

Short Paper

Health Information Technology Usability and Nurses' Job Satisfaction in Vietnam: The Indirect Role of Career Adapt-Abilities

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Abstract

Purpose – This study examined the associations among health information technology usability, Career Adapt-Abilities, and nurses' job satisfaction in selected hospitals in Vietnam and examined whether Career Adapt-Abilities statistically accounted for part of the association between health information technology usability and job satisfaction.

Method – A quantitative cross-sectional descriptive-correlational design was used. Data were collected from 250 staff nurses using the Health Information Technology Usability Evaluation Scale, the Career Adapt-Abilities Scale, and the Minnesota Satisfaction Questionnaire–Short Form. Descriptive statistics, Spearman's rank-order correlation, multiple linear regression, and a cross-sectional indirect-effect analysis were performed using jamovi version 2.3.28.

Results – Health information technology usability was positively associated with Career Adapt-Abilities ($\rho = .683$, $p < .001$) and nurses' job satisfaction ($\rho = .653$, $p < .001$). Career Adapt-Abilities were strongly associated with job satisfaction ($\rho = .758$, $p < .001$). Health information technology usability and Career Adapt-Abilities jointly explained 69.1% of the



variance in job satisfaction. The indirect association through Career Adapt-Abilities was significant ($\beta = .439$, $p < .001$), while the direct association remained significant ($\beta = .269$, $p < .001$).

Conclusion – Nurses' job satisfaction was associated with both technology usability and personal adaptive resources. Because the data were cross-sectional and self-reported, the findings should not be interpreted as establishing temporal or causal mediation, and generalizability beyond the selected hospitals is limited.

Recommendations – Hospitals should improve system usability, workflow integration, technical support, and nurse involvement in system evaluation.

Practical Implications: Hospitals should strengthen Career Adapt-Abilities through digital competency training, mentoring, peer learning, and supportive supervision.

Research Implication – The findings support integrated models that examine technological and psychosocial resources together when explaining nurses' work outcomes during digital transformation.

Keywords – health information technology, career adaptabilities, job satisfaction, nurses, indirect effect

INTRODUCTION

Health information technology has become an essential component of modern healthcare delivery, shaping how nurses document care, communicate with healthcare teams, access clinical information, and support patient safety. In hospital settings, systems such as electronic health records, computerized documentation platforms, and clinical decision support tools are increasingly used to improve workflow efficiency, reduce errors, and strengthen evidence-based practice (Amano et al., 2023; Kutney-Lee et al., 2021; Moore et al., 2020). Nurses constitute one of the largest groups of healthcare professionals using health information technology in daily clinical practice; therefore, their experiences with these systems are closely associated with work processes, care coordination, and organizational outcomes (Farokhzadian et al., 2020; Golay et al., 2022).

From the perspective of the Technology Acceptance Model, users are more likely to adopt and sustain technology use when they perceive a system as useful and easy to use (Davis, 1989; Venkatesh & Davis, 2000). In nursing practice, usable health information technology may support documentation accuracy, timely communication, workflow efficiency, and access to clinical information. When digital systems are perceived as beneficial, understandable, and controllable, nurses may experience greater efficiency and satisfaction in their work (Alrasheeday et al., 2023; Alshammari & Alenezi, 2023; Hussain et al., 2025). However, health information technology does not always produce

positive work outcomes. Poor system design, insufficient training, limited user control, and misalignment between digital platforms and clinical workflows may increase cognitive workload, documentation burden, frustration, and technology-related stress (Alobayli et al., 2023; Campione & Liu, 2024; Wirkkala et al., 2024). These challenges suggest that technological usability alone may not fully explain nurses' job satisfaction.

Career Adapt-Abilities provide an important psychosocial perspective for understanding how nurses respond to changing work environments. Career Adapt-Abilities refer to the adaptive resources that help individuals manage career-related tasks, transitions, and challenges, including concern, control, curiosity, and confidence (Savickas, 2005; Savickas & Porfeli, 2012). In digitally transforming healthcare environments, nurses are expected not only to use health information technology but also to continuously learn, adjust, and maintain professional effectiveness amid changing clinical and organizational demands. Previous studies have shown that Career Adapt-Abilities are associated with job satisfaction, career satisfaction, work engagement, professional development, and turnover-related outcomes among nurses and healthcare workers (Akturan et al., 2025; Sun et al., 2023; Tahiry & Ekmekcioglu, 2023; Walden et al., 2022).

