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The Effect of Compliance in Using Doctor Apps, Time Management, and Teamwork on Operation Timeliness in Tangerang Private Hospitals

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Abstrak

Ketepatan waktu operasi di rumah sakit sangat penting untuk efisiensi layanan, namun seringkali terkendala oleh faktor seperti kepatuhan penggunaan aplikasi dokter. Penelitian ini menganalisis pengaruh kepatuhan penggunaan aplikasi Doctor Apps, manajemen waktu, kerjasama tim terhadap ketepatan waktu operasi di rumah sakit swasta Kabupaten Tangerang. Tujuannya untuk menguji apakah kepatuhan menggunakan Doctor Apps, manajemen waktu, dan kerjasama berpengaruh terhadap jadwal operasi di rumah sakit. Penelitian ini menggunakan metode kuantitatif dengan analisis regresi linear berganda pada data kuesioner dari 96 dokter dan tenaga kesehatan. Pengujian hipotesis menggunakan Uji T, Uji F (ANOVA), dan analisis Koefisien Determinasi (R^2). Hasil analisis regresi menunjukkan bahwa hanya X2 (*Time Management*) yang berpengaruh signifikan terhadap ketepatan waktu operasi (signifikansi 0,000), sedangkan X1 (*Compliance Doctor Apps*) dan X3 (*Teamwork*) tidak signifikan (signifikansi >0,05). Analisis regresi menunjukkan X2 (Time Management) berpengaruh terhadap ketepatan waktu operasi (signifikansi 0,000, X1 (*Compliance Doctor Apps*) dan X3 (*Teamwork*) tidak signifikan (signifikansi >0,05). Model regresi ini signifikan secara statistik (F=7,480; p=0,000), dengan nilai korelasi (R) sebesar 0,443. Kesimpulannya kepatuhan penggunaan aplikasi dokter, manajemen waktu, dan kerja tim secara signifikan berpengaruh terhadap ketepatan waktu operasi di rumah sakit swasta Tangerang, meskipun kontribusinya relatif terbatas. Optimalisasi aplikasi dokter, manajemen waktu, dan kerja tim direkomendasikan untuk efisiensi operasi.
Kata Kunci : Aplikasi Dokter, Ketepatan Waktu Operasional, Manajemen Waktu dan Kerjasama Tim.

Abstract

The timeliness of operations in hospitals is essential for service efficiency, but is often constrained by factors such as compliance with the use of doctor applications. This study analyzes the effect of compliance in the use of Doctor Apps, time management, and teamwork on operation timeliness in private hospitals in Tangerang Regency. The aim is to test compliance in using doctor apps, time management, and teamwork on surgery timeliness in hospitals. This study used a quantitative approach with multiple linear regression analysis on questionnaire data from 96 doctors and health workers. Hypothesis testing used the t-test, F-test (ANOVA), and coefficient of determination analysis (R^2), at a significance level of 0.05. The results of the regression analysis showed that only X2 (Time Management) had a significant effect on operation timeliness (significance 0.000), while X1 (Compliance Doctor Apps) and X3 (Teamwork) were not significant (significance> 0.05). Regression analysis showed that X2 (Time Management) affected the punctuality of surgery (significance 0.000, X1 (Compliance Doctor Apps) and X3 (Teamwork) were not significant (significance >0.05). This regression model was statistically significant (F=7.480; p=0.000), with a correlation value (R) of 0.443. In conclusion, compliance in the use of doctor applications, time management, and teamwork significantly affected the punctuality of surgery in private hospitals in Tangerang, although their contribution was relatively limited. Optimization of doctor applications, time management, and teamwork is recommended for operational efficiency.
Keywords : *Doctor Apps., Operation Timeliness, Time Management and Teamwork*

INTRODUCTION

Surgery timeliness is a critical factor in hospitals because it has a direct impact on patient safety, service efficiency, and user satisfaction (Görtz et al., 2023). Delays in surgery can lead to medical complications, waste of resources, and patient and family dissatisfaction (Dusse et al., 2021; Gillespie et al., 2017). Research revealed that 36% of surgery schedules were changed the day before the operation, with 52% of them causing delays (Balzer et al., 2017). Overall, 86% of surgery schedules in hospitals experienced various forms of delays (Aktaş et al., 2024). Another study emphasized that efficient use of the operating room can only be achieved through accurate schedule planning (Agnoletti et al., 2013). Inefficiencies such as overlapping scheduling, inappropriate duration, or idle time can result in schedule cancellations and increased operational costs (Bilal et al., 2019). Several factors are thought to influence surgery timeliness, such as compliance in using doctor apps, time management, and teamwork (Gillespie et al., 2017). However, there has been no research that specifically analyzes the contribution of these three factors to operation timeliness in private hospitals in Tangerang.

