

EXPLORING THE KNOWLEDGE AND PERCEPTIONS OF HEALTHCARE WORKERS TOWARD DIGITAL HEALTH TECHNOLOGIES IN CHENNAI

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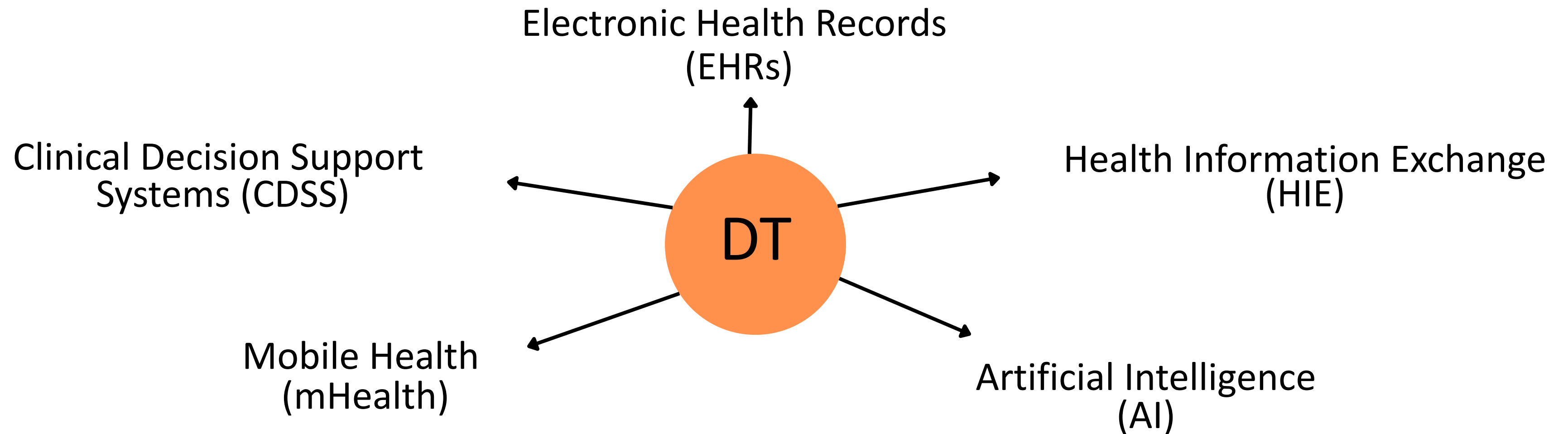
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Introduction

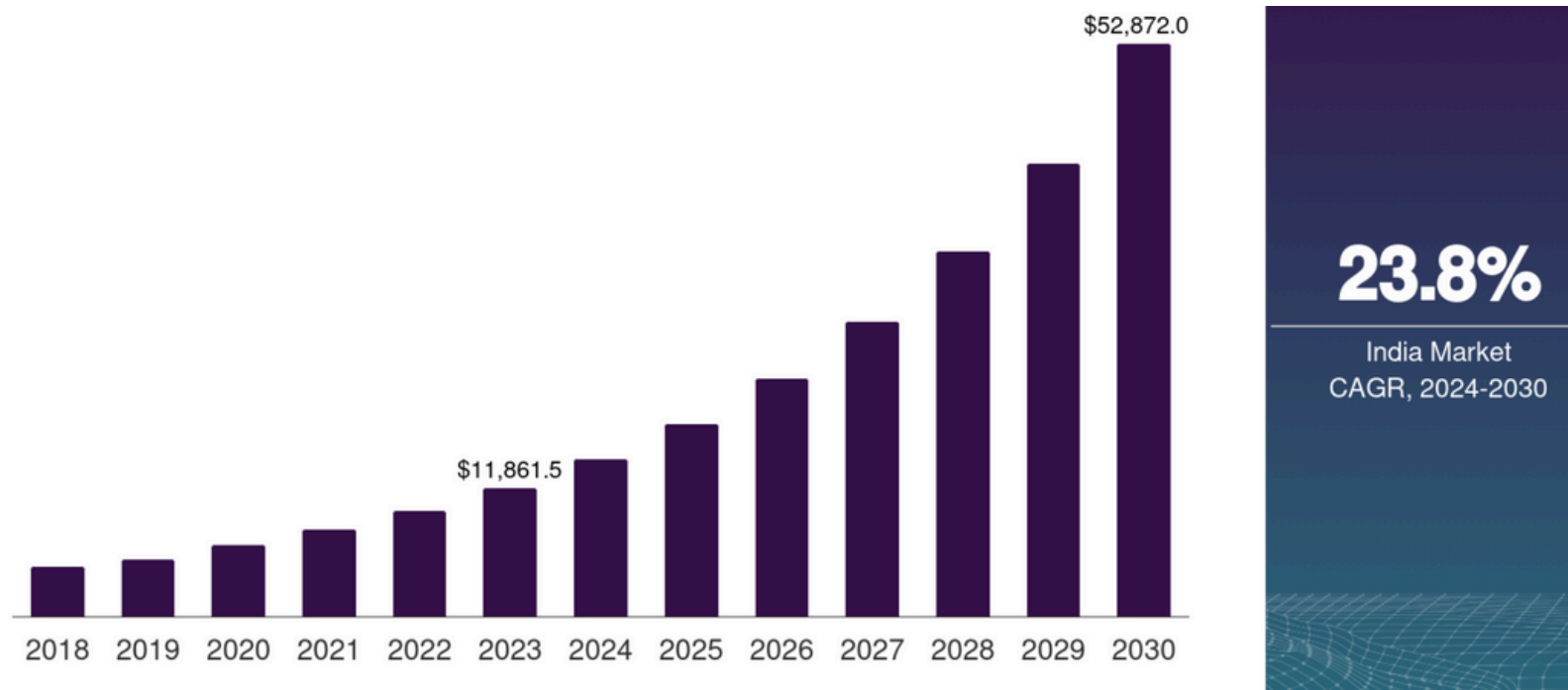
Digital Transformation (DT)

The process of integrating digital technologies into all aspects of healthcare delivery, operations, and administration to improve patient care, streamline processes, and enhance outcomes.

Applications in Healthcare



Setting the context



Accelerated Post-COVID Adoption: The COVID-19 pandemic acted as a catalyst for digital health adoption, particularly in telemedicine, electronic health records (EHRs), and remote patient monitoring.

- Ayushman Bharat Digital Mission (ABDM) and National Digital Health Mission (NDHM) aim to create a unified digital health ecosystem with individual health IDs, digital registries, and integrated data systems.
- eSanjeevani platform facilitated over 100 million teleconsultations across rural and urban India.
- Private Sector Push:
Hospitals and startups are adopting cloud-based EHRs, AI-powered diagnostics, and patient engagement platforms.

