TRANSFORMATIONAL LEADERSHIP, ORGANIZATIONAL CULTURE, AND COMPLETENESS OF ELECTRONIC MEDICAL RECORDS AMONG NURSES: A MIXED-METHODS STUDY

Aliffia Yulanda Prabawati*, Umi Solikhah, Vivi Leona Amelia, Dedy Purwito

Master of Nursing, Faculty of Health Sciences, Universitas Muhammadiyah Purwokerto
Jl. Raya Soepardjo Roestam 229 Purwokerto, Banyumas 53181

***e*-mail:** aliffiayulanda@gmail.com

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ABSTRACT

Introduction: Digital transformation in healthcare has demanded complete and accurate nursing documentation through Electronic Medical Records (EMRs). However, EMR completeness has remained suboptimal, indicating that technological implementation alone is insufficient. Organizational factors, particularly transformational leadership and organizational culture, play a critical role in influencing nurses' documentation practices. Effective leadership may enhance supervision and engagement, while a supportive culture promotes collaboration and accountability. Nevertheless, evidence regarding their combined influence on EMR completeness remains limited. **Purpose:** This study aimed to analyze the relationship between transformational leadership style and organizational culture on the completeness of EMRs among nurses. **Method:** A mixed-methods research design was employed. Quantitative data were collected from 112 nurses to examine the relationship between transformational leadership, organizational culture and the completeness of electronic medical records, while qualitative data were obtained from eight key informants to identify the contextual factors influencing documentation practices. **Result:** The mean score for transformational leadership style was 76.48 ± 8.39, categorized as good. The predominant organizational culture was market culture, with a mean score of 27.16 ± 4.45. EMR completeness was categorized as moderate, with a mean score of 58.46 ± 8.09. A significant correlation was found between transformational leadership style and EMR completeness ($p = 0.002$), whereas organizational culture was not significantly associated with EMR completeness ($p = 0.819$). Qualitative analysis identified four main themes: system barriers, workload issues, supervision gaps, and perception gaps. **Discussion:** Improving EMR documentation completeness required an integrated approach involving leadership effectiveness, organizational culture, system usability, and workload management.

Keywords: transformational leadership; organizational culture; electronic medical records completeness; nurses

INTRODUCTION

Electronic Medical Records (EMR) represent a key innovation in healthcare digitalization, enabling computerized documentation of patient information and improving patient safety and service quality. In Indonesia, EMR adoption has been mandated through Ministry of Health Regulation No. 24 of 2022, requiring healthcare facilities to gradually transition to electronic systems (Kementerian Kesehatan RI, 2022). However, the implementation of EMR does not necessarily ensure complete and consistent nursing documentation. In the study setting, a preliminary audit of nursing documentation in the outpatient unit showed that approximately 80% of the required documentation components were complete, indicating that around 20% remained incomplete. This finding demonstrates that incomplete nursing documentation remains a practical concern despite the implementation of an electronic medical record system.

This condition highlights an important research gap. While previous studies have largely examined the benefits, implementation challenges, and technological aspects of EMR, less attention has been given to organizational factors associated with the completeness of nursing documentation, particularly transformational leadership and organizational culture. Nurses are central users of EMR systems and are responsible for documenting nursing care throughout the patient care process. Therefore, examining the role of transformational leadership and organizational culture may provide a broader understanding of why documentation remains incomplete despite the availability of an electronic system. Accordingly, this study investigates the relationship between transformational leadership, organizational culture, and the completeness of electronic medical records documented by nurses in the study setting.

However, EMR implementation has remained challenging. Previous studies identified barriers such as limited infrastructure, inadequate training, resistance to change, and poor system usability (Arikan et al., 2021; Corbett et al., 2025; Sugiarto et al., 2024). These barriers particularly affected nurses, who play a central role in clinical documentation, resulting in incomplete records that may compromise patient safety, clinical decision-making, and legal accountability (Sugiarto et al., 2024). In addition, EMR use was associated with increased workload and fatigue, which further reduced documentation quality (De Groot et al., 2022; Jacques et al., 2025; Kaihlanen et al., 2021).

