

Navigating moral and ethical dilemmas in digital transformation processes within healthcare organizations

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Abstract

Objective: Healthcare systems around the world face a turbulent and unstable global and local ecosystem that changes daily and impacts the healthcare organization and its workforce. This challenging environment, coupled with economic pressures, is forcing healthcare systems to change and adopt strategic and technological processes to adapt to change at all levels of the system (macro-holistic multi-systemic, mezzo-organizational, and micro-personal).

Methods: In this study, through 32 in-depth, semi-structured interviews with healthcare professionals working in public general hospitals in central Israel, we examined, mapped, and highlighted the conflicts and moral dilemmas they have faced in recent years, alongside the processes of strategic, technological, and digital changes that the healthcare system has undergone.

Results: The findings from both a categorical-deductive approach and an inductive approach analysis reveals four main themes: *innovation paradox*, *quality and treatment conflict*, *information and knowledge conflict*, and *personal needs and values*. The themes and sub-themes are sorted across the three levels of the healthcare system.

Conclusions: These findings represent a wide range of conflicts and moral dilemmas that arise from the implementation of strategic change and digital transformation, adding to the already numerous ethical issues and moral dilemmas in healthcare and bioethics that are associated with three levels of the system. These challenges and moral conflicts can be barriers to implementing the necessary changes, as well as challenging individuals' internal values, potentially leading to burnout and moral distress. Given the importance of this issue and the intensification of change processes over the next few years, it is up to the management and key stakeholders to implement these processes in a way that addresses the conflicts and challenges that health professionals face. Minimizing the level of challenges and moral distress in the health sector will be to the benefit of the system, its workers, and the patients it serves.

Keywords

Moral and ethical dilemmas, healthcare organizations, digital transformation in healthcare

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Introduction

Over the past few decades, healthcare systems and their organization around the world have been faced with extensive and complex challenges. These are driven by many different local and global factors. Demographic, technological, economic, and political changes that affect the wider ecosystem in which these organizations operate are among the most important reasons for these healthcare-specific changes.^{1–5} At the same time, the demand for healthcare services is increasing. This is due to demographic

changes (e.g. longer life expectancy accompanied by chronic diseases) and growing consumption as a result of

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health awareness among the world's population. This demand is characterized by an increase in the volume and availability of medical services as well as modern medical technology. However, these additional needs have not been matched by increased financial resources allocated to meet them. This situation creates a gap between demand and supply that is widening by the day. This chronic crisis is one of the major challenges facing healthcare stakeholders.^{6–8}

These challenges have created an unstable, turbulent, and competitive environment for healthcare organizations to operate.

To thrive in an ever-changing environment, healthcare organizations must adapt and evolve. This necessitates adopting change processes that not only ensure their survival, but also maintain their profitability and relevance in the healthcare market. A key aspect of this adaptation involves strategic change processes, including the embrace of digital transformation and the integration of digital tools. However, this shift brings forth ethical and moral dilemmas. For instance, the adoption of new medical technologies often involves significant expenses, raising concerns about fair access. Economic constraints might compel healthcare providers to make prioritization decisions that could compromise the quality of patient care. Additionally, political shifts may lead to changes in healthcare policies, impacting the scope of coverage and the accessibility of services. These scenarios underscore the complex challenges and transformations within the healthcare sector, requiring healthcare professionals and organizations to navigate these changes with ethical and moral foresight.^{2,6,9,10}

Strategic and technological processes as adaptation to changes in the healthcare industry

Recent years have seen a surge in demand for healthcare services. This demand, coupled with the need to thrive in a turbulent and competitive environment influenced by global and local healthcare industry dynamics, has led to the implementation of numerous strategic changes across healthcare systems.¹⁰ The outbreak of COVID-19 in late 2019 and the challenges of providing immediate medical solutions in a pandemic—under conditions of stress, uncertainty, and budget shortfalls—intensified hospitals' financial pressures.¹¹ This situation acts as an accelerator, pushing the healthcare industry toward embracing changes at all levels. It leads to the adoption of medical, managerial, and technological innovations aimed at addressing market distress, uncertainty, and competition, all critical for survival.¹² Incorporating changes into the system and its organizations required assimilating new processes, including technological advancements that are part of the Fourth Industrial Revolution that is shaping the 21st century. These extensive digital changes triggered further

modifications in healthcare systems.^{12–16} These processes of digital transformation within healthcare systems and their organizations are broad and encompass a range of activities and various areas, such as diagnosis, treatment, research, service, and accessibility. This includes the establishment of worldwide databases, integration of artificial intelligence and Big Data in medical information analysis processes, adoption of robotics and distance diagnosis and treatment technologies, personalized medicine, telemedicine, digital services, maintenance of treatment continuity, and computerized patient file management.^{14,15}

Strategic and technological processes manifested in the three levels of the healthcare system—micro, mezzo, and macro

These changes involve multi-systemic (macro level), organizational (mezzo level), and personal (micro level) aspects and challenges.

