *International Journal of Medical Informatics*, 102, 50-61. <https://doi.org/10.1016/j.ijmedinf.2017.02.013>.
- Ebnehoseini, Z., Tabesh, H., Deldar, K., Mostafavi, S. M., & Tara, M. (2019). Determining the hospital information system (HIS) success rate: development of a new instrument and case study. *Open Access Macedonian Journal of Medical Sciences*, 7(9), 1407-1414. <https://doi.org/10.3889/oamjms.2019.294>.
- Gholampour, A., Jamshidi, M. H. M., Habibi, A., Motamedi Dehkordi, N., & Ebrahimi, P. (2020). The impact of hospital information system on nurses' satisfaction in Iranian public hospitals: The moderating role of computer literacy. *Journal of Information Technology Management*, 12(4), 141-159. <https://doi.org/10.22059/jitm.2020.299802.2491>.
- Giuse, D. A., & Kuhn, K. A. (2003). Health information systems challenges: the Heidelberg conference and the future. *International Journal of Medical Informatics*, 69(2), 105-114.

- [https://doi.org/10.1016/S1386-5056\(02\)00182-X](https://doi.org/10.1016/S1386-5056(02)00182-X).
- Gomer, S., Hasyim, & Kusumapradja, R. (2020). Acceptance model of hospital information management system: Case of study in Indonesia. *European Journal of Business and Management Research*, 5(5). <https://doi.org/10.24018/ejbmr.2020.5.5.505>.
- Handayani, P. W., Hidayanto, A. N., Pinem, A. A., Hapsari, I. C., Sandhyaduhita, P. I., & Budi, I. (2017). Acceptance model of a Hospital Information System. *International Journal of Medical Informatics*, 99, 11-28. <https://doi.org/10.1016/j.ijmedinf.2016.12.004>.
- Handayani, P. W., Hidayanto, A. N., Pinem, A. A., Sandhyaduhita, P. I., & Budi, I. (2018). Hospital information system user acceptance factors: User group perspectives. *Informatics for Health and Social Care*, 43(1), 84-107. <https://doi.org/10.1080/17538157.2016.1269109>.
- Ibrahim, R., Auliaputra, B., Yusoff, R., Maarop, N., Zainuddin, N. M., & Bahari, R. (2016). Measuring the success of healthcare information system in Malaysia: A case study. *IOSR Journal of Business and Management*, 18(4), 100-106. <https://doi.org/10.9790/487X-180402100106>.
- Kamaludin, K., & Kamaludin, K. Z. (2017). User acceptance of the human resource information system: A study of a private hospital in Malaysia. [User Acceptance of the Human Resource Information System: A Study of a Private Hospital in Malaysia]. *International Review of Management and Marketing*, 7(2), 207-217.
- Li, E., Clarke, J., Ashrafian, H., Darzi, A., & Neves, A. L. (2022). The impact of electronic health record interoperability on safety and quality of care in high-income countries: Systematic review. *Journal of Medical Internet Research*, 24(9), e38144. <https://doi.org/10.2196/38144>.
- Nadri, H., Rahimi, B., Afshar, H. L., Samadbeik, M., & Garavand, A. (2018). Factors affecting acceptance of hospital information systems based on extended technology acceptance model: a case study in three paraclinical departments. *Applied Clinical Informatics*, 9(02), 238-247. <https://doi.org/10.1055/s-0038-1641595>.
- Ologeanu-Taddei, R., Morquin, D., & Bourret, R. (2015). Understanding the perceived usefulness and the ease of use of a hospital information system: the case of a French university hospital. In R. Cornet, L. Stoicu-Tivadar, A. Hörbst, C. L. Calderón, S. K. Andersen & M. Hercigonja-Szekeres (Eds.), *Digital Healthcare Empowering Europeans* (p.p. 531-535). IOS Press.
- Rochmah, T. N., Fakhruzzaman, M. N., & Yustiawan, T. (2020). Hospital staff acceptance toward management information systems in Indonesia. *Health Policy and Technology*, 9(3), 268-270. <https://doi.org/10.1016/j.hlpt.2020.07.004>.