Introduction

Problem Statement

Despite major efforts to digitize healthcare, little is known about how ready or confident healthcare workers are to adopt these tool, putting digital programs at risk of poor adoption or failure.

Objectives

- To study healthcare workers' knowledge of digital health technologies
- To examine their perceptions towards digitalization
- To determine perceived barriers in digital health tool utilization

Review of Literature

Author(s), Year, Location	Sample Size & Sampling Technique	Salient Features
Mazandarani et al., 2022, Iran	240 healthcare workers; stratified random sampling	Measured telemedicine knowledge and attitude among primary health workers in underprivileged zones; observed increased awareness among doctors and midwives with previous training.
Joshi et al., 2021, India	150 primary care providers; convenience sampling	Found 64% were not trained in digital aids; training had a substantial impact on confidence and EHR usage.
Kruse et al., 2016, USA	Systematic review of 52 studies	Discovered 39 challenges of adopting EHR, such as cost, technical issues, and change resistance; highlighted the requirement for institution investment.
Greenhalgh et al., 2017, UK	Narrative review; multiple case studies	Developed a conceptual model of clinician resistance to new healthcare technology, including factors such as policy resistance and impaired professional relationships.

Review of Literature

Author(s), Year, Location	Sample Size & Sampling Technique	Salient Features
Ranschaert et al., 2019, Belgium	Survey of radiologists; purposive sampling	Discovered that radiologists were digitally ready to a high degree; high frequency of PACS use was associated with favorable attitudes toward technology.
Gure et al., 2021, Kenya	500 women and community health workers; stratified sampling	Assessed maternal mHealth interventions; determined that characteristics of design and implementation of the intervention affected use by maternal health clients.
Van der Velde et al., 2021, Netherlands	Qualitative interviews with 30 healthcare workers	Investigated the extent to which EHRs influenced communication between healthcare teams; determined that EHRs diminished face-to-face communication, which impaired teamwork.
Carayon et al., 2015, USA	Multi-center observational study; 120 participants	Explored the effect of electronic tools on workload and usability; determined that Explored the effect of electronic tools on workload and usability determined that system usability issues raised error and workarounds.

Review of Literature

Author(s), Year, Location	Sample Size & Sampling Technique	Salient Features
WHO, 2020, Global Strategy	Policy document; not applicable	Indicated the necessity for infrastructure and digital literacy; emphasized capacity-building as the main driver of digital health technology uptake.
Ross et al., 2016, USA	120 healthcare staff; cross-sectional survey	Discovered that training deficits caused failed implementation of EHR; advised systemic, role-based training schemes.

Methodology

Study Design

The study used a descriptive cross-sectional survey design with a quantitative strategy to measure the awareness and perceived barriers among healthcare workers on digital health technologies (DHTs).

Study Setting

The research was carried out among medical professionals serving in various clinical departments like Radiology, Outpatient (OPD), Inpatient (IPD), Surgery, Maternity/Obstetrics, Laboratory/Diagnostics, and Administrative/Other support units. The survey was distributed online, where it was possible for professionals to participate from various institutions.

Study Population

The target population consisted of all types of healthcare professionals. These included:

- Doctors (consultants, residents)
- Allied health professionals (radiographers, lab technicians, physiotherapists, etc.)
- Nurses
- Other healthcare staff (administrative and support staff)

Methodology

Sample size

104 responses were obtained from the online survey. Following data cleaning (removal of invalid or incomplete entries), 100 complete responses were used for the final analysis.

Sampling Technique

Convenience sampling method was used to enlist participants who were easily available and interested to take part in it. The sample represented professionals of varied backgrounds and departments so that there could be variation in role, experience, and exposure to digital.

Data Collection Tools and Procedure

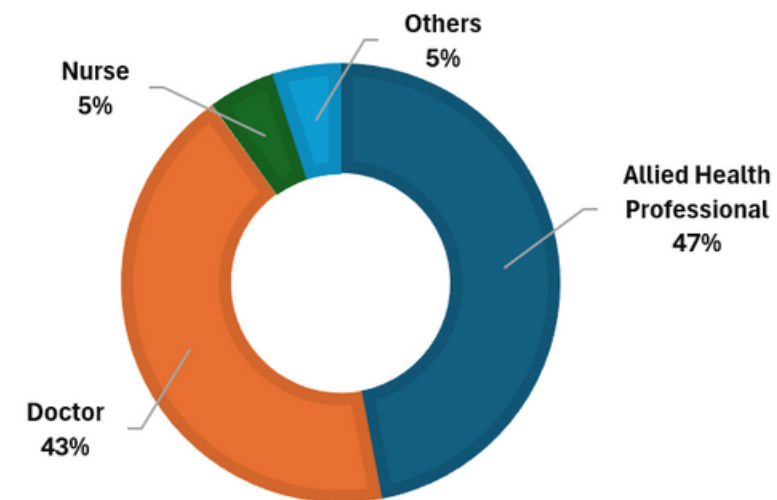
A structured questionnaire was created in Google Forms and sent electronically through email and social media. The questionnaire contained:

- Demographic information
- Likert-scale and multiple-choice questions measuring awareness, training, perceived barriers toward digital health technologies
- Department-specific questions regarding familiarity with terminologies and openness to utilizing DHTs

Results

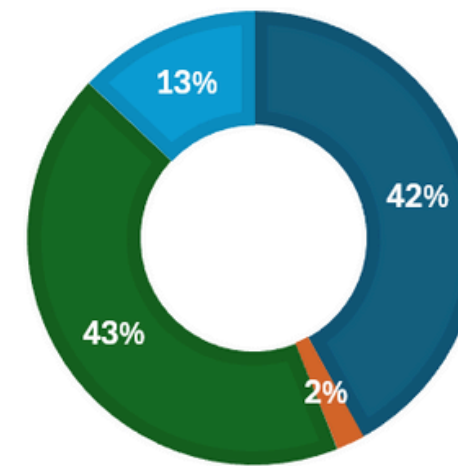
General Profiling

ROLE IN HEALTHCARE

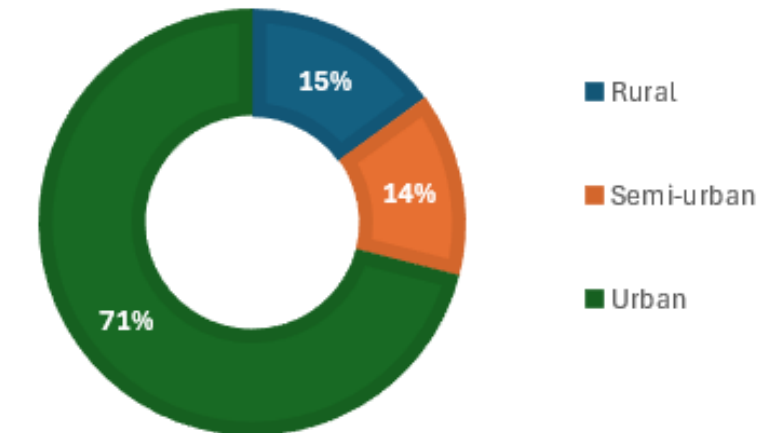


YEARS OF PROFESSIONAL EXPERIENCE:

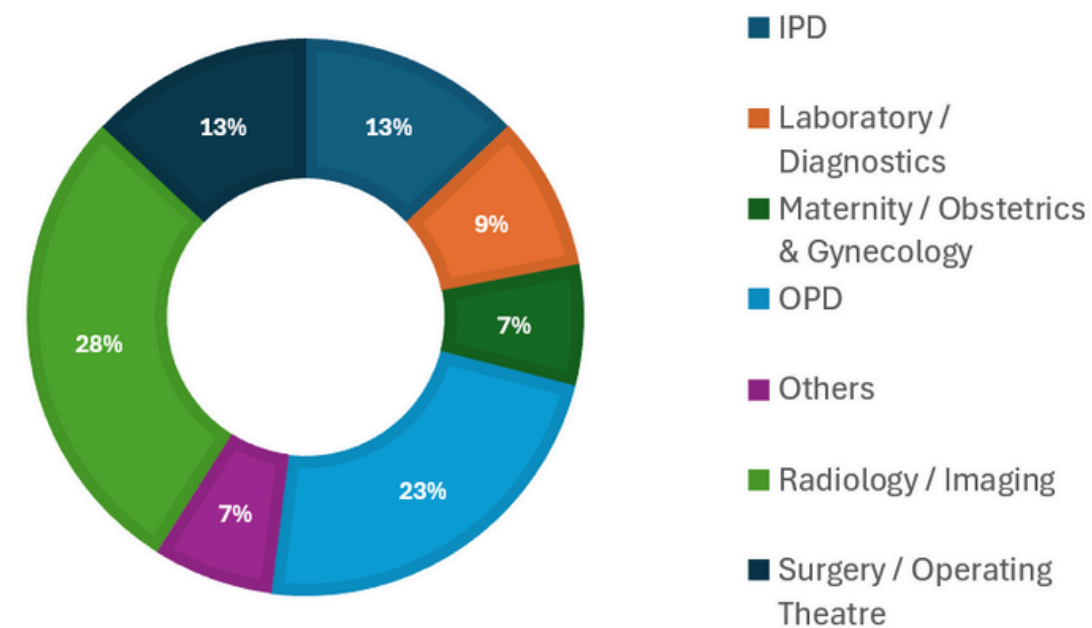
■ 1–5 years ■ 6–10 years ■ Less than 1 year ■ More than 10 years



LOCATION OF WORK:



DEPARTMENTS OF WORKERS

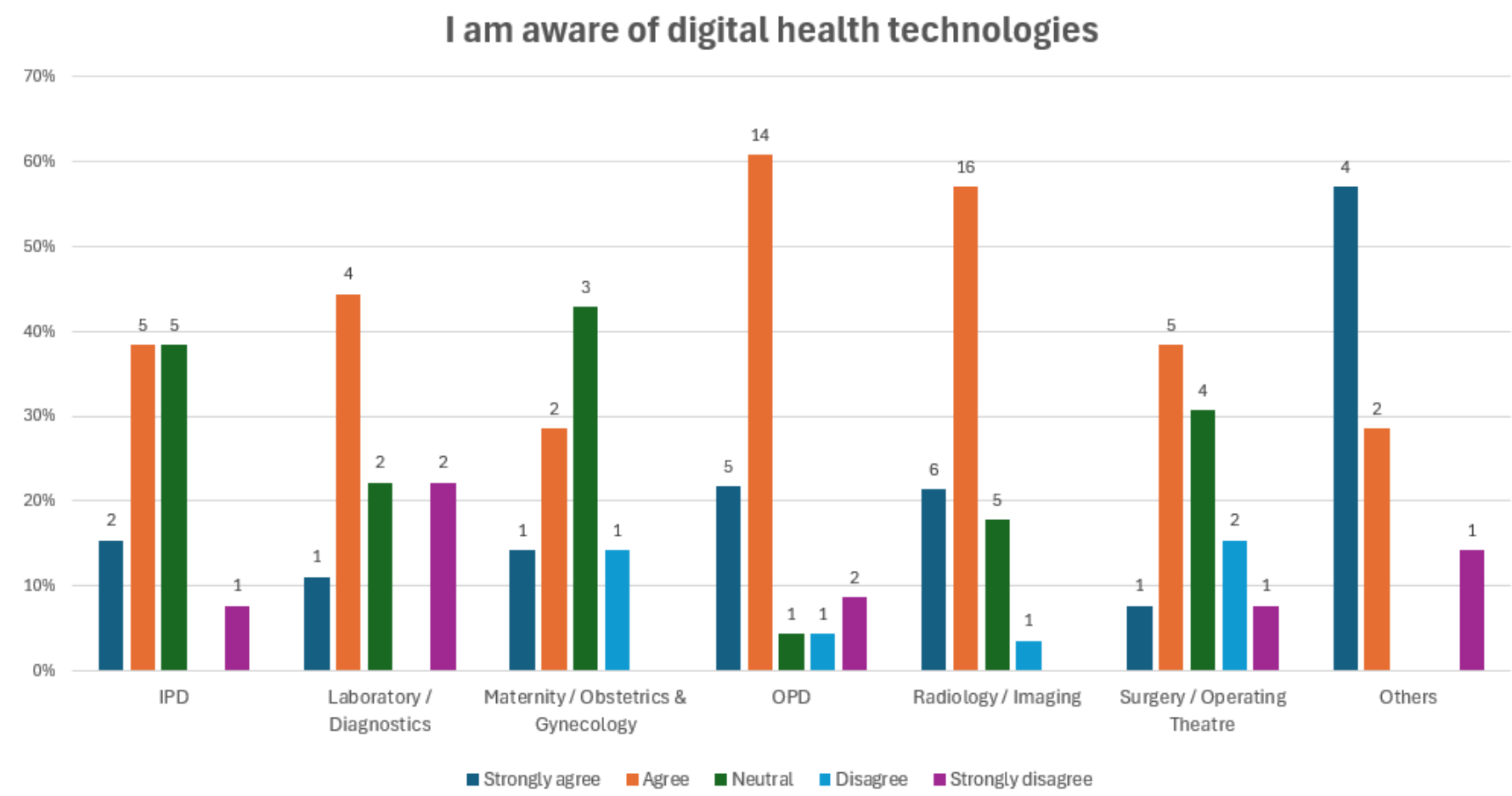


KEY FINDINGS

- 90% of respondents were either allied health professionals (47%) or physicians (43%)
- Predominantly Early-Career Respondents
- Urban-Centric Sample
- High Participation from Tech-Heavy Departments like Radiology (28%) and OPD (23%)

