Implementing electronic medical records (EMR) as a change management: challenges and insights as perceived by head nurses

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Abstract

Implementing digital information systems in healthcare presents significant technological and organizational challenges. Head nurses play a central role in this process, yet their perspectives remain underexplored. This study examined the implementation of electronic medical records (EMR) in a central Israeli medical center from the viewpoint of head nurses, focusing on change management. A qualitative content analysis was conducted based on semi-structured interviews with head nurses. Themes were identified regarding leadership strategies, challenges, and responses to EMR implementation. Five core categories emerged: (1) A positive approach to manage a change as key to successful implementation and staff mobilization; (2) EMR's perceived value in enhancing care quality, safety, and decision-making; (3) Leadership challenges in managing staff resistance through respectful dialogue and tailored solutions; (4) The importance of head nurses' active involvement and role modelling; and (5) Forming trust through transparent, committed leadership that increases cooperation. These insights may support policymakers and healthcare leaders in the European Union by highlighting the pivotal role of nurse managers in digital transitions and offering practical lessons for successful EMR adoption across publicly funded hospitals.

Keywords: Implementing electronic medical records, change management, head nurses, management strategies and challenges, quality and safety of care

Introduction

This article presents the findings of a qualitative study that aimed to investigate one of the most central and challenging issues in the healthcare domain in the digital era: implementing electronic medical records (EMR) and their meaning for the functioning of the head nurse. The aim of the article is to examine the experiences and strategies of head nurses in the implementation process, identify major challenges, and offer insights for successful management of change. EMR is a digital system for managing and documenting patients' medical information. This system allows secure keeping,

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updating, and sharing of patient data, while improving access to the information, reducing medical errors, and increasing the efficacy of clinical decision making processes (Uslu and Stausberg, 2021).

In Israel, the implementation of EMR began in the early 2000s across public hospitals, with various systems being introduced in different institutions. In recent years, the Israeli Ministry of Health has led a national initiative to implement a unified EMR platform across all government hospitals (Gerber and Topaz, 2014). The interviews for this study were conducted in 2024 in a public hospital in central Israel that had participated in this national project, and the new EMR was already fully implemented in the participating hospital, but still undergoing processes of adaptation and optimization.

Although EMR systems have been implemented in many hospitals around the world, the literature has yet to provide a sufficient response to questions related to managing the change as perceived by head nurses. A particular knowledge gap is evident regarding how they deal with resistance to the change, leading staff in a technological environment, and functioning as mediators between the management and the clinical staff (Strudwick et al., 2017).

The Israeli healthcare system offers a unique context for studying EMR implementation. It is characterized by a centralized structure, with strong governmental regulation and national digital health strategies led by the Ministry of Health (Gilboa, 2022). All citizens are covered under a National Health Insurance Law (1995), and hospital care is largely public and standardized. These structural features have promoted relatively rapid digitalization, while also posing challenges in workforce capacity, change readiness, and integration across organizations (Gerber and Topaz, 2014).

The main argument of the article is that the head nurse's role is no longer restricted to operational management rather it is expanding to include technological leadership that combines management, clinical, and technological competencies. By analyzing the experiences and insights of head nurses, the article strives to illuminate possible ways of improving processes of implementation and the organization's culture in this context. In an era of rapid technological progress, the healthcare system is under increasing pressure to modernize its work methods, where EMR is becoming a corner stone of this process. EMR systems offer the potential of improving the quality and safety of care by upgrading access to information, reducing errors, and facilitating adapted care (De Benedictis et al., 2020). Nonetheless, their implementation poses significant challenges in the transition from manual records to electronic records, particularly regarding management of the change and staff adjustment (Cho et al., 2021).

Head nurses, as team leaders, have a critical role in directing their staff in this process, while ensuring that the technical and human aspects of the implementation are handled (Strudwick et al.,

2017). This article examines the experiences and insights of head nurses in the process of implementing EMR systems in one of central government medical centers in Israel, based on data collected in 2024. The study focuses on the strategies they utilized, the barriers they encountered, and the factors that affected their success, offering practical recommendations that may support similar implementation efforts in other healthcare settings.

