

# The effect of digitalization on service orientation and service perception among Israeli healthcare professionals: A qualitative study

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## Abstract

**Objective:** Healthcare systems globally are adapting to rapid changes, including digitalization, to thrive. The main objective of this study is to investigate the impact of adapting to rapid changes, including embracing digitalization on the services provided by healthcare organizations, by mapping the healthcare professionals' perceptions and characterizing their experiences, as well as examining the difficulties and barriers they face in transforming their organization.

**Methods:** This qualitative study, based on semi-structured in-depth interviews with 38 healthcare professionals, examines the impact of embracing digitalization in service and clinical care and their perception of service. Interviews were analyzed using a categorial deductive and inductive approach across three levels.

**Results:** Eight main themes arose from the analysis: *The need for change, The importance of change, Communication, Training, Competitive leverage, Challenges and barriers and Implications for patient-therapist relationship*. The themes and subthemes were examined through the three levels of organizational change—the system, the organization, and the personal level. The results of the study indicate limited embrace of change within the systemic and organizational levels and inconsistencies across the three levels. The study also highlights the barriers and difficulties that stand in the way of these processes of change and development.

**Conclusions:** To ensure successful implementation, these processes require systemic planning, including budgeting for personnel training, organizational adjustments, and technological equipment. Additionally, addressing personal-level considerations such as relevant training and setting boundaries for caregivers is crucial to prevent burnout. Effective planning and management of these changes will facilitate optimal assimilation and enhance system efficiency.

## Keywords

Customer orientation in the healthcare system, strategic change, digitalization in healthcare, hospital management, digitalization in service delivery

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## Introduction

Global healthcare systems face evolving challenges: technological advancements, digitalization, demographic shifts, political dynamics, rising costs, mismatches between needs and demands, and quality concerns.<sup>1,2</sup> To survive in a competitive market, healthcare organizations must adopt change models and implement necessary changes at all levels of the system.<sup>1–5</sup>

One area in healthcare in which far-reaching changes have taken place is customer service. Recent years have

seen health organizations making substantial investments in their services, reflecting the importance they ascribe to this aspect of their activity.<sup>6</sup> Service improvements reflect

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organizations' customer-centric efforts to differentiate themselves and enhance their reputation and positioning in a competitive environment. To achieve this, it is crucial to embrace business strategies and integrate them into the organizational culture at all levels. This promotes organizational adaptation to the evolving market and ensures long-term survival.<sup>7,8</sup> When such processes take place, a conceptual shift occurs from paternalistic to patient-centered medicine.<sup>9,10</sup> This new approach is essential to meet evolving patient expectations as informed consumers, increased information accessibility, and shifts in the patient-caregiver dynamic. Service excellence has become a prominent goal for healthcare organizations.<sup>11</sup> Incorporating this approach into healthcare organizations requires attention to both care and care management. Current assessment criteria have expanded to include customer service aspects like accessibility, availability, clinical continuity, endurance, and attitude. Organizational aspects such as resource utilization, avoiding duplication, and quality are also considered.<sup>12,13</sup>

The COVID-19 pandemic impacted healthcare with increased workloads, staff shortages, and equipment deficiencies. Healthcare organizations faced challenges in competitiveness due to canceled surgeries, longer wait times, social distancing, reputational damage, reduced revenues, and financial instability.<sup>14–16</sup> However, the pandemic catalyzed the adoption of new technologies, leading to organizational changes, innovative tools like robots, and improved accessibility, patient-centered approach, and involvement in the clinical process and communication with caregivers and organizations.<sup>17</sup>

These ongoing changes have had significant impacts on both medical practices and organizational dynamics. To further enhance these processes, it is important to identify and address the barriers and challenges associated with digitalization. Understanding the implications of digitalization on patient-centered care enables improved and transparent medicine, strengthening trust and responsiveness.<sup>18,19</sup> Therefore, the literature review will focus on service orientation within the healthcare system and examine the effects of digitalization on service in the healthcare industry.

Customer orientation in an organization means that the organization delivers personally tailored services to its customers, responding to their interests, needs, and expectations.<sup>20</sup> Health organizations now treat patients as customers, aiming to meet their expectations.<sup>21</sup> The customer-oriented approach, using "customer" for patients, is now common, but it wasn't always the norm in medical care. This shift reflects the transformation of physicians, managers, and the healthcare system as a whole in treating patients as customers.<sup>4</sup> Service is now an integral part of the organization's value chain, playing a crucial role in shaping its differentiation and competitive strategy. It serves as a valuable resource that offers differentiation and a competitive edge.<sup>22,23</sup> Organizations prioritize patient-centered products and services, empowering patients to be

more active in decision-making.<sup>24,25</sup> Service orientation enhances organization's customer focus, professionalism, performance, and patient outcomes, leading to a competitive advantage.<sup>26</sup> This occurs at three organizational levels: systemic, organizational, and personal.<sup>25</sup> On the systemic level, the healthcare system adapts to a competitive market, establishing protocols and regulations to standardize service quality across organizations.

