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Understanding Technology Acceptance Among Healthcare Employees: A Quantitative Assessment for Hospitals

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Abstract: This study examines technology acceptance levels of healthcare employees in digital hospital settings, focusing on how individual and occupational characteristics influence the adoption and effective use of health information technologies. Using a quantitative survey design, data were collected from 600 healthcare professionals and administrative staff who actively use hospital information systems, electronic health records, and related digital applications. The data were analyzed using SPSS 27.0, and non-parametric statistical tests were applied due to the non-normal distribution of the variables. The findings indicate no statistically significant differences in technology acceptance by gender, whereas significant differences were observed across age groups, education levels, years of work experience, and professional roles. Technology acceptance and its subdimensions perceived usefulness, perceived ease of use, and behavioral intention were found to increase with higher age, educational attainment, and professional experience. Employees with advanced education and longer professional tenure demonstrated more positive attitudes toward digital technologies and stronger intentions to use them in their daily work practices. Differences were also evident between clinical and administrative staff, suggesting that professional responsibilities and workflow structures shape perceptions of technology. The results highlight that technology acceptance varies significantly according to certain individual and occupational characteristics and cannot be explained by a single demographic factor alone. Overall, the findings indicate that technology acceptance in digital hospitals is not limited solely to technical infrastructure; rather, it is a multidimensional and socio-technical process shaped by individual and professional factors such as age, educational level, professional experience, and occupational group. These results emphasize the importance of targeted training programs, user-centered system design, and organizational support strategies to enhance technology acceptance. By addressing the diverse needs and expectations of different employee groups, healthcare organizations can improve the effective integration of digital technologies and support the success of digital transformation initiatives.

Keywords: Technology acceptance, Healthcare employees, Health information technologies, Digital transformation

Introduction

Digital transformation in healthcare has become a strategic priority in recent years regarding the management of clinical processes, the enhancement of service quality, and the strengthening of patient safety. At the center of this transformation, health information technologies constitute the core digital infrastructure that enables electronic generation, exchange, and management of information in healthcare settings such as hospitals and clinics (Chong et al., 2022). By facilitating the integrated management of clinical and administrative processes, these systems form the foundation of digital hospital applications and directly support healthcare organizations' objectives related to service quality, process efficiency, and patient safety. The effective functioning of this digital infrastructure is closely associated with healthcare professionals' levels of adoption and actual use of

these systems. Previous studies have demonstrated that individual and professional characteristics play a decisive role in the acceptance of health information systems.

Technology acceptance has been reported to differ significantly according to age, educational level, professional experience, and occupational role, indicating that acceptance processes in hospital settings are sensitive to individual attributes (Tetik et al., 2024). One of the most influential theoretical frameworks developed to explain technology acceptance is the Technology Acceptance Model (TAM). Within this model, perceived usefulness is defined as the degree to which an individual believes that using a particular system will enhance job performance (Davis, 1989). The model posits that users' cognitive evaluations constitute the primary determinants of behavioral intention and provides a robust theoretical foundation for understanding the adoption of health information systems. In organizational contexts, the effects of external factors on usage intention are assumed to operate through the mediating roles of perceived usefulness and perceived ease of use (Venkatesh & Davis, 2000). This finding suggests that organizational conditions and system characteristics indirectly shape technology acceptance in hospital environments. However, healthcare professionals' technology acceptance cannot be explained solely by individual cognitive evaluations. Performance expectancy, effort expectancy, and social influence have been identified as key determinants in the adoption of digital systems, particularly in the context of telehealth technologies, where these variables significantly explain acceptance behavior (Rouidi et al., 2022). This evidence indicates that technology acceptance cannot be examined independently of its social and organizational context. Given the nature of healthcare services, trust and privacy play a central role in technology acceptance. The use of health technologies necessarily involves access to highly sensitive data, including personal health information and previous medical records, highlighting the importance of ethical responsibilities and data security in digital hospital environments (Dhagarra et al., 2020). Consistently, clinical studies have shown that data security and professional accountability constitute fundamental evaluation criteria in the adoption of clinical technologies (Klaic & Galea, 2020). These findings emphasize the importance of trust-based mechanisms in the acceptance of digital systems.