Organizational factors have been recognized as critical in addressing these challenges. Transformational leadership has been shown to enhance job satisfaction, performance, and adaptability to change by promoting motivation, vision, and individual support (Amrullah, 2022; Mushtaq & Hussain, 2021). Meanwhile, organizational culture influences employees' readiness to adopt innovation. Supportive and collaborative cultures facilitate EMR implementation, whereas rigid structures increase resistance (Cameron & Quinn, 2011; Satyanegara et al., 2023; Sinurat et al., 2023).

Recent evidence suggested that the interaction between leadership and organizational culture plays a crucial role in healthcare digitalization (Kiptulon et al., 2024; Makkasau, 2024; Masaong et al., 2023). Despite the recognized benefits of EMR, its implementation in Indonesia has remained suboptimal. A survey conducted by the Indonesian Hospital Association (PERSI) in 2022 reported that approximately 50% of hospitals have implemented EMR systems; however, only 16% have achieved optimal utilization. In addition, only about 40% of hospitals reported having adequate technological infrastructure to support digital health

services (Hardyanti et al., 2024). This indicates a gap between technological implementation and organizational readiness.

Previous studies have largely focused on technological aspects or examined leadership and organizational culture separately. However, limited research has explored their combined influence on EMR documentation completeness, particularly in developing countries. Therefore, this study addressed this gap by examining the integrated relationship between transformational leadership and organizational culture in influencing EMR completeness among nurses.

METHOD

Study Design

This study employed a sequential explanatory mixed-methods design. The quantitative phase used a descriptive cross-sectional correlational approach, while the qualitative phase was conducted through in-depth interviews with key informants to explore nurses' experiences and perceptions of EMR documentation practices. This design was chosen to combine quantitative and qualitative approaches to analyze the relationship between transformational leadership, organizational culture, and the completeness of electronic medical record (EMR) documentation among nurses (Creswell & Plano Clark, 2018; Polit & Beck, 2019).

Setting and Participants

This study was conducted from November 2025 to January 2026 at general hospitals that has been using the SIMGos platform for its Electronic Medical Record system since December 25, 2023. The study population consisted of nurses responsible for filling out and managing electronic medical records. In this study, there were 112 nurses who had completed an orientation period of approximately 9 months and were aged 23-45 years. They were recruited using purposive sampling based on predetermined inclusion and exclusion criteria. Inclusion criteria included nurses who had at least 9 months of work experience in the unit and were directly involved in the daily operations of electronic medical records. In-depth interviews with 6 key informants to explore nurses' experiences and perceptions related to EMR documentation practices. All participants met the eligibility criteria prior to enrolment.

Variable, Instrument and Measurement

This study examined three variables: transformational leadership, organizational culture, and the completeness of electronic medical record (EMR) documentation. Transformational leadership and organizational culture were treated as independent variables, while the completeness of EMR documentation served as the dependent variable. Transformational leadership was measured using a questionnaire adapted from the Multifactor Leadership Questionnaire (MLQ) developed by Bernard M. Bass and Bruce J (Rowold, 2005). Organizational culture was assessed using the Organizational Culture Assessment Instrument (OCAI) developed by Kim S. The instrument measures four types of organizational culture based on the Competing Values Framework: clan, adhocracy, hierarchy, and market culture (Heritage et al., 2014). The completeness of EMR documentation was measured using an observation checklist based on hospital documentation standards, which evaluates whether required documentation components were completed in the EMR system. Each nursing documentation item was assessed using a structured checklist and classified as either complete or incomplete based on the predetermined documentation standards. The checklist included essential components of nursing documentation, including the accuracy and completeness of nursing care documentation, nursing diagnoses, and

nursing interventions documented by nurses. The overall completeness level was calculated as the percentage of documentation items that met the specified criteria. Prior to data collection, the instruments were tested for validity and reliability. Reliability was assessed using Cronbach's alpha, with a coefficient of ≥0.70 indicating acceptable internal consistency.