Results

Awareness



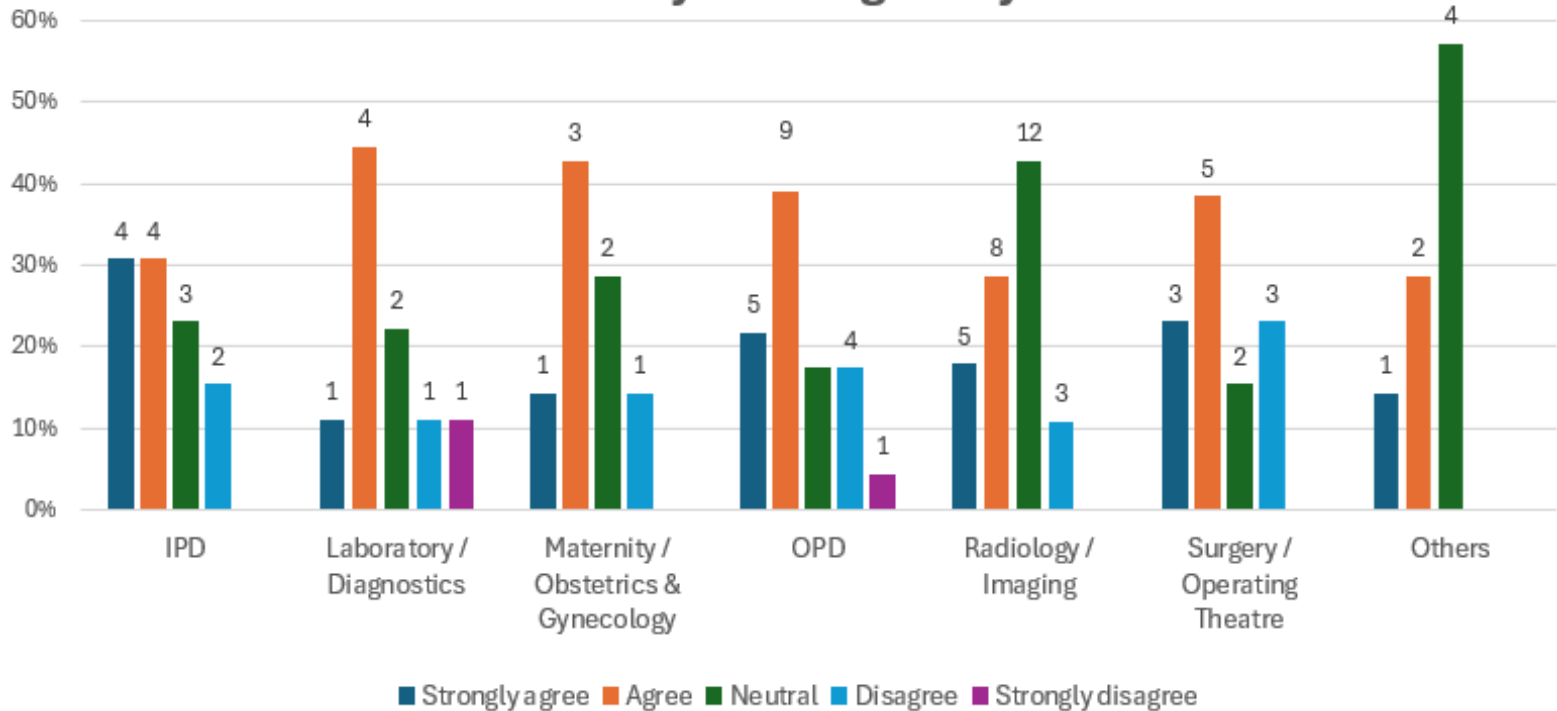
KEY FINDINGS

- Radiology Leads in Digital Awareness
- OPD Shows Strong Familiarity with EHR & Telemedicine.
- Basic terms (EHR, Telemedicine) were more familiar across units, while advanced ones (HIE, IoT) were mostly understood by Radiology, indicating a digital maturity gradient.
- Higher education, clinical role (doctor/midwife), and urban practice correlated with greater awareness of digital health tools