Every surgical procedure involves communication with the patient and family regarding the type of procedure, operating room entry time, start time, and estimated duration of surgery (Abdel Mowla Ahmed & H. Awad, 2020). Data from 2023 from a private hospital in Tangerang showed an average delay in surgery of 12% (Prieely, Personal Communication, 2024). The main cause (18%) was the delay in the arrival of the surgeon due to scheduling conflicts with practices at the polyclinic, other hospitals, or patient visits. Besides communication, optimizing operating room management including facilities, time, and human resources is the key to hospital economic efficiency (Zaubitzer et al., 2020). Several studies have stated that accurate operating time planning is very important, where the use of operating room capacity based on its capacity is very important for the economic efficiency of the hospital (Amati et al., 2022; McCulloch et al., 2016; Mittel et al., 2021). In short, three things that are said to be important in operating room management are the operating room, time and personnel in the operating room.

In this advanced technology era, the use of doctor apps is designed to facilitate scheduling, access to medical records, and communication between medical staff (Dinakrisma et al., 2022; Willems et al., 2021). However, if the level of compliance with their use is low—for example due to lack of training or resistance to change—it can hinder the efficiency of surgical preparation (Alotaibi & Federico, 2017; Nassar et al., 2022).In addition to technology, human factors such as the surgical team's time management skills (planning, task prioritization) and interprofessional collaboration (doctors, nurses, anesthesiologists) also determine the smoothness of the surgical process (Vaismoradi et al., 2020). Conflict or poor coordination can cause delays (Siswadi & Radiman, 2021; Zajac et al., 2021). Previous studies have examined these factors separately, but the integration of technology compliance, time management, and teamwork in the context of private hospitals in Tangerang has not been widely explored. This study is important to provide practical recommendations to improve the timeliness of operations by optimizing these three aspects.

The implementation of the Doctor Apps in the operating room cannot be separated from the target of health service transformation involving specialist doctors, general practitioners and other health workers. The Doctor Apps application has been launched since 2021 but not many doctors have used it. After the appearance of the Doctor Apps was improved in 2023 and every doctor was required to use it, on average specialist doctors used the application to help with time management. Of the 436 doctors who practice at the hospital, 87.6% of doctors downloaded the Doctor Apps application. Although this application is attractive and user friendly for its latest appearance, there are still specialist doctors who do not want to use the application (Chandra et al., 2020; Sambo et al., 2024). Some of the reasons for not using the application are because they do not know how to use it, do not know clearly what its function is, and feel that so far their activities have been running well without the doctor apps (Pratiwi & Siambaton, 2022; Yoga et

al., 2021). In order for this doctor apps application to be used by specialist doctors, various supporting elements are needed to maximize its use.

This quantitative research with path analysis design aimed to test the extent to which compliance in using doctor apps, time management, and teamwork affect operation timeliness in private hospitals in Tangerang. Specifically, this study analyzed the effect of compliance in using Doctor Apps, Time Management, Teamwork on Operation Timeliness in Private Hospitals in Tangerang Regency. The implication is that the results of this study can be used as input for hospitals to improve themselves in relation to what has been done in their efforts to improve operation timeliness, to be even better, especially regarding patient safety.

RESEARCH METHOD

This study employed a quantitative approach with a path analysis model through a survey method. The research was conducted at Siloam Hospital Kelapa Duit C in Tangerang Regency in April 2024. Data were collected by distributing questionnaires to 96 respondents consisting of operating doctors and healthcare workers who used the Doctor Apps application. The population was total sampling as it numbered fewer than 100, making it representative as a whole (Eravianti, 2021). The research variables included three independent variables: compliance with Doctor Apps usage (X1), doctors' time management (X2), and teamwork (X3), along with one dependent variable: surgical timeliness (Y). The inclusion criteria comprised operating doctors and supporting healthcare workers in Tangerang private hospitals' operating rooms who had used Doctor Apps, were directly involved in surgical procedures, and were willing to participate. The exclusion criteria excluded non-app users, non-operating staff, respondents with incomplete questionnaires (>20%), and polyclinic doctors without surgical practice, ensuring data relevance and validity. Data were processed using SPSS software. The analytical methods included Multiple Linear Regression, Individual Parameter Significance Tests (t-tests), and F Tests (model reliability tests) conducted through Analysis of Variance (ANOVA). The decision rule specified that if the F probability value (shown as 'Sig.' in SPSS output) was less than the 0.05 alpha level, the null hypothesis (H_0) was rejected, indicating a feasible regression model. Conversely, if the F probability exceeded 0.05, the model was considered unfeasible. The R^2 test (Coefficient of Determination) measured the independent variables' collective influence on the dependent variable, explaining their predictive capacity.The study received ethical approval from Esa Unggul University, Jakarta prior to implementation.