Data Analysis

Data analysis was conducted in an integrated manner by combining statistical and thematic approaches. Quantitative data were analyzed using IBM SPSS version 23. The analysis began with univariate tests to describe participant characteristics and provide an overview of variables related to leadership, organizational culture, and EMR completeness. Next, bivariate analysis was performed using Spearman's rank correlation test to examine relationships between variables, followed by multiple linear regression to analyze the simultaneous effects of independent variables on documentation completeness. All quantitative instruments were confirmed to meet validity and reliability criteria with a Cronbach's alpha coefficient of ≥ 0.70. Meanwhile, qualitative data from the interviews were analyzed using content or thematic analysis techniques to identify key patterns related to the challenges and supporting factors of electronic documentation. The final results of both analyses were then synthesized to draw comprehensive conclusions regarding the relationship between transformational leadership and organizational culture on nurses' documentation behavior.

Ethical Consideration

This study received ethical approval from the Health Research Ethics Committee of Muhammadiyah Purwokerto University (No. KEPK/UMP/20/XII/2025). All participants were informed about the study objectives and procedures prior to participation.

RESULT

A. Quantitative Research

Participant Characteristics

Based on Table 1, the study involved 112 participants. The age of participants ranged from 23 to 45 years. Most participants were female, accounting for 70 nurses (62.5%), while male participants totaled 42 nurses (37.5%). In terms of educational background, the majority of participants held a diploma degree (D3) with 72 nurses (64.3%), while 40 nurses (35.7%) had a bachelor's degree or professional nursing degree (Ners). Regarding job position, most participants worked as staff nurses, totaling 75 nurses (67.0%). This was followed by senior nurses or nurse in charge (PJ) with 29 nurses (25.9%), and head nurses with 8 nurses (7.1%). Based on work experience, most respondents had 5–10 years of experience (57 nurses; 50.9%), followed by less than 5 years (41 nurses; 36.6%), and more than 10 years (14 nurses; 12.5%).

Table 1. Characteristics of Participants (n = 112)

Variable	Mean ± SD	n	%
Age (years)	31.79 ± 5.225		
Gender			
Female		70	62.5
Male		42	37.5
Education			
D3		72	64.3
S1/Ners		40	35.7
Job position			
Staff Nurse		75	67.0
Senior Nurse		29	25.9
Head Nurse		8	7.1
Work Experience			
< 5 tahun		41	36.6
5-10 tahun		57	50.9
≥ 10 tahun		14	12.5
Unit			
IGD		15	13.4
Outpatient Care		15	13.4
ICU		11	9.8
Perinatology		10	8.9
IBS		20	17.9

Variable	Mean ± SD	n	%
Inpatient Care		33	29.5
Hemodialysis		8	7.4
Transformational Leadership Style			
Low		0	0
Medium		72	64.3
High		40	35.7
Organizational Culture			
Clan	22.89 ± 5.446		
Adhocracy	25.24 ± 3.278		
Market	27.16 ± 4.452		
Hierarchy	24.76 ± 3.158		
EMR Completeness	26.42 ± 3.218		
Complete		44	39.3
Incomplete		68	60.7

Frequency Distribution of EMR Completion Rates Among Nurses

The results of data analysis of 112 EMRs, this study examined the completeness of Electronic Medical Record completion by nurses, as measured using an instrument consisting of 30 statements (RM1 through RM30). The results of the categorization of EMR completeness levels are presented in the table below:

Based on Table 1, the results of the univariate analysis show that the majority of respondents had Electronic Medical Records classified as incomplete, totaling 68 EMRs (60.7%). EMRs in the "moderate" completeness category numbered 33 (29.5%), while only a portion of EMRs fell into the "complete" category specifically, 11 EMRs (9.8%)—meaning they were still classified as incomplete.

Current and Desired Organizational Culture

Table 2. Comparison of Average Scores for Current and Desired Organizational Culture

Variable	Mean Currently	Mean Desired	Gap
Clan	22.89	28.46	-5.57
Adhocracy	25.24	22.90	2.34
Market	27.16	22.13	5.03
Hierarchy	24.76	26.36	-1.60

Based on Table 2 and Figure 1, the results of the analysis show that the dominant organizational culture at present is the Market culture, with the highest mean score (27.16). However, the organizational culture most desired by respondents is the Clan culture, with a mean score of 28.46. The largest positive gap is found in the Clan dimension (5.57).