The macro level refers to the whole system and includes processes and the setting of policies and objectives. It also sets priorities in a framework of demographic, economic, technical, and political changes common to all health systems worldwide.^{17,18} At the macro level, healthcare systems face challenges, such as adapting to an aging population, coping with economic turbulence, integrating rapid technological innovation, maintaining policy continuity amid political change, responding to global health threats, and overcoming inequalities in access to care. These issues require strategic foresight, resilient policies, and collaborative efforts at the national and global levels to ensure that healthcare remains sustainable, equitable, and responsive to evolving global needs. Addressing these challenges is critical to developing healthcare systems that can effectively meet the needs of diverse populations in a changing world.^{10,17–19}

The mezzo level involves the development and implementation of policy and management strategies within healthcare organizations, focusing on organizational adaptations and strategic decisions in areas, such as budgeting, procurement, work processes, and human resource management. Challenges at this level include navigating bureaucratic barriers, overcoming resistance to change, and meeting the demands of delivering high-quality healthcare services cost-effectively. Healthcare organizations at the mezzo level are tasked with translating broad healthcare policies into practical, context-specific strategies. Effective resource management is a critical challenge as these organizations must ensure the delivery of quality care while operating within financial constraints, often requiring creative solutions to improve efficiency. An organization's structure and culture have a significant impact on its ability to embrace change and adopt new practices, such as adopting technology and moving toward patient-centered models of care. Addressing resistance to change and ensuring that new practices are aligned with established

ones are essential to improving the quality of care and operational efficiency. Ultimately, the mezzo level plays a pivotal role in achieving healthcare goals, requiring strategic foresight, flexibility, and a deep commitment to healthcare excellence.^{10,19,20}

The micro level, which focuses on individual healthcare professionals, has undergone significant changes due to strategic and technological shifts. This development has led to a paradigm shift toward patient-centered care, which has fundamentally changed the dynamics between healthcare providers and patients.^{21,22} At the same time, the roles of clinicians and managers within healthcare settings have been redefined, introducing a degree of ambiguity regarding responsibilities and authority.¹⁷ While these changes are intended to improve the quality of care, they have resulted in blurred boundaries and undefined roles, complicating the professional landscape for healthcare workers. Furthermore, this lack of clarity can lead to conflicts of interest and challenges in maintaining professional autonomy as health professionals navigate the complexities of modern health care.^{23,24}

The changes in the environment of healthcare organizations described above, which are reflected in the three levels of the system, require, in addition to the legal framework, comprehensive ethical guidance and principles.²⁵

Ethical conflict, ethical judgement, and moral dilemmas

The principles of medical ethics are founded on four fundamental guidelines, namely, the benefits of the patient, the right of the patient to self-governance, the obligation to avoid harming patients, even if doing so may serve the greater good, and the concept of justice, which emphasizes equitable access to healthcare resources.²⁶

Ethical conflict and moral dilemmas refer to situations where an individual or group is confronted with conflicting moral principles or values and must choose between two or more courses of action that may be ethically justifiable, but cannot all be pursued simultaneously as this might create an antecedent to moral distress. The phenomenon is complex and impacts the physical, psychological, and emotional well-being of healthcare professionals as they are facing ethical conflict and moral dilemmas on a daily basis.²⁷ Ethical judgment is defined as the ability to reason and determine which action, behavior, or approach is the most appropriate among all the alternatives in a given situation. This is dependent on the values we share in the society and culture around us.^{28,29} Hence, it serves as a crucial instrument in decision-making processes, with respect to individuals, organizations, and wider society. A number of factors are likely to interfere with these processes and silence the inner voice of values, thus making ethical judgement more difficult. This happens when a person's internal

set of values clashes with the organization's values or culture. This conflict is likely to create an internal value problem.^{28,30–32}

In this study, we aim to map and highlight the conflicts and moral dilemmas that health professionals have had to face in recent years, alongside the processes of change that the health system has undergone as a result of the chronic crisis and changes, described above. Understanding healthcare professionals' challenges and moral conflicts better will aid management and stakeholders in implementing processes that address these issues. This will help reduce antagonistic behavior and foster improved cooperation, contributing to a better healthcare system for workers and patients and enhancing overall sustainability.

Method

The current research

This qualitative study employs 45-minute semi-structured in-depth interviews with healthcare professionals from public general hospitals in the center of the country to explore how strategic change and digital transformation in Israeli healthcare organizations affect the moral dilemmas and conflicts of healthcare professionals.

