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Research article

The effects of healthcare workers' technostress and change fatigue levels on their turnover intentions

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Abstract

This study aims to examine the effects of technostress and change fatigue levels on turnover intention among healthcare workers. The widespread use of digital technologies in healthcare has increased stress factors such as information overload, uncertainty, and constant connectivity. In this context, the predictive effects of the subdimensions of technostress (techno-overload, techno-invasion, and techno-uncertainty) and change fatigue on turnover intention were analysed. The research was conducted using a cross-sectional survey design with 162 healthcare workers employed at Akyazi State Hospital. Data were collected through a questionnaire, and statistical analyses, including correlation, multiple regression, and simple regression, were performed. According to the findings, techno-overload has a positive effect, while techno-invasion and techno-uncertainty have negative and statistically significant effects on turnover intention. The explanatory power of the model was 18.7%. Furthermore, a positive and significant relationship was found between change fatigue and turnover intention, with an explanatory power of 13.4%. In conclusion, technological stressors and ongoing organizational changes influence the turnover intentions of healthcare workers. Therefore, it is recommended that training and support programs be implemented to facilitate employees' adaptation to digital systems and to manage change processes more effectively.

Keywords: *Burnout; change fatigue; healthcare workers; technostress; turnover intention*

1. Introduction

The integration of digital technologies into clinical work has reshaped both practice and personal domains for healthcare staff, with clear implications for mental and physical wellbeing (Kumar, 2024). In this context, technostress is discussed through specific creators such as techno-overload, techno-invasion, techno-complexity, techno-uncertainty, and techno-insecurity, together with appraisals that can yield distress or eustress and that influence core work outcomes (Kopuz et al., 2025). Hospital-based evidence points to medium to high levels of technostress among practitioners and identifies techno-uncertainty and techno-overload as prominent drivers, underscoring the need for organizational responses in digitalized care settings (Keshavarz et al., 2025). Prospective findings further indicate links between technology-related demands and alterations in stress biology, which highlights occupational health relevance beyond self-report outcomes (Kaltenegger et al., 2024).

Rapid and continuous technology adoption in healthcare can elevate perceived demands, reduce job satisfaction, and strengthen withdrawal cognitions, often through burnout as a central mechanism (Dhaouadi et al., 2024; Kopuz et al., 2025). In parallel, recurring organizational initiatives contribute to

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change fatigue among nurses, characterized by sustained exposure to change, exhaustion, diminished agency, and passive acceptance, with documented individual and organizational consequences (Cao et al., 2024; Lv et al., 2025). These pressures coincide with continuing concerns about turnover intention, including among early-career nurses, which reinforces the importance of technology and change-related antecedents for retention strategies (Lay and Masingboon, 2025). At the same time, strengthening informatics competencies and providing targeted support can bolster performance and may buffer technology-related strain in clinical workflows, suggesting a dual focus on capability building and load reduction (Kumar, 2024; Baek et al., 2025). For historical scope, broader syntheses have described technostress effects on employee wellbeing and quality of life, which provides continuity with recent evidence while emphasizing the need for contemporary interventions (La Torre et al., 2019).

1.1. Technostress

Contemporary evidence positions technostress as a salient job demand in healthcare, with psychological, physiological, and behavioural consequences that extend to performance and retention (Kumar, 2024; Wang and Yao, 2025). Recent multi-setting studies show that technology demands and low ICT self-efficacy heighten specific techno-stressors, while work–home conflict fuels techno-overload, techno-complexity, and techno-invasion; among these, techno-invasion is most consistently linked to poorer well-being (Wang and Yao, 2025). In hospitals, technostress relates to higher turnover intention directly and through strain pathways, aligning with longitudinal and structural models that connect technostress to burnout and quitting cognitions (Bao et al., 2024; Dhaouadi and Chouikha, 2024; Siddiqi and Rahman, 2025). Physiological correlates have also been observed, suggesting that sustained technostress can manifest in stress biomarkers alongside fatigue and exhaustion (Kaltenegger et al., 2024).

While the dark-side effects dominate, a dualistic picture has emerged. Techno-eustress can coexist with techno-distress, and in nursing samples positive appraisals of technology relate to better job attitudes when support and design factors are present (Kopuz et al., 2025; Keshavarz et al., 2025). Informatics competency and knowledge sharing appear protective, linking lower technostress to stronger work performance (Baek et al., 2025). Conversely, high change velocity in clinical settings compounds technostress with change fatigue, elevating exhaustion and intention to leave, which underscores the need to pair digital rollouts with change-management supports (Lv et al., 2025; Yu et al., 2025). Given that disengagement and low resilience amplify turnover risk, organizations that monitor techno-stressors and invest in engagement, resilience, and supervisor support are better positioned to blunt technostress effects on retention (Poku et al., 2025; Siddiqi and Rahman, 2025). For historical continuity, prior work also linked technology-induced strain to job outcomes in knowledge workers, foreshadowing today's healthcare findings (Brooks and Califf, 2017).

1.2. Technostress and healthcare services

Healthcare digitalization has expanded clinicians' technology touchpoints across documentation, decision support, coordination, and communication, which elevates techno-stressors in daily practice (Keshavarz et al., 2025). In hospital settings, system complexity and frequent updates disrupt workflow, increase cognitive load, and erode job satisfaction, which in turn raises turnover intention (Bao et al., 2024). Emerging evidence links technostress with burnout and physiological strain, underscoring consequences that extend beyond perceived inconvenience (Kaltenegger et al., 2024; Zheng et al., 2024).

