

Implementation of Electronic Prescription the Outpatient Services of the X Hospital: Evaluation of Readiness Factors

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Abstract: The implementation of electronic prescriptions in hospitals has been evaluated to have an impact on patient safety and hospital income. This method of prescription had been implemented in X hospital; however, a previous study found that the frequencies of usage were low. From March to April 2019, this mixed-method study conducted an explanatory sequential method design in X hospital to identify the proportion of physicians used electronic prescription and its contributing factors. Quantitative data was used to design questions for an in-depth interview with informants of X hospital. The result showed that only 23% of X hospital physicians used electronic prescriptions, while 58,3% of them used manual prescription and some electronic prescriptions. Physicians who did not use electronic prescriptions at all were counted to be 18,7%. Physicians who did not use electronic prescription would have the potential to cause medical errors and reduction of hospital revenue. It has been found that the system and supporting factors might be not adequate to follow up on the electronic prescription despite its sufficient human resource factors and work environment.

1 INTRODUCTION

In outpatient services, one of the factors that could potentially lead to medical errors is an error reading prescription. Error reading on manual prescription cannot be read, the prescription information is not complete, the use of abbreviations that are not standard, dose errors, mistakes rules of use, as well as errors of dose forms (Palappallil & Pinheiro, 2018). The use of technology in the health sector used to reduce medical errors and improve patient safety, one of them with electronic prescribing (Kierkegaard, 2013). With electronic prescribing may reduce errors reading the recipe as much as seven-fold. (Klepser, Lanham, & Cochran, 2016). The use of electronic prescriptions in various countries has a common goal, namely to reduce medical errors. Use of electronic prescription in many countries have similar objectives, namely to reduce medical errors. However, in doing so, physicians use prescription compliance varies. In the United States, an increase in the use of e-prescribing from 2008 to 2014 (Klepser et al., 2016). While European countries such as England, Sweden, Denmark, and Estonia, the case progress increased the use of e-prescribing from year to year (Deetjen, 2016). The increasing use of

electronic prescriptions in the United States and Europe due to the private sector's role in investment, and the role of government as policymaker (Samadbeik, Ahmadi, Sadoughi, & Garavand, 2017). Whereas the development of electronic prescribing other countries like in India since its launch in 2014, the response of physicians as much as 60.7% are still using manual prescription (Palappallil & Pinheiro, 2018). In Indonesia, the implementation of electronic prescriptions has not been widely applied in hospitals and other healthcare facilities. This is because it is still constrained by the number of patients so much that it takes a long time to enter, and the inability of hospital management gives reward and punishment to the physician in applying electronic prescription (Asyary, Kusnanto, & Fuad, 2013).

The successful implementation of electronic prescribing in Europe, influenced the seven factors that influence the factor advances in information technology in the health system, the system design is good, the facilities are standardized, strong leadership, readiness digital employees and patients, have the planning and implementation of the appropriate (Deetjen, 2016). Due to the conditions in Indonesia are not the same as in Europe as a whole, is rather difficult to apply the factors that affect the

successful implementation of electronic prescriptions. To evaluate the readiness of the implementation of electronic prescriptions in Indonesia, the used approach to four factors, namely the readiness factor of the system, human resource readiness factors, environmental factors work readiness, and the readiness of the supporting factors (Pratiwi, 2013). With this approach, you can know the achievement of each factor to evaluate.

In Europe, the adoption of electronic prescribing is also used to increase hospital revenue. This is due to patient adherence to physician's recommendation to pay for healthcare in the hospital, so the hospital will increase revenue from pharmaceutical units (Deetjen, 2016). X hospital in Depok has a revenue decrease in Pharmacy. This is because many outpatient prescriptions do not take the medicine at the pharmacy installation. The escape of these prescriptions influenced the use of a prescription manual. Therefore, X hospital in Depok establishes the use of electronic prescriptions, the use of electronic prescribing targets by 100% in outpatient services. But in its implementation, there are still many physicians or specialists who prescribe manually, so that the target is not reached the use of electronic prescribing. Impact, revenue X Hospital in Depok has not increased according to the targets set. The researchers wanted to evaluate the use of electronic prescribing readiness factors in X Hospital, seen from the factor of the system, human resource factors, environmental work factors, and the readiness of the supporting factors.

2 METHOD

This research is a mixed-method, with the sequential explanatory approach. This approach uses two phases, collecting quantitative data, analyzing the results, and then use the results to the qualitative research phase. Qualitative data helps strengthen and clarify information in the initial quantitative (Creswell, 2016). This study was conducted at X Hospital Depok, beginning in March until April 2019. In quantitative research, researchers will take the proportion of data that is matched the use of electronic prescriptions between data in the clinic with the data in Pharmacy. Proportions obtained were then grouped into three categories, the first category is the use of electronic prescribing 0%, category 2 uses an electronic prescription and prescription manual, and category 3, the use of electronic prescribing 100%. To deepen the evaluation of the use of electronic prescriptions, used in-depth

interviews. The subjects were medical assistants were 3 people who represent each category. Triangulation is done by observation of electronic prescription data in Pharmacy taken in April 2019. The results of in-depth interviews compiled in transcripts and matrix are grouped into the readiness factor of the system, the human factor, the work environment factors, and supporting factors (Pratiwi, 2013).

