

Understanding the Root Causes of Healthcare Professionals' Frustration with Digital Tools

Marie Wosny^{a,b,1}

^a*School of Medicine, University of St. Gallen*

^b*Institute for Implementation Science in Health Care, University of Zurich*

ORCID ID: Marie Wosny <https://orcid.org/0009-0000-2791-0774>

Abstract. The increasing integration of digital tools in healthcare has the potential to improve patient outcomes, yet often leads to frustration among users. This study explores the root causes of healthcare professionals' frustrations with technologies in hospitals. Secondary analysis of qualitative interviews with 52 clinicians in Switzerland revealed recurring challenges with digital tools, particularly clinical information systems, that are related to performance, usability, and data accessibility. These issues disrupt clinical workflows, compromise patient care, and can affect the well-being of clinicians. Addressing these issues through collaborative efforts could improve system design, reduce frustration, and enhance healthcare delivery.

Keywords. Healthcare information technology, clinical information systems, healthcare professionals, qualitative research

1. Introduction

In recent years, digital tools like electronic health records, clinical information systems (CIS), and emerging technologies such as artificial intelligence have become integral to healthcare, offering the potential to improve efficiency, patient safety, outcomes, and the accessibility of affordable, high-quality care [1, 2]. However, despite their potential benefits, digital systems often frustrate healthcare professionals (HCPs) due to poor design and ineffective workflow integration, reducing job satisfaction and contributing to emotional exhaustion and burnout [3]. Although the challenges of complex digital environments in hospitals and the concerns of healthcare administrators are documented, the personal experiences and thoughts of HCPs are frequently overlooked in both the design process and broader discussions surrounding the adoption of digital tools [4].

To address this gap, a previous study sought to gain deeper insights into the ongoing challenges of health information technology by conducting in-depth interviews that captured the firsthand perspectives and lived experiences of HCPs [5]. The study, conducted in hospitals across Switzerland, revealed that 88% of HCPs experience frustration with the digital tools they are required to use, underscoring a significant concern that demands closer examination [5]. Building on these findings, this follow-up study utilizes the same dataset to conduct a more detailed investigation into the

¹ Corresponding Author: Marie Wosny, University of St. Gallen (HSG), mariejohanna.wosny@unisg.ch

underlying causes of HCPs' frustration with digital tools in hospitals while also identifying the applications that contribute most to these frustrations. Identifying the root causes of frustration is critical for optimizing the design and integration of these technologies within clinical workflows, as this research aims to offer insights that can reduce frustration, guide future innovations, and improve healthcare delivery.

2. Methods

2.1. Study design and participant recruitment

This qualitative interview study investigated HCPs' firsthand experiences with digital tools in hospital settings. The study design facilitated an in-depth exploration of their experiences and adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) [6]. HCPs with at least six months of experience using digital tools in Swiss hospitals were recruited using convenience, snowball, and purposive sampling to ensure diversity across roles, work experiences, and medical specialties.

2.2. Data collection and data analysis

Interviews took place either in person or via video call from May to August 2023 until data saturation was reached [7]. Interviews were transcribed verbatim, anonymized, and reviewed by participants for accuracy. An inductive thematic analysis, following Braun and Clarke's framework [8], was conducted using ATLAS.ti software [9], which facilitated the systematic coding, organization, and identification of themes across the dataset, enabling a comprehensive exploration of patterns and insights within the qualitative data. Two researchers independently coded the data, with a third providing validation through iterative discussions. Themes were refined and grouped into broader categories. The findings were shared with participants to ensure credibility and trustworthiness, and all quotes were translated into English for reporting. While the full study results and detailed methodology have been previously reported [5], this study specifically investigates HCPs' frustrations with digital tools by a Qualitative Secondary Analysis (QSA) [10] of the original dataset, aiming to identify the root causes of frustration and determine which tools contribute the most to this feeling of dissatisfaction.