Recent studies further indicate that perceived usefulness and perceived ease of use remain the primary determinants of healthcare professionals' adoption of digital systems. In the context of electronic personal health records, these two variables have been reported as the strongest predictors of adoption behavior (Kim et al., 2025). Meta-analytic evidence additionally demonstrates that technology acceptance is shaped not only by individual perceptions but also by normative and social dimensions. Perceived value and social norms have been shown to significantly explain usage intention in health information technologies, suggesting that acceptance processes in hospital settings are inherently multidimensional (Chong et al., 2022). Despite this growing body of literature, existing research predominantly addresses technology acceptance from the perspective of general users or patients, while quantitative investigations focusing on healthcare professionals in hospital settings and examining acceptance mechanisms in relation to demographic and professional characteristics remain limited. Studies that comprehensively analyze the adoption of digital hospital systems from the perspective of healthcare professionals constitute an important gap in literature. Against this background, the present study aims to quantitatively examine the technology acceptance levels of healthcare professionals working in hospital settings and to elucidate the adoption mechanisms of digital hospital systems within the framework of the core components of the TAM. By addressing healthcare professionals' technology acceptance in relation to demographic and professional variables, this study seeks to fill an important gap in the literature and to provide empirical evidence to support the effective diffusion of digital hospital applications

Literature Review

TAM constitutes one of the most widely employed theoretical frameworks for explaining the relationships among perceived ease of use, perceived usefulness, and behavioral intention in the adoption of health technologies. Studies on electronic personal health record systems emphasize that these two cognitive evaluations determine behavioral intention either directly or indirectly (Walle et al., 2023). Quantitative studies examining the role of system characteristics in healthcare professionals' technology acceptance have shown that the maturity and functionality levels of the implemented technology strengthen perceived usefulness and perceived ease of use, and that these two constructs jointly explain usage intention to a significant extent (Hussain, 2025). This evidence indicates that, in hospital settings, the acceptance process is shaped not only by individual attitudes but also by the quality and characteristics of the information system itself. In the context of professional education and clinical competency development, the validity of the TAM core has likewise been confirmed. Perceived usefulness has been reported to exert a direct effect on behavioral intention, whereas perceived ease of use functions as a fundamental component of the acceptance process through system comprehensibility and practical applicability (Chen et al., 2024). Systematic reviews evaluating the health

technology acceptance literature clearly demonstrate that perceived usefulness and perceived ease of use constitute the core of the model. These two values are identified as the most frequently employed variables in literature, and the relationship between perceived usefulness and behavioral intention is consistently among the most robustly validated links (AlQudah et al., 2021). Nevertheless, the distinct nature of healthcare services also brings the limitations of the parsimonious form of the model into focus. It has been argued that reducing TAM to its two core constructs facilitates empirical investigation yet does not always adequately capture the organizational and contextual complexity of healthcare environments (Lee, 2025). This assessment suggests that acceptance processes in hospital settings should be examined in conjunction with organizational and contextual factors.