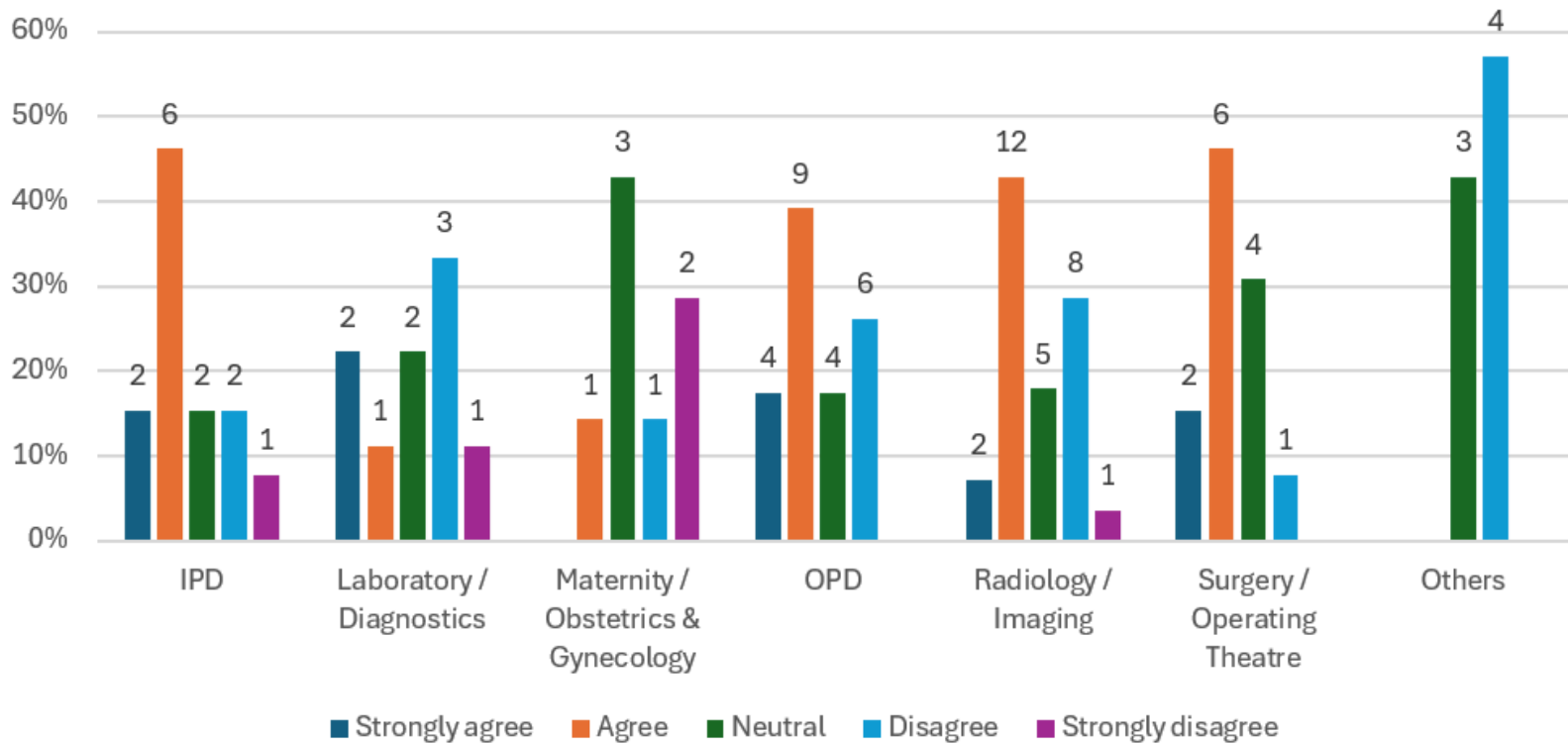
Results

Perceptions and Attitudes

I have concerns about data privacy and patient confidentiality with digital systems.



I fear that AI or robotic technologies may eventually replace some healthcare jobs

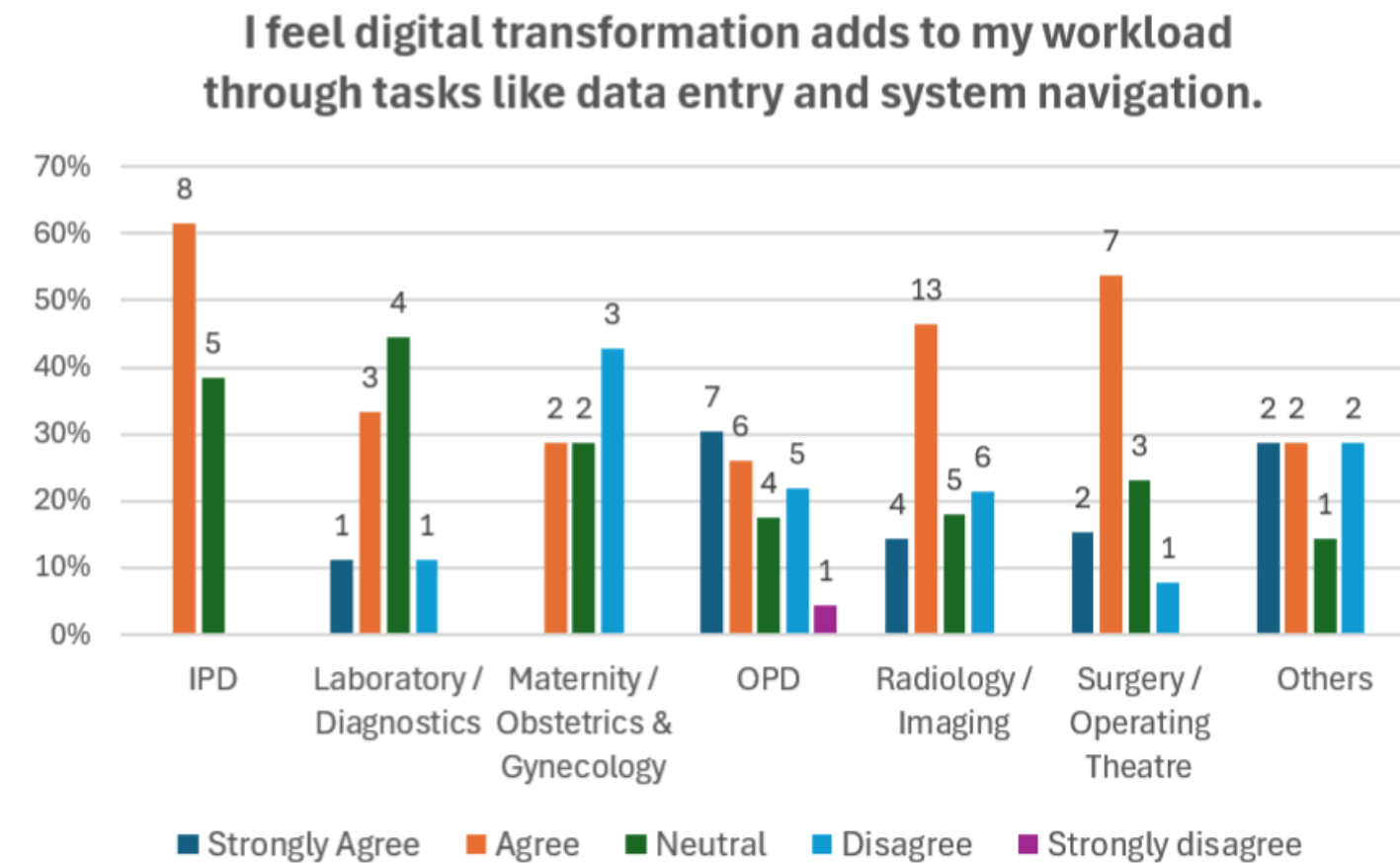
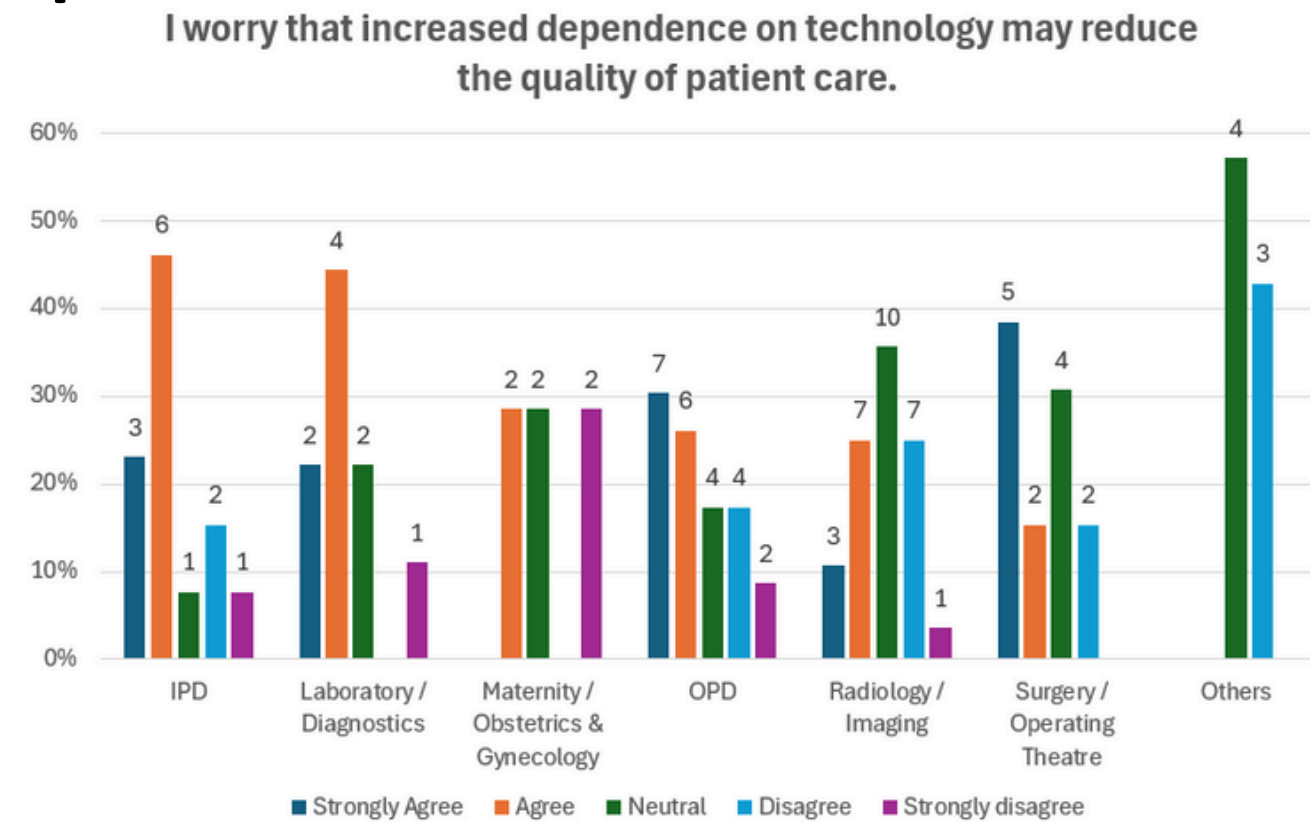