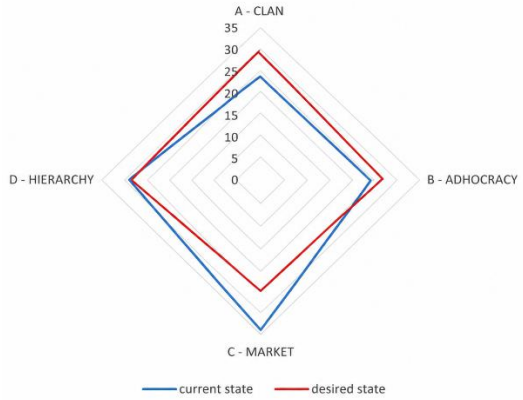

Figure 1. Organizational Culture Profile

The Relationship between Transformational Leadership Style and EMR Completeness

Table 3. Results of the Analysis of the Relationship between Leadership Style and EMR Completeness

Variable	EMR Completeness		p-value
	Complete (n, %)	Incomplete (n, %)	
Transformational Leadership Style			0.002
Low	0 (0)	0 (0)	
Medium	36 (50.0)	36 (50.0)	
High	8 (20.0)	32 (80.0)	
Total	44 (39.3)	68 (60.7)	

Among respondents with a moderate perception of transformational leadership style, the majority—36 respondents (50%)—had complete Electronic Medical Records (EMR), whereas among those with a high perception of transformational leadership style, the majority—32 respondents (80%)—had incomplete EMR. p-value = 0.002 ($p < 0.05$).

The Relationship between Dimensions of Organizational Culture and EMR Completeness

Table 4. Results of the Analysis of the Relationship between Dimensions of Organizational Culture and EMR Completeness

Variable	EMR Completeness		p-value
	Complete (mean±SD)	Incomplete (mean±SD)	
Clan	23.77 ± 5.17	22.31 ± 5.58	0.169
Adhocracy	24.57 ± 3.05	25.68 ± 3.37	0.080
Market	27.31 ± 4.24	27.06 ± 4.62	0.772
Hierarchy	24.50 ± 3.36	24.92 ± 3.03	0.496

There was no difference in the mean organizational culture scores between the group of nurses with a complete RME and the group with an incomplete RME across all dimensions of organizational culture. In the 'clan' dimension, the mean score for the group with a complete RME was 23.77 ± 5.17, whilst that for the group with an incomplete RME was 22.31 ± 5.58 (p = 0.169). Similarly, in the 'adhocracy', 'market' and 'hierarchy' dimensions, none of the differences in mean scores reached statistical significance.

Based on the quantitative findings, which revealed that EMR completeness was still suboptimal, transformational leadership had a significant negative relationship, and organizational culture showed no significant effect, a qualitative approach was subsequently conducted. This phase aimed to explore in depth the underlying factors, perceptions, and contextual challenges experienced by nurses and key stakeholders in implementing EMR documentation.

B. Qualitative Research

Table 5. Characteristics of Informants

Informant Code	Position	Gender	Age (years)	Education	Work Experience
Informant 1	PP/ Key Informant	Female	28	Ners	5
Informant 2	PP/ Key Informant	Female	32	Ners	1.5
Informant 3	PP/ Key Informant	Male	30	D3	6
Informant 4	PP/ Key Informant	Female	27	Ners	3
Informant 5	PP/ Key Informant	Female	35	D3	4
Informant 6	PP/ Key Informant	Male	33	D3	1.5
Informant 7	RM/Key Informant	Female	35	S1 Public Health.	8
Informant 8	Kabid/Key Informant	Female	32	Ners	10

According to Table 5, there were eight informants in this study, comprising six nurses, one medical records officer and one head of nursing care. The majority of the informants were female, aged between 27 and 35 years, with between 1.5 and 10 years' work experience. Their educational levels varied, ranging from a Diploma III to a Bachelor of Nursing. The data were then analyzed using NVivo 15, yielding the following results:

Table 6. Matrix Code Analysis of the Relationship between Organizational Culture and Documentation

Variable	Fact. Eks	Fact. Int	Documentation Issues
Cultural Internalization	3	3	3
Old Habits	2	2	2
Work Orientation	3	3	3
Perceptions of Documentation	2	2	2

Based on Table 6, which presents the results of the qualitative analysis, the themes of cultural internalization and work orientation were the most frequently occurring themes, each appearing three times across the external factors, internal factors and documentation issues categories. Meanwhile, the themes of old habits and perceptions of documentation each appeared twice in each category.