On an organizational level, being service-oriented and customer-focused involves strategic planning, cultural change, implementing standards for positive patient experience, and emphasizing patient and family-centered vision and values. It also includes innovating service access, customized marketing, and fostering service consciousness among administrative and clinical staff.

On the personal level, Service orientation greatly impacts the patient-caregiver connection, trust-building, patient satisfaction, and responsiveness to treatment. Shifting from paternalistic to patient-focused medicine rebalances power dynamics and reduces the asymmetry in the patient-caregiver relationship.<sup>12</sup> It was found that Involving the patient in decision-making and the therapeutic process enhances responsiveness to treatment, improves medical care, and increases patient satisfaction.<sup>27–32</sup> These developments, however, pose new challenges to organizations.

These changes occur alongside the widespread digital transformation revolution, particularly prominent in healthcare with advancements in clinical care, diagnosis, research, service, and accessibility.<sup>33,34</sup> Integrating technology improves performance, streamlines processes, and optimizes resource utilization, aiming for stability and sustainability.<sup>33,35</sup> These changes encompass various aspects of medicine and utilize artificial intelligence, big data, robots, and digital equipment to enhance diagnosis, knowledge sharing, personalized medicine, and remote care, benefiting individuals and healthcare organizations.<sup>17,33</sup>

Service-related activities, like appointment management and telemedicine, have transformed with the availability of applications and devices for accessing clinical information and databases, managing appointments, and utilizing medical applications. Digitalization offers clear advantages, improving medical care safety, care management, follow-up possibilities, and patient responsiveness. It enables more advanced and effective procedures. However, introducing new technologies presents challenges for patients and care providers, as implementation poses numerous difficulties.<sup>35–39</sup>

In Israel, healthcare digitalization aligns with global trends and faces challenges from local reforms, competition, and patient empowerment. The complex system comprises diverse health organizations with varying ownership and characteristics.<sup>3,4</sup> In this sense, Israel serves as a case study for healthcare systems facing similar challenges. Implementing digitalization in healthcare requires careful planning and cross-organizational cooperation to overcome difficulties. Thus, researchers play a vital role in advancing

knowledge and establishing a strong theoretical foundation for successful digitalization, benefiting patients and caregivers.<sup>33</sup> Therefore, the current study seeks to examine the influence of digital transformation in healthcare organizations on service, by mapping perceptions of medical professionals on the subject and characterizing their experience, difficulties, and barriers during organizational changes.

## Methodology

### Study design

The study employed a qualitative, in-depth semi-structured interview design to investigate the impact of digital transformation on healthcare organizations and on healthcare professionals' experience of providing care and their perceptions relating to service, as healthcare organizations have been striving to adopt business strategies and enhance their customer orientation. A diverse sample of 38 healthcare professionals, from four large hospitals in central Israel participated in the study.

The chosen methodological approach is appropriate for this study because the implementation of adaptive change processes and digital transformation within hospitals occurs in a complex and dynamic environment. This environment is influenced by various external factors that are primarily mediated by individuals within the hospital. Therefore, gaining insights into their perspectives, character, and worldview is vital for comprehending the change processes and their ramifications.<sup>40–42</sup> To achieve a comprehensive understanding of their coping mechanisms, participants were provided with an opportunity to express their experiences in subjective terms that cannot be quantified. These personal accounts were analyzed solely through qualitative means to explore the nuanced aspects of their experiences. Each argument or generalization drawn from the participants' words is grounded in the empirical evidence provided by the quotations.<sup>41</sup>

### Study sample and settings

A total of 38 healthcare professionals participated in this research, comprising 18 physicians (12 male and 6 female) and 20 nurses (16 female and 4 male). In this research, healthcare professionals are regarded as integral members of the healthcare clinical team. This includes senior general doctors, specialists, and nurses, regardless of their gender or specific specialization. These professionals were actively employed in four public general hospitals situated in central Israel. The selection of these medical organizations was based on specific criteria, including size and location, with a particular emphasis on hospitals operating in competitive and dynamic environments. Therefore, four large hospitals were selected. The choice

of these hospitals was made considering their workload and size, as well as their implementation of new technologies. This approach aimed to capture a diverse range of healthcare settings through different hospitals and different departments that could provide valuable insights into the effects of digitalization on service orientation and perception among healthcare professionals. A preliminary list of healthcare professionals from the selected hospital and department was created, and an invitation to participate in the research was sent to them by mail. Additionally, participants were requested to recommend other eligible healthcare professionals who met the study criteria. By utilizing a snowball sampling approach, the study aimed to include a diverse range of healthcare professionals who could offer valuable insights into the research topic, even if they were not initially on the primary list. This sampling method involved identifying initial participants and relying on their assistance to refer other eligible individuals within their professional network.