1. Literature review

The era of technological change in healthcare systems has led to a deep transformation in the status and role of head nurses as leaders of EMR implementation process. The existing literature stresses several critical aspects related to this process. With the appearance of EMR and healthcare workers' difficulties with accepting and implementing this technology, it became clear that it is essential to understand and manage the change processes (Shoolin, 2010). Changes are challenging, but managing change is even harder (Shoolin, 2010). Resistance to change is one of the greatest barriers to successful implementation in any organization (Sholler, 2016).

Change management theories, such as Kotter's eight-step model (Kotter and Cohen, 2014), provide a useful framework for understanding the stages of EMR implementation. This theoretical framework emphasizes the need to build a sense of urgency, form a leading coalition, and develop trust and a clear vision for the change process. Using this theory allows head nurses to lead change in a structured and focused manner. The framework of the Technology Acceptance Model (TAM) devised by Davis (1987) helps understand the factors affecting the implementation of new technologies, stressing perceived benefits and ease of use. This model is particularly suitable for understanding the challenges and opportunities facing clinical staff when implementing EMR.

Head nurses have a crucial role in creating a safe and quality work environment and improving care outcomes in the organization. Studies indicate that advanced management capabilities, which include knowledge, competencies, attitudes, and suitable behaviors, are critical for the success of head nurses and for realizing the organization's aims (Abd-Elmoghith and Abd-Elhady, 2021). Head nurses have a critical role in implementing technology through education, advocacy, and direct support of the staff. The influence of head nurses depends on their ability to obtain additional resources, their availability, and their appropriate training (Strudwick *et al.*, 2017). Head nurses are key to forming a successful work environment; they often set the tone and they have a considerable impact on multidisciplinary elements (Moore *et al.*, 2016). Managing and leading successful and

efficient processes of implementing new technologies in general and EMR in particular are strongly influenced by managers' ability to handle the change and resistance among the staff.

Recent international studies emphasize the central role of nurse leaders in driving digital transformation in hospitals. Laukka *et al*. (2023) found that head nurses in Finland often face challenges such as digital overload, limited support, and increased pressure to lead technological change without adequate training. Despite these challenges, their engagement was crucial for staff adaptation and digital integration. Similarly, Burgess and Honey (2022) highlight how nurse leaders act as enablers of digital adoption by building trust, providing clinical relevance to digital tools, and facilitating ongoing education. These findings align with the current study's focus on head nurses as key change agents in EMR implementation.

While the benefits of implementing EMR are clear, there might be unintended consequences that head nurses will have to deal with: multiple changes in work processes and in the work environment, changes in information flow, discrepancies between work processes, and designing worksheets. All these can result in errors and have a detrimental effect on the safety of care (Gephart *et al*., 2015). EMR is one of the most important information systems for everyday use by head nurses, intended to support managerial decision making (Saranto *et al*., 2023). As a platform for managerial decision making, EMR provides data-based insights such as analyzing performance trends, following adherence to clinical protocols, and identifying areas that require improvement of the quality and safety of care (Chen, 2023). Hence the importance ascribed to this study.

2. EMR implementation in the Israeli context and in the study site

The implementation of electronic medical records (EMR) in Israeli hospitals began in the early 2000s, initially with varied systems developed independently across institutions. The process was gradual and unstandardized, with different hospitals adopting different technologies and levels of digital integration (Goldschmidt, 2014; Gerber and Topaz, 2014).

At the medical center in which this study was conducted, the process of EMR integration began in 2004, primarily for administrative purposes such as appointment scheduling and patient registration (Goldschmidt, 2014). In 2014, the system was expanded to include a clinical documentation module, implemented in approximately 70% of inpatient wards and intensive care units. However, the remaining departments continued using paper-based records, creating parallel documentation systems that limited continuity of care and cross-departmental communication.

In response to national needs for improved interoperability and data quality, the Israeli Ministry of Health initiated a strategic program aimed at standardizing EMR platforms across all government hospitals (Gilboa, 2022).

Between 2021 and 2023, as part of the Ministry of Health's national initiative to implement a unified EMR system in government hospitals, the medical center transitioned to a new, standardized EMR platform. During this phase, departments that had not previously used electronic records began full implementation, while others migrated from older systems to the new platform. This transition marked a major digital transformation across all clinical units, including departments that had formerly relied exclusively on manual documentation.

