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FACTORS INFLUENCING DOCTORS' COMPLIANCE IN COMPLETING ELECTRONIC MEDICAL RECORDS AT OUTPATIENT POLYCLINICS

Nelci Ndun *, Apris A. Adu, Noorce Ch. Berek, Anderias Umbu Roga, Christina R. Nayoan
Program Studi Kesehatan Masyarakat, Fakultas Kesehatan Masyarakat, Universitas Nusa Cendana
Jl. Adi Sucipto Penfui, Kotak Pos 104, No hp/wa: 082114777798, Kupang – NTT. 85001, Indonesia
Email: *nelci.ndoen1975@gmail.com*

Abstrak

Digital transformation in healthcare through the implementation of Electronic Medical Records (EMR) aims to improve service quality, documentation efficiency, and patient safety. However, physician compliance in completing EMRs at the Outpatient Clinic of Prof. Dr. W. Z. Johannes Kupang Hospital remains low, with only 28.9% categorized as compliant. This study aimed to analyze factors influencing physician compliance in EMR completion based on the Theory of Planned Behavior (TPB), including attitude, subjective norms, perceived behavioral control, and intention. A cross-sectional design was employed with a total sample of 38 attending physicians using validated and reliable questionnaires and observation checklists. Data were analyzed using Chi-square tests and logistic regression. The findings showed that attitude (p=0.015; PR=0.049) and intention (p=0.022; PR=0.052) significantly affected physician compliance. Physicians with negative attitudes and weak intentions had a higher risk of non-compliance. Meanwhile, subjective norms (p=0.836; PR=1.333) and perceived behavioral control (significant only in bivariate analysis) did not influence compliance. Technical barriers such as inadequate facilities, limited system integration, and administrative workload also contributed to low compliance levels. This study concludes that internal factors particularly attitude and intention play a more dominant role in determining physician compliance than external pressures or organizational support. Strengthening perceived benefits, improving system usability, and providing adequate training are essential to enhance physician compliance in EMR completion.

Keywords: Electronic Medical Records, physician compliance, Attitude, Intention

Introduction

The Indonesian government's strategic steps to improve the quality of services and patient safety[1]. One form of implementation is the implementation of Electronic Medical Records (EMR) as stipulated in the Minister of Health Regulation Number 24 of 2022 concerning Medical Records. This policy aims to accelerate the process of recording patient data efficiently, accurately, and integratedly. Prof. Dr. W.Z. Johannes Regional General Hospital, Kupang, as the highest referral hospital in East Nusa Tenggara Province, has implemented this system since early 2024. However, the level of doctor compliance in completing EMR remains relatively low, with only 38.8% of doctors completing the EMR completely, while the majority do not meet the established filling standards.

Several previous studies have shown that medical personnel compliance with medical record completion remains a challenge in various healthcare facilities. Doctors in Indonesia experience 79.5% non-compliance, caused by low knowledge and motivation, as well as high workloads.[2] Incomplete medical data can hinder the process of diagnosis, treatment, and clinical decision-making [3]. Dutta (2020) found that the implementation of e-medical records was often hampered by changes in workflow,

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limited technical training, and concerns about data security [4]. Meanwhile research according to [5] shows the importance of hospital support in improving the completeness of filling out medical records.

Given these conditions, further analysis is needed to understand the factors influencing physician compliance in completing e-medical records at Prof. Dr. W.Z. Johannes Kupang Regional General Hospital. The approach used in this study refers to the Theory of Planned Behavior (TPB), which assesses the influence of attitudes, subjective norms, behavioral control, and intentions on physician compliance behavior in using digital systems. This approach is expected to provide a comprehensive understanding of the determinants of physician behavior in implementing the e-medical records system at regional referral hospitals.

This study aims to analyze the factors that influence doctors' compliance in filling out e-medical records at the Outpatient Polyclinic of Prof. Dr. W.Z. Johannes Kupang Regional General Hospital, including aspects of attitude, subjective norms, behavioral control, and doctors' intentions towards using the system.

Metode

This study will use an analytical observational research type with a Cross-Sectional study design to determine the effect of attitudes towards behavior, subjective norms, perceived behavioral control and intentions on doctor compliance in filling out Electronic Medical Records (E-Medical Records) at the Prof. Dr. W.Z. Johannes Kupang Regional General Hospital Polyclinic. Research data collection was carried out using interview and observation methods. The questionnaire consists of several parts, namely: respondent identity, attitudes towards filling out E-Medical Records, subjective norms, behavioral control, and intentions in filling out E-Medical Records. The respondent identity questionnaire includes data on name, age, gender, length of service, employment status, and type of specialist/subspecialist.