Healthcare professionals with less than 4 years of work experience in the specific hospital or those primarily employed in hospitals or medical centers located in peripheral geographic areas were excluded from the study. This criterion aimed to ensure that participants had a certain level of professional experience and were working in hospitals situated in more central or urban regions, which may have different dynamics and factors influencing service orientation and perception. As a result of applying the exclusion criteria, two interviews were excluded from the final sample. Therefore, the study included a total of 38 healthcare professionals who were interviewed. The sample size was determined to be sufficient, adhering to the principle of data saturation. Through qualitative analysis, the identified categories and themes consistently emerged, indicating that a larger sample size was unnecessary to achieve a comprehensive understanding of the research objectives.<sup>40–42</sup>

### Data collection tool

Semi-structured interviews have a flexible structure. Facilitated by open questions, they encourage the interviewee to tell his or her story. Therefore, a pre-drafted guidance page with general questions, which was not presented to the interviewees, was used by the interviewers as the basis for the conversation.

The guidance page was created by drawing upon previous research that analyzed the evolving ecosystem of healthcare organizations and focused on strategic changes and adaptations within them. The questionnaire was developed based on a previous research questionnaire. This study serves as an extension of one of the recommendations derived from the background research and its findings.<sup>3,4</sup> The semi-structured interview guidance draft consisted of two main questions designed to capture participants'

perceptions. The first question sought to explore the changes in the healthcare market over the past decade and their influence on both the overall system and the participants' respective organizations. If participants did not naturally address the topic of technology and digital transformation, an additional prompt was introduced to encourage their input on this aspect.

The second question focused on participants providing their own account of the specific changes that have occurred within their hospital, with a particular emphasis on digitalization and focus on topics relevant to the research, such as the caregiver's experience, difficulties they have faced, their perception of the quality of service provided, relationships with patients, and service orientation. Participants were encouraged to describe how these changes have affected their personal experiences, the challenges they have encountered, and the impact on their colleagues and patients.

Participants were encouraged to freely share their experiences and perspectives and reflect valuable insights regarding the changes in the healthcare market, the impact of digitalization in their specific hospital, and the personal experiences and challenges they are facing, allowing them to narrate their stories in an open and unrestricted manner. By encouraging interviewees to speak freely, the study sought to capture rich and authentic narratives that would provide valuable insights into the research topic.<sup>40–42</sup>

### *The study procedure and ethical considerations*

After obtaining ethical approval from the ethics committee of Hadassah Academic College, the research team initiated contact with healthcare professionals via mail using snowball sampling. Upon their agreement to collaborate, an invitation for a Zoom meeting was shared with the participants to facilitate the interview process. Considering the time constraints of interviewees, we scheduled interviews per their requests. Only invited participants could enter the Zoom meeting using a password. Before each interview, participants were provided with a consent form to review and sign. The form confirmed the study's approval by the ethics committee, informed participants of their right to discontinue the interview at any time, and assured them that their personal information, including names and workplaces, would remain confidential and undisclosed. All interviews, lasting approximately 45 min each, were conducted in 2022 with the participants' consent. The interviews were recorded and transcribed in accordance with the norms of transcription. All interviews were conducted by the PI and her research assistants—students of healthcare management—who had been carefully trained by the PI, including special guidance before and after the interviews to help them process the data and their emotional reactions. All interviews were conducted in Hebrew, and following data analysis, the findings were translated from Hebrew to English.

### *Data management and analysis*

The information collected in the interviews was analyzed within both the categorial deductive approach—which is based on themes that exist in the proposed theory—and the inductive approach, which encourages the researcher to identify additional categories that emerge as meaningful during the analysis. Combining these methods throughout the process of analyzing the data is considered essential<sup>42</sup> because it allows the researcher to address the categories that derive from the theoretical basis as well as new categories that arise from the data.<sup>43</sup> This method has been chosen for this research due to the complex reality within which transformations occur, a reality that is also affected by hospital and medical center-internal dynamics. Therefore, the character and worldview of our interviewees is a critical element in understanding these changes and how they are handled.<sup>40</sup> The analytical process comprised five primary stages. Initially, the interviews were read and reread independently to identify emerging themes. Subsequently, all data related to the already classified themes were examined and analyzed. The data were then sorted, and related themes were combined and categorized into sub-themes. These sub-themes were integrated to construct a comprehensive representation of the participants' interpretations of their coping experiences. Additionally, the themes were organized across the three levels of the healthcare system, allowing for a broader perspective when combined with relevant literature. In instances of disagreements or differences between researchers, resolution was achieved through thoughtful discussions and mutual consensus.