The Job Demands–Resources model further supports the need to mine both technological and personal resources. According to this model, work environments include job demands that require sustained effort and may lead to strain, as well as job resources that support motivation, performance, and well-being (Bakker & Demerouti, 2007). Health information technology usability may function as a job resource when it facilitates efficiency, communication, and decision-making. Conversely, it may become a job demand when systems are difficult to use, poorly supported, or poorly integrated into nursing workflows (Wirkkala et al., 2024). Career Adapt-Abilities may therefore serve as personal resources that help nurses manage technology-related demands and support more positive work outcomes in digitally transforming environments (Kumi et al., 2024; Rahbar Zeraati et al., 2024).

Despite growing attention to digital health and nursing workforce outcomes, important knowledge gaps remain. Previous studies have commonly examined health information technology usability, technology acceptance, or job satisfaction as separate or direct-effect relationships (Alshammari & Alenezi, 2023; Kalankesh et al., 2020; Kutney-Lee et al., 2021). Other studies have investigated Career Adapt-Abilities in relation to work engagement, career satisfaction, professional development, and turnover intention (Akturan et al., 2025; Sun et al., 2023; Yamada et al., 2024). However, limited empirical evidence explains how health information technology usability and Career Adapt-Abilities are jointly associated with nurses' job satisfaction, particularly in hospital settings undergoing digital transformation. More specifically, few studies have examined the indirect role of Career Adapt-Abilities in the association between health information technology usability and nurses' job satisfaction.

This gap is particularly relevant in Vietnam, where hospitals are increasingly adopting digital health systems, electronic medical records, and information technology-based clinical workflows. Although Vietnam has made progress in digital health policy and hospital-based digital health programs, implementation challenges remain, including technology adoption, system readiness, digital literacy, and workforce adaptation (Ngô et al., 2024; Tran et al., 2022; Tran et al., 2025). At the same time, job satisfaction remains an important issue among healthcare workers in Vietnam, as it is influenced by workplace conditions, organizational support, and professional development opportunities (Huynh et al., 2024; Sa et al., 2024). Understanding how technological usability and adaptive personal resources are associated with nurses' job satisfaction is therefore important for nursing informatics, health management, and nursing workforce development in Vietnam.

The novelty of this study lies in its integration of technological and psychosocial perspectives to explain nurses' job satisfaction. Rather than examining health information technology usability as an isolated correlate, this study examines whether Career Adapt-Abilities statistically account for part of the association between health information technology usability and nurses' job satisfaction. By integrating the Technology Acceptance Model, Career Construction Theory, and the Job Demands–Resources model, the study provides a more comprehensive framework for examining how digital health usability and personal adaptive resources are jointly related in hospital nursing practice (Bakker & Demerouti, 2007; Davis, 1989; Savickas & Porfeli, 2012).

Therefore, this study aimed to examine the relationships among health information technology usability, Career Adapt-Abilities, and nurses' job satisfaction in selected hospitals in Vietnam. Specifically, the study sought to assess nurses' perceptions of health information technology usability, Career Adapt-Abilities, and job satisfaction; examine the relationships among these variables; estimate the independent associations of health information technology usability and Career Adapt-Abilities with job satisfaction; and examine the extent to which Career Adapt-Abilities statistically accounted for part of the association between health information technology usability and nurses' job satisfaction.

METHODOLOGY

Study Design

This study employed a quantitative cross-sectional descriptive-correlational design to examine the associations among health information technology usability, Career Adapt-Abilities, and nurses' job satisfaction. This design was appropriate for describing the levels of the main study variables and determining the strength and direction of their associations without manipulating the study environment. It also enabled the examination of a cross-sectional indirect-effect model in which Career Adapt-Abilities were assessed for their statistical indirect role in the association between health information technology usability and nurses' job satisfaction.

Study Setting, Participants, and Sampling

The study was conducted at two private secondary-level general hospitals located in Da Nang and Nha Trang, Vietnam, under the same healthcare organization. Each hospital had an officially approved capacity of 200 beds and provided both inpatient and outpatient services. Both hospitals had implemented integrated health information technology systems in routine clinical operations, including electronic medical records, hospital information management systems, electronic nursing documentation, electronic prescribing, and laboratory information systems.