The questionnaire on attitudes towards completing the RME, subjective norms, behavioral control, and intentions in completing the RME each consisted of 10 statements with a Likert scale of 1–4 (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree), with a total score of 10–40. All questionnaires have been declared valid and reliable through validity and reliability tests. The validity test showed a calculated r value > r table (0.361) and a p-value < 0.05 for all items, while the reliability test produced a Cronbach's Alpha value of 0.930 for attitudes, 0.793 for subjective norms, 0.777 for behavioral control, and 0.945 for intentions, all of which were > 0.7. In addition, an observation sheet was used to assess physician compliance in completing the RME based on the completeness and timeliness of filling, with the assessment results expressed as a percentage.

The sample in this study were 38 Responsible Doctors (DPJP) who worked at the outpatient polyclinic of Prof. Dr. W.Z. Johannes Kupang Regional General Hospital. The sample size was determined using the Lemeshow formula. The sampling technique used the total sampling method with inclusion criteria, namely doctors who served as DPJP at the outpatient polyclinic and were willing to be respondents in the study. While the exclusion criteria included interns and doctors who were on leave, sick, or not actively on duty during the study period. The data that had been prepared for analysis were processed using SPSS software. Data analysis was carried out univariately to see the distribution of respondents in the form of tables and graphs, and bivariate using the Chi-square test to determine the relationship between two variables. Furthermore, multivariate analysis was carried out using multiple linear regression to determine the variables that most influenced doctor compliance in filling out the RME at Prof. Dr. W.Z. Johannes Kupang Regional General Hospital with a significance level of 0.05.

Results

Table 1. Respondent Characteristics

Characteristics	Frequency	%
Age		
23-36 Year	3	7.9
37-48 Year	23	60.5
49-60 Year	12	31.6
Total	38	100
Gender		
Man	12	31.6
Woman	26	68.4
Total	38	100
length of work		
1-5 Year	1	2.6
6-10 Year	5	13.2
> 10 Year	32	84.2
Total	38	100
Employee Status		
civil servants	36	94.7
contract	2	5.3
Total	38	100
Polyclinic		
Neurology	5	13.2
obstetrics	3	7.9
Dermatology and venereology	3	7.9
pediatrics	3	7.9
General surgery	2	5.3
Urology surgery	2	5.3
DOTS/Lung	2	5.3
Dentistry and Oral Surgery	2	5.3
nutrition	2	5.3
Medical rehabilitation	2	5.3
Eye	2	5.3
Internal	2	5.3
Anesthesia	1	2.6
Digestive surgery	1	2.6
Oncological surgery	1	2.6
Orthopedic surgery	1	2.6
Hematology medical oncology	1	2.6
Heart	1	2.6
Gynecologic oncology	1	2.6
ENT	1	2.6
Total	38	100

Based on table 1, it is known that the majority of research respondents were women (68.4%) with civil servant status (94.7%) aged 37-48 years (60.5%), had worked for more than 10 years (84.2%), and most came from the Neurology Polyclinic (13.2%).

Table 2. Variable Frequency Distribution

Characteristics	Frequency	%
Attitude		
Positive	14	**36.8**
Negative	24	**63.2**
Total	38	**100**
Subjective Norms		
Good	18	**47.4**
Not good	20	**52.6**
Total	38	**100**
Control Doctor Behavior		
Good	16	**42.1**
Not good	22	**57.9**
Total	38	**100**
Respondent's Intentions		
Strong	18	**47.4**
Weak	20	**52.6**
Total	38	**100**
Compliance		
Obedient	11	**28.9**
Not obey	27	**71.1**
Total	**38**	**100**

Based on table 2, it is known that the respondents' attitudes towards filling out the RME were mostly negative (63.2%), subjective norms were mostly assessed as less than good (52.6%), doctors' behavioral control was mostly assessed as less than good (57.9%), respondents' intentions were mostly weak (52.6%), and overall respondents' compliance in filling out the RME was mostly non-compliant (71.1%).