3 RESULT AND DISCUSSION

Hospital X in Depok, target the use of electronic prescribing in outpatient service is 100%. In March 2019, the resulting data on the use of electronic prescriptions as follows:



Figure 1: Percentage Use of Electronic Prescriptions Outpatient Services Hospital X in March 2019.

From Figure 1, it appears that the use of electronic prescribing is still below the target, the highest percentage only 63.82%. The use of electronic prescriptions per category can see the table below:

Table 1: Proportion of Electronic Prescription Usage Each Category.

Category	Average Number of Prescriptions	Percentage of Use Electronic Prescriptions	Quantity
1	83,11	0%	9
2	53,76	1-99,9%	28
3	6,81	100%	11
Total			48

From table 1 above, it can be seen that the physicians who use electronic prescribing on target (100%), only 11 out of 48 physicians (23%), and there are nine physicians or specialists from 48 (18.7%) who did not use electronic prescriptions and there are 28 physicians or specialists from 48 (58.3%) still using manual prescriptions and electronic prescriptions. More and more prescriptions are written, the more disobedient use of electronic prescriptions. The fewer the number of prescriptions, the more committed the use of electronic

prescriptions. To determine the outpatient service specialists anywhere who does not use electronic prescriptions can be seen in the following table:

Table 2: Proportion of Use Prescription Electronics Category 0%.

No.	Name of Specialist	Outpatient Clinic	Total Prescription
1	dr. F	Dermatologist	179
2	dr. Cc	Dermatologist	22
3	dr. H	Neurologist	169
4	dr. Cb	Neurologist	15
5	dr. Bt	Ortho	14
6	dr. Ag	Pulmonology	30
7	dr. D	Internist	99
8	dr. S	Internist	199
9	dr. G	Psychiatric	21

From Table 2 above, it can be seen that the majority of specialists who do not use the electronic prescription, the prescription number exceeds the average number of prescriptions category 0% which is equal to 83.11. So that the number of prescriptions, inversely related to the use of electronic prescribing by physicians. More and more specialist are using prescription manually, also affect hospital revenue. Prescriptions that go into pharmacy installation X Hospital will be reduced because the patient does not redeem the manual prescription medication in the hospital. In contrast to the use of electronic prescriptions entirely go first to the pharmacy installation. When they see table 2 above, internists, neurologists, and dermatologists have the highest number of prescriptions. Drugs of the third specialists also include classes of drugs that are expensive, to influence the decline in X Hospital income. In Europe, the adoption of electronic prescribing is also used to increase hospital revenue. This is due to patient adherence to physician's recommendation to pay for healthcare in the hospital, so the hospital will increase revenue from pharmaceutical units (Deetjen, 2016).

Electronic prescription comes as a solution to reduce medication errors. However, when the use of electronic prescribing is not applied correctly, as they combined with a manual prescription, then it would only cause new problems (Ghasemi et al., 2019). Innovation in an organization including hospitals must meet the interests of the two elements, the first should involve top management to buy, adopt, or to innovate. While both have to involve users of these innovations (Faber, van Geenhuizen, & de Reuver, 2017). From Table 2 above, specialists who have many prescriptions tend not to use electronic prescribing. In this case, the policymakers do not

involve the user, in this case, the physicians in the design concept of electronic prescriptions. Although the development of electronic prescriptions tailored to the user can encourage the physician to use and reduce their dissatisfaction (Ghasemi et al., 2019).

To further deepen in answering the question of how and why the use of electronic prescribing is still low, we stepped into a stage of qualitative, in-depth interviews with using the instrument. Evaluation of the use of electronic prescribing is done by four factors readiness approach (systems, human resources, work environment, and support).

Factors readiness of the system can be seen from the quality system. In-depth interviews show that the electronic prescription system is still much constrained in its use and is expected also in line with the electronic medical record. Because if already electronic prescriptions, but medical records are still manual, the work is not effective. Build a system that has a high quality is not easy, so it should continue to do a lot of system improvements, to produce the expected system users and outputs to be achieved as mentioned by the informant A, B, and C below:

“.... My suggestion for electronic prescribing more drugs to the list needs to be updated, to avoid no-name prescription drugs want, no need to ask to the pharmacy again ...” (Informant A).

“.... If you can add features in the patient diagnosis electronic prescription system to be more efficient so it does not work the same twice so consistent - the same electronics allow for quicker” (Informant B).

“..... The system needs to be improved, in order not to die alone like an error or application ...” (Informant C).