The total nursing workforce across the two hospitals comprised 436 nurses. After applying the predefined inclusion and exclusion criteria, 325 nurses were identified as eligible and constituted the sampling frame. Eligible participants were nurses aged 21 to 55 years who were employed full-time, held a valid nursing license, worked in inpatient or outpatient departments, were directly involved in patient care, and routinely used health information technology systems in clinical practice. Nurses working in administrative or non-patient-care positions and those who were on maternity leave, sick leave, official travel, or otherwise unavailable during the data-collection period were excluded.

The required sample size was determined using an a priori power analysis in G*Power version 3.1.9.4. The analysis was based on a one-tailed correlation test, an expected effect size of 0.30, an alpha level of 0.01, and statistical power of 0.99. The minimum required sample size was 222 participants. To allow for potential non-response, the target sample was increased to 250 nurses.

Simple random sampling was used to select participants from the sampling frame. Each of the 325 eligible nurses was assigned a unique identification number, and random numbers were generated using Microsoft Excel. A total of 250 nurses were selected from the randomized list, ensuring that each eligible nurse had an equal probability of selection. The 250 selected nurses were invited to participate, and all agreed and returned complete and valid questionnaires. No replacement of selected participants was required. Therefore, the final analytic sample consisted of 250 nurses, corresponding to a response rate of 100% (250/250) and representing 76.9% of the eligible sampling frame.

Research Instruments

Data were collected using a structured self-administered questionnaire comprising four sections. The first section collected participants' demographic and professional characteristics, including age, sex, highest educational attainment, years of clinical experience, and the type of health information technology training attended.

The second section assessed health information technology usability using the 20-item Health Information Technology Usability Evaluation Scale developed by Schnall et al.

(2018). The scale comprised four dimensions: impact (4 items), perceived usefulness (8 items), perceived ease of use (5 items), and user control (3 items). Each item was rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating more favorable perceptions of health information technology usability.

The third section assessed Career Adapt-Abilities using the 24-item Career Adapt-Abilities Scale developed by Savickas and Porfeli (2012). The scale comprised four dimensions, with six items in each dimension: concern, control, curiosity, and confidence. Responses were rated on a 5-point scale ranging from 1 (not strong) to 5 (very strong), with higher scores indicating stronger psychosocial resources for managing career-related tasks, transitions, and challenges.

The fourth section assessed nurses' job satisfaction using the adapted 20-item Minnesota Satisfaction Questionnaire–Short Form reported by Dzimbiri and Molefi (2021), based on the original instrument developed by Weiss et al. (1967). The version used in this study comprised two dimensions: intrinsic satisfaction (11 items) and extrinsic satisfaction (9 items). Each item was rated on a 5-point scale ranging from 1 (very dissatisfied) to 5 (very satisfied), with higher scores indicating greater job satisfaction.

Translation, Validation, Pilot Testing, and Reliability

The instruments were translated into Vietnamese using a forward–backward translation procedure. Three experts with backgrounds in English linguistics, medical research, nursing, and clinical practice reviewed the original, translated, and back-translated versions to ensure linguistic clarity, semantic equivalence, and conceptual consistency. Discrepancies were resolved through discussion before the questionnaire was finalized.

Content validity was evaluated by four experts in clinical psychology, medical research, hospital scientific research and international relations, and nursing management. They assessed the clarity, relevance, cultural appropriateness, and conceptual alignment of the items, and minor wording revisions were made based on their recommendations.

A pilot study was conducted among 50 nurses who were similar to the target participants but were not included in the main study. Cronbach's alpha coefficients ranged from .903 to .979 for the Health Information Technology Usability Evaluation Scale, from .950 to .979 for the Career Adapt-Abilities Scale, and from .960 to .972 for the Minnesota Satisfaction Questionnaire–Short Form. These findings indicated high internal consistency, although coefficients exceeding .95 were interpreted cautiously because they may indicate substantial item similarity or potential redundancy.

Construct validity was additionally examined using exploratory factor analysis conducted separately for the three instruments in the main-study sample of 250 nurses. Minimum residual extraction with oblimin rotation and parallel analysis was used. Sampling adequacy and factorability were assessed using the Kaiser–Meyer–Olkin measure and Bartlett’s test of sphericity. These supplementary analyses did not alter the original item composition, subscale definitions, scoring procedures, or primary results of the approved study.