Recent studies in the context of mobile health applications have demonstrated that perceived ease of use enhances perceived usefulness, and that both constructs exert direct effects on behavioral intention (Park et al., 2025). This finding indicates that learning burden and usability play a central role in healthcare professionals' adoption of digital applications. Similarly, studies examining healthcare professionals' acceptance behavior in telemedicine applications emphasize that perceived ease of use and perceived usefulness jointly constitute the strongest determinants of behavioral intention **(**Porat et al., 2025). This evidence suggests that simplicity of system design and expectations regarding clinical contribution are decisive in the acceptance of remote healthcare services. The effect of perceived ease of use on behavioral intention has been explained in technology acceptance literature through both direct and indirect pathways. It has been noted that ease of use may directly influence behavioral intention, while also exerting an indirect effect through perceived usefulness (Liu, 2022). This perspective highlights learning and implementation costs as critical elements in healthcare professionals' system adoption processes. Quantitative studies investigating the adoption of mobile health applications have further confirmed, through structural equation modeling, that perceived ease of use and perceived usefulness jointly exert a positive effect on behavioral intention (Serban, 2025). This result indicates that the fundamental hypothesis paths to be specified in hospital-based models are strongly supported by the existing literature. Finally, in certain contexts of digital health solutions, perceived usefulness and perceived ease of use have been shown to influence behavioral intention not directly but through attitude as a mediating variable. Attitude has been reported to constitute a decisive determinant of intention, with ease of use and usefulness primarily shaping attitudinal evaluations (Karkonasasi et al., 2023). This finding indicates that the potential mediating role of attitude should be explicitly tested when examining technology acceptance among hospital staff. Overall, prior studies show that technology acceptance among healthcare professionals is primarily shaped by perceived ease of use, perceived usefulness, and behavioral intention, and that the success of digital transformation in hospital settings largely depends on these cognitive evaluations. Accordingly, the present study aims to quantitatively test the relationships among these core constructs in a sample of healthcare professionals working in hospital environments.

Method

This study employed a quantitative research approach using survey design. Data were collected between October and December 2025. A digital questionnaire was administered to participants and distributed via Google Forms platform. The study population consisted of healthcare and administrative staff working at Gebze Fatih State Hospital who actively use health information technologies. A total of 669 questionnaires were collected. Of these, 69 questionnaires were excluded due to incomplete, erroneous, or inconsistent responses, and 600 questionnaires were retained for statistical analysis.

A. Research Design and Hypotheses

Technology Acceptance Model (TAM): The Technology Acceptance Model was employed to measure employees' levels of adoption of health information technologies. The scale consists of the subdimensions of Perceived Usefulness, Perceived Ease of Use, and Behavioral Intention to Use (Davis, 1989; Hussain et al., 2025). In the measurement tool, 5-point Likert statements are scored as "I strongly disagree (1)", "I disagree (2)", "I am undecided (3)", "I agree (4)", "I strongly agree (5)". The scale does not contain any reverse-scored statements. In our study, the Cronbach Alpha internal consistency coefficient was calculated as 0.92.

Hypotheses

To identify the factors affecting technology acceptance, the following hypotheses were formulated:

H1: There is a statistically significant difference in technology acceptance according to employees' gender.
H2: There is a statistically significant difference in technology acceptance according to employees' age groups
H3: There is a statistically significant difference in technology acceptance according to employees' educational level
H4: There is a statistically significant difference in technology acceptance according to total professional experience.
H5**:** There is a statistically significant difference in technology acceptance according to occupational group

Results and Discussion

Data were analyzed using SPSS 27.0 with a 95% confidence interval and a significance level of $p < 0.05$. Normality was assessed using the Shapiro–Wilk and Kolmogorov–Smirnov tests, and non-parametric methods were applied. The Mann–Whitney U Test was used for two-group comparisons, and the Kruskal–Wallis Test for multiple-group comparisons. The results for Hypothesis 1 (H1) are presented in Table 1. The Mann–Whitney U test indicated no statistically significant differences between male and female participants in perceived usefulness, perceived ease of use, behavioral intention to use, or overall technology acceptance.

Table 1. Evaluation of technology acceptance and its subdimensions according to gender

Sub-dimension	Gender	N	Mean Rank	U	Z	P*
Perceived Usefulness	Male	310	291.80	42252.50	-1.49	0.136
	Female	290	309.80			
Perceived Ease of Use	Male	310	294.35	43043.00	-0.988	0.323
	Female	290	307.08			
Behavioral Intention to Use	Male	310	306.97	42944.00	-1.102	0.271
	Famale	290	293.58			
Overall Technology Acceptance Scale	Male	310	295.77	43484.00	-0.749	0.454
	Famale	290	305.56			

P <0.05 indicates statistical significance. Mann–Whitney U Test.