Capability gaps and thin support structures amplify these effects. Lower informatics competency and limited hands-on assistance intensify overload, invasion, and uncertainty, whereas targeted training and responsive help desks buffer strain and sustain performance (Baek et al., 2025; Keshavarz et al., 2025). Concurrent organizational change compounds the burden through change fatigue and disengagement, further increasing intentions to quit and highlighting the need to align digital rollouts with change-management resources for nursing teams (Lv et al., 2025; Yu et al., 2025). Evidence from adjacent settings converges on the same mechanism. Techno-invasion and work–home interference depress well-being when self-efficacy and support are weak (Wang and Yao, 2025), and technostress can strengthen the link between low perceived support and turnover intention among nurses (Siddiqi and Rahman, 2025).

Two earlier studies provide useful context. Technostress inhibitors and supportive designs are associated with better work performance, while creators such as complexity and uncertainty hinder it (Li and Wang, 2021). Among teleworkers, higher technostress relates to lower job satisfaction, a pathway consistent with healthcare environments adopting always-on digital tools (Suh and Lee, 2017).

1.3. Change fatigue and its relationship with technostress

Change fatigue, characterized by cumulative stress, exhaustion, and diminished motivation during continuous organizational change, has been repeatedly documented in nursing settings and is linked to lower job satisfaction and stronger intentions to quit (Cao et al., 2024; Duan et al., 2025; Lv et al., 2025). In hospitals, simultaneous initiatives such as workflow redesign, performance reforms, and unit relocations intensify this burden, while supportive climates and distributed leadership appear protective (Fernemark et al., 2024; Yu et al., 2025). Evidence from recent studies shows that higher change fatigue co-occurs with burnout, weaker commitment, and elevated turnover intention among nurses, underscoring the need for targeted prevention and early support (Sarigul and Ugurluoglu, 2023; Lv et al., 2025).

Accelerated digitalization is a prominent driver of change fatigue because new health information technologies often raise cognitive load and always-on connectivity, which are classic technostress pathways (Bao et al., 2024; Baek et al., 2025; Keshavarz et al., 2025). Physiological correlates, including biomarkers of chronic stress, further indicate that technostress is not merely perceptual, reinforcing its potential to erode well-being during technology rollouts (Kaltenegger et al., 2024). When technology change is frequent, employees report more overload, invasion, and uncertainty, job satisfaction declines, and intentions to leave increase, a pattern observed beyond healthcare and consistent with earlier telework evidence (Suh and Lee, 2017; Shin and Shin, 2024). Recent nursing research also shows that technostress can strengthen the negative effects of low perceived support on turnover intention, highlighting the

value of pairing digital implementations with supervisor support, responsive help desks, and structured change-management resources (Duan et al., 2025; Siddiqi and Rahman, 2025).

1.4. Technostress during the COVID-19 period

The COVID-19 pandemic compelled the extensive use of technology in healthcare services, thereby intensifying technostress. Remote work arrangements and a surge in digital tools heightened employees' reliance on technology, creating extra pressure (Genc, 2020). Lopes et al. (2024) found that the excessive utilization of technology and related uncertainties triggered anxiety and mental health concerns among healthcare professionals. Throughout the pandemic, the constant availability of digital communication platforms made maintaining work-life balance challenging; this phenomenon, termed "techno-invasion," contributed to elevated levels of anxiety and depression (Galvin et al., 2022).

1.5. The role of technostress in healthcare

In modern healthcare, technostress has become a prominent stressor as digital tools permeate patient care, communication, and administration. Recent studies link higher technostress with poorer well-being, lower performance, and stronger turnover intentions, especially when technology demands exceed user resources or support (Bao et al., 2024; Wang and Yao, 2025). Among nurses, capability building matters, since informatics competency and knowledge sharing can buffer technostress effects on work performance (Baek et al., 2025). Physiological evidence also indicates a stress burden associated with tech-related strain, reinforcing its clinical relevance (Kaltenegger et al., 2024). Periods of intensified remote or digitally mediated work further amplify anxiety and reduce satisfaction, underscoring technostress as a meaningful risk for burnout in care settings (Andrulli and Gerards, 2023). Supportive supervision can weaken the technostress-turnover link, providing a practical lever for retention (Siddiqi and Rahman, 2025).

1.6. The relationship between turnover intentions, technostress, and change fatigue

Technostress and change fatigue jointly drive turnover intentions by eroding job satisfaction and commitment. Multi-wave and cross-sectional findings show technostress predicts intentions to leave, while resources and support mitigate this pathway (Bao et al., 2024; Keshavarz et al., 2025). Concurrently, frequent or intensive organizational changes elevate fatigue, which co-occurs with burnout and higher turnover intention among nurses (Duan et al., 2025; Lv et al., 2025; Yu et al., 2025). Burnout mechanisms are central, with emotional exhaustion and reduced accomplishment tightly linked to turnover intention (Zheng et al., 2024). Broader psychosocial risks, such as elevated occupational stress and related strain, compound these effects and signal the need to integrate change management, stress reduction, and retention strategies (Dyrbye et al., 2019; Poku et al., 2025; Polat and Yesil, 2025).

1.7. The combined effects of technostress and change fatigue on healthcare workers

Technostress and change fatigue jointly intensify nurses' intentions to leave by increasing overload, eroding satisfaction, and elevating strain (Bao et al., 2024; Lv et al., 2025; Yu et al., 2025). Evidence also shows that burnout is a central pathway linking these pressures to quitting cognitions, with emotional exhaustion and lowered accomplishment closely tied to turnover intention (Poku et al., 2022; Zheng et al., 2024;). Technostress further undermines psychological well-being, which compounds attrition risk in care settings (Asad et al., 2023). Supportive supervision can buffer some of these effects, yet high technostress still strengthens the tendency to consider leaving (Siddiqi and Rahman, 2025), while change-fatigue climates independently predict turnover intention among nurses (Sarigul and Ugurluoglu, 2023).