Data Collection Procedure

Data collection was conducted from October 16 to December 12, 2025, after ethical approval, institutional authorization, and permission from the participating hospitals had been obtained. The 250 nurses selected through simple random sampling were invited to participate and were informed about the study purpose, procedures, voluntary nature of participation, confidentiality protections, and their right to decline or withdraw without penalty.

Nurses who agreed to participate provided written informed consent before completing the structured self-administered questionnaire. Participants completed the questionnaire independently, and no personally identifiable information was recorded. Each questionnaire was assigned a unique study code to protect participants’ identities and facilitate data management.

The returned questionnaires were reviewed for completeness before data entry. All 250 invited nurses returned complete and valid questionnaires, resulting in a response rate of 100% (250/250). No questionnaire was excluded from the final analysis. The completed questionnaires were coded, securely stored, and used solely for research purposes.

Data Analysis

Data were screened for completeness, coding accuracy, out-of-range values, and missing data before analysis. The final dataset included 250 complete cases with no missing values; therefore, no imputation or case deletion was required. Statistical analyses were performed using jamovi version 2.3.28. Frequencies, percentages, means, and standard deviations were used to summarize participant characteristics and the main study variables. Exploratory factor analyses were conducted separately for the three instruments using minimum residual extraction, oblimin rotation, and parallel analysis, as described in Section 2.4.

The distributions of the composite scores were assessed before inferential analysis. Because the scores showed departures from normality, Spearman’s rank-order correlation was used to examine the bivariate associations among health information

technology usability, Career Adapt-Abilities, and job satisfaction. Multiple linear regression was subsequently conducted to estimate the independent associations of health information technology usability and Career Adapt-Abilities with job satisfaction. Although the composite scores were not normally distributed, linear regression was considered appropriate because its distributional assumption concerns the residuals rather than the individual variables. Linearity, residual normality, homoscedasticity, independence of residuals, multicollinearity, and influential observations were assessed using regression diagnostics. Both unstandardized and standardized coefficients, standard errors, 95% confidence intervals, and p-values were reported.

A cross-sectional indirect-effect analysis was performed using the medmod module in jamovi version 2.3.28. Direct, indirect, and total associations were estimated with 95% confidence intervals based on 5,000 bootstrap resamples. All statistical tests were two-tailed, and $p < .05$ was considered statistically significant.

Ethical Considerations

The research protocol, study instruments, and data-collection procedures were reviewed by the Scientific Research Council and approved by the Institutional Ethics Review Committee of Trinity University of Asia under Protocol Code TUA-IERC-015-R02. Permission to conduct the study was also obtained from the participating healthcare organization and both hospitals before data collection. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

All selected nurses received information about the study purpose, procedures, potential benefits, voluntary participation, confidentiality protections, and their right to decline or withdraw at any time without penalty. Written informed consent was obtained from each participant before questionnaire completion.

Questionnaires were identified only by unique study codes, and no personally identifiable information was collected. Research data were securely stored and accessible only to the research team. Findings were reported in aggregate form. The names of the participating hospitals were withheld in accordance with institutional confidentiality requirements and the conditions of ethical approval.

RESULTS

Participants' Demographic and Professional Characteristics

Participants' demographic and professional characteristics are presented in Table 1.

A total of 250 nurses were included in the final analysis. The participants had a mean age of 31.00 years ($SD = 4.50$) and a mean of 8.18 years of clinical experience ($SD = 4.50$). Most participants were female ($n = 211, 84.4\%$), whereas 39 were male (15.6%). Regarding

highest educational attainment, 124 participants had completed college-level education (49.6%), 112 held bachelor's degrees (44.8%), 11 had intermediate-level qualifications (4.4%), and three held master's degrees (1.2%). Regarding health information technology training, 144 participants had been trained by information and communication technology personnel (57.6%), 56 by colleagues (22.4%), and 11 by managers (4.4%), whereas 39 participants reported self-directed learning or no formal training (15.6%).

