Public Health Perspectives Journal 6 (1) 2021 20-30

Public Health Perspective Journal

http://journal.unnes.ac.id/sju/index.php/phpj

The Influence of Electronic Medical Record Toward Drug Planning Quality at the Pharmacy Department of the Hospital 'X'

Menik Hendrawati✉, **Farid Agushybana, Apoina Kartini**

Fakultas Kesehatan Masyarakat, Universitas Diponegoro, Indonesia

Article Info

Article History:
Accepted 19 July 2020
Approved 07 September 2020
Published 23 April 2021

Keywords:
Electronic Medical Record(s), Service Quality, Information Quality, System Quality, Drugs Planning Quality

Abstract

Since 2016, the Hospital 'X' has been operating an Electronic Medical Record (EMR) and it is integrated with all units, including pharmacy, and it intends to increase its efficiency. 50% of hospital's income comes from the pharmacy and there is no evaluation related to the using of EMR towards quality of drugs planning. The purpose of this research is to know the correlation between technology factors (system quality, information quality, service quality) of EMR and quality of drugs management at the pharmacy of the Hospital 'X'. This research uses quantitative research method with cross-sectional approach, and it involves 53 respondents with questionnaire as the data collection technique. The data itself analyzed by SEM PLS (Structural Equation Model-Partial Least Square). The research results show that the information quality of EMR gave significant correlation with the quality of drugs planning, whereas the system quality and EMR service quality were not influenced. The correlation between the information quality and the perception of drugs management quality was significant with T-statistics 7,9508>1.96 and the sample original value was 0.6551. The system quality was not significant with T-statistics 1.6159 < 1.96 and the sample original value was positive, 0.1702. The service quality was not significant with T-statistics 0.6297 < 1.96, with the sample original value was negative, -0.0591. This research shows that the simplicity aspect in understanding the information influences towards the utilization of drugs management, but it needs to increase the system and service quality from the devices, connectivity, network, and upgrading the staff capability aspects.

✉Correspondence Address:
Jl. Prof Soedarto No 1269 FKM UNDIP, Semarang, Indonesia
Email : menikrazief26@gmail.com

p-ISSN 2528-5998
e-ISSN 2540-7945

INTRODUCTION

Enhancement of service quality is not only considered as an important issue in management sector, but also it is one of important factors to create an optimal health services (Faturahmah & Raharjo, 2017; Wijayantiningrum, Wijayanti, & Raharjo, 2019). Pharmacy services is considered as supporting facility and main revenue center in the hospital and it is required to comply with the Health Minister Regulations No. 72 2016 and 90% of healthcare services in the hospital use pharmacy supplies (medicines, chemicals, radiology supplies, disposable medical supplies, medical tools, and medical gases). 50% of hospital income comes from pharmacy supplies management, so it needs planning and drugs procurement evaluation in order to establish efficient drugs management (Mahdiyani, Wiedyaningsih, & Endarti, 2018; Satrianegara & Bujawati, 2018; Triaktariyani, 2018). Drugs and disposable medical management uses data of electronic information system like in the US, so the hospital is able to compete and increase its service quality and patient safety, then it will efficiently affect on the savings of drugs expenditure cost, and also the benefit enhancement for the patient (Nesi & Kristin, 2018; Salmon & Jiang, 2012). Information system is a technology combination to support operation and management in the hospital (Widodo, Agushybana, & Jati, 2018). The EMR administration in the hospital is part of Management Information Systems. In accordance with the public demands about better health service quality, the EMR administration has an advantage i.e. it prevents a medical error through three mechanisms: adverse event prevention, gives fast response if the adverse event occurred, tracks and provides feedback about the adverse event. The EMR also important in managing the healthcare problems management, because it provides integrity and accuracy, also it becomes a solution to enhance cost efficiency, access, and service quality (Jahanbakhsh, Tavakoli, & Mokhtari, 2011; Qureshi, Shah, Khan, Miankhel, & Nawaz, 2013; Widayanti, 2015).

90.7% Hospitals in the US with EMR facility give an access to the pharmacist to check the EMR for drugs therapy management, and only 50% of those hospitals give an access to the pharmacist documenting the recommendations and progress notes in the EMR (Nelson, Poikonen, Reese, Halta, & Weir, 2017). Seeing the lack of benefit evidence on the patient and also the lack of cost effectiveness evidence, the electronic health technology must be carefully evaluated especially in the social-technical factor, in order to maximize the success possibility of electronic health implementation and adoption (Black et al, 2011).