1.8. Strategies to mitigate technostress and change fatigue

Hospitals can reduce turnover intentions by pairing clear change communication with supportive climates, leadership that builds readiness, and resources that ease continuous change (Lv et al., 2025; Yu et al., 2025). Strengthening digital skills and informatics competency improves performance and lowers strain, while supervisor support buffers stressors when technostress is present (Baek et al., 2025; Siddiqi and Rahman, 2025). Routine monitoring of techno-stressors together with well-being indicators enables early intervention (Wang and Yao, 2025). Recent reviews highlight that the combined effect of technostress and change fatigue on quitting cognitions in healthcare is still underexplored (Cao et al., 2024; Duan et al., 2025). Turnover intention remains a reliable precursor of actual exit and carries meaningful cost and safety consequences in nursing (Ki and Choi-Kwon, 2022; Muir et al., 2022; Stemmer et al., 2022; Mafula et al., 2025). Guided by this gap, the present study examines how technostress and change fatigue jointly shape turnover intentions among healthcare workers, using up-to-date evidence (Bao et al., 2024; Lay and Masingboon, 2025).

2. Materials and methods

2.1. Type of the study

This research adopts a cross-sectional and quantitative design aimed at investigating the effects of technostress and change fatigue on turnover intentions among healthcare workers employed at Akyazi State Hospital. Using convenience sampling, data were collected via a survey instrument.

2.2. Research ethics

Prior to conducting this study, approval was obtained from the Ethics Committee of Sakarya Applied Sciences University on October 11, 2024 (Document No. E-145523) and from the Sakarya Provincial Health Directorate on November 22, 2024 (Document No. E-96454696-604.01-260401554). The research was carried out in accordance with the approvals granted by these institutions, ensuring participant confidentiality and voluntariness throughout the process.

2.3. Population and sample

The study population consists of 242 healthcare personnel employed at Akyazi State Hospital. This group includes 19 specialist physicians, 8 general practitioners, 3 dentists, 1

nutritionist, 2 physical therapy specialists, 1 psychologist, 1 pharmacist, 114 healthcare services staff, and 93 auxiliary personnel. The intent was to include the entire population in the study, administering face-to-face questionnaires to the healthcare workers. Participants were selected voluntarily, and all responses were collected anonymously. Demographic characteristics, technostress levels, change fatigue, and turnover intentions were evaluated through appropriate scales.

2.4. Data collection instruments and related methodologies

This quantitative research aimed to examine the impact of technostress and change fatigue on turnover intentions among healthcare personnel working at Akyazi State Hospital. A questionnaire comprising a Descriptive Information Form, the Technostress Scale, the Change Fatigue Scale, and the Turnover Intention Scale was used for data collection.

2.4.1. Descriptive information form

This form gathered socio-demographic details about participants (e.g., gender, age, marital status, job title, length of service, education level) along with questions related to internet use.

2.4.2. Technostress scale (TS)

Technostress was measured using the 23-item, five-factor "Technostress Scale," originally developed by Tarafdar et al. (2007) and adapted into Turkish by Ilgaz et al. (2016). The scale employs a five-point Likert-type rating (1 = Strongly disagree, 5 = Strongly agree). Its construct validity and reliability have been confirmed in both the original and the adapted versions (Tarafdar et al., 2007; Ilgaz et al., 2016). In the original study, Cronbach's alpha coefficients for the sub-dimensions ranged between 0.74 and 0.89 (Tarafdar et al., 2007), while in the Turkish adaptation, they ranged between 0.78 and 0.87 (Ilgaz et al., 2016), indicating strong internal consistency. Scores were interpreted on a scale ranging from 1.00 to 5.00, calculated using the following formula:

$$\text{Range Interval} = \frac{Max.\ Value\ -\ Min.\ Value}{5}$$

This reliable and valid instrument evaluates distinct dimensions of technostress, with items categorized as follows:

Techno-Overload: Items 1, 2, 3, 4, 5
Techno-Invasion: Items 6, 7, 8, 9
Techno-Complexity: Items 10, 11, 12, 13, 14
Techno-Insecurity: Items 15, 16, 17, 18, 19
Techno-Uncertainty: Items 20, 21, 22, 23

2.4.3. Change fatigue scale (CFS)

The Change Fatigue Scale, developed by Bernerth et al. (2011) and adapted into Turkish by Ekingen and Yildiz (2021), was used to assess participants' levels of change fatigue. The scale is a six-item and unidimensional; in this study, responses were recorded on a five-point Likert scale (1 = Strongly disagree, 5 = Strongly agree), with higher scores indicating greater fatigue related to organizational change. In the Turkish healthcare validation, the instrument demonstrated excellent internal consistency (Cronbach's $\alpha = .901$) and acceptable split-half reliability (Spearman-Brown = .84), supporting its reliability for use with healthcare personnel (Ekingen and Yildiz, 2021). Sample items include "There are too many change initiatives in my organization" and "I am tired of all the changes here."