Table 1. Participants' Demographic and Professional Characteristics (N = 250)

Characteristics	Category	n	%
Age	M = 31.00, SD = 4.50	-	-
Sex	Female	211	84.4
	Male	39	15.6
Highest educational attainment	Intermediate	11	4.4
	Bachelor	112	44.8
	College	124	49.6
	Master	3	1.2
Years of clinical experience	M = 8.18, SD = 4.50		
HIT training attended	Self-learned/untrained	39	15.6
	Trained by ICT personnel	144	57.6
	Trained by colleagues	56	22.4
	Trained by manager	11	4.4

Note. HIT = Health Information Technology; ICT = Information and Communication Technology; M = mean; SD = standard deviation

Descriptive Statistics of the Main Study Variables

Descriptive statistics for the main study variables and their dimensions are presented in Table 2. Participants reported favorable perceptions of health information technology usability, with an overall mean score of 3.89 (SD = 0.49), corresponding to an interpretation of "agree." Among the usability dimensions, impact had the highest mean score (M = 4.07, SD = 0.56), followed by perceived usefulness (M = 4.03, SD = 0.57), user control (M = 3.80, SD = 0.66), and perceived ease of use (M = 3.65, SD = 0.49).

Career Adapt-Abilities were rated as strong overall (M = 4.18, SD = 0.49). Confidence had the highest mean score and was interpreted as very strong (M = 4.22, SD = 0.52), followed by control (M = 4.19, SD = 0.54), curiosity (M = 4.18, SD = 0.54), and concern (M = 4.13, SD = 0.56), which were interpreted as strong. Participants were satisfied with their jobs overall (M = 4.03, SD = 0.47). Intrinsic satisfaction had a higher mean score (M = 4.09, SD = 0.46) than extrinsic satisfaction (M = 3.96, SD = 0.58).

Table 2. Descriptive Statistics of the Main Study Variables (N = 250)

Variable and dimension	M	SD	Interpretation
Health Information Technology Usability	3.89	0.49	Agree
Impact	4.07	0.56	Agree
Perceived Usefulness	4.03	0.57	Agree
Perceived Ease of Use	3.65	0.49	Agree
User Control	3.80	0.66	Agree
Career Adapt-Abilities	4.18	0.49	Strong
Concern	4.13	0.56	Strong
Control	4.19	0.54	Strong
Curiosity	4.18	0.54	Strong
Confidence	4.22	0.52	Very strong
Job Satisfaction	4.03	0.47	Satisfied
Intrinsic Satisfaction	4.09	0.46	Satisfied
Extrinsic Satisfaction	3.96	0.58	Satisfied

Note:

HITU: 4.21–5.00 = strongly agree; 3.41–4.20 = agree; 2.61–3.40 = neutral; 1.81–2.60 = disagree; 1.00–1.80 = strongly disagree.

CAA: 4.21–5.00 = very strong; 3.41–4.20 = strong; 2.61–3.40 = moderately strong; 1.81–2.60 = slightly strong; 1.00–1.80 = not strong.

Job satisfaction: 4.21–5.00 = very satisfied; 3.41–4.20 = satisfied; 2.61–3.40 = neutral; 1.81–2.60 = dissatisfied; 1.00–1.80 = very dissatisfied.

Construct Validity of the Study Instruments

The exploratory factor analysis results for the three study instruments are presented in Table 3. Separate exploratory factor analyses indicated high sampling adequacy for all three instruments, with Kaiser–Meyer–Olkin values ranging from .940 to .962. Bartlett’s tests of sphericity were statistically significant for all instruments ($p < .001$). Parallel analysis retained four factors for the Health Information Technology Usability Evaluation Scale, four factors for the Career Adapt-Abilities Scale, and two factors for the Minnesota Satisfaction Questionnaire–Short Form. The retained factors explained 76.7%, 83.8%, and 73.4% of the total variance, respectively.

The four-factor solutions for the Health Information Technology Usability Evaluation Scale and the Career Adapt-Abilities Scale showed Tucker–Lewis Index values of .917 and .936 and root mean square error of approximation values of .098 and .088, respectively. The two-factor solution for the Minnesota Satisfaction Questionnaire–Short Form showed weaker fit indices (Tucker–Lewis Index = .827; root mean square error of approximation = .148), indicating more limited support for its proposed dimensional structure.