The interviews for this study were conducted in 2024, approximately one year after the main implementation phase had concluded. By that time, the EMR system was fully operational across the hospital, allowing head nurses to reflect not only on the initial transition but also on ongoing adaptation processes and the integration of the system into daily clinical and managerial routines.

3. Methodology

The current study was based on a qualitative approach and on the principles of grounded theory research (Creswell and Creswell, 2023), aimed at exploring the experiences and insights of head nurses in the process of implementing EMR. For this purpose, five semi-structured in-depth interviews were conducted with head nurses selected by purposeful sampling. The study was carried out at a government academic medical center in central Israel encompassing 720 beds. A uniform EMR information system was implemented in all in-patient departments and ambulatory services approximately two years before the study was conducted.

After receiving the written informed consent of head nurses, five interviews were held one-on-one and face-to-face, following a semi-structured interview guide. All the interviews were recorded and transcribed word for word. Each interview lasted approximately 45 minutes.

The interview guide was written in advance and included all stages of the interview, its aim, questions on general data about the interviewees, and six question categories, each comprised of 2-4 open-ended questions (Appendix 1). All the interviews followed the same guide; however, room was left for probing and deepening the data. A pilot was conducted, where the questions were explored; following the pilot, the questions were adapted for the needs of the study by expert validation.

Head nurses with at least one year's experience in a managerial role, who had managed the transition from manual medical records to electronic medical records, were chosen for the study.

Table 1. Profile of head nurses participating in the study

Interviewee	Gender	Age	Education	Length of experience as head nurse (years)
Interviewee 1	Female	49	Master's degree	5
Interviewee 2	Female	47	Master's degree	19
Interviewee 3	Male	39	Master's degree	5
Interviewee 4	Female	45	Master's degree	2
Interviewee 5	Female	53	Master's degree	11

Source: author's representation

All the interviewees were registered nurses, with a master's degree and advanced training in their field of occupation, such as emergency medicine, oncology and intensive care.

Data analysis was conducted in steps, as suggested by Creswell and Creswell (2023). In the first step, all texts from the interviews that had been fully recorded and transcribed were reread, with the aim of becoming thoroughly familiar with the data and identifying primary themes or prominent patterns. The content of the interviews was divided into meaningful units (quotes, ideas, or behaviors). Each unit of meaning was coded following main topics from the emerging categories. When a new content arose that was not included in the existing categories, a new category was added. The categories were reorganized. Specific categories found to be interrelated were clustered into one category. In-depth analysis of the categories was performed, after identifying the meanings that arose from each quote or idea. Associations were found between the main themes, behaviors, and attitudes identified. Interpretation and conceptualization utilized quotes from the interviews that represent the major patterns, to reinforce the claims and interpretations (Creswell and Creswell, 2023). The main categories were gathered under an overarching theme and are presented in Table 2.

Table 2. Categories emerging from the content analysis

Overarching theme	Perceptions of head nurses to implementing change: managing the change, challenges, and management strategies	
	1	Perception of managing change *"I like changes, [I] have faith in changes"*
	2	Perception of implementing change – benefits of the EMR *"Documentation is a reflection of the work processes, facilitating their monitoring and analysis and reaching management decisions"*

Categories	3	Managerial challenge: dealing with the staff's resistance and concerns
		"Listening to the staff and understanding their difficulties helped me find adapted solutions"
	4	Managerial proficiencies for implementing change: personal involvement and personal example
		"I am an active partner in the change processes… and I give myself as an example and use the system"
	5	Managerial strategy for implementing change: forming trust
		"If they see that it is important for me [head nurse], it is important for them too and they [the nurses] have faith in it"

Source: author's representation

The validity and reliability of the findings in this article were confirmed by peer debriefing, utilizing a colleague who is an expert in qualitative research. The recorded interviews were transcribed and the transcripts were subsequently read carefully.