2.4.4. Turnover intention scale (TIS)

Turnover intention was measured using the single-factor, five-item Turnover Intention Scale originally developed by Wayne, Shore, and Liden (1997). In this study, responses were recorded on a five-point Likert scale (1 = Strongly disagree, 5 = Strongly agree), and higher scores indicate a stronger intention to leave. Evidence from a Turkish sample shows that the same five-item, single-factor structure explains 73.43% of the variance and exhibits excellent internal consistency (Cronbach's $\alpha = .906$) (Demirci and Secilmis, 2020). In that study, the Turkish wording was obtained via a translation-back-translation procedure.

2.5. Data analysis

Data were analyzed in IBM SPSS 25 and AMOS 22. For participants and all study variables, descriptive statistics were computed (frequency, percentage, mean, standard deviation). Internal consistency was examined with Cronbach's alpha for each scale and, where applicable, its subdimensions. The measurement model was assessed by confirmatory factor analysis; model fit was evaluated using χ^2/df, CFI, TLI, RMSEA, and SRMR indices, with commonly accepted thresholds applied for adequate or good fit such as CFI and TLI ≥ 0.90 to 0.95, RMSEA ≤ 0.06 to 0.08, and SRMR ≤ 0.08 (Hu and Bentler, 1999; Kline, 2016).

Prior to inferential analyses, distributional assumptions were checked. Univariate normality was assessed via skewness and kurtosis and supplemented by the Kolmogorov-Smirnov test; absolute skewness < 2 and kurtosis < 7 were taken as indicative of approximate normality (West et al., 1995; George and Mallery, 2010).

Group differences were tested with independent-samples t-tests and one-way ANOVA. Pearson product-moment correlations were used to examine associations among variables, and linear regression models were employed to estimate the effects of technostress and change fatigue on turnover intention. All tests were two-tailed with $\alpha = .05$. Descriptive and assumption-check statistics (e.g., skewness, kurtosis, normality tests) are reported in the Findings section, not here.

2.6. Validity and reliability analyses

2.6.1. Confirmatory factor analysis (CFA) for the technostress scale

Using maximum likelihood estimation, a CFA was conducted on the pre-specified five-factor, 23-item technostress measurement model.

The model demonstrated acceptable-to-good fit across multiple indices (see Table 1), supporting the five-dimensional structure ($\chi^2/df = 2.157$, $p < .001$; RMSEA = 0.041; NFI = 0.917; CFI = 0.941; GFI = 0.922; AGFI = 0.897). Recommended cutoffs and corresponding interpretations are presented alongside the observed values in Table 1.

Table 1
CFA fit indices for the Technostress Scale and recommended cutoffs.

Fit index	This study	Recommended cutoffs*	Interpretation
χ^2/df	2.157	≤ 3 (good); ≤ 5 (acceptable)	Good
RMSEA	0.041	≤ 0.05 (good); ≤ 0.08 (acceptable)	Good
NFI	0.917	≥ 0.90 (acceptable); ≥ 0.95 (excellent)	Acceptable
CFI	0.941	≥ 0.90 (acceptable); ≥ 0.95 (excellent)	Acceptable-Good
GFI	0.922	≥ 0.90 (acceptable)	Acceptable
AGFI	0.897	≥ 0.85 (acceptable); ≥ 0.90 (good)	Acceptable (near good)

*(Bicer and Sarigul, 2025)

2.6.2. Confirmatory factor analysis for the change fatigue scale

Since the Turkish validity and reliability analyses of the scale had previously been established, exploratory factor analysis (EFA) was not performed. Using maximum likelihood estimation, a CFA was conducted on the pre-specified single-factor, six-item model. The model demonstrated acceptable fit across multiple indices (Table 2): χ^2/df = 2.328, p < .001; RMSEA = 0.049; NFI = 0.936; CFI = 0.921; GFI = 0.865; AGFI = 0.889.

Table 2
CFA fit indices for the Change Fatigue Scale and recommended cutoffs.

Fit index	This study	Recommended cutoffs*	Interpretation
χ^2/df	2.328	≤ 3 (good); ≤ 5 (acceptable)	Acceptable
RMSEA	0.049	≤ 0.05 (good); ≤ 0.08 (acceptable)	Good
NFI	0.936	≥ 0.90 (acceptable); ≥ 0.95 (excellent)	Acceptable
CFI	0.921	≥ 0.90 (acceptable); ≥ 0.95 (excellent)	Acceptable
GFI	0.865	≥ 0.85 (acceptable); ≥ 0.90 (good)	Acceptable (near good)
AGFI	0.889	≥ 0.85 (acceptable); ≥ 0.90 (good)	Acceptable (near good)

*(Bicer and Sarigul, 2025)

2.6.3. Confirmatory factor analysis for the turnover intention scale

Since the Turkish validity and reliability analyses of the scale had previously been established, exploratory factor analysis (EFA) was not performed. Using maximum likelihood estimation, a CFA was conducted on the pre-specified single-factor, five-item Turnover Intention Scale. The model demonstrated acceptable-to-good fit across multiple indices (Table 3): χ^2/df = 2.028, p < .001; RMSEA = 0.032; NFI = 0.948; CFI = 0.907; GFI = 0.882; AGFI = 0.895. Accordingly, the one-factor structure of the TIS is supported in this sample.

2.7. Reliability analysis

Table 4 presents the reliability analysis results for the scales used in this study. Internal consistency was evaluated using Cronbach's alpha. In line with established guidelines in the social sciences, coefficients ≥ .80 indicate high reliability, whereas values between .60 and .79 are considered acceptable, particularly in early-stage or exploratory research (Nunnally and Bernstein, 1994; Hair et al., 2019). As shown in Table 4, the scales used in this study exhibit alpha coefficients within acceptable-to-high ranges, supporting their suitability for subsequent analyses.