Table 3. Summary of Exploratory Factor Analysis Results for the Study Instruments
(N = 250)

Instrument	KMO	Bartlett's $\chi^2(df)$	Factors retained	Cumulative variance explained	TLI	RMSEA (90% CI)
Health Information Technology Usability Evaluation Scale	.940	5,748 (190)	4	76.7%	.917	.098 (.088–.109)
Career Adapt-Abilities Scale	.962	8,699 (276)	4	83.8%	.936	.088 (.079–.096)
Minnesota Satisfaction Questionnaire–Short Form	.943	6,231 (190)	2	73.4%	.827	.148 (.139–.157)

Note. Minimum residual extraction with oblimin rotation was used, and the number of factors was determined through parallel analysis. All Bartlett's tests of sphericity were statistically significant at $p < .001$. Factor loadings of .30 or greater were considered salient. KMO = Kaiser–Meyer–Olkin measure; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; CI = confidence interval.

Correlations Among the Main Study Variables

The correlations among health information technology usability, Career Adapt-Abilities, and job satisfaction are presented in Table 4. Spearman's rank-order correlation analysis showed statistically significant positive associations among the three main study variables. Health information technology usability was positively associated with Career Adapt-Abilities ($\rho = .683$, $p < .001$) and job satisfaction ($\rho = .653$, $p < .001$). The strongest bivariate association was observed between Career Adapt-Abilities and job satisfaction ($\rho = .758$, $p < .001$). Higher perceived health information technology usability was therefore associated with stronger Career Adapt-Abilities and greater job satisfaction; however, these cross-sectional associations should not be interpreted as evidence of causality.

Table 4. Spearman's Rank-Order Correlations Among Health Information Technology Usability, Career Adapt-Abilities, and Job Satisfaction

Variables	M	SD	1	2	3
1. Health Information Technology Usability	3.89	0.49	-		
2. Career Adapt-Abilities	4.18	0.49	.683***	-	
3. Job Satisfaction	4.03	0.47	.653***	.758***	-

Note. Values below the diagonal are Spearman's rho coefficients. M = mean; SD = standard deviation. All tests were two-tailed. *** $p < .001$.

Factors Associated with Nurses' Job Satisfaction

The multiple linear regression results for factors associated with nurses' job satisfaction are presented in Table 5. Regression diagnostics supported the adequacy of the model assumptions. No problematic multicollinearity was identified ($VIF = 2.02$; tolerance = .496), and the Durbin–Watson statistic was 2.04. Inspection of the residual and Q–Q plots indicated acceptable linearity, homoscedasticity, and approximate residual normality. The maximum Cook's distance was .123, indicating no highly influential observation.

Table 5. Multiple Linear Regression of Factors Associated with Nurses' Job Satisfaction

Predictor	B	SE	β	95% CI LL	95% CI UL	t	p
Intercept	0.563	0.149	—	0.270	0.856	3.79	< .001
Health Information Technology Usability	0.253	0.047	.269	0.160	0.347	5.35	< .001
Career Adapt-Abilities	0.593	0.048	.618	0.498	0.688	12.31	< .001
Model summary	R = .831	R ² = .691	Adjusted R ² = .688				

Note. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; CI = confidence interval; LL = lower limit; UL = upper limit; R = multiple correlation coefficient; R² = coefficient of determination.

The regression model accounted for 69.1% of the variance in job satisfaction ($R = .831$, $R^2 = .691$, adjusted $R^2 = .688$). Health information technology usability was positively associated with job satisfaction ($B = .253$, $SE = .047$, $\beta = .269$, 95% CI [.160, .347], $p < .001$), as was Career Adapt-Abilities ($B = .593$, $SE = .048$, $\beta = .618$, 95% CI [.498, .688], $p < .001$). Career Adapt-Abilities showed the larger independent association with job satisfaction.

Cross-Sectional Indirect-Effect Analysis

The direct, indirect, total, and component-path associations are presented in Table 6. The total association between health information technology usability and job satisfaction was statistically significant (estimate = 0.667, $\beta = .708$, $p < .001$). A statistically significant indirect association through Career Adapt-Abilities was also observed (estimate = 0.414, 95% bootstrap CI [0.327, 0.507], $\beta = .439$, $p < .001$).