4. Results

After analyzing the interviews with the head nurses, five main categories were identified that reflect their perceptions towards implementation of the change: (1) perception of managing change, (2) perception of implementing change – benefits of the EMR, (3) managerial challenge: dealing with the staff's resistance and concerns, (4) managerial proficiencies for implementing change: personal involvement and personal example and (5) managerial strategy for implementing change: forming trust. These categories are affiliated with the overarching theme "Perceptions of head nurses to implementing change: managing the change, challenges, and management strategies".

Analysis and interpretation of the selected categories

Perception of managing change - "I like changes, [I] have faith in changes"

The findings that arose from analyzing the content of the interviews with the head nurses indicate that the ability of the head nurses to accept and lead change is a critical component of the implementation process. Quotes of Interviewee 1, such as *"I'm a person who accepts change… I*

become strongly… involved in change and I like to introduce changes", accentuate the importance of a positive attitude that allows them to serve as role models for the staff. An outlook that includes initiating change allows the head nurses to lead with confidence, as reflected in quotes such as *"I like to introduce changes".*

The phrase *"have faith in changes"* expresses not only the understanding that there is need for change but also the inner faith of the head nurse that it brings meaningful added value to the staff and their work. When the head nurse sees change as something positive and necessary, her leadership becomes more authentic. Faith in the change trickles down to the staff through daily communication, personal example, and forming a work environment that facilitates cooperation. The optimistic attitude of the head nurse contributes to forming a sense of confidence and reducing the staff's natural concern of change.

In summary, it can be said that head nurses' perception of managing change combines a positive and proactive view. This view contributes to the long-term success of change and to leading the staff in complex circumstances.

Perception of implementing change: benefits of EMR - "Documentation is a reflection of the work processes, facilitating its monitoring and analysis and reaching management decisions"

The data analysis stresses the perception of the head nurse whereby EMR is not merely a means of recording but rather a major executive tool. This system provides access to up-to-date, extensive, and accurate information that makes it possible to reach data-based decisions in real time. Improving quality and safety processes: *"Quality indices – easier to follow and supervise"* – EMR constitutes a professional platform for improving care quality and safety processes. It makes it possible to hold efficient monitoring of records, locate gaps, and identify areas that require improvement. In this way, head nurses perceive EMR as an active apparatus for identifying and preventing failure. Accessible and available information, evident in *"the ease with which electronic data are retrieved"*, allows the head nurse to supervise care, identify irregular patterns, and expose problems swiftly. This transparency improves the effectiveness of reaching management decisions. The combination of analyzing records and monitoring stresses the role of EMR in supporting decision making based on data rather than only on intuition.

In summary, head nurses perceive the EMR as an active management tool that helps improve clinical decision-making, patient safety, and increases managerial professionalism. This reflects a

conceptual shift in the role of the head nurse from a primarily operational position to one that actively integrates data-driven decision-making into daily practice.

Managerial challenge: dealing with the staff's resistance and concerns - "Listening to the staff and understanding their difficulties helped me find adapted solutions"

The findings that arose from the content analysis of the data collected from the head nurses stress the importance of active listening. The head nurse understands that resistance does not appear in a vacuum, rather expresses the staff's concerns and needs. Her ability to listen respectfully creates a basis for effective coping with difficulties. *"I listen. When [they] start jumping [becoming agitated], I first of all listen, because sometimes the answer is [waiting] already between the lines"*. Respectful conversation and the ability to listen to the staff allow the head nurse to form trustful relations. Trust is the basis for the staff's readiness to follow the manager and participate in the implementation process. Sometimes resistance develops into outright or hidden conflict. *"Why do we need it? We're doing fine with the manual records... they [nurses] were concerned that it would slow down the process and cause delays in the treatment, particularly in urgent situations"*. The ability of the head nurse to manage the conflicts in a respectful and accommodating manner makes it possible to solve problems in real time and maintain a professional atmosphere: *"I told them, 'Don't worry', we'll get used to it gradually..."*. Through conversation and guidance, the head nurse helps the staff feel that they are capable of handling the challenge. The sense of personal and professional efficacy is a critical element in reducing resistance.

In summary, contending with resistance to change is a major challenge in the process of managing EMR implementation.