Research population and data collection

Our study focused on 32 healthcare professionals from public general hospitals in central Israel, including 20 doctors and 12 nurses, selected through snowball sampling. This method ensured we engaged with those directly involved in patient care. We specifically included practitioners actively working in these roles for the last 3 years to capture insights on recent changes in healthcare. Non-practitioners and those with less than 3 years of current experience were excluded to concentrate on the perspectives of those most familiar with the evolving dynamics and challenges in patient care. Using open-ended questions as a facilitator, interviewers prompted participants to share their personal narratives. All interviews were conducted by the first author, a PhD in healthcare management with 15 years of qualitative analysis experience, and her trained research assistants. This ensured a deep understanding of the qualitative data. The interviewers relied on a guidance page containing general questions as a framework for the conversation, but this was not shared with the interviewees. To ensure the relevance and effectiveness of our questionnaires, we conducted expert reviews for content validity and utilized the initial interviews as a pilot phase, allowing for iterative refinement based on participant feedback and expert consultation.

At first, the interviewees were asked a general question regarding the processes of change in the healthcare system and in their hospital, such as business and financial

behavior, marketing, and competitiveness, and then they were asked about digital changes in their workplace and their perception regarding the change, experience, difficulties, and challenges. Interviewees were encouraged to tell their personal stories.

Procedure

Following ethical approval from the ethics committee of Hadassah Academic College, we contacted healthcare professionals who worked in public hospitals in the center of Israel by using snowball sampling and inquired whether they would be interested in taking part in the study. Prior to each interview, the participant was asked to sign a consent form stating that the study had been approved by the ethics committee, that they could stop the interview at any point, and that their names and workplaces would not be revealed.³³

The interviews took place digitally via Zoom in 2021–2023, and, consistent with customary qualitative interview and analysis practices, the interviews were recorded and transcribed, and field notes pertaining to the interviews were taken.

Data analysis

The information gathered from the interviews was analyzed using both a categorical–deductive approach—based on themes that exist in the proposed theoretical anchor of moral dilemmas and conflicts—and an inductive approach, in which the researcher identifies and includes newly emerging categories that have significance during the analysis process. It is essential to combine these methods throughout the process of analyzing the data.^{34–}

³⁶ This allows the researcher to address the categories that emerge from the theoretical base as well as new categories that emerge from the data.³⁷ This method has been chosen for this research recognizing the complex reality and challenging environment within which the hospitals underwent strategic changes. Thus, in order to comprehend the change processes and their consequences in terms of moral dilemmas and ethics, it is essential to have insight into their perceptions, perspectives, experiences, and worldview in understanding these changes. In this way, they were provided a chance to share their personal experiences, which cannot be measured and can only be analyzed qualitatively.³⁸ Our interview sample size was strategically determined in alignment with anticipated referrals and follow-ups, ensuring we reached information saturation. This approach allowed us to confidently state that no new information was observed, affirming the depth and reliability of our findings. The analytical steps were as follows: (a) each transcript was independently read and re-read by the three researchers; this crucial first step allowed each researcher to immerse themselves in

the data, facilitating an initial identification of themes based on the participants' perspectives and experiences; (b) inductive themes: following the initial reading, all the researchers performed inductive coding for themes independently; this approach allowed codes to emerge from the data without being constrained by pre-existing theories or frameworks; each researcher generated a list of themes based on the participants' narratives, capturing key concepts and categories as they appeared in the text; (c) to enhance the reliability and validity of the coding scheme, all three researchers were involved in the analysis of each transcript; after completing their independent coding, the researchers convened to compare, discuss, and reconcile their findings; this collaborative and iterative process was essential for identifying discrepancies, refining codes, and reaching a consensus on a final set of codes; (d) inter-rater agreement and decision rules: the researchers achieved an inter-rater agreement through a consensus process rather than statistical measures; when disagreements on codes or themes arose, detailed discussions were held to reach mutual understanding and agreement, ensuring a consistent and collaborative approach to the coding framework; (e) theme development and categorization: with a reliably coded dataset established through consensus, the researchers worked together to sort the codes into themes and sub-themes; this collaborative effort ensured that the emerging themes were deeply rooted in the data, providing a coherent narrative of the participants' experiences; these themes were then systematically related to the three levels of the healthcare system, offering structured insights into the participants' coping strategies and challenges³⁹; (f) sort the themes across the three levels of the healthcare system, which, together with the relevant literature, enabled us to gain a broad perspective of the participants' inner perceptions and moral world; this illuminated their struggles and challenges throughout these processes³⁵; disagreements and differences between the researchers were resolved through discussion; and, finally, (g) validation and refinement: the final analytical step involved all three researchers in a comprehensive review of the data and the developed themes to ensure an accurate representation of the participants' experiences. This process included checks for consistency across the dataset and validation of the themes' comprehensiveness and relevance.