In a major change, in this case from manual to electronic prescribing prescription must have the support of top management (Ghasemi et al., 2019). With the commitment of the top management, generate an electronic prescription system is not easily generated error, electronic prescribing medic integrated with electronic records and would require substantial investment value. Integration of electronic prescriptions with electronic prescribing, besides, to further streamline the service time also reduces medication errors in patients geriatric weak, and have a history of complex diseases (Moro Agud et al., 2016).

Human resource readiness factors can be seen from the perceived impact and adaptation of user-friendly electronic prescriptions. The system to be especially helpful in reducing errors in the administration of drugs to patients. Obstacles that happens is difficult to use electronic prescriptions if

patients a lot because the doctor must explain the diagnosis directly to the patient in conjunction with the input data into the electronic prescription system. The following statements from informants A, B, and C on it.

.....” *Help, if the patient is not crowded. If more crowded over the manual prescription. Because complicated, doctors diagnosing patients still manually, keep an electronic prescription. Happens to work twice that. So yes, all wrote the manual prescription let me quickly...*” (Informant A).

.....” *If longer use little help patients, if more crowded even be inhibiting the use of electronic prescription.*” (Informant B).

.....” *Very helpful, to avoid incorrect attachment of barcode or wrong in reading the recipe ...*” (Informant C).

Resistance to change from the user side may happen when they do not see the added value of such changes, but if they voluntarily follow the changes but no carrying capacity of hospital management, they will combine the use of manual and electronic prescribing (Gagnon, Nsangou, Payne-Gagnon, Grenier, & Sicotte, 2014). Depth interviews above, it appears that open resistance from physicians to change from manual to electronic prescribing prescription, but at the time many patients, they will go back to using a manual recipe, because the medical record still manually to avoid double work. Carrying capacity required hospital management to accommodate the desire of physicians in medical records and electronic prescriptions are integrated.

Readiness factors of the work environment can be seen when using the attitude on the implementation of electronic prescriptions. The same problems can be responded to differently. When there was a slight problem with the application of electronic prescriptions, there are re-using the recipe manually, but there are still repeating the use of electronic prescriptions to succeed. This can be seen in the following informant's narrative:

.....” *Ever are difficult to use it, but sometimes the data of patients seeking treatment rather not appropriate, should that today the patient A, even the outpatient B was yesterday already went, so we use the manual prescription....*” (Informant A).

....” *In the application there is already a patient's name, so all that remains is to prescribe the medicine. Sometimes a prescription for one patient can be sent twice. For example, the first prescription has been sent, apparently, there are additional prescription drugs. So, the recipe for additional drugs is made*

again, or sometimes the recipe sent is illegible in the pharmacy, so we make it again, maybe that's what makes double the use of electronic prescription...” (Informant B).

....” *This is difficult to use it, but yes for any error, so I use the recipe manually anymore ...*” (Informant C).

In Kuwait, a physician as the user responds positively, but almost half of these studies provide input to electronic prescriptions that should have a better function, which will make them not back to using a manual recipe (Almutairi, Potts, & Al-Azmi, 2018). Function problems in the application of electronic prescriptions will determine the readiness of the working environment responds positively to the use of electronic prescribing. In-depth interviews mentioned above is seen in the work environment in the X hospital has responded positively to the use of electronic prescriptions, but with the malfunction of the application, some specialists still use electronic prescribing for the patient is not a lot, and re-use prescription manuals for many patients that services are not hampered.

Factors supporting viewable readiness of equipment and networks. The successful use of a system should also be supported by the network equipment and standardized so it does not hamper the current will be used. It is like a narrative following informant:

“.... *Ever, it is difficult for access, sometimes like an error when you want to log into the electronic system ...*” (Informant A).

“.... *Sometimes a sudden want to login directly application error*” (Informant B).

“..... *directly error Sometimes the time will log in suddenly an error immediately, or the computer suddenly restarts immediately do not know why ...*” (Informant C).

In various countries have made significant efforts to promote the use of electronic prescriptions with several substantial investments to develop a good system, but a little forgotten maintenance of equipment and the network as a contributing factor (Gagnon et al., 2014). Kuwait also noted that to conduct electronic prescription there must be adequate technical support for the implementation of electronic prescribing application maintenance (Almutairi et al., 2018). From in-depth interviews above, it appears that the maintenance of the equipment and network absolutely must be met for the smooth use of electronic prescribing in hospitals X. routine and unscheduled maintenance of the

equipment and the network, the user can reduce electronic prescriptions complain of hard login or sign in to the app.

4 CONCLUSIONS

The use of electronic prescriptions in X Hospital Depok does not comply with the specified target (100%). 23% use of the electronic prescription as a whole is still far from the target set. While the use of the still use of electronic prescriptions and prescriptions manual amounted to 58.3%, and that does not use at all prescription electronics by 18.7%. Specialists who do not use electronic prescriptions, potentially cause medical errors and reduce hospital income. It has been found that the system and supporting factors might be not adequate to follow up on the electronic prescription despite its sufficient human resource factors and work environment.

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