3. Results

3.1. Participant characteristics

A total of 52 HCPs from 24 medical disciplines and 14 hospitals in Switzerland participated, with an average age of 40.31 years (SD=10.18). Physicians made up 71% (37/52) of the sample, of which 59% (22/37) were in senior roles and 41% (15/37) were residents. Registered nurses comprised 29% (15/52), of which 67% (10/15) were in senior and 33% (5/15) in junior positions (Table 1). Most participants had significant digital tool experience, with 62% (32/52) for over a decade, 13% (7/52) for five to ten years, and 25% (13/52) for less than five years. No direct correlation was observed across participant characteristics, such as roles and reported frustration levels.

Table 1. Characteristics of study participants (n=52).

Category	Details	Metrics (%)
Professional role	Senior physician	22 (59)
	Resident physician	15 (41)
	Senior nurse	10 (67)
	Junior nurse	5 (33)
Digital tool experience	>10 years	32 (62)
	5-10 years	7 (13)
	<5 years	13 (25)
Number of medical disciplines involved		24
Number of hospitals involved		14
Total number of participants		52 (100)

3.2. Root causes of healthcare professionals' frustration with digital tools

Frustration with digital tools was mentioned 84 times by HCPs. Of these, 70% (59/84) were directly linked to specific tools as a root cause, with CIS being the most frequently mentioned (42%, 35/84), followed by dictation and speech recognition tools (8%, 7/84), and tumor board tools (8%, 7/84) (Table 2). In contrast, 30% of the reports (25/84) were tied to broader concerns within the digital hospital ecosystem, such as inefficiencies (10%, 8/84), non-operability (7%, 6/84), and administrative burden (6%, 5/84), which addressed systemic issues as the root cause of frustration, rather than specific tools.

Table 2. Digital tool-related root causes of healthcare professionals' frustration in hospitals.

Root causes of frustration due to			
Specific digital tools	Reports (%)	Digital hospital ecosystem	Reports (%)
Clinical information system (CIS)	35 (42)	Inefficiencies	8 (10)
Dictation/speech recognition tool	7 (8)	Non-operability	6 (7)
Tumor board tool	7 (8)	Administrative burden	5 (6)
Alert and nurse call system	2 (2)	Lack of interoperability	2 (2)
Cardiologic evaluation tool	2 (2)	Lack of benefit	2 (2)
E-Mail	2 (2)	Internal bureaucracy	1 (1)
HR tool	2 (2)	Patient safety risks	1 (1)
Blood inventory management system	1 (2)	-	-
Performance tracking tool	1 (1)	-	-
Sum	59 (70)		25 (30)
Total reports			84 (100)

The root causes of frustration related to the specific tools are similar to those reported for general issues within the digital hospital ecosystem (Table 3). For instance, the CIS frustrates HCPs due to issues related to system performance and reliability, technical limitations, inefficiencies from redundant tasks or excessive click depth, system instability, freezes, inoperative components, and frequent errors, all of which disrupt workflows and compromise patient care. Furthermore, usability and workflow challenges, such as unintuitive interfaces and the system's unsuitability for some medical tasks like generating patient summaries, hinder efficiency and pose potential safety risks. Lastly, data access and integration issues, e.g., restricted access to critical information and a lack of interoperability, exacerbate frustration and complicate care coordination.

Similarly, HCPs reported that the dictation and speech recognition tools frustrate them due to system performance and reliability issues, including frozen or unresponsive tools, malfunctioning components, and error-prone functionalities. HCPs worried that the dictation tool occasionally produces contextually accurate but clinically incorrect transcriptions, where recognized words are grammatically correct but do not reflect the true medical intent, potentially leading to clinical misunderstandings or patient harm.

Additionally, efficiency and usability challenges, such as time-consuming processes and the tool's lack of suitability for clinical purposes, further hinder its effectiveness.