Findings

This section does not encompass all the components of the themes discussed in the study. Rather, it focuses on the findings relevant to this article: the impact of strategic change and digital transformation in hospitals on the moral dilemmas and conflicts of healthcare professionals. The findings of themes and sub-themes are summarized in Table 1 and sorted across the three levels of the healthcare system.

Table 1. Classified themes and sub-themes.

Theme	Sub-theme	Macro-holistic Level	Mezzo-organizational Level	Micro-individual Level
Innovation paradox	<i>Advantages and disadvantages of technology and innovations</i>	✓	✓	✓
	<i>Cybersecurity</i>	✓	✓	✓
	<i>Efficacy of using resources</i>	✓	✓	
<i>Quality and treatment conflict: keeping the benefits of the patient</i>	<i>Computerized conflict</i>		✓	✓
	<i>Time conflict</i>		✓	✓
	<i>Paternalism and co-creation, patient self-governance</i>		✓	✓
	<i>Responsibility and accountability</i>		✓	✓
	<i>Face-to-face vs. virtual</i>		✓	✓
<i>Information and knowledge conflict</i>	<i>Mentoring and training</i>		✓	✓
	<i>Overflow of information</i>		✓	✓
<i>Personal needs and values</i>	<i>Boundaries and personal price</i>			✓
	<i>Personal values</i>			✓
	<i>Defensive medicine</i>			✓

This was done on the basis of a primary, immediate effect rather than a secondary, long-term effect. It is obvious that elements that have individual effects, and even broad organizational effects, also have long-term effects at the macro level, and vice versa: moral dilemmas at the macro level are certain to have long-term effects at the mezzo and micro levels. As can be seen in the table, not all themes and sub-themes are related to all levels of the health-care systems. The themes of *innovation paradox* and the sub-themes *advantages and disadvantages of technology and innovations*, *cybersecurity*, and *efficacy of using resources* refer to all levels. The *quality and treatment conflict: keeping the benefits of the patient*, and *information and knowledge conflict* together with their sub-themes refer to both mezzo-organizational and micro-individual levels, and the *personal needs and values* relate to the micro-individual level.

Innovation paradox

This theme is divided into three sub-themes: *advantages and disadvantages of technology and innovations*, *cyber security*, and *efficacy of using resources*.

Advantages and disadvantages of technology and innovations.

Analysis of the interviews showed a wide agreement regarding the advantages of technology and innovations. According to the interviewees, the widespread adoption of this technology and innovative tools was expected to bring significant progress throughout the entire system for the benefit of the patients and the system.

“It’s hard for me to imagine how we used to work when we had to do all the testing and searching. Now it is all on one screen, and you go from window to window. Being able to see different simulations of a patient saves a lot of time.

The transition over the years to a computerised medical record has taken us light years forward in terms of quality of care, with one click, you can find everything, this greatly enhances the quality of care and saves a lot of time.”

However, collectively, they highlighted the difficulties and problems associated with these changes, such as the overload of work and the need for more time and effort to gain control over the technology.

“The demand for health services is growing, and the equipment and the stuff is staying the same, which creates a huge difficulty ... So this very, very good technology makes it more difficult than it makes it easier.”

The analysis of the interviews revealed a complex reality, with both advantages and disadvantages associated with the ongoing processes of innovation that healthcare and its workers have undergone in recent years. While there is a perception that innovative tools and technology will benefit the system, its workers, and its patients, there is also a paradoxical concern about the problems and challenges that accompany it. Consequently, there is uncertainty among workers about whether these changes will ultimately benefit the patients, the system, or themselves.

“Overall, the changes are positive, but you have to be very careful to keep your foot on the brakes so as not to lose [control of] it. Also, in terms of professional diagnosis, you don’t want to miss an important diagnosis because of this.”

There are two sides to it ... on the one hand, it gives us the opportunity to treat and listen to the patient better, but on the other hand, it complicates the whole process because you have to write points on the page and then write on the computer and you don’t always have time to do all that.”

Cyber security. In this theme, the interviewees also mentioned the issue of cybersecurity, underscoring their challenges with maintaining medical confidentiality, as they feel responsible for safeguarding patients’ sensitive information. However, they expressed concerns about the security of these data as cyber-attacks and information breaches could undermine their ability to protect it effectively. This created complexities in how they managed and protected medical information.

“I’m not very familiar with this area, but if they can break into a big hospital, I think you can break into anything. The Pentagon being hacked means that everything can be hacked, so you have to be careful what you write, how you write. I’m sorry to say that sometimes I go through and see some kind of open computer that anybody can log on to, and that bothers me a lot.”

There were quite a few colleagues here whose trigger was information security. The fear of abusive use of information. Personally, I don’t think you can avoid it. It’s there. We need to think about how to make it more secure, but it seems to me that the train has left the station.”