Managerial proficiencies utilized in implementing change: personal involvement and role modelling - "I am an active partner in the change processes... and I give myself as an example and use the system"

The quote *"I am an active partner in the change processes... and I give myself as an example and use the system"* reflects the approach of the head nurse as a manager who leads from a position of personal involvement. She does not make do with managing from a distance or giving instructions, rather takes an active part and demonstrates for the staff how the change processes should be carried out. When the head nurse is personally involved and gives an example, she conveys to the staff a

clear message: the change is important and meaningful. The manager becomes a role model and her involvement motivates the staff to make a similar effort. *"I'm constantly involved and it's important for them [the nurses]. Involvement is the thing… involvement"*. The active involvement of the head nurse expresses her dedication and caring about the implementation process and about the staff. This involvement attests to her professional responsibility and her commitment to the success of the change. A head nurse who is strict about consistently performing successive monitoring in the process conveys to the staff that she is constantly *"in the process, I'm with it…"*. Monitoring allows her to identify gaps, correct mistakes in real time, and show the staff that the process is under successive and caring supervision. The involvement of the head nurse reduces the sense of distancing and resistance among the staff. They see that the manager not only requires them to introduce change, but rather also copes with the same challenge herself. Role modelling is a major tool for creating trust. When the manager takes an active part in the process, the staff trusts her more and sees her as a leader who can be followed.

In summary, it may be said that management proficiencies and role modelling are major elements in managing the implementation of change.

Managerial strategy for implementing change: forming trust - "If they see that it is important for me [head nurse], it is important for them too and they [the nurses] have faith in it"

The findings that arose from content analysis of the interviews with the head nurses accentuate the topic of building trust in the change as key to successful leadership: the understanding that the process begins with the manager's own faith in the change. The head nurse serves as a leader, and when she demonstrates faith in the truth and importance of the change process, she creates a foundation of trust and motivation among the staff. Her faith conveys confidence that the change is positive, important, and necessary, which creates a sense of certainty and reduces concerns among the staff. Trust is formed not only through declarations but also in everyday communication with the staff. The head nurse arranges for transparency and explains the aims of the change, the necessary steps, and the anticipated benefits. *"Any process slated for assimilation should be very very clear: why is it beginning, where did it come from, what event preceded it…"*. When the staff understands the underlying logic of the change, trust in the process increases. The head nurse understands that her role as manager is critical for successful implementation. Her strong faith in the change, together with the understanding that she is leading the way, encourage the staff to *"have faith in the importance of the change"*.

In summary, it may be said that forming trust between the head nurse and staff is a central element in successful management of implementing the electronic tool, which facilitates diminishing resistance, increased sense of commitment by the staff, and an improved process of accepting the new system, which manages to transform the implementation of EMR into a more positive process linked to the caregiving staff.

5. Discussion

The article investigates challenges involved in managing electronic medical records from the perspective of head nurses, which encompassed examining management of the change, the challenges, and the management strategies involved in this process. The findings presented emphasize the major role of head nurses in leading complex change processes, the challenges they face, and the strategies they use to cope successfully.

One of the key elements highlighted in the interviews was the importance of the head nurse's individual perception toward change. A positive approach, as emphasized in quotes such as *"I like changes, [I] have faith in changes"*, allow nurses to serve as role models for their staff. This approach is consistent with previous studies indicating that managers who believe in the importance of change and exude confidence in the process generate motivation among their workers (Kotter and Cohen, 2014).

Furthermore, the findings indicate that EMR is perceived as a major tool not only for documenting but also for managing the quality and safety of care. As stressed in the quote: *"Documentation is a reflection of the work processes"*. Head nurses identify the system's potential to provide accurate data and improve the ability to reach decisions. This insight is compatible with the Technology Acceptance Model (TAM) (Davis, 1987), theory that highlights the perceived usefulness and benefit facilitating successful implementation.

Another significant category was the challenge of dealing with staff resistance. Head nurses emphasize the importance of listening to the staff and the need to understand the underlying causes of resistance. As one interviewee stated: *"Listening to the staff and understanding their difficulties helped me find adapted solutions"*. This approach highlights the importance of empathy and responsiveness, and supports previous literature which emphasizes open communication and transparency as essential components in building trust and fostering collaboration during digital transformations (Strudwick *et al*., 2017).