The results for H2 are presented in Table 2 below. Statistical analyses revealed statistically significant differences in technology acceptance and all its subdimensions across age groups ($p < 0.05$). The findings demonstrate a clear age-related pattern, indicating that perceived usefulness, perceived ease of use, behavioral intention to use, and overall technology acceptance scores increase progressively with age. Younger participants reported lower levels of acceptance, whereas older participants exhibited more positive evaluations of digital technologies.

Table 2. Evaluation of technology acceptance and its subdimensions according to age group

Sub-dimension	Age Group	N	Mean Rank	χ^2	P*
Perceived Usefulness	20 Under	5	65.40	36.344	0.000*
	21-30	164	260.05		
	31-40	208	302.24		
	41-50	164	332.38		
	51-60	59	338.08		
Perceived Ease of Use	20 Under	5	91.80	44.448	0.000*
	21-30	164	245.19		
	31-40	208	308.75		
	41-50	164	328.65		
	51-60	59	364.60		
Behavioral Intention to Use	20 Under	5	151.50	27.336	0.000*
	21-30	164	261.44		
	31-40	208	299.79		
	41-50	164	330.48		
	51-60	59	340.89		
Overall Technology Acceptance Scale	20 Under	5	69.70	44.685	0.000*
	21-30	164	246.69		
	31-40	208	304.97		
	41-50	164	334.18		
	51-60	59	360.25		

P <0.05 indicates statistical significance. Kruskal–Wallis Test

The lowest mean rank scores were observed among participants aged 20 years and under, suggesting comparatively weaker perceptions of usefulness, greater perceived difficulty of use, and lower intention to adopt health information technologies in this age group. In contrast, the highest mean rank scores were obtained in the 51–60 age group, indicating stronger perceptions of usefulness, greater ease of use, and higher behavioral intention toward digital systems. This pattern suggests that older healthcare professionals may perceive digital technologies as more beneficial for clinical practice and workflow efficiency, possibly due to accumulated professional experience and a clearer understanding of the practical value of such systems. Overall, these results indicate that age constitutes a significant and direct determinant of technology acceptance in digital hospital environments and plays a critical role in shaping healthcare professionals' perceptions and adoption intentions. This finding further implies that age-specific training strategies and tailored implementation approaches may be necessary to promote more equitable and effective adoption of digital technologies across different age groups.

According to Table 3, statistically significant differences were observed in technology acceptance and all of its subdimensions across educational levels ($p < 0.001$). The results of H3 demonstrate a clear educational gradient, indicating that perceived usefulness, perceived ease of use, behavioral intention to use, and overall technology acceptance scores increase as the level of education rises. Participants with higher educational attainment reported more positive evaluations of digital technologies and stronger intentions to adopt them in their professional practice. The lowest mean rank scores were observed among high school graduates, suggesting comparatively weaker perceptions of usefulness, greater perceived difficulty of use, and lower behavioral intention toward health information technologies in this group. In contrast, the highest scores were obtained from employees holding a master's degree, indicating stronger confidence in the benefits of digital systems, greater ease of interaction with technology, and higher willingness to integrate such systems into daily clinical workflows. This pattern suggests that advanced education may enhance cognitive readiness, technology literacy, and the ability to recognize the clinical and organizational value of digital health technologies. Overall, these findings indicate that educational level constitutes a significant determinant of technology acceptance among healthcare professionals and plays a central role in shaping perceptions, usage intentions, and adoption behavior. This result further implies that differentiated training programs and continuous professional education initiatives may be essential to reduce educational disparities and promote more uniform adoption of digital technologies across healthcare staff with varying educational backgrounds.