### *Trustworthiness*

Ensuring the trustworthiness of a study is crucial to establish the credibility and reliability of the findings. In this research, rigorous measures were undertaken to maintain the trustworthiness of the study. This included selecting qualified researchers with relevant expertise in healthcare, ensuring accurate and credible research, employing rigorous methods for data collection and analysis by carefully designed questions facilitated detailed responses, including a diverse sample of healthcare professionals, using multiple data sources to validate findings, and maintaining transparency through reflexivity and detailed documentation. These measures enhance the credibility and reliability of the study.

### *Results*

The analysis of the 38 interviews revealed eight main themes, which were explored across the three levels of organizational change in customer orientation. They are presented, as seen in Table 1, classified into the emerging themes and sub-themes. As the table shows, some categories or sub-categories only applied to one or two of the three

**Table 1.** Themes and sub-themes by organizational levels.

Theme	Sub-theme	Systemic level	Organizational level	Personal level
The need for change		✓	✓	✓
Change processes	<i>ununiform assimilation</i>	✓	✓	
	<i>gaps between units and departments in the same organization</i>		✓	
The importance of change	<i>care continuity</i>	✓	✓	
	<i>efficacy</i>	✓	✓	
	<i>availability</i>			✓
	<i>quality</i>			✓
Communication	<i>internal communication</i>		✓	
	<i>internal management</i>			
	<i>communication with patients: digital versus frontal</i>			
Training	<i>digital literacy</i>		✓	
	<i>skills</i>			
Competitive leverage			✓	
Challenges and barriers	<i>work overload: time, duplicity, equipment</i>			✓
	<i>blurred boundaries</i>			✓
	<i>digital orientation</i>			✓
	<i>reward problem</i>			✓
	<i>accountability</i>			
	<i>cyber risks</i>		✓	✓
Implications for patient–therapist relationship	<i>patient experience</i>			✓
	<i>caregiver experience</i>			✓
	<i>patient empowerment</i>			✓
	<i>defensive medicine</i>			

examined levels. The categories *need for change*, *change processes*, and *importance of change*, including their sub-themes, applied on the systemic and organizational levels. The categories and sub-categories *internal managerial communication*, *communication with patients*, *training*, and *competitive leverage* were only addressed on the

organizational level. The category *implications for patient–therapist relationship* and sub-categories *caregiver experience*, *patient experience*, and *patient empowerment* were addressed on the personal level. The category *challenges and barriers* related to all three levels: the system, the organization, and the personal level.

When interviewees related to the systemic level, they reflected on the transformation of the healthcare system as a whole, emphasizing how important it is to make the necessary overall adjustments. The study participants were in agreement regarding the foundational need to adapt to changes and embrace transformations to meet the needs of a shifting market. An additional emerging necessity was to improve the system's effectivity.

*Innovation and technology undoubtedly work to our benefit. It allows us, on the professional level, to be much more professional, make much better decisions, and it allows us really to get the most complete information, which is great, and really needed in today's reality.*

Despite the widespread understanding that changes are necessary, interviewees reported that the various organizations in the healthcare system did not demonstrate uniformity in software or work methods. This fact interfered with information sharing between organizations and compromised the continuity of care.

*On the systemic level, these systems still do not function properly, because they are being developed and formed and are not yet perfect. For example, communication between hospitals. A month ago, a patient was hospitalized at ... (name of hospital), he was released and came to me. I have no way of seeing the report of his release! Why?...*

This problem was also reflected in the nature of the technologies that were proposed and embraced and the equipment itself. Some of the staff were not familiar with the available options, and differences were reported between practitioners working at community clinics and those working in hospitals.

*Many have experienced this... but it is not the mainstream of the healthcare system right now and it varies a lot from one hospital to the next... the governmental hospitals work differently, in \_\_\_ they work with different systems... generally, there hasn't been any major leap in the last decade in terms of the entire healthcare system...*

An additional difficulty exposed in the interviews was that the healthcare system did not seem to make the necessary workload and workforce adjustments in order to meet the new developments.

*This doesn't work... it always boils down to insufficient staff... it's quite nerve wrecking and of course there is no financial ability... certainly this is a problem, no doubt, that in a future world with digital means... I am not a medical economist but in terms of economizing and prioritizing and allocating resources to the right places—we don't have that right now.*

On the organizational level, other prominent categories were *change processes*, *organizational communication*, *training*, and *competitive leverage*. For example, the category *importance of change* was expressed on the organizational level.

*I think progress allows us to receive the information more fully, things are faster, more advanced, helpful for the treatment and help the whole system to be organized, on the departmental aspect too.*

Participants reported differences within the organization regarding the degree to which digitalization was assimilated, including using technological tools for service and patient management. In other words, an organization may have incorporated a system only partially, or incorporated different systems.