Figure 2. Word Frequency Results using NVivo 15

The word cloud analysis in Figure 2 shows that the most frequently occurring terms are 'documentation', 'nurses', 'system' and 'workload', indicating that documentation practices play a central role but are not yet optimal. The prominence of terms such as "not yet" and "still" reflects the perception that EMR documentation has not yet reached an optimal level of completeness. Furthermore, the emergence of "workload" and "system" highlights these factors as the main barriers, whilst organisational culture and leadership appear less prominent, which supports the quantitative findings of this study.

Table 7. Results of a Comparative Analysis between Nurses and Management

Variable	Nurse	Management
Organisational Culture	6	9
Workload (Contextual)	6	5
Leadership	6	13
Leadership and Management	10	2
Technical Issues	7	5
RME Systems and Technology	10	2
Obstacles (Workload)	6	2

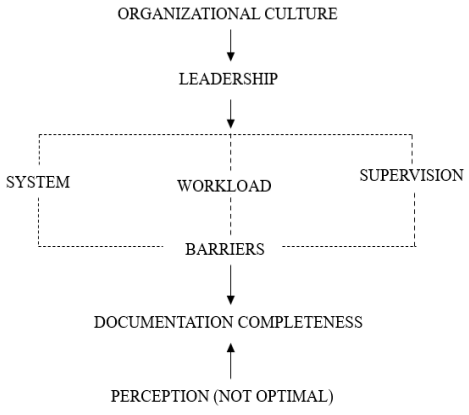

Figure 3. Nurses vs Management Gap

Based on the matrix analysis carried out previously, several key themes (Table 8 and Figure 3) were identified which reflect the role of transformational leadership and organisational culture in the completeness of electronic medical record entries, as follows:

Theme 1: System Barriers

System-related issues emerged as the most dominant factor affecting EMR documentation completeness. Findings from matrix coding and word frequency analysis highlighted that terms such as "system" and "documentation" were frequently mentioned, indicating ongoing challenges in system usability and performance. Nurses reported difficulties related to system functionality, technical errors, and lack of integration, which hindered efficient documentation. These issues were also reflected in the high frequency of references to EMR systems and technology among nurses (Table 9), suggesting that system barriers remain a primary obstacle in achieving optimal documentation completeness.

Theme 2: Leadership Gaps

Leadership was found to play an important yet not fully optimal role in supporting EMR implementation. Matrix coding analysis (Table 8) showed that managerial support and leadership style were strongly associated with external factors, such as policies and work environment. However, supervision demonstrated lower frequencies, indicating suboptimal monitoring. In addition, findings from organizational culture analysis (Table 7) revealed that cultural internalization and induction processes showed moderate but not dominant influence (3;3;3), suggesting that organizational values related to documentation have not been fully embedded. This condition may limit the effectiveness of leadership in enforcing documentation standards, indicating that leadership operates within a cultural context that is not yet fully supportive.

Theme 3: Workload Issues

Workload emerged as a significant barrier influencing nurses' ability to complete EMR documentation. The word cloud analysis revealed "workload" as a prominent term, reflecting the burden experienced by nurses during documentation processes. High workload, combined with system inefficiencies, contributed to delays and incomplete records. Nurses frequently reported workload-related barriers (Table 9), emphasizing that documentation tasks are often perceived as additional responsibilities rather than integrated components of patient care.

Theme 4: Perception Gap

A notable finding of this study is the existence of a perception gap between nurses and management. Nurses more frequently highlighted technical challenges, system limitations, and leadership-related issues, whereas management emphasized leadership and organizational culture as strengths (Table 9). This discrepancy indicates a misalignment between policy-level perspectives and frontline experiences. The conceptual model (Figure 2) further illustrates that this perception gap influences how problems are identified and addressed, ultimately affecting documentation completeness.