Table 3. Evaluation of technology acceptance and its subdimensions according to educational level

Variable	Education Level	N	Mean Rank	χ^2	P*
Perceived Usefulness	High School	32	93.11	100.602	< 0.001
	Associate	180	330.92		
	Bachelor's	261	274.83		
	Master's	127	362.40		
Perceived Ease of Use	High School	32	84.02	89.131	< 0.001
	Associate	180	321.02		
	Bachelor's	261	281.05		
	Master's	127	365.22		
Behavioral Intention to Use	High School	32	118.55	70.966	< 0.001
	Associate	180	309.44		
	Bachelor's	261	287.58		
	Master's	127	360.22		
Overall Tecnology Acceptance Scale	High School	32	74.28	96.857	< 0.001
	Associate	180	321.71		
	Bachelor's	261	297.13		
	Master's	127	371.36		

$p < 0.01$ indicates statistical significance. Kruskal–Wallis Test.

Table 4 presents the results of H4. It indicates that there are statistically significant differences in technology acceptance and all its subdimensions according to total professional experience ($p < 0.001$). The mean rank scores for perceived usefulness, perceived ease of use, behavioral intention to use, and overall technology acceptance increase as years of professional experience increase. Employees with 0–1 years of experience exhibit the lowest mean ranks across all dimensions, whereas those with 11–15 years and 16 years or more of experience demonstrate the highest levels of technology acceptance. These findings suggest that greater professional experience is associated with higher acceptance and more positive evaluations of health information technologies. This pattern suggests that accumulated clinical experience may enhance professionals' ability to recognize the practical benefits of digital systems and integrate them more effectively into clinical workflows. Moreover, more experienced employees may develop greater confidence and

technological self-efficacy, thereby perceiving digital technologies as less demanding and more supportive of their professional performance.

Table 4. Evaluation of technology acceptance and its subdimensions according to total professional experience

Dimension	Years of Experience	N	Mean Rank	χ^2	p*
Perceived Usefulness	0-1 Years	14	95.54	67.992	0.000*
	2-5 Years	156	255.92		
	6-10 Years	135	281.93		
	11-15 Years	166	350.85		
	16 Years Above	129	331.30		
Perceived Ease of Use	0-1 Years	14	92.04	75.363	0.000*
	2-5 Years	156	245.86		
	6-10 Years	135	278.50		
	11-15 Years	166	358.49		
	16 Years Above	129	337.60		
Behavioral Intention to Use	0-1 Years	14	115.18	64.032	0.000*
	2-5 Years	156	262.86		
	6-10 Years	135	267.82		
	11-15 Years	166	348.93		
	16 Years Above	129	338.01		
Overall Technology Acceptance Scale	0-1 Years	14	80.21	84.647	0.000*
	2-5 Years	156	244.46		
	6-10 Years	135	271.03		
	11-15 Years	166	363.01		
	16 Years Above	129	342.57		

p <0.001 indicates statistical significance. Kruskal–Wallis Test

Table 5. Evaluation of technology acceptance and its subdimensions according to occupational group

Dimension	Profession	N	Mean Rank	χ^2	P*
Perceived Usefulness	Physician	125	361.40		
	Nurse	130	281.33		
	Other Health	172	302.23	53.510	0.000*
	Administrative	152	288.95		
	Support	21	126.10		
Perceived Ease of Use	Physician	125	367.83		
	Nurse	130	288.68		
	Other Health	172	286.42	53.756	0.000*
	Administrative	152	296.69		
	Support	21	115.79		
Behavioral Intention to Use	Physician	125	361.04		
	Nurse	130	276.90		
	Other Health	172	288.59	45.072	0.000*
	Administrative	152	304.38		
	Support	21	155.74		
Overall Technology Acceptance Scale	Physician	125	372.44		
	Nurse	130	283.75		
	Other Health	172	286.14	57.202	0.000*
	Administrative	152	297.88		
	Support	21	112.52		

p <0.001 indicates statistical significance. Kruskal–Wallis Test.