Pharmacy Information System (PIS) as part of the EMR that helps the pharmacist to make a decision about patient's medicine therapy which emphasizes on the medical error subtraction, enhances communication between nurses and pharmacy department, provides integration and interoperability in drugs administration. The PIS has main feature, such as receipt management, clinical screening, inventory management, and reporting (drugs utilization and cost of purchased drugs), so the pharmacy department is not only responsible for the drugs supplies but also in the pharmacy planning. Technology also enhances the work time efficiency on the pharmacist until 82% (Tikoo & Langton, 2014). A research conducted in Ethiopia shows that the differences between physical amount of drugs and noted amount in the data of important drugs from 0% until 60%. The loss caused by expired drugs in a-6 (six) month period is 1337.6 USD from six health facilities (Nanati, Legese, 2017). In last two decades in the US, there is a significant advantage from the implementation of health information technology such as EMR, Computerized Physician Order Entry (CPOE), system that supports clinical decision, e-prescribing telemedicine, and administration function (Appari, Carian, Johnson, & Anthony, 2012). CPOE is part of EMR and used to help the doctors to communicate with another medical staff (nurses, therapists, or the other doctors) or cross department (pharmacy, radiology, laboratory) especially about patient care through

computerized and documented patient record system (Altuwajri, Bahanshal, & Almehaid, 2011). There is positive correlation between the using of health information technology and care quality, especially in the research that uses references which were published between 1994-2010 (Buntin, Burke, Hoaglin, & Blumenthal, 2011).

The respondent from the healthcare facility with CPOE reports about the diminishing of medication errors for prescribing process (e-prescribing), drugs dispensing, and administration component (Angela, Bakti, & Adisasmito, 2019). CPOE affects on customer satisfaction (doctor and nurse), organization settings in teaching hospital, and also proponent of clinical decision (Appari et al, 2012; Niknam, Khammarnia, Zand, & Fallahnejad, 2018). These previous researches study about the effect of EMR on financing efficiency, patient care quality enhancement, reduce the medical errors, and support the clinical decision which has showed significant result, but, the role of EMR itself from the perception of technology utilization towards drugs planning at pharmacy department has not studied yet. The purpose of this research is to analyze about the relationship between EMR technology quality (system quality, information quality, and service quality) and drugs planning at the pharmacy department in Hospital 'X' in order to evaluate the utilization of EMR towards management activity at the hospital's pharmacy department.

METHOD

This research analyzes the effect of independent variable, namely technology factor, i.e. technology quality from HOT FIT (system quality, information quality, and service quality) towards dependent variable, that is drugs planning quality measured from drugs planning quality perception (forecasting, logical and rational planning, comprehensive, flexible planning, definite purpose establishment, effective financing, staff participation, accurate planning, human resources development, alternative drafting). This research is analytic research with quantitative approach. This research also uses cross sectional as period approach, specifically running this research in specific period of time, so the result is an illustration of that exact time. The method of this study is survey through questionnaire. The subject of the study is determined by total sampling method, for paid leave respondent(s) or he/she cannot follow the research process, he/she will not be included. The data collection technique uses questionnaire. The research questions cover the obedience and smoothness of EMR implementation, the impact of EMR implementation towards pharmacy planning, and dig the factors related to human factor, organization, and technology in the Hospital 'X'. Secondary data comes from note-taking and reporting at the pharmacy department, the medical record department, or Management Information System (MIS).

The questionnaire testing is based on the questionnaire testing of Hidayat's research about Early Warning System that uses Liken scale questionnaire (Hidayat, Agushyabana, & Nugraheni, 2020). This testing is used to prevent systematic error, which is the validity test is done through Product Moment test from Pearson and reliability test with Alpha Cronbach. There are four processes in data processing phase, i.e. coding, tabulation, analysis, and data interpretation. Multivariate analysis statistic test is used to observe the relationship between the impact of independent variable and dependent variable in this research. Independent variable is technology factors (system quality, information quality, service quality), dependent quality is drugs planning quality perception. The data analysis uses SEM-PLS (Structural Equation Model-Partial Least Square). Outer Model is valuation on reliability and variable validity by convergent validity, discriminant validity, and composite reliability. After that assumption is fulfilled, the researcher runs inner model evaluation to know the relationship between variable, significant, and R-square.

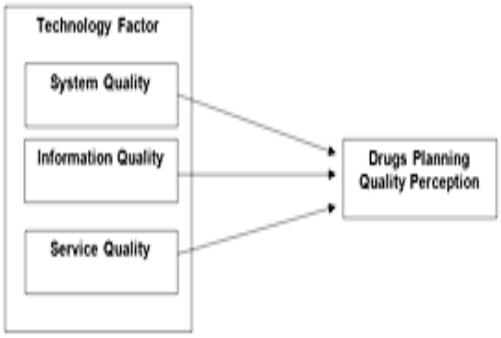

Figure 1. Research Concept Framework

Research Hypothesis

H1 : System quality has correlation with drugs planning quality perception.