Table 3
CFA fit indices for the Turnover Intention Scale and recommended cutoffs.

Fit index	This study	Recommended cutoffs*	Interpretation
χ^2/df	2.028	≤ 3 (good); ≤ 5 (acceptable)	Good
RMSEA	0.032	≤ 0.05 (good); ≤ 0.08 (acceptable)	Good
NFI	0.948	≥ 0.90 (acceptable); ≥ 0.95 (excellent)	Acceptable–good
CFI	0.907	≥ 0.90 (acceptable); ≥ 0.95 (excellent)	Acceptable
GFI	0.882	≥ 0.85 (acceptable); ≥ 0.90 (good)	Acceptable (near good)
AGFI	0.895	≥ 0.85 (acceptable); ≥ 0.90 (good)	Acceptable (near good)

*(Bicer and Sarigul, 2025)

Table 4
Reliability analysis results.

Scale / Subdimension	Cronbach's α	Reliability
Technostress Scale (overall)	0.841	High
— Techno-Overload	0.712	Acceptable
— Techno-Invasion	0.699	Acceptable
— Techno-Complexity	0.772	Acceptable
— Techno-Insecurity	0.647	Acceptable
— Techno-Uncertainty	0.895	High
Change Fatigue Scale	0.842	High
Turnover Intention Scale	0.856	High

2.8. Research hypotheses

In line with the aim of this study, which is to reveal the effects of technostress and change fatigue on turnover intention among healthcare workers, hypotheses were formulated at the construct level rather than by demographic subgroups.

H1: The dimensions of technostress significantly predict turnover intention among healthcare workers.

H1a: Techno-overload has a significant effect on turnover intention.

H1b: Techno-invasion has a significant effect on turnover intention.

H1c: Techno-complexity has a significant effect on turnover intention.

H1d: Techno-insecurity has a significant effect on turnover intention.

H1e: Techno-uncertainty has a significant effect on turnover intention.

H2: Change fatigue significantly predicts turnover intention among healthcare workers. (Optional, if you report a combined multiple-regression model)

H3: Considered jointly, technostress dimensions and change fatigue explain additional variance in turnover intention.

3. Results

Table 5 presents the socio-demographic characteristics of

the participants and certain variables related to their internet usage. Of the 162 individuals who participated in the study, 65.4% were female, 53.1% were single, and 9.9% were employed as specialist physicians. Additionally, 40.1% of the participants held a bachelor's degree. The proportion of participants who primarily accessed the internet via mobile phones, tablets, or PDAs was 35.2%. The most frequently used social media platform was Twitter (X), with a usage rate of 29.6%, while the most widely recognized online communication tool was Telegram, at 36.4%. Furthermore, 30.2% of the participants rated their knowledge level of the hospital's automation system as "somewhat." Moreover, 32.1% believed that their institution was open to change and innovation, and 40.7% indicated that advancements and developments in artificial intelligence would have partially beneficial effects. The average age of the participants was 43.15 ± 9.53 years, and their average tenure in their profession was 10.48 ± 5.69 years.

In Table 6, the mean values for all the scales and their subdimensions used in the study are presented. Participants' levels on the Technostress Scale were identified as moderate ($\bar{X}$ = 2.92 ± SD = 0.459). Examining the scale's subdimensions revealed mean scores for Techno-Overload ($\bar{X}$ = 2.74 ± SD = 0.675), Techno-Invasion ($\bar{X}$ = 2.95 ± SD = 0.744), Techno-Complexity ($\bar{X}$ = 2.73 ± SD = 0.682), Techno-Insecurity ($\bar{X}$ = 3.04 ± SD = 0.626), and Techno-Uncertainty ($\bar{X}$ = 3.18 ± SD = 0.815). Participants' scores on the Change Fatigue Scale were also determined to be moderate ($\bar{X}$ = 3.37 ± SD = 0.532). However, when examining the Turnover Intention Scale, participants' scores were found to be relatively low ($\bar{X}$ = 2.28 ± SD = 0.819).In Table 7, analyses were conducted using the Independent Samples T-Test and One-Way ANOVA to determine whether participants' technostress levels differed by demographic variables. According to the results, there were no statistically significant differences ($p > 0.05$) in technostress levels based on gender, marital status, primary internet access method, most frequently used social network, awareness of specific online communication tools, level of knowledge about the hospital's automation system, perceptions of the institution's openness to change and innovation, or views on advances in artificial intelligence.

Table 5
Socio-demographic characteristics of participants (n=162).

Variables	Categories	n	%
Gender	Male	56	34.6
	Female	106	65.4
Marital Status	Married	76	46.9
	Single	86	53.1
Profession	Dentist	9	5.6
	Dietitian	15	9.3
	Pharmacist	12	7.4
	Physiotherapist	12	7.4
	Security Officer	14	8.6
	Administrative Unit	1	0.6
	General Practitioner	15	9.3
	Psychologist	13	8.0
	Healthcare Personnel	12	7.4
	Cleaning Staff	7	4.3
	Medical Secretary	11	6.8
	Specialist Physician	16	9.9
	Data & Security & Support & Service Personnel	13	8.0
Education Level	High School	18	11.1
	Associate Degree	34	21.0
	Bachelor's Degree	65	40.1
	Master's Degree	35	21.6
	Doctorate	10	6.2
How do you primarily access the internet?	Home internet connection	53	32.7
	Mobile phone/Tablet/PDA	57	35.2
	Wi-Fi Hotspots	52	32.1
Which social network do you use most often?	Facebook	44	27.2
	Instagram	35	21.6
	Twitter (X)	48	29.6
	WhatsApp	35	21.6
Which online communication tool are you familiar with?	Telegram	59	36.4
	WhatsApp, Instagram	53	32.7
	Zoom, Teams	50	30.9
What is your knowledge level of the hospital's automation system?	Somewhat	49	30.2
	Moderate	43	26.5
	Good	38	23.5
	Very Good	32	19.8
Do you think your institution is open to change and innovation?	Yes	52	32.1
	No	55	34.0
	Partially	55	34.0
What is your opinion on the current advancements and developments in artificial intelligence?	When used correctly, it can make life easier	41	25.3
	Partially Beneficial	66	40.7
	Beneficial	55	34.0

Table 6
Mean scores of the scales.