Table 5 demonstrates that there are statistically significant differences in technology acceptance and all its subdimensions across occupational groups ($p < 0.001$). The results of H5 indicate that physicians exhibit the highest mean rank scores for perceived usefulness, perceived ease of use, behavioral intention to use, and overall technology acceptance. In contrast, support service personnel display the lowest mean ranks across all dimensions, indicating comparatively weaker perceptions of usefulness, greater perceived difficulty of use, and lower intention to adopt digital technologies. Nurses, other health professionals, and administrative staff show moderate levels of technology acceptance, reflecting intermediate evaluations of both the benefits and usability of health information systems. The observed pattern suggests that professional responsibilities and proximity to clinical decision-making processes play a critical role in shaping technology acceptance. Physicians, who rely

heavily on digital systems for diagnosis, treatment planning, and clinical documentation, may perceive health information technologies as more integral to their professional performance and patient care outcomes. Conversely, support service personnel may interact with digital systems less frequently or in more limited functional contexts, thereby perceiving fewer direct benefits and greater usage barriers. Overall, these findings indicate that occupational role constitutes a significant determinant of technology acceptance in digital hospital environments and highlight the importance of role-specific system design, training strategies, and implementation policies. Tailoring digital solutions and educational interventions to the distinct needs and workflows of different professional groups may be essential to promote more balanced and effective adoption of health information technologies across hospital staff. In addition, these results suggest that uniform implementation strategies may be insufficient to address the heterogeneous expectations and competencies of diverse occupational groups. Accordingly, differentiated adoption frameworks that align technological functionalities with role-specific clinical and administrative tasks may enhance both acceptance levels and system utilization efficiency.

Conclusion

This study examined whether healthcare professionals' levels of technology acceptance in digital hospital environments differ according to demographic and professional variables. The findings indicate that technology acceptance varies significantly according to certain individual and occupational characteristics. Analyses conducted by gender revealed no statistically significant differences in perceived usefulness, perceived ease of use, behavioral intention, or overall technology acceptance ($p > 0.05$). This finding suggests that male and female healthcare professionals exhibit largely similar perceptions and acceptance levels regarding health information technologies (Alloghani, 2017). Comparisons across age groups demonstrated statistically significant differences in technology acceptance and all its subdimensions ($p < 0.05$). The results indicate that perceived usefulness, perceived ease of use, behavioral intention, and overall technology acceptance increase with age. The lowest levels were observed among participants aged 20 years and below, whereas the highest levels were found in the 51–60 age group. These findings indicate that age has a significant and direct effect on technology acceptance and related constructions (McFarland, 2001). Analyses based on educational level revealed statistically significant differences in technology acceptance and all subdimensions ($p < 0.001$). Technology acceptance scores increased with higher educational attainment, with the lowest levels observed among high school graduates and the highest among individuals holding a master's degree. This finding suggests that educational level is an important determinant in healthcare professionals' technology adoption processes (Davis, 1989; Holden & Karsh, 2010). Similarly, analyses according to professional experience revealed statistically significant differences in technology acceptance and all subdimensions ($p < 0.001$). As professional experience increased, perceived usefulness, perceived ease of use, behavioral intention, and overall technology acceptance also increased. The lowest acceptance levels were observed among employees with 0–1 year of experience, whereas the highest levels were found among those with 11 years or more of experience (Venkatesh et al., 2003). Finally, statistically significant differences in technology acceptance were identified across occupational groups ($p < 0.001$). Physicians exhibited the highest levels of technology acceptance, while support services staff demonstrated the lowest levels. Nurses, other healthcare professionals, and administrative personnel showed moderate levels of technology acceptance. This finding is consistent with the literature indicating that physicians tend to report higher perceived usefulness and technology acceptance due to their direct use of technology in clinical decision-making processes (Holden & Karsh, 2010). Overall, the findings indicate that technology acceptance in digital hospitals is not limited solely to technical infrastructure; rather, it is a multidimensional and socio-technical process shaped by individual and professional factors such as age, educational level, professional experience, and occupational group.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in EPSTEM journal belongs to the authors.

Conflict of Interest

* The authors declare that they have no conflicts of interest.

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