KEY FINDINGS

1. High Concern for Data Privacy Across Departments
 - Most departments, especially Radiology and IPD, reported strong concerns about data privacy, aligning with global findings where over 80% of clinicians fear patient information breaches.
2. Digital Exposure Increases Privacy Anxiety
 - Departments more digitally integrated reported greater anxiety about confidentiality, reflecting a paradox: greater usage leads to greater perceived risk.
3. Fear of Job Replacement by AI is Significant
 - Departments like Radiology and Allied Health, where AI is more present, showed notable fear of job displacement echoing global studies where 65% of nurses and 58% of doctors feared being replaced.

Results

Perceptions and Attitudes



KEY FINDINGS

Increased Workload Is a Major Concern

- Many respondents, especially from high pressure areas like OPD/IPD, reported that digital tools have added to their workload mainly due to data entry and complex interfaces.

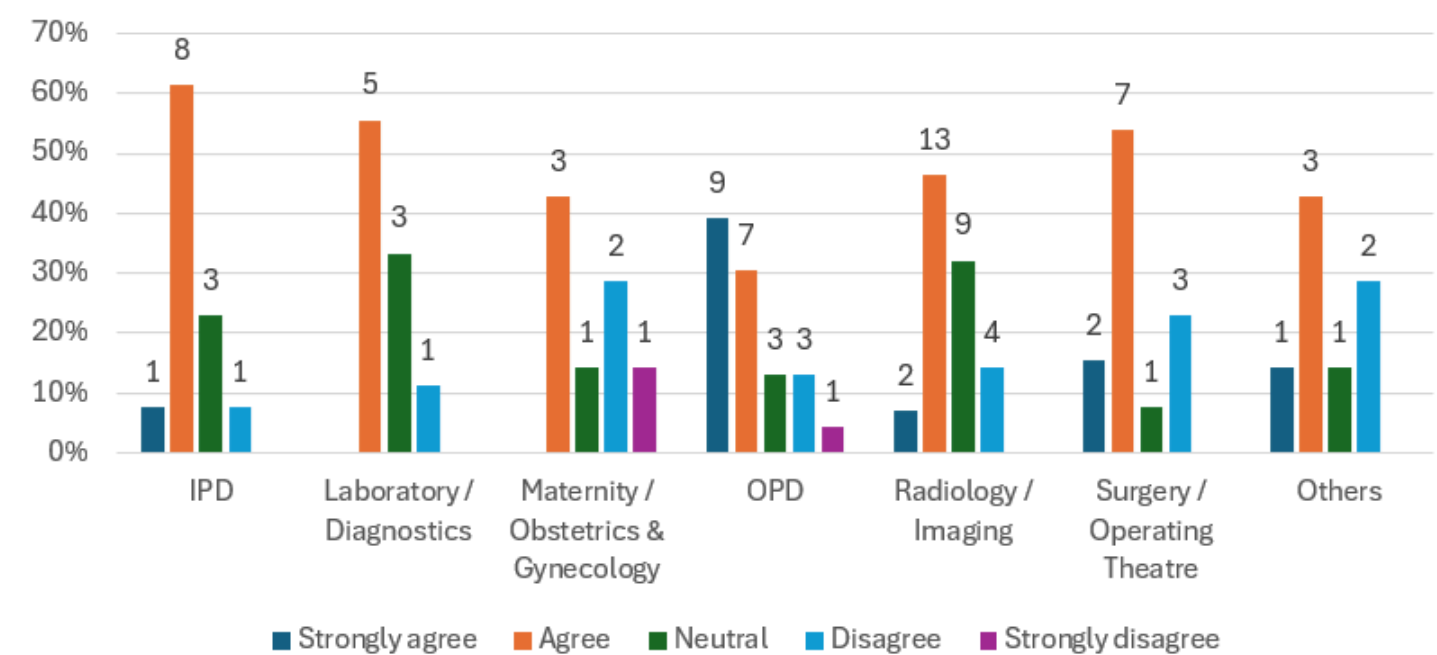
Fear That Technology Undermines Human Touch