Scales and Sub-Dimensions	Min.	Max.	Mean (M)	SD	Skewness	Kurtosis
Technostress Scale (overall)	1.48	4.43	2.92	0.459	**-0.458**	**-0.952**
— Techno-Overload	1.00	4.60	2.74	0.675	—	—
— Techno-Invasion	1.00	4.50	2.95	0.744	—	—
— Techno-Complexity	1.00	5.00	2.73	0.682	—	—
— Techno-Insecurity	2.00	5.00	3.04	0.626	—	—
— Techno-Uncertainty	1.00	5.00	3.18	0.815	—	—
Change Fatigue Scale	12.00	30.00	18.24	4.102	—	—
Turnover Intention Scale	1.00	5.00	2.28	0.819	—	—

Table 7
Results of T-tests and One-Way ANOVA for technostress scale levels.

Variables	Categories	M	SD	T/F	p
Gender	Male	2.90	0.409	-0.233	0.816
	Female	2.92	0.485		
Marital Status	Married	2.95	0.459	0.896	0.372
	Single	2.88	0.460		
How do you primarily access the internet?	Home internet connection	2.89	0.520	0.110	0.896
	Mobile phone/Tablet/PDA	2.94	0.413		
	Wi-Fi Hotspots	2.91	0.448		
Which social network do you use most often?	Facebook	2.86	0.383	0.498	0.684
	Instagram	2.99	0.583		
	Twitter (X)	2.91	0.454		
	WhatsApp	2.92	0.421		
Which online communication tool are you familiar with?	Telegram	2.88	0.373	3.001	0.053
	WhatsApp, Instagram	3.04	0.577		
	Zoom, Teams	2.82	0.387		
What is your knowledge level of the hospital's automation system?	Somewhat	2.92	0.488	0.478	0.698
	Moderate	2.90	0.442		
	Good	2.98	0.428		
	Very Good	2.85	0.483		
Do you think your institution is open to change and innovation?	Yes	2.96	0.470	1.359	0.260
	No	2.96	0.442		
	Partially	2.83	0.462		
What is your opinion on the current advancements and developments in artificial intelligence?	When used correctly, it can make life easier	2.87	0.481	1.158	0.317
	Partially Beneficial	2.98	0.449		
	Beneficial	2.87	0.454		

In Table 8, the Independent Samples T-Test and One-Way ANOVA were employed to examine whether participants' change fatigue levels differed according to demographic variables. The results indicated that there were no statistically significant differences (p > 0.05) in change fatigue levels with respect to gender, marital status, primary internet access method, most frequently used social network, awareness of online communication tools, level of knowledge about the hospital's automation system, perceptions regarding the organization's openness to change and innovation, or views on advances in artificial intelligence.

In Table 9, Independent Samples T-Tests and One-Way ANOVA were used to analyze whether participants' turnover intention levels varied according to demographic variables. The findings revealed that there were no statistically significant differences (p > 0.05) in turnover intention based on gender, marital status, primary internet access method, most frequently used social network, familiarity with particular online communication tools, perceptions of the organization's openness to change and innovation, or views on advances in artificial intelligence. However, there was a statistically significant difference (p < 0.05) related to the level of knowledge about the hospital's automation system.

According to the Tukey post-hoc tests, which were conducted to identify where differences lay in terms of knowledge about the hospital's automation system, participants with "limited" knowledge demonstrated a higher turnover intention than those with a "moderate" level of knowledge.

According to the results of the correlation analysis for all scales: A statistically significant relationship was found between technostress and change fatigue (r = .671, p < .05). No statistically significant relationship emerged between technostress and turnover intention (r = –.017, p > .05). However, there was a statistically significant relationship between change fatigue and turnover intention (r = .366, p < .05). Furthermore, statistically significant relationships were identified between the sub-dimensions of the Technostress Scale, and both change fatigue and turnover intention.

The following statistical relationships were observed:

Techno-Overload and change fatigue (r = .634, p < .05)

Table 8
Results of T-tests and One-Way ANOVA for change fatigue scale levels.