*But after the surgery they have to go to recovery, which is a different ward. There they don't use computers at all, I don't know why...it's really a problem.*

*Our ward is entirely computerized, but when patients arrive from day-hospitalization and come directly here there's a problem. I know that in day-hospitalization they work with paper, so I see their papers and I see how they worked.*

Another sub-category relevant on the organizational level was *care continuity*, because maintaining care continuity within the same organization is problematic when the organization is only partially computerized. Interviewees reported that these circumstances, when some information was computerized while some was recorded manually, resulted in duplicity and added to the workload.

*In principle, in a manual record... in principle, if there is a ward that uses the same software as we do, it will go automatically to our computer. But at the ER, for instance, they don't use Kimlo (name of software) so it will not transfer automatically.*

Within the category *importance of change*, the sub-categories *efficacy* and *quality of service* emerged. Here there were differing opinions due to partial assimilation of technologies. In some organizations, employees reported effective digitalization leading to high quality of service.

*In the end it allows you access to data that you couldn't have dreamed about in the time of manual things, previous hospitalizations, you don't have to search the archives for a patient's record, prior imaging, lab tests, everything is accessible with a few clicks. It saves a lot of work and improves it too.*

*There is a lot of information in the same place and it's accessible to everybody when we treat a patient, and*

*there is a team that is so multi-disciplinary and so many people caring for the same patient, everyone writes their own consultation and the consultations are available to each one and you can get a full picture of your patient.*

Interviewees also reported that using compatible software reduced human errors caused when care providers forget details, take notes inaccurately or inattentively, make mistakes when prescribing medication, etc.

*But in the end, we are human beings. And if I work in three rooms and I just had a baby delivery in one room, and I was busy in another room, and you have to administer antibiotics at a certain time, then I get a computer alert right away. So yes, technology helps us give better quality care.*

Interviewees indicated that partial assimilation of technology led to duplicate reports, or that relying on digital equipment that did not match the needs or digital abilities was counterproductive, leading to additional workloads or waste of time and human resources.

*If I have to write everything on a piece of paper as well as in the computer what is already in the computer, then it's not really convenient, it's just more pages. Let's say that if we had a tablet...that would be more convenient.*

*It complicates the whole process because it's writing points on paper and then typing into the computer, and we don't always have time for all that.*

Another category that received significant emphasis on this level was using digital means to streamline communication, both among workers in the organization and between practitioners and patients.

*And here comes the Zoom and from a point of view of ward administration, it was "America". I can really promote—academically too, for our specialists and residents—regular meetings with multi-disciplinary teams. This raised the level of these meetings because every time we bring consultants from other wards.*

These processes allowed staff to control and monitor data in real time, even though such changes too required administrative adaptation.

*She looks at the data she has, in the end, how many tests were not done, she doesn't see us in the field anymore, she is less with us. This is annoying.*

According to interviewees, digitalization also improved diagnosis and facilitated consultation among physicians across organizations in Israel and abroad.

*We are part of the 50 counties that take part in that, and all our data go to them, and I receive all the information of all the patients in Europe... everything is of course anonymous and it's good for everyone because that's how you learn, you compare between centers and there are results that let you see and where to improve and I think it promotes all of us...*

Another sub-category is digital communication with patients. There seemed to be agreement regarding the advantages of digitalized communication for saving time and reducing costs for the patients. Yet, some interviewees were dissatisfied with the loss of personal touch in remote treatment and concerned about this trend enhancing in the future.

*I still think there is no substitution to direct touch between doctor and patient... in terms of touch and sense of confidence and the attitude towards our patients, it's very important. It's nice that you're available and answer video and WhatsApp calls, no doubt this is appreciated, but still the personal touch is an important part of a doctor's work.*

*I would miss the diagnosis if I only did it online... you have to sit, check, and feel... it also builds trust between patient and caregiver, which is terribly important...it's an important tool but cannot be a substitute. You have to use it to the right measure.*

Interviewees also addressed medical education and training, a category that applied to the organizational level as well. They claimed that digital transformation required proper training and reported varying levels of training. Some interviewees believed that the ability to adapt to new technologies depended on age and digital orientation.

*Because we are not a generation born into technology, so a lot of it we had to learn from scratch. Every new thing is stressful, and there will always be staff members who will get on board, certainly the younger ones, because everything is easier for them technologically, and the older ones, you can see them getting stressed and deterred by technology and they have barriers.*

*The older ones took much more time. To the older ones it was very hard, and to us (the younger ones) it was a bit easier. This is really a mental change.*

Participants had a range of opinions regarding the type of training and support that could be useful.

*Because my team is not big, so I have the option of doing personal training. For some, once is enough, others need*

*three or four times, and I even had someone who needed a whole week to get it. Some even need a month.*

Some interviewees mentioned certain abilities or skills as critical for assimilation of technology.