Closely related to this was the emphasis placed on personal involvement by head nurses and the role of personal example in the implementation process. Phrases such as *"I am an active partner in the change processes… and I give myself as an example"* emphasize the importance of personal leadership for creating trust among the staff. Managers who are involved in the process and demonstrate personal commitment have more success in mobilizing their staff for the process.

Finally, the concept of trust emerged as a foundational management strategy in the implementation of EMR. The creation of trust between the head nurse and the nursing team was described as pivotal to the process, with statements like: *"If they see that it is important for me [head nurse], it is important for them too."* This trust was cultivated through transparency, clarity in communicating the goals and benefits of the change, and consistent leadership behavior. The findings reinforce the idea that trust, once established, can reduce resistance, enhance cooperation, and support a more sustainable transition to digital systems (Strudwick *et al*., 2017; Kotter and Cohen, 2014).

Conclusion

Implementing EMR is perceived by head nurses as a complex but vital step towards modernization of the healthcare system, with the purpose of improving the quality of care. The discussion of the findings emphasizes the importance of head nurses' role in change processes and their central leading of EMR implementation. The findings show that the success of the process depends on a combination of personal involvement, understanding the staff's challenges, and the ability to build trust. These insights might constitute a foundation for developing training programs focused on strengthening managerial abilities among head nurses, with the aim of successfully implementing additional changes in the healthcare system.

In addition, several policy-level recommendations may facilitate successful implementation. These include ensuring organizational commitment at all management levels, allocating dedicated resources for EMR training and support, integrating head nurses in early decision-making processes, and establishing national guidelines that promote standardization while allowing local adaptation. Such measures can support smoother adoption and long-term sustainability of digital health systems in hospitals.

Although this study is context specific to Israel, the findings hold broader relevance for healthcare systems in Europe. In particular, the emphasis on trust, leadership engagement, and structured support mechanisms may inform EU-level strategies aimed at strengthening the digital competencies of nurse leaders and facilitating more effective EMR integration in public hospitals.

This study is subject to several limitations that may affect the scope and interpretation of its findings: the study included five in-depth interviews with head nurses from a single medical facility, therefore the findings do not necessarily represent the entire population of head nurses in different hospitals. Expanding the sample in further studies may improve the generalizability of the results. The current study was based on a qualitative approach and therefore lacks examination of statistical associations performed in quantitative research. Integrating a mixed methods methodology in further studies may provide a more comprehensive picture of implementation processes.

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Appendix 1

Qualitative research: questions for in-depth interview

General information:

Sex: Male / female   Age: _____   **Marital status**: Single / married / divorced / widowed

Schooling: Registered nurse / Bachelor's degree / Master's degree / Nurse practitioner

Position: Head nurse / Assistant head nurse

Length of experience as head nurse/assistant: ___ years

I. Initial questions:

1. Please tell me about your position and your areas of managerial responsibility.

2. How do you see your role in the process of implementing change in your department in general and regarding electronic medical records in particular?

3. What experience do you have with similar processes of change in organizations?

II. Questions about attitudes to implementing change:

1. How do you feel about the change involved in switching to electronic medical records?

2. What benefits do you identify in using electronic medical records?

3. What concerns or challenges for your staff do you see in use of this technology?

4. To what degree do you think that this change is important and impactful for the quality of care in the department?

III. Managerial challenges of implementation:

1. What are the major challenges you encounter as a manager in leading this change?

2. How do your staff respond to the shift to electronic medical records? Are you experiencing resistance, and if so – how?

3. How do you usually deal with resistance? Do you have certain strategies or methods that you utilize?

4. What tools or support do you feel that you lack for managing the process of implementation?

IV. Support and coping strategies:

1. What tools and resources are at your disposal for supporting the implementation process?

2. What strategies do you utilize to overcome challenges or resistance by the staff?

3. How do you perceive the support role of the hospital management in the assimilation process? Do you have suggestions for improvement?

V. Looking forward:

1. What are your expectations regarding the impact of electronic medical records on everyday work and patient care?

VI. Summary questions:

2. Is there anything else you would like to add about the process of implementing and managing electronic medical records that we did not discuss?

3. How would you recommend that others in a similar situation prepare for implementing a new digital system?