Overall, the findings indicate that EMR documentation completeness is influenced by interconnected systemic and organizational factors. System barriers and workload issues emerged as the primary challenges, while leadership and organizational culture played supportive but less dominant roles. Importantly, the presence of a perception gap between nurses and management highlights the need for better alignment in addressing

implementation challenges. These results suggest that improving EMR documentation requires an integrated approach that strengthens system performance, optimizes workload management, and enhances leadership effectiveness within a supportive organizational culture.

DISCUSSION

Documentation Completeness and EMR Challenges

The present study found that EMR documentation completeness among nurses remains suboptimal, with 60.7% of records categorized as incomplete. This finding indicates that the implementation of EMR at the study site has not yet translated into consistently complete nursing documentation. Rather than indicating a failure of digitalization itself, the finding suggests that the availability of an electronic system does not automatically ensure that documentation requirements are incorporated into routine nursing practice.

The qualitative findings help explain this result. Nurses reported that documentation was affected by high workload, limited time, and difficulties encountered during EMR use. These conditions suggest that incomplete documentation may occur not because nurses do not recognize the importance of documentation, but because documentation competes with immediate clinical demands. This interpretation is consistent with previous studies showing that workload, user competence, and system usability can limit the benefits of EMR implementation (Danar et al., 2025; Dewi et al., 2025; Ginting et al., 2024; Maawati et al., 2025). Therefore, the high proportion of incomplete records in this study appears to reflect a gap between the formal availability of EMR and the practical conditions under which nurses are expected to complete documentation.

The finding is important because incomplete nursing documentation can affect the continuity and reliability of patient information and may subsequently influence patient safety and legal accountability. (Asmiragani et al., 2025; Ni Putu Emy et al., 2024).

Transformational Leadership and EMR Completeness

The results of the study in Table 4.2, with a p-value of 0.002, indicate that transformational leadership has a positive and significant relationship with the completeness of electronic medical records. These findings suggest that the better the implementation of transformational leadership by ward heads and nursing managers, the higher the level of completeness in the documentation carried out by nurses.

According to the theory of transformational leadership developed by Burns and Bass, transformational leaders are able to enhance organizational commitment by changing individuals' values, motivation and awareness in order to achieve shared goals. Nurses working under transformational leaders demonstrate greater self-confidence in carrying out documentation tasks and are more motivated to meet established recording standards.

Furthermore, a systematic review by Haoyan et al. (2023) found that transformational leadership has a positive relationship with nurses' organizational commitment, which ultimately contributes to improved performance and compliance with work procedures. This suggests that leadership presence alone is insufficient to improve documentation. This counterintuitive finding indicates that transformational leadership may remain symbolic or administrative rather than operational, particularly when not translated

into effective supervision, accountability, and routine clinical practice.

The Qualitative findings support this interpretation, showing that leadership is primarily oriented toward external and administrative aspects rather than direct clinical engagement. This contrasts with previous studies reporting positive effects of transformational leadership on performance, suggesting that its effectiveness depends on practical implementation, including supervision and ongoing support (Boamah et al., 2022; Brady Germain & Cummings, 2010; Labrague et al., 2020; Rn & Student, 2022; Specchia et al., 2021).

Organizational Culture and EMR Completeness

In contrast to transformational leadership, organizational culture was not significantly associated with EMR completeness in the quantitative analysis. However, the qualitative findings indicate that organizational culture may still influence documentation indirectly. In addition, the dominant market-oriented culture differed from the nurses' preference for a more clan-oriented culture. This discrepancy is relevant because a market-oriented environment may emphasize performance and target achievement, whereas the preference for clan culture reflects a stronger need for collaboration, communication, and interpersonal support.