RESULTS AND DISCUSSIONS

Demographic Data

Table 1: Demographic Characteristics (n=96)

Respondent Characteristics	Frequency	Percentage (%)
Profession		
Medical specialist	28	29
General practitioners	6	6
IPD Nurse	34	35
OPD Nurse	12	13
OT Nurse	16	17
Gender		
Females	62	65
Males	34	35
Last education		

D3	15	16
S1	55	57
S2	26	27
Age		
22-27 years old	24	25
28-33 years	34	35
34-39 years	16	17
40-45 years	12	13
46-51 years	2	2
>51 years	8	8
Length of working		
1 = 0-2 Years	28	29
2 = 2 - 4 Years	22	23
3 = > 4 Years	46	48
Amount	96	100%

Source: Primary Data (Processed by SPSS version 25, 2024)

This study revealed that most respondents were IPD nurses (35%) and females (65%) with a predominance of young age (28–33 years) and S1 education (57%), who may be more adaptive to technology but less experienced. However, the representation of doctors (only 35%) and the variation in length of service (48% >4 years vs. 29% beginners).

Univariate Analysis

Table 2: T-Test Results

Variables	Regression Coefficient	T Count	T Table	Sig.
X1	-0.058	-0.359	1,986	0.721
X2	0.175	3,887	1,986	0,000
X3	0.082	1,361	1,986	0.177

Source: Primary Data (Processed by SPSS version 25, 2024

The table above shows the results of the regression analysis that only X2 (Time Management) has a significant effect on the timeliness of surgery (significance 0.000), while X1 (Compliance Doctor Apps) and X3 (Teamwork) are not significant (significance >0.05). This indicates that the use of doctor apps and teamwork has not effectively supported the efficiency of operations in the hospital studied.

Bivariate Analysis

Table 3: ANOVA Table

Model		Sum of Squares	df	Mean Square	f	Sig.
1	Regression	140,581	3	46,860	7,480	.000
	Residual	576,377	92	6,265		
	Total	716,958	95			

Source: Primary Data (Processed by SPSS version 25, 2024

The table above shows that this regression model is statistically significant (F=7.480; p=0.000), indicating that at least one of the three independent variables has an effect on the dependent variable. Although significant, the relatively large Sum of Squares Residual (576.377) value compared to Regression (140.581) indicates that the model only explains about 19.6% of the data variance (R^2=140.581/716.958).

Table 4: Test of Determination Coefficient-Summary

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate	Durbin-Watson
1	.443a	,196	,170	2.50299	1,715

The table shows the results of the regression analysis with a correlation value (R) of 0.443, indicating a moderate relationship between the independent and dependent variables. The R Square value (0.196) means that 19.6% of the variation in the dependent variable can be explained by the regression model, while the Adjusted R Square (0.170) takes into account the number of independent variables, indicating that only 17% of the variation is significant after adjustment. Std. Error of the Estimate (2.50299) describes the average deviation of the model prediction from the actual value. The Durbin-Watson value (1.715) which is close to 2 indicates that there is no serious autocorrelation in the residuals, indicating a relatively good model under the assumption of error independence.