Likewise, tumor board tools frustrate HCPs due to the root causes of inefficiencies, functionality issues, and system malfunctions. HCPs reported spending excessive time and energy just trying to log in and that the system's inefficiency significantly obstructs productivity. Additionally, usability challenges, including poor user-friendliness, a nonintuitive design, and insufficient support, further complicate its use, especially in situations like board meetings, where the platform is critical for collaboration.

Table 3. Selected examples of digital tools and reasons for frustration with supporting quotes.

Digital tool	Reason for frustration	Exemplary quotation
Clinical information system (CIS)	- Technical limitations	<i>"So, when we want to do something and we discover that in the clinical information system technically it is not possible [...], there is this feeling of frustration." (Resident physician)</i> <i>"It is frustrating when things are unnecessarily complicated. Like, why does it have to be so complicated to upload a picture [...]? Every smartphone can do that, so I do not understand why it has to be so difficult to attach a PDF [...]." (Senior nurse)</i> <i>"This program is frustrating to work with. It is just very inefficient and takes forever [...]." (Resident physician)</i>
	- Inefficiencies	
	- System instability	
	- Inoperative components	
Dictation/speech recognition tool	- Prone to errors	<i>"There are word errors, which the other person may not recognize because they do not see a grammatical or content-related mistake, but [...] it is factually incorrect. [...] That leads to a lot of frustration for me [...]." (Senior physician)</i> <i>"[...] then I write by hand, which takes three times as long as compared to when the tool works. We honestly do not have time for that [...], it is simply frustrating." (Resident physician)</i>
	- Poor usability	
	- Unintuitive interfaces	
	- Unsuitable for clinics	
Tumor board tool	- Restricted access	<i>"The tumor board tool, it is not intuitive. As a visual person, I find it very cumbersome to enter information." (Senior physician)</i> <i>"Someone tried to log in, and [...] were having difficulties. That is extremely frustrating." (Senior physician)</i>
	- Lack of interoperability	
	- Inefficiencies	
	- Non-functional components	
Tumor board tool	- Poor user-friendliness	

4. Discussion

This study reveals that HCPs experience significant frustration with digital tools, mainly due to performance issues, inefficiencies, usability challenges, and limited data access that disrupts workflows. Frustration with technology is a prevalent issue among clinicians and has been identified as one key factor contributing to emotional exhaustion and burnout [11]. Despite significant task variability across professional roles and disciplines, this did not directly influence frustration levels, underscoring that frustration with digital tools is a pervasive issue impacting user experience universally. Previous research demonstrated that infrastructure limitations, technical issues, psychological barriers, and workload concerns are significant obstacles to the full adoption of digital health technologies, while enablers such as targeted training, perception of usefulness, and incentivizing multi-stakeholder involvement are crucial for enhancing integration [12]. Specifically, the CIS design requires collaboration with IT vendors and clinicians to ensure alignment with clinical workflows, user requirements, and data quality standards while balancing customization costs [13]. Building on these insights identified in this study could significantly improve HCPs' well-being and acceptance, as well as the integration of digital tools into their workflows. To achieve this, vendors, hospital

management, and end users must collaborate more closely to ensure that digital solutions are user-centered and aligned with the actual needs of HCPs [14]. Moreover, successfully integrating digital tools requires hospital management to not only focus on adopting IT systems but also to lead ongoing organizational change and ensure strategic alignment to meet clinicians' needs [15]. Thus, by fostering a more supportive digital environment, system improvements, and multi-stakeholder commitment, there is potential to reduce frustration, improve efficiency, and ultimately mitigate HCPs' emotional exhaustion.

5. Conclusion

In conclusion, this study highlights the significant frustrations experienced by HCPs with digital tools such as CIS due to the root causes of performance issues, inefficiencies, and usability challenges. Addressing these technical barriers through collaborative efforts between IT and healthcare stakeholders together with end users is essential for improving tool integration into clinical workflows. By prioritizing a user-centered design, there is potential to reduce frustration, improve efficiency, and support healthcare delivery.

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