Efficacy of using resources. Reflecting on the theme of resource efficacy within the healthcare system, they highlighted the nuanced balance between embracing technological advancements and managing the practical implications of such innovations. These technologies undoubtedly improve efficiency and the quality of care, yet they also underscore the challenge of optimizing their use without overextending already limited resources.

It is definitely a double-edged sword. On the one hand, it really opens up the opportunity for us to be present with our patients, to really listen to what they’re saying. But on the other hand, it makes things quite complicated. We have to take notes on paper and then we have to enter everything into the computer. And to be honest, there’s not always enough time to do it properly.”

Quality and treatment conflict

The *quality and treatment conflict* theme embodies four sub-themes, including *computerized conflict*, *time conflict*, *face to face vs. virtual*, *responsibility and accountability*, and *paternalism and co-creation*, *patient self-governance*. All sub-themes relate to complex dilemmas in quality of care and treatment as the interviewees struggle with maintaining a good quality of care in areas, such as long-distance treatment, telemedicine, and the use of technology and robotics in treatment and service.

Computerized conflict and time conflict. Within this sub-theme, the findings highlighted a significant tension arising from the increased use of computers for various tasks, leading to a time conflict. This conflict, as described, potentially threatens the quality of patient care. For example, the transition to electronic health records and the integration of patient data into specialized applications require a significant investment of time. This situation presents a moral dilemma, in which the ideal of providing high-quality care is opposed to the practical demands and time constraints imposed by technological advances.

“Registering information on a computer often limits the ability to write and describe freely. While it makes information readily accessible, it also encourages brief entries, leading to potentially important details being omitted due to the convenience of quick, click, click, click.”

“Look, you’re looking at a computer more than the patient; that’s for sure. We have a lot of stuff to fill in on the computer instead of spending time with the patient. On top of that, [the system] wants you to be trained and expects you to have conversations with the patient and record exactly what medications you’ve given them and you say to yourself, ‘if I didn’t have all these things to fill in,

maybe I could really help the patient a little bit more, manage to take care of them a little bit more'. So it's hard, sometimes I'd rather not have it."

Paternalism and co-creation, patient self-governance. The interviewees highlighted a significant shift in the patient–therapist dynamic, moving from a traditionally paternalistic relationship toward a more balanced and collaborative model, largely facilitated by the advent of digital technologies. This evolution toward patient self-governance and empowerment is notably supported by digital tools that enhance patients' access to their own medical information and enable more informed participation in their treatment plans. For instance, the use of electronic health records (EHRs) and patient portals allows patients to review their medical data, test results, and treatment options at their convenience, fostering a sense of ownership and responsibility over their health decisions. Additionally, mobile health applications and online resources provide patients with the means to understand their conditions better, track their health progress, and communicate more effectively with their healthcare providers. This digital empowerment challenges traditional healthcare roles and necessitates a reevaluation of ethical considerations surrounding patient autonomy as healthcare professionals must now navigate the balance between guiding treatment and supporting patient-led decision-making.

"At the end of the day, I think it is important for both the patient and the therapist/ provider to understand that this is a relationship that is designed to take care of the patient, not just in terms of health, but something more holistic. Sometimes it requires the therapist/ provider to move a bit away from the old patronising attitude that I decide what is good for the patient without [the patient] even having an opinion on the matter, but to understand that it is something collaborative, what the patient wants, but even that is not easy."

Another aspect of this sub-theme is the patient's level of accessibility to medical information. This again contributes to the change in the position of the caregiver.

"Patients are digitally equipped and use Doctor Google ... It makes information accessible, but it is difficult to explain to patients that there is no screening and no internal control and that everyone can read what they want. ... You have to give it the right proportions."

Responsibility and accountability. The evolving patient–therapist dynamic introduces ethical considerations of responsibility and accountability, reflecting the changing nature of their relationship. Ethical considerations are related to

issues of responsibility as the role and status of the carer evolve alongside increased patient autonomy and participation in the treatment journey. For example, the integration of digital wearable devices and increased access to medical information has led some respondents to express concerns. They highlight that this accessibility could, at times, shift some of the responsibility for diagnosis and treatment away from the doctor.

"With all the liberality and freedom, I think the medical staff should take more responsibility for the patient ... I think they should be responsible for a lot of things. There's a problem with that: on the one hand, I don't think that responsibility should be given to unprofessional people, on the other hand, today there's so much freedom to do what you want, so you come up with complaints later."

This also extends to the responsibility associated with the digital tools themselves—questioning the extent of their accountability for the tools' operation and use.

Take, for example, a big data app that predicts diseases by analyzing changes in a baby's heart rate. It makes me wonder, what's my responsibility here? Do I act on this data, or do nothing since medicine isn't always black and white? But then, what about the baby's vital signs? Should these changes prompt me to check on the baby more closely?"