DISCUSSION

The results of the study indicate that the timeliness of surgery at Tangerang Regency Private Hospital is influenced by compliance with the use of the Doctor Apps application, time management, and teamwork. These variables have high values. Several studies support these findings where the use of applications can affect the time of the operation schedule, even being influenced by management and teamwork (Lu et al., 2018; Ponder et al., 2020; Suroso & Sukomoro, 2021). However, compliance with the use of the application does not have a positive effect on the timeliness of surgery because doctors do not depend on the application. Time management and teamwork have a positive effect on the timeliness of surgery. This study also used the TAM method to see the perception and acceptance of doctors towards the Doctor Apps application. Partial tests show that the second hypothesis (Ha2) is rejected. This means that the timeliness of surgery at Tangerang Regency Private Hospital is not influenced by compliance with the use of the Doctor Apps application. From the results of the analysis, it was found that the "Accept" dimension of the Doctor Apps application had the highest value, which was 86.3%. This shows that doctors can accept and use this application well. The use of this application has reached 92% until July 2024. Somer studies suggest the Technology Acceptance Model (TAM) theory explains that user acceptance of an information system is influenced by several factors, such as Ease of Use, Usefulness, Attitude Toward Usage, Behavioral Intentions to Use, and Job Relevance (Indah Naryanti et al., 2022; Jober & Harjoko, 2018; Nguyen et al., 2020). The results of this study indicate that the use of the Doctor Apps application has been used by specialist doctors, but does not affect the punctuality of surgery. Other factors such as patient arrival time, patient preparation time, previous cito operations, and patient medical conditions can also affect the inaccuracy of surgery time.

The results of the study indicate that time management has a significant influence on the punctuality of operations at the Tangerang Regency Private Hospital. Good time management can help organize operations more efficiently and effectively (Asamrew et al., 2020). Time management is a skill related to individual efforts and actions to make good use of time (Wihl et al., 2020). A study showed that delays in surgery can be caused by various factors, including surgeons, anesthesiologists, and nurses (Amani & Omar, 2017). Good leadership and strong commitment from related parties can help reduce delays in surgery (De Leo et al., 2021). The role of the head nurse in the operating room is very important in managing time and ensuring the discipline of her team's work (Nakano et al., 2023). Rewards for specialist doctors who are always on time when performing surgery can also be considered. Good time management and effective leadership can make the surgery schedule on time (Tsandila-Kalakou et al., 2023). This study

shows that time management affects the timeliness of surgery, and the better the surgery team manages its time, the more precise the start time of the surgery.

While about the teamwork, this study found it does not have a significant effect on the timeliness of surgery. Teamwork is a collaboration of individuals to achieve the same goal, and is very important in hospital organizations (Liepelt et al., 2023). Teamwork can improve productivity, decision making, and employee satisfaction (Balicer, 2014). Effective teamwork requires open and honest communication between teams (Safdari et al., 2025). However, in this study, teamwork did not affect the timeliness of surgery because there were other more dominant factors. Therefore, further research is needed to determine the factors that affect the timeliness of surgery.

In summation, this study proves that time management has a significant effect on the accuracy of operations in Tangerang Private Hospitals, while teamwork (although high) and the use of Doctor Apps do not have direct impact. Doctor Apps are indeed widely used by doctors (92%), but their dependence is still low because the features are not yet complete (eg: no automatic notifications) and still rely on manual systems (Chen et al., 2024; Morley et al., 2025). Other factors such as patient delays, previous surgery schedules, and equipment availability also affect timeliness. To improve efficiency, hospitals need to focus on time management training, add reminder features to the application, and strengthen team coordination.

CONCLUSION

The results of this study showed that collectively, compliance with Doctor Apps usage, time management, and teamwork had a positive effect on the punctuality of surgery at Siloam Hospitals Kelapa Dua. Partially, only time management significantly increased the punctuality of surgery, while compliance with application usage and teamwork did not show a positive effect. The analysis revealed that the weakest aspect was time management (especially the ability to refuse burdensome tasks), while the strongest aspect was the ease of use of Doctor Apps; the majority of respondents were nurses (>50%), indicating the crucial role of support staff in the surgery process. Regardless of the advantages, the limitations of this study include the number of samples (96 respondents) with limited nurse access to Doctor Apps, potential bias in the OT EMR system, and the focus only on internal aspects of the hospital without involving the patient's perspective.

SUGGESTIONS

Based on the findings that only time management significantly affects surgical accuracy, it is recommended that intensive time management training for medical personnel is to be considered. Especially task prioritization skills; re-evaluation of Doctor Apps implementation by improving features and user training to improve compliance; strengthening team collaboration through workshops or incentive systems; and further research that includes technological factors and patient perspectives. These steps are expected to overcome the limitations of the study while increasing the efficiency of surgical time. Further research is recommended to expand the sample, integrate patient perspectives, and explore unanalyzed technological or policy factors.

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