*You need some quality, probably a combination of a few things: openness to change, relatively quick adjustment, and to try, ask, inquire, not to be afraid of that.*

On the organizational level, another category emerged: the change as a competitive element against other health-care organizations.

*The more equipment or new technology you have, (the more) you will draw patients, so it does affect that very much. To our benefit, too, if we are customers or a medical team, it's for our advantage, it helps us.*

In this context, interviewees presented arguments for reinforcing the changes and directing them towards customer service, emphasizing that healthcare services should not rely solely on digitalization.

*The technologies are not those who lead the competition. What might win the competition is service, because technology you can buy, service you have to know how to produce, and preserve, and develop. You have to match between them.*

On the personal level, the most prominent theme was the effect of the changes on the patient–therapist relationship, with the sub-themes *caregiver experience*, *patient experience* (as perceived by interviewees), *defensive medicine*, and *patient empowerment*.

Most interviewees reported that in their view, the technological changes had improved patients' experience regarding the availability and accessibility of medical services. In their perception, the new service features were more convenient to patients, sometimes to physicians too. Yet, in a reality in which appointments already felt too short, providing digital services and entering information electronically seemed to increase work overload and compete for the doctor's attention when seeing patients.

*There is more satisfaction because you can turn to the doctor at any time with online requests, with questions, it's more accessible. On the other hand, there is dissatisfaction because during an appointment, the doctor is occupied with the computer and the technical aspects. I think there is room there for improvement, to make it easier for the doctor so that he can digitize but be available to the patient in front of him, and not constantly busy with entering it into the computer... so there are both these sides... this increases accessibility and communication and*

*transparency... a patient can also see, from his side, results, imaging... make appointments... it's more accessible.*

Interviewees also discussed the limitations of digital appointments in terms of providing accurate diagnosis and meeting the wide range of needs of the various wards and specialties. They also tied between digital medicine and the degree of intimacy and familiarity with a patient, such that chronic patients can be good candidates for digital follow up.

*Still, not seeing the patient and touching him and checking him properly, that part is missing... I can rely on some of the things, but I can see how he breathes, see his color, the physical checkup that includes looking, but everything else, it's hard... so I said that it was good for the case of chronic patients.*

*I think it matters which situation, in a clinic or hospital or corridor medicine... so in a hospital, in my feeling, it's less (appropriate)... a patient in E.R or internal ward, it's less appropriate... a matter of distant follow up, I don't really see that... it's still not assimilated all the way, but distant consultation in several areas—yes.*

In addition, interviewees indicated other aspects of the patient–therapist relationship that were harder to perform digitally, such as showing empathy, relieving anxieties, providing emotional support, building trust, and eliciting cooperation. They believed that these inadequacies considerably impaired their ability to offer high quality service.

*In the end, I believe medical care is 50% psychological treatment. The patient wants someone to listen, to see his distress. Obviously if you come with back pain, you want a solution, but a substantial part of that is that he wants someone to see that he's in pain and understand how much and provide an outlet for this thing... so the communication must be close, with touch, it can't be exclusively in Zoom.*

*In the end everybody understands that you must feel the patient and understand who and what is in front of you. After all, they are doctors, they are not computers and they are not robots...*

*Even the hug at the end of the conversation feels absent... when we see your face and body movement, something else of the five senses is missing, other things that I'm not sure digitation can provide a full response to...*

When discussing the patient–therapist relationship and using digital tools for customer service, diagnosis, or



therapy, participants mentioned the change in the patient's status. They believed that the change resulted from patients' exposure to information available online and their own medical records and lab results. They also thought that organizational processes such as being more transparent and providing collaborative care contributed to that change. For example, interviewees reported that patients had become more involved in the treatment, highly informed, and more demanding, while the doctor's authority diminished.

*Information totally belongs to patients... they receive the lab results before the doctor sees them... that's part of the difficulty of medicine, to break away from its paternalistic landscape... digitalization can lead to ownership, when the information is more accessible, they will feel they own it... digitalization helps us change the rules of the game...*

*The doctor, in some way, makes a recommendation... you know how to integrate between what the patient reads (on Google) and all the background and treatment options that are not always fully understood. I don't say to any patient anything with an exclamation mark. I say my opinion, but in the end it's a free market, I don't force (anything) on you... that's what I think. In the end, he decides...*

In this context, the interviewees indicated a perceptual change in the attitude towards the patient as a customer both in the service delivered and in the language used. They maintained that this shift had taken root in recent years, making medical care more difficult.

*In my opinion, the really big change is mostly that I have to call them customers and not patients. That bothers me even more. Really fun. No one is my patient, everybody is my customer, so they think I have to give them the same treatment.*

Furthermore, interviewees spoke about defensive medicine, which stemmed from a change in the doctors' status and the digital possibilities of documentation and follow up, including by the patient/customer. This, according to interviewees, could be both an advantage and a disadvantage.