Table 3. Relationship of research variables

Variable	Compliance				Total		*p-value*	PR (95% CI)
	obedient		not obey					
	n	%	n	%	n	%		
Attitude								
Positive	8	57.1	6	42.9	14	100		
Negative	3	12.5	21	87.5	24	100	0.011	4,571 (1,445-14,461)
Total	11	28.9	27	71.05	38	99.95		
Subjective Norms								
Good	6	33.3	12	66.7	18	100		
Not good	5	25.0	15	75.0	20	100	0.836	1,333 (0,490-3,630)
Total	11	28.9	27	71.1	38	100		
Control Doctor Behavior								
Good	8	50.0	8	50.0	16	100		
Not good	3	13.6	19	86.4	22	100	0.028	3,667 (1,149-

								11,698)
Total	11	28.95	27	71.1	38	100		
Respondent's Intentions								
Strong	9	50.0	9	50.0	18	100		
Weak	2	10.0	18	90.0	20	100	0.018	5,000 (1,241-20,146)
Total	11	28.95	27	71.1	38	100		

Based on Table 3, it is known that respondents with positive attitudes were more compliant with filling out the RME (57.1%) compared to respondents who were not compliant (42.9%), respondents with good subjective norms were more compliant with filling out the RME (66.7%) compared to respondents who were compliant (33.3%), respondents with good behavioral control had the same number of compliant (50.0%) as non-compliant (50.0%), and respondents with strong intentions had the same number of compliant (50.0%) as non-compliant (50.0%).

Tabel 4. Influence of research variables

Variable		**Coefficient (B)**	*p-value*	PR	95% CI
Attitude	Positive (Ref)	-	-	-	-
	negative	3,014	0,015	0,049	0,004-0,556
Intention	Strong (Ref)	-	-	-	-
	Weak	-2,954	0,022	0,052	0,004-0,657
Constanta		4,799	0,002		

Based on Table 4, it is known that from the results of the logistic regression test, the Attitude (Negative) variable has a p-value of 0.015 ($p<0.05$). The Exp (B) or PR value of 0.049 means that respondents with negative attitudes have a 0.049 times greater chance of complying (or a risk of approximately 20.4 times greater for non-compliance) in filling out the RME compared to respondents with positive attitudes. The Intention (Weak) variable also has a p-value of 0.022 ($p<0.05$). The Exp (B) or PR value of 0.052 means that respondents with weak intentions have a 0.052 times greater chance of complying (or a risk of approximately 19.23 times greater for non-compliance) in filling out the RME compared to respondents with strong intentions.

Discussion

The Influence of Attitudes on Doctors' Compliance in Filling in e-Medical Records at the Outpatient Polyclinic of Prof. Dr. W.Z. Johannes Kupang Regional General Hospital

The results of the analysis in this study indicate that there is a significant influence between the doctor's attitude and compliance in filling out the EMR, where respondents with a positive attitude were more compliant in filling out the EMR (57.1%), while respondents with a negative attitude were dominated by non-compliance (87.5%). Multivariate analysis also confirmed that attitude is the most influential factor on doctor's compliance in filling out the e-Medical Record in the outpatient clinic of Prof. Dr. W. Z. Johannes Kupang Regional General Hospital.

This research aligns with Hung's statement that user attitudes, both positive and negative, directly influence behavior in using electronic medical records systems. When individuals perceive EMRs as useful, easy to use, or supportive of their work, they are more likely to comply with the filling procedures. Conversely, negative attitudes will decrease interest and compliance with the system [6].

Although most respondents expressed a positive attitude, this study also found barriers to the EMR process. Seventy-four percent of respondents stated that completing the EMR was a workload, due to the separation of some features (such as panoramic images), the repetition of data input, and the need for additional time to complete medical information while still serving patients. These findings are consistent with Felt-Lisk et al. (2009) who stated that the time burden and administrative demands of digital systems can influence healthcare workers' perceptions and attitudes toward EMR [7].

Despite these obstacles, all respondents (100%) still believed that completing the EMR is the responsibility of doctors and can improve the quality of care. Ninety-four percent stated that the EMR expedites record-keeping, reduces medical errors, and facilitates coordination between healthcare professionals. This indicates that understanding the benefits of EMR has fostered a strong positive attitude. This aligns with research by Hung and Kukk, who found that knowledge about the goals and benefits of digital health innovation forms the basis for attitudes and ultimately influences behavior [8]. Therefore, attitude is a key factor that determines the level of doctor compliance in completing the RME.

The Influence of Subjective Norms on Doctors' Compliance in Filling in e-Medical Records at the Outpatient Polyclinic of Prof. Dr. W.Z. Johannes Kupang Regional General Hospital

The results of the analysis in this study indicate that subjective norms have no influence on physician compliance in filling out e-Medical Records (PR 1.333; 95% CI = 0.490-3.630). In this study, 71.1% of respondents were compliant in filling out the EMR, and 28.95% were non-compliant. Respondents with poor subjective norms only had 25.0% compliance in filling out the EMR, while respondents with good behavioral control only 33.3% were compliant in filling out the EMR. Although this is different from Hascic's study that subjective norms have an influence on compliance in filling out electronic medical records, this study is in line with Hascic's study that subjective norms have no influence on respondent compliance in filling out the EMR [9]. In this study, only 57.89% of respondents felt burdened by the demands of hospital policies regarding completing EMRs. Meanwhile, concerns about receiving reprimands and a supportive hospital work culture were 73.68%, and concerns that not completing EMRs would hinder other service colleagues were 73%, despite this, respondents remained non-compliant in completing their medical records. Research conducted at a hospital in Yogyakarta found that the obstacle to implementing EMRs was resistance from doctors and senior staff. Interview results showed that at the beginning of EMR implementation, there was resistance from some doctors and resistance from some senior staff, but this did not affect the overall compliance of respondents in completing EMRs [10].