Face-to-face vs. virtual. According to the interviewees' analysis, another significant factor affecting the *quality of treatment* is the conflict of *face to face vs. virtual* in treating the patients and the absence of physical touch in long-distance treatment. The interviewees expressed ethical concerns about their ability to provide effective and compassionate care in scenarios where they interact with patients via computers, such as Zoom, or other platforms and rely on technological tools, such as Tyto, to gather necessary information.

"There is no other way to replace the direct contact between doctor and patient. It is very, very important, it is nice that you are available and that you answer video and WhatsApp calls, no doubt it is appreciated, but still direct human contact is a very important part of the doctor's work."

They also pointed out that, regardless of the consensus that digital transformation contributed to maintaining the quality of care, the use of this tool has also generated a lack of time and resources that could have spent attending to the patients.

"When you go digital, you spend a lot of time writing on your computer. And today it is understandable that you

spend a lot of time writing, and I think if you think about the number of patients we see on a daily basis, the time I have with a patient that I actually see and talk to [them] is significantly less because of digitalisation.”

Information and knowledge conflict

In the *information and knowledge conflict* theme, two sub-themes were obtained: *overflow of information* and *mentoring and training*. Overall, the interviewees agreed that the contribution of digital tools to the level of professionalism and knowledge in the profession are important in terms of adding opportunities to help with diagnostics, consulting with colleagues around the world, computerizing processes, and the use of digital tools to expand this capability.

Overflow of information. At the same time, while recognizing the importance of these technologies in enhancing their professional knowledge, they often lead to an overwhelming influx of information. This overload makes it difficult to focus on relevant material and can result in time being spent with little or no tangible benefit.

“It is difficult for people to separate true information from false information. One of the things we’re working on is generating more data that people can rely on. There is a lot of disinformation, and there is too much information that is not always accurate and not always reliable.”

Mentoring and training. In this category, the interviewees emphasized their need to learn and train in order to have optimal use of the technological tools once again—the system’s lack of resources clashes with their concept of professionalism. The interviewees emphasized the importance of diverse learning methods and training, noting that younger generations are generally more adept at learning quickly and adapting to changes. They argued that this might lead to a sense of being overlooked by the system and a feeling that their needs are not being adequately fulfilled.

“I can’t keep up with the development of technology. For example, yesterday, I had a patient who wanted me to email him a letter to the emergency department, and I couldn’t do it. I told him I would fax it to him, but he said it was not up-to-date. Sometimes it’s hard for me to keep up with learning how to work with these technologies.”

The senior doctors, who put their ears to the heart to hear, see that the digital transformation has taken us away from the patients and the logical practice. They think that we have neglected contact with the patient in favour of technology.”

According to the interviewees, they struggle to fully embrace the change process due to constraints, such as time, effort, and resource limitations within the system. Although they recognized the importance of investing in the process, they sometimes felt inadequate as professionals because their tools, equipment, and knowledge were not as perfect as they would have liked, which could ultimately hinder the benefits for their patients.

“There’s a lot of technology that hasn’t been adapted to the whole system yet. So not every place knows how to use that technology. You need very skilled people to use smart technology.”

Personal needs and values

This theme embodies three sub-themes: *boundaries* and *personal price*, *personal values*, and *defensive medicine*.

Boundaries and personal price. Several important issues are reflected in the *personal needs and values* theme, among them were the changes in the role of the caregiver, resulting in a blurring of boundaries. They face dilemmas concerning the personal cost they must bear due to the absence of boundaries, unclear working hours, and an unrewarding workload.

“This has led to a major change in the nature of work and also in the location of work and the boundaries, because there is no such thing as going to work. Work goes with us.”

There are no working hours. I go to work, go home and continue working on the computer. On the one hand, there is availability, on the other hand, it is very difficult to find a balance between work and private life. I think it affects the quality of the work.”

Personal values. The health professionals highlighted an internal conflict: the tension between the benefits of digital tools and the fear that these technologies could undermine their ability to provide compassionate hands-on care. They value empathy, direct patient interaction and the human touch as core elements of healing. While acknowledging the efficiency that digital tools bring, there’s a concern that an over-use of technology could undermine these essential personal values, suggesting that traditional methods of care may sometimes be more effective.

There’s a certain discomfort I feel when I cannot physically examine a patient, see them in person and fully understand their situation. It’s challenging to make decisions or provide treatment without that direct, visual assessment, even for the patient. However, I acknowledge that there

are times when virtual consultations can make things easier for everyone involved. Deciding when to choose these virtual interactions over face-to-face visits is really a matter of clinical and ethical judgement and the nuanced art of medicine.