- Patient-centric departments expressed concern that overdependence on digital tools may reduce the personalized care experience

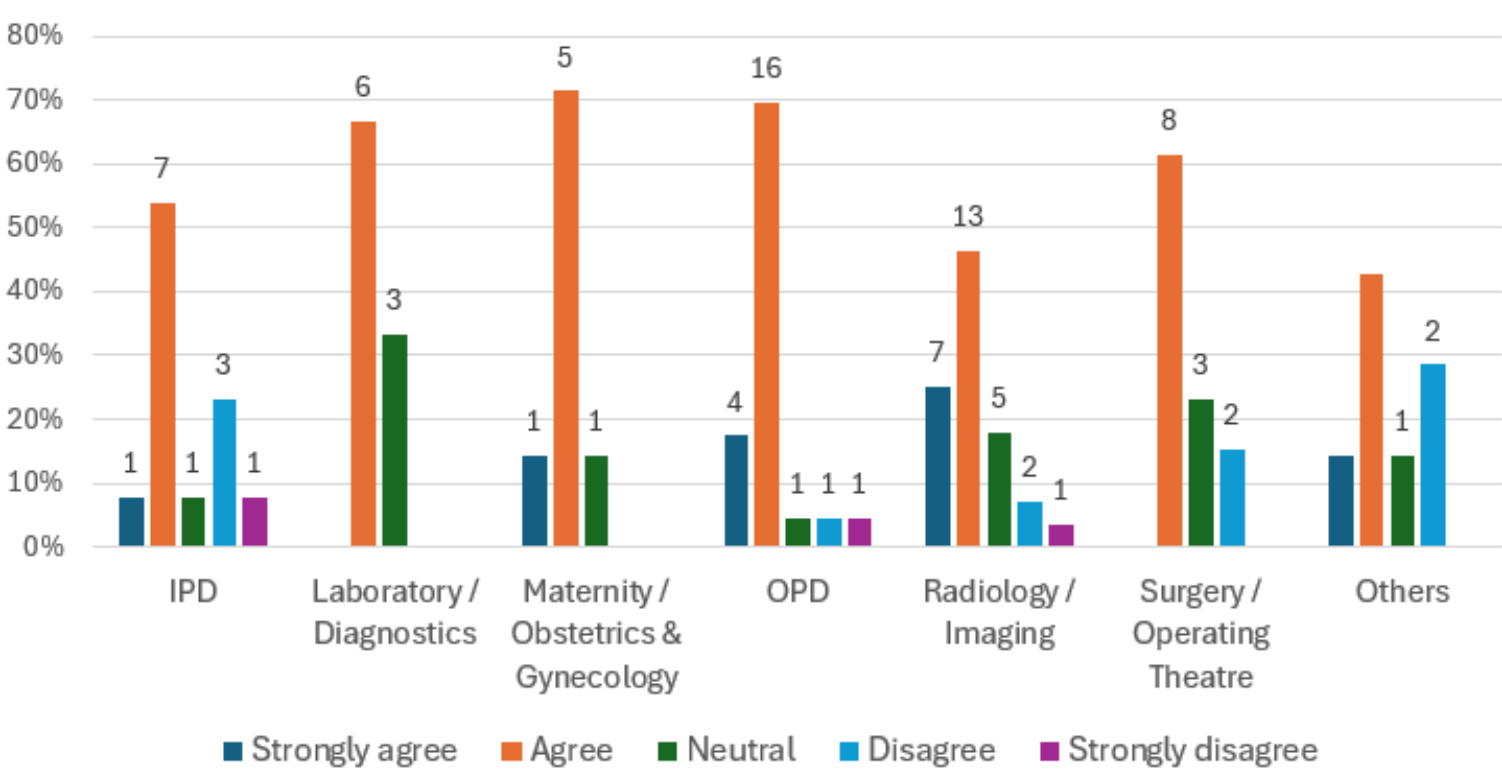
Results

Perceptions and Attitudes

I am concerned about reduced communication and collaboration with colleagues due to digital workflows.



Training opportunities such as workshops, conferences, or online courses on digital tools are readily accesible.



KEY FINDINGS

Digital Training is Unevenly Distributed

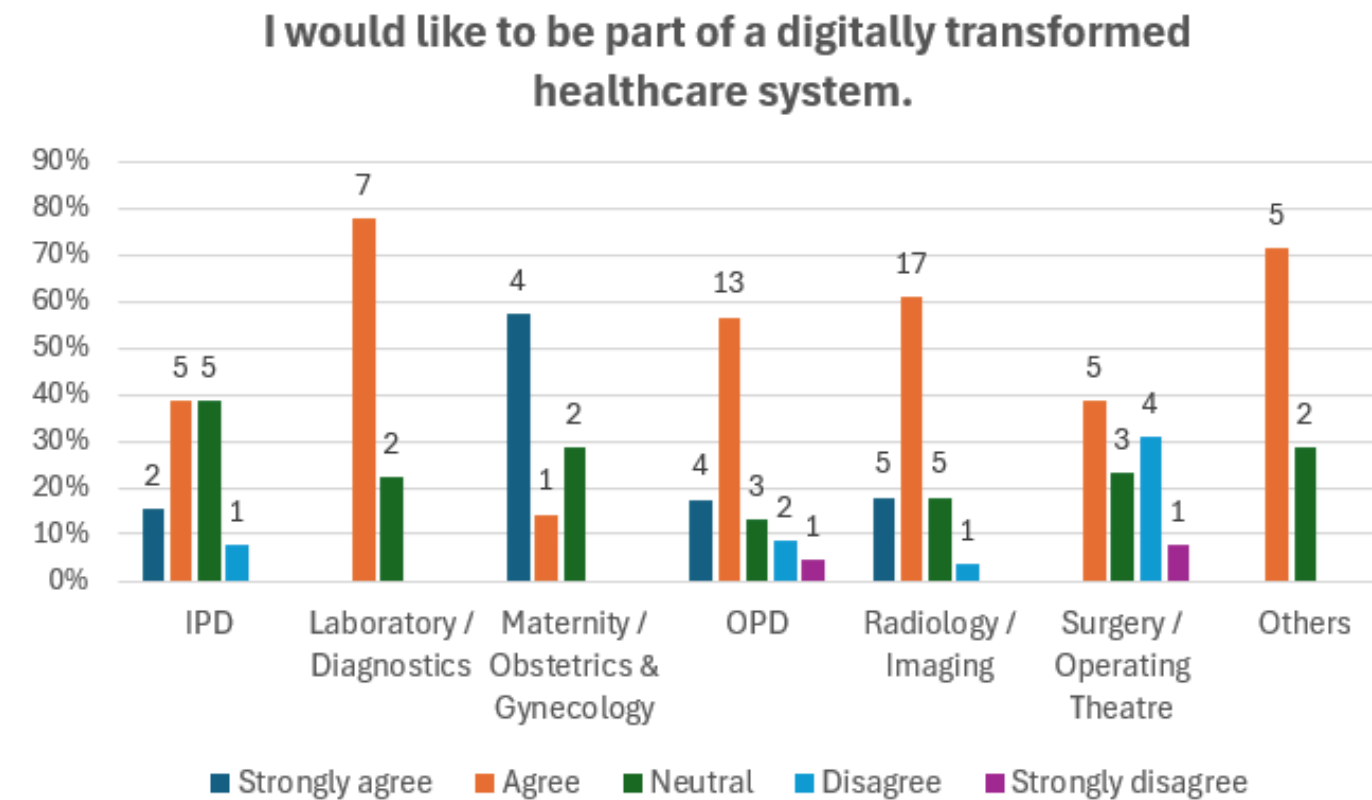
- Departments like Radiology receive frequent digital training, but frontline clinical units (e.g. IPD, Others) often lack access to formal training.