The absence of a significant quantitative association therefore does not necessarily mean that organizational culture has no relevance to EMR documentation. Rather, its influence may be indirect and may operate through other factors, such as teamwork, communication, perceived support, and work processes. Previous studies have similarly emphasized the importance of collaborative organizational environments in supporting healthcare professionals' engagement and quality improvement (Ellis et al., 2023; Mohamed et al., 2025; Nilsen et al., 2020; Tietschert et al., 2019). The present findings extend this perspective by suggesting that cultural change alone may not be sufficient to improve EMR completeness unless it is accompanied by changes in the work environment and documentation processes.

System and Workload as Primary Explanatory Factors

The integration of the quantitative and qualitative findings indicates that system-related and workload factors may provide a more immediate explanation for the incomplete documentation observed in this study. Although leadership and organizational culture were the main organizational variables examined quantitatively, nurses consistently described practical barriers related to workload and EMR system performance. These findings suggest that documentation completeness is influenced not only by individual attitudes or leadership but also by the conditions under which documentation is performed.

This interpretation is consistent with previous research identifying workload, usability, and workflow disruption as important determinants of electronic documentation practices (Melnick et al., 2020 and Ratwani et al., 2018). In the present study, nurses' experiences suggest that when clinical demands are high or the system is difficult to use, documentation may be postponed, abbreviated, or left incomplete. This finding has a practical implication for the study site. Such interventions may be more effective than relying primarily on education or reminders because they address the conditions that contribute to incomplete documentation.

Perception Gap Between Nurses and Management

Another important finding was the difference between nurses' and management's perceptions of the factors affecting EMR documentation. Nurses predominantly identified workload and system-related problems, whereas management perceived leadership and organizational culture as relatively adequate. This discrepancy suggests that the problem may not simply be the absence of organizational support, but a difference in how organizational support is experienced at different levels.

A clear perception gap was identified between nurses and management. Nurses emphasized system-related challenges and workload, whereas management perceived leadership and organizational culture as adequate (Insani & Purwito, 2020). The perception gap is important because managerial assessments may indicate that policies, leadership structures, and organizational expectations are already in place, while frontline nurses may continue to experience practical barriers when implementing those expectations. Similar discrepancies between organizational policy and frontline working conditions have been described in healthcare settings (Bodenheimer & Sinsky, 2014; Marquis & Huston, 2017; Wiig et al., 2020). In the present study, this gap may help explain why organizational-level factors did not translate into better EMR documentation outcomes.

Therefore, improving EMR completeness requires mechanisms that connect managerial expectations with frontline experience. Regular feedback from nurses, direct observation of documentation workflows, and joint problem-solving between management, nursing staff, and information-system personnel may help identify barriers that are not apparent from managerial perspectives alone.

Overall, EMR documentation challenges are systemic and multifactorial, shaped by the interaction of leadership, organizational culture, and technological factors.

CONCLUSION AND RECOMMENCATION

Conclusions

This study provides preliminary evidence that the completeness of Electronic Medical Record documentation by nurses remains suboptimal, with a substantial proportion of records classified as incomplete. However, these factors should not be interpreted as having a direct causal effect based on the cross-sectional design of this study.

Rather than indicating that transformational leadership reduces documentation quality, this unexpected finding suggests that leadership may not yet be sufficiently translated into direct supervision, feedback, accountability, and support for routine clinical documentation. Organizational culture was not significantly associated with EMR completeness in the quantitative analysis, although the qualitative findings suggested that organizational culture may have an indirect and contextual role in shaping collaboration and documentation practices.

The study also identified a discrepancy between the current and preferred organizational culture, particularly the preference for greater collaboration and interpersonal support, as well as a perception gap between management and nurses regarding the barriers to EMR documentation. These findings indicate that improving EMR completeness requires attention to both organizational conditions and the practical realities of frontline nursing work.

Nevertheless, the findings should be interpreted cautiously because the cross-sectional design does not establish causality or confirm mediation pathways.

Recommendation

Healthcare organizations should adopt an integrated approach to improving EMR documentation completeness that addresses organizational, human, and technological factors simultaneously. EMR optimization should focus on usability, system responsiveness, and alignment with nurses' clinical workflows. Workload and documentation burden should also be assessed to ensure that nurses have sufficient time and appropriate conditions to complete EMR documentation. Future research should further examine these relationships using longitudinal or intervention designs.

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