In addition to the internal conflict between using digital tools and maintaining compassionate care, healthcare professionals also express concern about external pressures. In particular, they worry that the adoption of these technologies and processes may be driven more by competitive advantage or business profitability than by direct quality or benefit to patient care. This concern suggests that the drive for technological integration may sometimes conflict with their core values, which should always be focused on the welfare and benefit of the patients they serve. This layer of concern adds complexity to their dilemma as they navigate not only the impact of technology on their practice, but also the shifting priorities of the broader healthcare landscape.

Virtual visits aren't paid at the same rate as in-person visits. As a result, there's a tendency for the hospital to encourage in-person visits because of the greater financial benefit. However, this approach doesn't always serve the best interests of our patients, and sometimes it feels like the financial incentives don't quite align with prioritising their needs and well-being.

Defensive medicine. The interviewees also delved into personal dilemmas regarding whether the digital transformation and computerizing processes serve their interests. They pointed out that the tools assist them in recording information and enhance their professionalism by helping them remember and better manage tasks, which could be beneficial as they strive to provide the best treatment. However, they acknowledged that this technology could allow their supervisors to monitor them more closely, potentially leading to defensive medical practices and a sense of mistrust and insecurity within the system.

"We have to make sure that they don't come back to us later in the reviews: 'Why didn't you do that?' As if it were better for us to end up with a description that looks 'good' on the computer.

Everything is recorded. ... Everywhere in the department, they film 24 hours a day, and there is someone there or maybe a few people watching. For example, if you don't give eye drops at 8am, you get comments on the weekend."

Discussion

In the last couple of decades, the healthcare system around the world has been facing tremendous global and local

changes that affect the system at all its levels.¹⁻⁵ The recent years and the recent crisis of the COVID-19 pandemic have accelerated the severe situation of chronic crisis in terms of the gap between demand and supply that is widening by the day. This reality forces policy-makers and management strategies in the healthcare systems to accelerate strategic change and embrace digital transformation in healthcare systems worldwide.^{2,6,9,10} However, these far-reaching changes must be addressed in the mezzo level as well as at the micro level as these processes are likely to become more extreme in the future and influence healthcare's well-being and work satisfaction.²⁸

In light of the above, this study examined the effect of the strategy and implementation of digital transformation in healthcare organizations in terms of conflicts and moral dilemmas that health professionals face daily. The finding presents a wide range of conflicts and moral dilemmas that add to the already numerous ethical issues and moral dilemmas in health care and bioethics. Undoubtedly, digital tools will aid in narrowing the disparities in the standard of care and wait times between peripheral and central areas, consequently leading to a fairer distribution of healthcare services. Nevertheless, these tools also present several drawbacks, including challenges in adaptation and limited accessibility for vulnerable populations, as well as the potential to undermine trust between medical professionals and patients.

The findings highlighted moral dilemmas and conflicts associated across three levels: macro-holistic, mezzo-organizational, and micro-individual. This highlights the need to manage organizational change at all levels of the healthcare system to embed change processes better.⁹ At the macro level, ethical issues such as economic considerations, equitable access to healthcare resources, the pros and cons of technology, and cybersecurity concerns have either emerged or worsened. These challenges necessitate a strategic approach by policy-makers and stakeholders to effectively allocate resources, set public health priorities, and balance the integration of technology within healthcare systems.

Within organizations, at the mezzo level, the transformation in processes is reshaping organizational visions, goals, and cultures. Decisions regarding resource allocation, workforce management, and the implementation of digital health solutions are leading to ethical dilemmas. These include conflicts between ensuring quality care and operational efficiency, maintaining patient benefits while managing costs and integrating digital health technologies. The findings suggest that these changes often result in conflicts of interest and values among healthcare professionals, highlighting the need for a balanced approach that considers both financial and medical ethics, equitable healthcare provision, and the challenges of digitalization.^{24,25,28,40}

Some of the conflicts here are also manifested in the micro-individual level as healthcare professionals are

coping with a broad range of changes that affect their day-to-day work, such as home care, remote treatment, use of technology and robotics in treatment, change in the nature and character of the patient–provider relationship, and the patient’s degree of autonomy and involvement in the treatment process, as presented here and in addition to various studies in recent years.^{41–43} This gives rise to many moral and ethical dilemmas as the principle is to provide the best possible treatment in light of the new tools and possibilities and according to the new status and complexity of the patient–provider relationships, for example, making a choice for a patient that may violate their autonomy. Another dilemma relates to the lack of time and resources in prioritizing their time at work, conflicts of face to face vs. virtual treatment for the benefits of the patients, etc. At this level, healthcare professionals also refer to their personal needs and values as sometimes they feel neglected and not seen by the system and management. They refer to the blurred boundaries conflict in relation to personal time, effort, and responsibility and the personal price they have to pay, which can result in defensive behavior and defensive practice out of alignment with their values and beliefs, which may neither be to their overall personal benefit nor to the benefit of the organization and patients.