The direct association remained statistically significant after accounting for Career Adapt-Abilities (estimate = 0.253, $\beta = .269$, $p < .001$). Health information technology usability was positively associated with Career Adapt-Abilities ($\beta = .710$, $p < .001$), and Career Adapt-Abilities were positively associated with job satisfaction after accounting for health information technology usability ($\beta = .618$, $p < .001$). These findings indicate a statistical indirect association through Career Adapt-Abilities; however, the cross-sectional design does not establish temporal ordering or causal mediation. Because the

observed-variable indirect-effect model was just-identified, global model-fit indices were not informative and were therefore not reported. Figure 1 summarizes the standardized direct and indirect associations among health information technology usability, Career Adapt-Abilities, and nurses' job satisfaction.

Table 6. Cross-Sectional Indirect-Effect Analysis of Career Adapt-Abilities in the Association Between Health Information Technology Usability and Nurses' Job Satisfaction

Effect	Path	Estimate	Bootstrap SE	95% Bootstrap CI LL	95% Bootstrap CI UL	β	z	p
Indirect association	HIT Usability → Career Adapt-Abilities → Job Satisfaction	0.414	0.046	0.327	0.507	.439	8.98	< .001
Direct association	HIT Usability → Job Satisfaction	0.253	0.052	0.152	0.359	.269	4.91	< .001
Total association	HIT Usability → Job Satisfaction	0.667	0.045	0.581	0.759	.708	14.95	< .001
Component path	HIT Usability → Career Adapt-Abilities	0.698	0.044	0.612	0.782	.710	15.85	< .001
Component path	Career Adapt-Abilities → Job Satisfaction	0.593	0.060	0.473	0.714	.618	9.86	< .001

Note. HIT = health information technology; Estimate = unstandardized coefficient; Bootstrap SE = bootstrap standard error; CI = confidence interval; LL = lower limit; UL = upper limit; β = completely standardized coefficient. Bootstrap standard errors and 95% confidence intervals were estimated using 5,000 bootstrap resamples. The z statistics were calculated using the bootstrap standard errors. Because the data were cross-sectional, the indirect association should not be interpreted as evidence of temporal ordering or causal mediation.

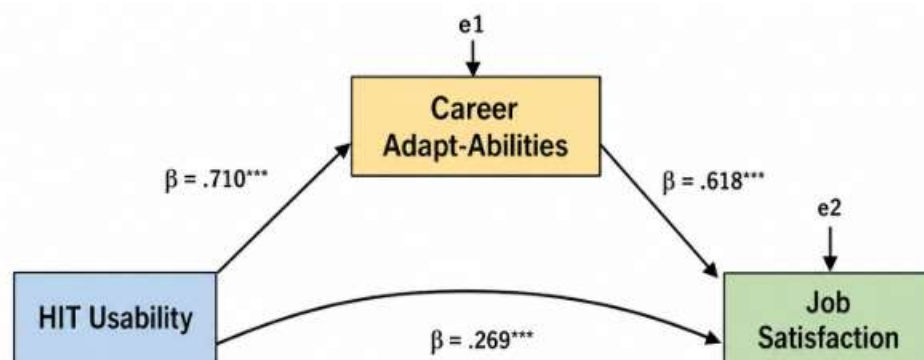


Figure 1. Cross-Sectional Indirect-Effect Path Model Linking Health Information Technology Usability, Career Adapt-Abilities, and Nurses' Job Satisfaction. Note. HIT = health information technology; β = standardized coefficient; ***p < .001.

DISCUSSION

This study examined the associations among health information technology usability, Career Adapt-Abilities, and nurses' job satisfaction. Both health information technology usability and Career Adapt-Abilities were positively associated with job satisfaction, with Career Adapt-Abilities showing the stronger standardized association. The cross-sectional indirect-effect analysis further indicated that Career Adapt-Abilities statistically accounted for part of the association between health information technology usability and job satisfaction.

Nurses reported generally favorable health information technology usability, with impact and perceived usefulness receiving the highest ratings, whereas perceived ease of use received the lowest. This pattern is consistent with previous studies indicating that usable digital systems may support documentation, communication, workflow coordination, and positive work experiences among nurses (Alrasheeday et al., 2023; Alshammari & Alenezi, 2023; Kutney-Lee et al., 2021). However, the comparatively lower ease-of-use rating suggests continuing challenges related to system learning, navigation, technical support, and integration into clinical workflows, as reported in earlier research (Alobayli et al., 2023; Campione & Liu, 2024; Wirkkala et al., 2024).