Digital Tools May Hinder Collaboration

- Many clinicians especially in team-based units like IPD, OPD express concern that electronic workflows reduce face-to-face interaction, weakening team dynamics.
- The findings emphasize that technology must complement, not replace, collaborative care, and digital transformation should support not disrupt interpersonal communication in healthcare settings.

Results

Perceptions and Attitudes



KEY FINDINGS

Strong Overall Willingness Across Departments

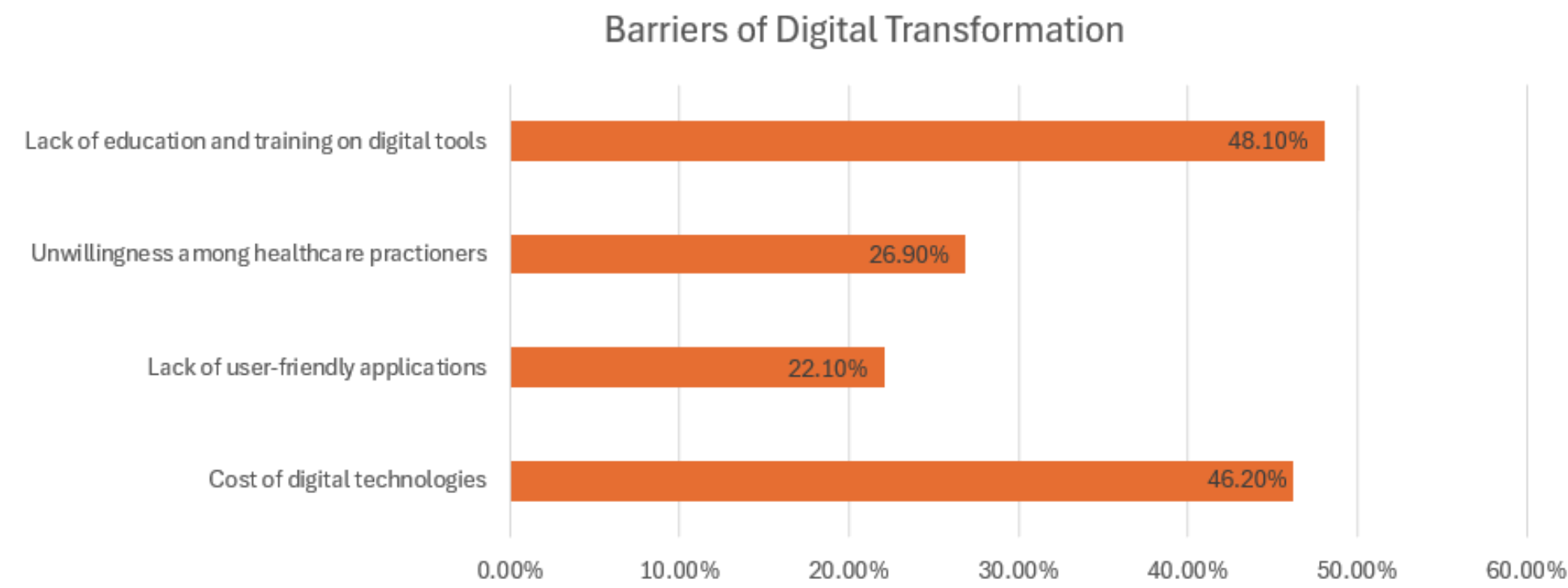
- Despite concerns, most healthcare workers especially from tech-familiar departments like Radiology and IT show high enthusiasm for digital transformation.

Positive Attitudes Drive Digital Adoption

- Literature and survey findings agree: positive sentiment and self-efficacy are key predictors of digital technology acceptance in healthcare.

Results

Barriers



KEY FINDINGS

1. Lack of Training Is the Top Barrier (48.10%)
 - Almost half of the respondents identified inadequate education and training on digital tools as the biggest challenge, highlighting a critical skills gap in the healthcare workforce.
2. High Cost Remains a Major Constraint (46.20%)
 - Financial burden from implementation, maintenance, and upgrades continues to impede adoption, especially in low-resource or public healthcare settings.
3. Practitioner Resistance Affects Adoption (26.90%)
 - Over one-fourth of healthcare workers noted resistance from peers, often due to fears of change, increased workload, or lack of involvement in decision-making.
4. User-Unfriendly Systems Limit Engagement (22.10%)
 - Many clinicians find current systems unintuitive, leading to underutilization and workflow disruption, underlining the need for user-centered design.

Recommendations

1. Develop department-specific digital literacy initiatives

- The study found uneven awareness across departments — Radiology and OPD showed higher familiarity with EHRs and Teleconsultation, while Maternity and IPD lagged behind. This indicates the need for customized awareness campaigns where knowledge is low.

2. Address psychological resistance through focused communication

- The results showed significant anxiety over AI replacement, loss of personal touch, and increased workload, especially in IPD and patient-facing units. These concerns impact perception negatively and should be managed through workshops that clarify AI's role and highlight human–tech collaboration.

3. Enhance usability and address affordability issues

- Among the top barriers reported were high cost of technologies (46.2%). Low-cost tech options to ensure wider adoption.

4. Mandate regular training and involve users in tech design

- A major barrier cited was lack of training (48.1%), and departments with training showed higher willingness to adopt. Also, collaboration issues arose where workflows lacked user input. These indicate that training and user participation in system design are crucial for trust and adoption.

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