These realities highlight the need for appropriate and inclusive action on the part of all levels of the system and the individual. Research has shown that persistent moral dilemmas and conflicts of interest can challenge an individual’s internal values.^{28,31,32,44} This scenario can result in moral distress, where the individual is aware of the moral course of action but fails to act accordingly, causing psychological distress due to the inability to do what is right, according to their values. This might lead to burnout, a decrease in patient interaction or even leaving the healthcare profession.^{29,44,45} The findings of this study, combined with data from earlier studies, highlight and map the healthcare professionals’ challenges and moral conflicts that stem from the implementation of strategic change and digital transformation. These challenges and moral conflicts can be barriers to bringing about the necessary changes; hence, it is up to the management and key stakeholders to implement these processes in a way that addresses their conflicts and challenges.

Study limitations

The exploration of dynamic and emerging processes in healthcare technology is crucial for maximizing their effectiveness and impact. However, this study faces limitations that highlight areas for further inquiry. A notable limitation is the scope of perspectives included in our analysis. While we have endeavored to understand the strategic impact of technology in healthcare, our study did not encompass a broad spectrum of viewpoints from various stakeholders,

including patients and healthcare professionals from different specialties. This limitation suggests that our understanding of the complexities and nuances of technological integration in healthcare might be incomplete. Furthermore, the study’s design did not adopt a longitudinal approach, which is essential for capturing the continuous and rapid evolution of technology in healthcare. The absence of a longitudinal perspective means that the study may not fully account for the ongoing innovations and their long-term effects on healthcare practices and outcomes.

Additionally, the use of snowball sampling introduces bias and reduces the representativeness of the sample. The study’s location involving public general hospitals in central Israel also limits the generalizability of findings as healthcare systems vary geographically and structurally. This limitation underscores the need for future research to incorporate diverse stakeholder perspectives and employ longitudinal study designs to ensure a comprehensive and up-to-date understanding of how technological advancements are reshaping healthcare.

Conclusions, practical recommendations, and future direction

This study set out to explore the strategic implementation and impact of digital transformation in healthcare organizations, with a particular focus on the ethical conflicts and moral dilemmas faced by healthcare professionals in their daily practice. Our findings reveal a wide range of ethical conflicts and moral dilemmas across the healthcare system, from the macro-holistic to the mezzo-organizational and micro-individual levels. These challenges inherent to healthcare and bioethics are intensified by the rapid integration of digital tools and technologies. While digital transformation has the potential to reduce disparities in the quality of care and waiting times, particularly between peripheral and central areas, it also poses significant challenges, including difficulties in adaptation, accessibility issues for certain populations, and the potential erosion of trust and responsibility between healthcare providers and patients. The study highlights the urgent need for wide-ranging action at all levels of the healthcare system to address the ethical conflicts and challenges posed by digital transformation. The persistent moral dilemmas and conflicts of interest highlight the potential for moral distress among healthcare professionals, which can lead to burnout, reduced interaction with patients, or even leaving the profession. Accordingly, we present several policy recommendations to support decision making by healthcare professionals at all levels. The development of comprehensive policy frameworks is essential in guiding the ethical integration of technology in healthcare. These frameworks should address economic inequalities, ensure equitable access to healthcare resources, and outline standards for the ethical use of technology and privacy. At

the mezzo level, the creation of an organizational framework for ethical codes of conduct is crucial. Establishing a well-defined ethical framework adapted to digital changes will provide ethical guidelines for the actions of healthcare professionals, managers, and medical staff and promote a broad, holistic vision that encompasses organizational, managerial, and medical considerations across the system. This is in line with the 2017 Geneva Declaration of the World Medical Association (WMA), which calls for ethical codes that reflect the changing environment and perceptions of healthcare professionals. In addition, the development of ethical leadership and awareness throughout the system and at the individual level is essential. This should be integrated into the training processes for healthcare students and staff as ethical leadership has been identified as a key factor in creating such a climate. Personal mentoring of healthcare professionals can address both technical and social aspects, especially for those less familiar with digital tools. These processes will foster an organizational culture that serves as a supportive framework and upholds the organizational and individual code of ethics. This organizational climate will enable healthcare professionals to openly express their dilemmas and conflicts, creating a safe space for them to share their inner experiences. This environment will strengthen them and encourage the development of moral courage, which is the ability to take the right action despite external pressures. Practice and guidance are essential in fostering this quality. Given the importance of this issue and the expected pace of change in the coming years, researchers are urged to continue to explore this phenomenon. Using research to improve our understanding and awareness and to identify potential interventions to minimize the challenges and moral distress faced by healthcare professionals will benefit the system, its staff, and the patients it serves.

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