*We really have to be very accurate in the information we pass along, because we must remember that today, in the digital age, I assume that anyone who comes to me... just consultation in the clinic or if it's a family that came to talk to me after a surgery, they record me... undoubtedly, this creates a kind of defense.*

*They told you to do something, you consulted and you chose not to do it, and now you're complaining because he didn't*

*explain? The patient can come and complain... I think digitalization helps the documentation of these things, it's not "he said, she said", it's documented...*

All interviewees expressed ideas related to challenges and barriers and discussed the way they were handled. This theme applied to all three levels of change. For example, interviewees reported that partial digitalization caused duplicity and that they often had to record the same information twice. They also indicated time waste and complained about the absence of technological equipment compatible with the necessary digital changes.

*As a nurse, the difficulty is that they thought we had become a machine, they actually think that. You have the computer, and a few other things, so you can treat more patients. They throw [tasks] at you, it causes medical errors, occasional impatience.*

*The rise of digitalization did not reduce the doctor's work but added [to it]. It's not that we work less but that there are more expectations... I took a blood test today and people expect [results] immediately...because an email is not something that takes time, but if you do it with 50 people, it's impossible...*

Using digital tools in patient management, care continuity, and managing medical records provided extensive exposure to information. However, given workloads and time constraints, interviewees saw this capacity as a disadvantage. In addition, interviewees believed that the inability to perform digital-based diagnosis created unnecessary workloads.

*A sea of information, and it's both an advantage and a disadvantage... in the end, not all this information is relevant, but let's say, as a doctor that receives sometimes 12 or 14 admissions a night, and you are the only physician in that shift, the amount of information expected of you—it's huge, it's an amount of information that is really huge and that I suppose did not exist in the past without the information systems.*

*In an electronic appointment, there is more tendency to send people to E.R. It's much harder to assess it, so the tendency is to send to E.R because I have no way of seeing and feeling the abdomen... because if I could see them, maybe I would be calm.*

Another challenge that came up in the interviews was the difficulty of blurred boundaries. Digitalization has obscured the lines between different therapeutic disciplines, as well as between the patient and practitioner. In addition, the

patient's identity has been blurred and the personal time and space of both patient and caregiver has been intruded.

*For some people it was very hard. It blurred the boundaries between home and work, and I think maybe also the status... some doctors felt that their status was damaged... there is no longer the doctor's magic...there was something missing for certain people...*

*If you are an accessible person and you are willing to get messages on your free time (and some people don't) so it works...*

Study participants reported that all these constraints yielded increased workload, and that the organization expected them to provide uncompromised care. Despite these difficulties, however, many interviewees indicated that the system did not reward workers who embraced the changes.

*As far as I'm concerned, at this stage it's still not...not available enough and simple to operate and something you can easily use... unrewarded, meaning that right now, for example, all virtual sessions are counted as appointments, but sometimes they take longer with all the techniques involved.*

*There are many problems with that, the system is not exactly built for that. It doesn't reward for that.*

## Discussion and conclusions

Recent years have seen accelerated transformation in healthcare systems worldwide, in response to changes in the ecosystems where these systems are active.<sup>10,44,45</sup> In light of these changes, the current study examined the effect of digitalization in healthcare organizations. These organizations are striving to become customer focused and service oriented, in order to cope with the competition in the market, adapt to the new normal, and survive in the local and global healthcare markets. Reflecting an overarching approach to organizational change, the effects were tested across three levels: systemic, organizational, and personal.<sup>25</sup>

It is highly important to manage organizational change across all levels, to assure proper management and efficacy.<sup>22</sup> Digitalization of service has become integral to an organization's value chain, and is a dominant and significant component in designing and implementing an organization's differentiation and competitive strategy.<sup>23</sup>

The findings of the current study indicate that the implications apply to all three levels—systemic, organizational, and personal—yet the extent of the impact varies within the system and even within an organization. This section will examine the changes across all levels, from personal

to systemic, and discuss their implications to the system's survival and efficacy as it becomes more service oriented and customer/patient centered.