Variables	Categories	M	SD	T/F	p
Gender	Male	18.55	4.199	0.690	0.491
	Female	18.08	4.061		
Marital Status	Married	18.38	3.914	0.450	0.653
	Single	18.09	4.327		
How do you primarily access the internet?	Home internet connection	18.18	4.314	0.131	0.877
	Mobile phone/Tablet/PDA	18.08	4.010		
	Wi-Fi Hotspots	18.48	4.051		
Which social network do you use most often?	Facebook	18.18	3.913	0.426	0.734
	Instagram	18.88	4.587		
	Twitter (X)	18.16	4.033		
	WhatsApp	17.80	4.020		
Which online communication tool are you familiar with?	Telegram	18.10	3.831	0.640	0.529
	WhatsApp, Instagram	18.75	4.823		
	Zoom, Teams	17.88	3.577		
What is your knowledge level of the hospital's automation system?	Somewhat	18.48	4.933	0.490	0.690
	Moderate	17.76	3.483		
	Good	18.73	4.031		
	Very Good	17.93	3.618		
Do you think your institution is open to change and innovation?	Yes	18.30	4.332	0.047	0.954
	No	18.32	4.004		
	Partially	18.10	4.049		
What is your opinion on the current advancements and developments in artificial intelligence?	When used correctly, it can make life easier	17.41	3.968	1.304	0.274
	Partially Beneficial	18.72	4.295		
	Beneficial	18.29	3.937		

Techno-Invasion and change fatigue (r = .414, $p < .05$)
Techno-Complexity and change fatigue (r = .381, $p < .05$)
Techno-Insecurity and change fatigue (r = .508, $p < .05$)
Techno-Uncertainty and change fatigue (r = .253, $p < .05$)
Techno-Overload and turnover intention (r = .254, $p < .05$)
Techno-Invasion and turnover intention (r = –.179, $p < .05$)
Techno-Uncertainty and turnover intention (r = –.219, $p < .05$)

In order to investigate their effects on turnover intention, a multiple regression analysis was conducted. In this analysis, the arithmetic means of the techno-overload, techno-invasion, and techno-uncertainty dimensions were included as independent variables, and the arithmetic mean for turnover intention served as the dependent variable. A summary of the resulting multiple regression model is presented in Table 11.

The analysis indicated that techno-overload, techno-invasion, and techno-uncertainty all had statistically significant predictive effects on turnover intention ($p < .05$). The model was deemed significant overall (F = 10.082; p = .000), and the correlation coefficient for the model was calculated as .432. The model explained 18.7% of the variance in turnover intention (R^2 = .187). Regarding the significance of the regression coefficients based on t-test results: Techno-overload was found to exert a positive and significant effect on turnover intention (t = 4.818; p = .000). Techno-invasion (t = –3.674; p = .000) and Techno-uncertainty (t = –2.401; p = .000) were found to produce significant negative effects.

Table 9
Results of T-tests and One-Way ANOVA for turnover intention scale levels.

Variables	Categories	M	SD	T/F	p
Gender	Male	2.37	0.854	1.055	0.293
	Female	2.23	0.799		
Marital Status	Married	2.22	0.854	-1.024	0.308
	Single	2.35	0.776		
How do you primarily access the internet?	Home internet connection	2.36	0.914	1.381	0.254
	Mobile phone/Tablet/PDA	2.14	0.780		
	Wi-Fi Hotspots	2.36	0.749		
Which social network do you use most often?	Facebook	2.31	0.849	0.495	0.686
	Instagram	2.36	0.860		
	Twitter (X)	2.16	0.832		
	WhatsApp	2.32	0.732		
	Telegram	2.24	0.811		
Which online communication tool are you familiar with?	WhatsApp, Instagram	2.28	0.749	0.154	0.857
	Zoom, Teams	2.33	0.908		
What is your knowledge level of the hospital's automation system?	Somewhat	2.55	0.950	2.658	0.040
	Moderate	2.13	0.701		
	Good	2.20	0.678		
	Very Good	2.16	0.837		
Do you think your institution is open to change and innovation?	Yes	2.30	0.816	0.058	0.944
	No	2.25	0.869		
	Partially	2.30	0.783		
What is your opinion on the current advancements and developments in artificial intelligence?	When used correctly, it can make life easier	2.22	0.808	0.195	0.823
	Partially Beneficial	2.27	0.815		
	Beneficial	2.33	0.843		

Table 10
Bivariate correlations (Pearson's r) among key variables.

Predictor (Technostress dimension)	Outcome	r	p
Techno-Overload	Change Fatigue	0.634	< .05*
Techno-Invasion	Change Fatigue	0.414	< .05*
Techno-Complexity	Change Fatigue	0.381	< .05*
Techno-Insecurity	Change Fatigue	0.508	< .05*
Techno-Uncertainty	Change Fatigue	0.253	< .05*
Techno-Overload	Turnover Intention	0.254	< .05*
Techno-Invasion	Turnover Intention	–0.179	< .05*
Techno-Uncertainty	Turnover Intention	–0.219	< .05*

Accordingly, higher levels of techno-overload lead to increased turnover intentions, while rises in techno-invasion and techno-uncertainty reduce turnover intentions. Thus, among the sub-hypotheses evaluated under H4, H4a, H4b, and H4e were accepted, whereas no significant effect was observed for techno-complexity and techno-insecurity; thus, H4c and H4d were rejected. In addition, because correlation analysis had also revealed a significant relationship between change fatigue and turnover intention, a simple linear regression analysis was conducted to determine the direction and impact of this

Table 11
Regression model for the effects of technostress dimensions and change fatigue levels on the turnover intention scale.

Dependent Variable	Independent Variable	Unstandardized Coefficients		Standardized Coefficients	t	p	VIF
		B	S.H	β			
Turnover Intention Scale	(Constant)	2.543	.348		7.313	.000	
	Techno-Overload	.457	.095	.377	4.818	.000	1.186
	Techno-Invasion	-.322	.088	-.293	-3.674	.000	1.232
	Techno-Uncertainty	-.177	.074	-.176	-2.401	.018	1.042
	R=0.432	R^2=0.187		F= 12.082		p=0.00	
Dependent Variable	**Independent Variable**	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**p**	**VIF**
		B	S.H	β			
Turnover Intention Scale	(Constant)	.952	.275		3.466	.001	
	Change Fatigue Scale	.073	.015	.366	4.973	.000	1.000
	R=0.366	R^2=0.134		F= 24.726		p=0.00	

relationship. The arithmetic means of change fatigue served as the independent variable, and the arithmetic mean of turnover intention was the dependent variable. The summary of this simple regression model is likewise presented in Table 11. The analysis showed that the model was statistically significant (F = 24.726; p = .000), with a correlation coefficient of .366. The model explained 13.4% of the variance in turnover intention (R^2 = .134). The significance test (t-test) for the regression coefficient indicated that increases in change fatigue significantly heightened turnover intention. Considering these findings, H5 was accepted.