The Influence of Behavioral Control on Doctors' Compliance in Filling in e-Medical Records at the Outpatient Polyclinic of Prof. DR. W.Z. Johannes Kupang Regional General Hospital

Bivariate analysis results showed that behavioral control had a significant relationship with physician compliance in completing the EMR. This means that when physicians perceived the system as easy to use and supported by adequate resources, their compliance rate was higher. However, in multivariate analysis, this variable did not have a significant effect. This suggests that when analyzed alongside other variables, the influence of behavioral control on physician compliance is less dominant, likely because other factors such as intention, attitude, or subjective norms exert a stronger influence on compliance.

This research aligns with research at Insan Permata Hospital, which demonstrated a significant relationship between behavioral control and physician compliance in completing RMEs. Behavioral control was measured through two main aspects: managerial support in the form of rewards and work design created by the physicians themselves. Both aspects serve as structural support that can enhance physicians' ability and opportunities to comply with RME use [11].

In relation to the Theory of Planned Behavior, perceived behavioral control plays a role in shaping actual behavior through the perception of ease or obstacles in carrying out the RME filling [9]. This means that even if doctors have the knowledge and motivation, they won't be able to perform the required behavior if they feel they lack adequate time, facilities, training, or organizational support. Conversely, when the work structure is supportive, for example, by ensuring the RME system is easy to use, the workflow is clear, training is available, facilities are provided, and reward mechanisms are provided, doctors are more likely to comply with the RME.

This is one of the causes of the high percentage of physician non-compliance in the behavioral control aspect in this study, namely 86.4% of doctors with poor behavioral control showed non-compliance in filling out the RME. This illustrates that suboptimal facility and system support also plays a role in the low level of compliance. Based on the interview results, most doctors stated that the RME filling process was not supported by adequate facilities, such as poor internet network quality, frequently unresponsive computers, and limited computer equipment in some clinics. Furthermore, management attention was considered still low, as indicated by the lack of training on the use of RME for doctors as DPJP, while the RME system has complex features and requires a good technical understanding.

The Influence of Intention on Doctors' Compliance in Filling in e-Medical Records at the Outpatient Polyclinic of Prof. Dr. W.Z. Johannes Kupang Regional Hospital

The results of this study indicate that there is a significant influence between intention and doctor compliance in filling out e-Medical Records (e-RM) at the Outpatient Polyclinic of Prof. DR. W.Z. Johannes Kupang Regional General Hospital. This finding indicates that the stronger the doctor's intention to use EMR, the higher their level of compliance in filling out data in EMR completely, timely, and according to standards. In the context of the Theory of Planned Behavior, intention is the main predictor of the formation of actual behavior, including doctor compliance with the rules, procedures, and standards that have been established in the use of electronic-based medical recording systems or EMR [12].

The results of this study are in line with previous research by Putrina which stated that intention has a significant influence on compliance behavior [13]. A similar thing is also reinforced by Ivana's study which found that intention is influenced by user attitudes, subjective norms, and perceived behavioral control, which then contribute to compliance behavior in operating RME [14].

However, the results of this study are inconsistent with several previous studies that have shown that user intentions are not always directly proportional to actual compliance behavior. Although intention is an important factor in predicting behavior, there are other variables that can act as barriers or moderators, so that intention does not automatically result in compliance in practice [15].

Conclusion

This study shows that physician compliance in completing e-Medical Records (EME) at the Outpatient Polyclinic of Prof. Dr. W. Z. Johannes Kupang Regional General Hospital is still low. Of the four Theory of Planned Behavior variables, only attitude and intention significantly influence compliance, with attitude being the most dominant factor. Physicians with positive attitudes and intentions are more likely to comply with completing E-Medical Records.

In contrast, subjective norms and behavioral control had no effect on compliance, despite social pressure, policy demands, and technical barriers such as suboptimal facilities. These findings confirm that physician compliance is more influenced by internal factors than external support or pressure.

Efforts to increase compliance need to be focused on strengthening the perception of benefits, improving the EMR system, and providing training that supports the formation of positive attitudes and intentions in using EMR.

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