On the personal level, the transformations seem to have a considerable impact on patient empowering, patient experience, and caregiver experience, as the physician's paternalistic role shifts and the patient's status and active involvement intensify. This finding supports previous studies, such as that of Györfy et al.,<sup>46</sup> in which doctors who provided remote digital services reported deeper, more egalitarian relationship and more engaged patients. Yet, difficulties and challenges were also indicated. For example, according to our interviewees, the changes have lessened the doctor's status as a knowledgeable authority. Interviewees reported that they had sometimes served merely as mediators between the patient and the vast amount of information, occasionally feeling unimpactful. There is also the risk to patients caused by self-access to information, some of which is not up to scientific standards and thus may lead the patient to make uninformed decisions, as also indicated in other studies for example Scullard et al. study on the reliability of medical advice on the internet.<sup>47</sup>

The study also reveals a tendency of doctors to practice defensive medicine because they are careful not to give unambiguous instructions, possibly leading to compromised quality of care. This finding lends support to other studies, such as that of Margalit et al.,<sup>36</sup> which found a dramatic decrease in the amount of information passed along in computerized patient-caregiver communication. A necessary conclusion is that digitalization must be monitored and managed, and medical staff must be supported and trained so they are able to optimize their communication with patients.

Another important point applying to the personal level is the challenge of providing medical care with personal touch. Interviewees believed that digitalization may lead to less empathic and more detached diagnosis and treatment. The reasons for that include the following: changes in the patient-caregiver relationship; decreased time dedicated to the patient; and handling technology during an appointment rather than paying personal attention. Similar findings were presented in previous research. In both Sinsky et al.<sup>38</sup> and Sobral et al.<sup>39</sup> it was found that during appointments, physicians dedicated more time (up to twice longer) to managing and recording medical information than to personal interaction with patients. This means that unless appointments become considerably longer, the time dedicated to patients will decrease while work overloads increase.

There is no doubt that on the personal level, digitalization carries benefits, but it is crucial to protect both the patient and caregiver in this regard. Organizations must strengthen the doctor's status while keeping the patient at the center. This goal can be facilitated by building a

supportive system for the doctors, setting new boundaries in digital patient management, and instituting clear medical frameworks.

On the organizational level, we can see from previous research that hospital administrations are guided by business and financial considerations and thus have become more focused on strategy and goals.<sup>3,4</sup> Digital service is part of that trend. The findings of the current study show that digital transformations are part of the effort to maximize these developments and push organizational shifts towards more patient-oriented service. Yet, these efforts are not uniform; even within the same organization, digitalization is adopted to various degrees and there are different levels of transparency and implementation of strategic change across the different levels of the organization.

Calculated application of technology can no doubt lead to organizational improvements, for example, by saving time and cost or enhancing accessibility to information and services for both caregiver and patient. However, without overall planning or clear outline and with only partial implementation, organizations risk increased workloads, duplicate records, errors, compromised quality of care, and cyber hazards. To assimilate new technologies wisely, there should be system-wide collaboration when implementing policy in customer service and in equipment, such as software, computers, tablets, cameras, etc. Furthermore, organizational change must apply to all levels of the organization; and the assimilation of new technologies must be continuous and include adjustments across all levels, which will lead to better cooperation and smoother integration.<sup>22,48</sup>

Succeeding in these efforts also requires coordinated training and easy accessibility to routine support for teams across all levels. Such support may reduce objections and improve the efficacy of the change. Other positive outcomes may include increased patient responsiveness to therapy, improved service, and enhanced satisfaction, since current reports indicate varying levels of patient cooperation and satisfaction with digital medical services.<sup>49</sup>

On the systemic level, the results of the current study show that the transformations are partial and ununiform. This can be solved if the system makes the necessary adjustments and planning. These include legislation, appropriate budgeting, coordination, and prioritizing of technologies, in terms of allocating budgets for equipment and personnel. In addition, when training personnel in the healthcare professions, including in the field of healthcare management, more emphasis should be placed on service.

The findings of this study join those of other studies in the field as they shed light on growing activity in Israel and worldwide that encompasses the three levels of the healthcare system. These shifts are expected to intensify as technology progresses and the markets change. The results of the study provide deeper knowledge on the topic, allowing us to tackle problems and meet the

challenges as we develop key processes of planning and assessment. These processes will require overall systemic planning, including budgeting of personnel training and organizational and inter-organizational adjustments in technological equipment and training. It is important for these processes to be transparent to both workers and patients, in order to guarantee cooperation throughout the system. Proper planning must also seek solutions on the personal level, such as using technology to reduce the digital overload (new innovations), offering relevant training, and setting clear boundaries to protect caregivers and prevent burnout.

Making healthcare organizations service-oriented and customer-centered may promote the service value chain. With proper planning and managing of the change such that all organizational levels are addressed, change assimilation will be optimal, and the system can improve and become more efficient. Further benefits may include better control over growing costs and predicting future problems. Overall, the healthcare system will improve its sustainability and survival chances, benefiting its organizations and patients.

## Limitations and recommendations for future research

Undoubtedly, enhancing our understanding of these evolving and relatively new processes will contribute to optimizing their impact. Further research on these phenomena from various perspectives (e.g. patient perspective) will be valuable in generating comprehensive insights and achieving better outcomes. By exploring these topics from different angles, we can gain a more holistic understanding and uncover potential opportunities for improvement and advancement.

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