4. Discussion

According to the present study, techno-overload positively predicts turnover intention, whereas techno-invasion and techno-uncertainty show negative associations in the multivariate model; techno-complexity and techno-insecurity do not exhibit unique effects when other dimensions are controlled. The overload finding accords with recent evidence that technology-driven work intensification increases withdrawal cognitions and exit risk in healthcare and knowledge settings (Bao et al., 2024; Dhaouadi and Chouikha, 2024). In hospital environments where electronic documentation and interdepartmental coordination are heavy, unmanaged digital demands continue to undermine performance and retention (Baek et al., 2025; Kopuz et al., 2025).

The negative coefficients for invasion and uncertainty diverge from work that treats all techno-stressors as uniformly harmful, yet they are plausible under strong capability-building and support conditions. Studies show that ICT self-efficacy and school or organizational support dampen strain from complexity and insecurity, and that the effects of specific techno-stressors are context dependent rather than universally detrimental (Li and Wang, 2021; Wang and Yao, 2025). Qualitative and mixed-methods accounts with health professionals likewise report that participatory rollouts, hands-on training and rapid troubleshooting can neutralize distress and sometimes enable eustress alongside high digital demand (Baek et al., 2025; Keshavarz et al., 2025). This literature provides a coherent explanation for invasion and uncertainty not translating into higher turnover intention when updates are paired with proximal support. The present study also identifies a positive association between change fatigue and turnover intention. This aligns with concept analyses and empirical reports in nursing that describe change fatigue as a resource-depleting state linked to adverse work attitudes and intention to quit, especially under rapid and continuous change (Cao et al., 2024; Fernemark et al., 2024; Duan et al., 2025; Lv et al., 2025; Yu et al., 2025). Together with the overload finding, the pattern suggests a reinforcing process in which digital acceleration amplifies fatigue with change and fatigue strengthens withdrawal cognitions.

Proximal mechanisms observed elsewhere support these interpretations. Network analysis positions burnout and self-efficacy at central nodes connecting nurse experiences to turnover intentions, indicating actionable targets for intervention (Zheng et al., 2024). Work engagement and resilience are associated with lower turnover intention, and resilience can mediate the protective effect of engagement (Poku et al., 2025). Perceived supervisor support reduces nurses' intention to leave, while technostress can weaken or moderate these protective paths, underscoring the need to manage digital demands alongside social support practices (Siddiqi and Rahman, 2025). In practical terms, the converging evidence supports three priorities for similar hospitals: calibrate digital workload and documentation standards, couple system updates with timely training and rapid help-desk access, and strengthen unit-level engagement and resilience programs so that uncertainty is converted into capability rather than strain.

5. Conclusion and recommendations

This study shows that technology-related demands and change processes are differentially associated with healthcare workers' turnover intentions in a public hospital. In the multivariate model, techno-overload is positively related to turnover intention, techno-invasion and techno-uncertainty are negatively related, and techno-complexity and techno-insecurity show no unique effects when other dimensions are controlled. Change fatigue is positively related to turnover intention. Given the modest explained variance (technostress model R^2 = 0.187; change fatigue model R^2 = 0.134), interventions should target levers closest to these observed effects.

5.1. Implications for practice (administrators/managers).

Govern digital workload: streamline EHR documentation and approvals; remove redundant clicks; allocate protected documentation time; use scribes/automation where feasible.

Bound connectivity: codify after-hours response norms and escalation protocols; protect quiet hours to keep connectivity supportive rather than invasive.

Stabilize upgrades: stage rollouts; provide brief, role-based training near go-live; maintain super-user support and rapid troubleshooting so "uncertainty" becomes skill gain. Monitor and act: track unit-level indicators (documentation backlog, overtime tied to IT tasks, short technostress/change-fatigue pulses) and trigger targeted workflow or staffing fixes. Sequence change: avoid stacking digital initiatives; involve frontline staff to maintain ownership and reduce fatigue.

5.2. Policy implications (health authorities/system leaders).

Procure for usability and burden reduction: require vendor evidence of reduced documentation time/clicks for common tasks. Fund digital literacy and super-user capacity: provide protected training time and sustain local expert networks. Issue sector guidance on connectivity boundaries: minimum standards for after-hours expectations and escalation.

Mandate change-management plans: staged rollouts with user participation and post-implementation evaluations that include staff outcomes (technostress, change fatigue, turnover intention). Findings derive from a single public hospital, are cross-sectional, and rely on self-report, limiting generalizability and causal inference. Future multi-site, longitudinal studies should test mediators (e.g., job satisfaction, burnout) and moderators (e.g., organizational/technical support, digital literacy) to clarify when connectivity and frequent updates function as adaptive "challenge" demands versus hindrances.

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Informed consent: Ethical approval for this study was obtained from the Ethics Committee of Sakarya University of Applied Sciences (No. E-26428519-050.99-145523; 11 October 2024). Informed consent was obtained from all participants.

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