Career Adapt-Abilities were rated highly and showed a stronger standardized association with nurses' job satisfaction than health information technology usability. This finding suggests that concern, control, curiosity, and confidence are important personal resources for nurses working in changing clinical and digital environments. It is consistent with Career Construction Theory and previous studies linking Career Adapt-Abilities with job satisfaction, career development, work engagement, and lower turnover-related outcomes among nurses and healthcare workers (Akturan et al., 2025; Savickas, 2005; Sun et al., 2023; Walden et al., 2022).

The regression model explained 69.1% of the variance in job satisfaction, indicating strong combined associations of health information technology usability and Career Adapt-Abilities with this outcome. However, this relatively high value should be interpreted cautiously because all variables were measured using self-reported questionnaires at the same time and among nurses from two hospitals within the same organization. Shared measurement methods and the relatively homogeneous study context may therefore have contributed to the explained variance.

The indirect-effect analysis showed a significant indirect association through Career Adapt-Abilities, while the direct association between health information technology usability and job satisfaction remained significant. From the Job Demands–Resources perspective, usable technology may function as a job resource, whereas Career Adapt-Abilities may serve as a personal resource that supports nurses in managing clinical and digital demands (Bakker & Demerouti, 2007; Wirkkala et al., 2024). Nevertheless, the cross-sectional design does not establish temporal ordering or causal mediation.

These findings suggest that healthcare organizations should address both technological and workforce-related factors. Improving system usability, technical support, and workflow-based training may enhance nurses' experiences with health information technology, while mentoring, career development, and professional learning opportunities may strengthen Career Adapt-Abilities (Sun et al., 2023; Wirkkala et al., 2024). These implications should be considered practice-oriented recommendations rather than confirmed causal interventions.

This study contributes evidence from Vietnamese nurses by integrating technological usability and personal adaptive resources within one analytical model. However, the cross-sectional and self-reported design, the inclusion of only two hospitals within the same organization, and possible common-method bias limit causal interpretation and generalizability. The comparatively weaker factor fit for job satisfaction and reliability coefficients above .95 warrant further examination of construct validity, item performance, and possible redundancy. Future multicenter and longitudinal studies using diverse settings, multiple data sources, and confirmatory factor analysis are recommended.

CONCLUSIONS

This study found that health information technology usability and Career Adapt-Abilities were positively associated with nurses' job satisfaction in selected hospitals in Vietnam. Career Adapt-Abilities showed the stronger standardized association and statistically accounted for part of the association between health information technology usability and job satisfaction, while the direct association remained significant. These findings highlight the relevance of both usable technology and personal adaptive resources to nurses' job satisfaction in digitally transforming healthcare environments. However, the cross-sectional design does not establish temporal or causal relationships.

RECOMMENDATIONS

Hospital administrators, nurse managers, and nursing informatics leaders should consider improving health information technology usability by prioritizing ease of use, user control, technical support, and alignment with nursing workflows. Regular usability assessments and nurses' feedback should be incorporated into system implementation and evaluation, particularly because perceived ease of use received the lowest rating.

Nursing workforce development programs may also include digital competency training, mentoring, peer learning, and supportive supervision to strengthen nurses' concern, control, curiosity, and confidence. These technological and professional development strategies should be evaluated before being considered effective interventions for improving job satisfaction. Future multicenter and longitudinal studies should examine temporal relationships, replicate the indirect-effect model in more

diverse settings, and further assess the construct validity and item performance of the instruments.

IMPLICATIONS

The findings highlight the need to address both technological and workforce-related factors in hospitals undergoing digital transformation. Hospital administrators and nursing leaders should consider improving system ease of use, user control, technical support, workflow integration, and nurses' involvement in health information technology evaluation. Digital competency training, mentoring, peer learning, and supportive supervision may also help strengthen nurses' Career Adapt-Abilities.

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DECLARATIONS

Conflict of Interest

The researcher declares no conflict of interest in this study.

Informed Consent

Written informed consent was obtained from all participants before data collection.

Ethics Approval

The study was approved by the Institutional Ethics Review Committee of Trinity University of Asia under Protocol Code TUA-IERC-015-R02.

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