H2 : Information quality has correlation with drugs planning quality perception.

H3 : Service quality has correlation with drugs planning quality perception.

RESULT AND DISCUSSION

There are 53 respondents that fill the questionnaire. 49 respondents (92.5%) are female and 4 respondents (7.5%) are male. Their education backgrounds are Senior High School (27 respondents, 50.94%), Diploma (18 respondents, 33.96%), Bachelor (8 respondents, 15.1%). They have various working length, such as 26 respondents with 1-5 year working length (49.06%), 11 respondents (20.75%) for 5-10 year working length, and 16 respondents (30.19%) for +10 year working length. Based on those data, the respondents are mainly female with Senior High School as their education background, and they have 1-5 working length.

Respondent Variable Description

Quality System

Table 1. Quality System Variable

DIMENSION	SCORE
Customer Simplicity (SQ1)	3.58
Easy to Learn (SQ2)	3.90
Data Accuracy (SQ3)	3.01
Availability and Utilization of Feature and Function (SQ4)	3.33
Data Security (SQ5)	4.18
Efficiency (SQ6)	3.56
Reliability (SQ7)	2.44
Average of System Quality Variable	3.43

System Quality Variable (SQ) has seven (7) dimensions and it uses Likert scale, such as TD (Totally Disagree), D (Disagree), N (Neutral), A (Agree), TA (Totally Agree), and it is divided into scale 1-5. Based on Table 1, the average score of SQ variable is 3.43, the respondents choose neutral on the statement of SQ questionnaire. Data security dimension gets highest agree score and reliability dimension gets the most disagree score.

Information Quality

Table 2. Information Quality Variable

DIMENSION	SCORE
Information Completeness (IQ1)	2.89
Accuracy (IQ2)	2.94
Easy to Understand (IQ3)	3.85
Briefness (IQ4)	3.73
Relevance (IQ5)	3.63
Average of Information Quality Variable	3.41

Based on Table 2, the average score of Information Quality is 3.41, the respondents choose to be neutral towards all of the Information Quality questionnaire statements except the information quality of EMR gets disagree valuation from the respondents.

Service Quality (SVQ)

Table 3. Variable of Service Quality

DIMENSION	SCORE
Fast Response (SVQ1)	3.33
Guarantee of Pharmacy Services (SVQ2)	2.67
Follow-up Services (SVQ3)	3.12
Technical Support from the Management (SVQ4)	3.78
Empathy (SVQ5)	3.53
Average of Service Quality Variable	3.29

Based on Table 3, the average score of Service Quality variable is 3.29, and the

respondents choose to be neutral towards the statements of SVQ questionnaire. Dimension of technical support from the management gets 'neutral' from the respondents and gains the highest score (3.78). Dimension of guarantee of pharmacy services gets 'disagree' valuation by the respondents and gains the lowest score (2.67).

Perception of Drugs Planning Quality

Table 4. Variable of Drugs Planning Quality Perception

DIMENSION	SCORE
Forecasting (DPQ1)	3.15
Logical and Rational Planning (DPQ2)	3.89
Comprehensive (DPQ3)	3.9
Flexible Planning (DPQ4)	3.82
Definite Purpose Establishment (DPQ5)	3.67
Effective Financing (DPQ6)	3.66
Human Resources Development (DPQ7)	3.46
Staff Participation (DPQ8)	3.91
Accurate Planning (DPQ9)	3.8
Alternative Drafting (DPQ10)	3.52
Average of Drugs Planning Quality Perception Variable	3.68

According to Table 4, the average score of drugs planning quality variable is 3.68, the respondents choose 'neutral' towards the statements of DPQ questionnaire. Dimension of staff participation gets highest response (3.91) and the respondents choose neutral. Forecasting dimension gets 'neutral' valuation from the respondents but gains lowest score.

Multivariate Analysis

Outer Model Evaluation

Validity and reliability testing on each latent variable, such as system quality variable, information quality, service quality, and drugs planning quality perception, use SmartPLS software. Dimension of individual reflexive is considered valid if loading (value with the latent variable that want to be measured is ≥ 0.5, if one of the indicators has loading factor value 0.5, that indicator must be dropped, because that indicates the indicator is not quite good to measure the latent variable precisely.

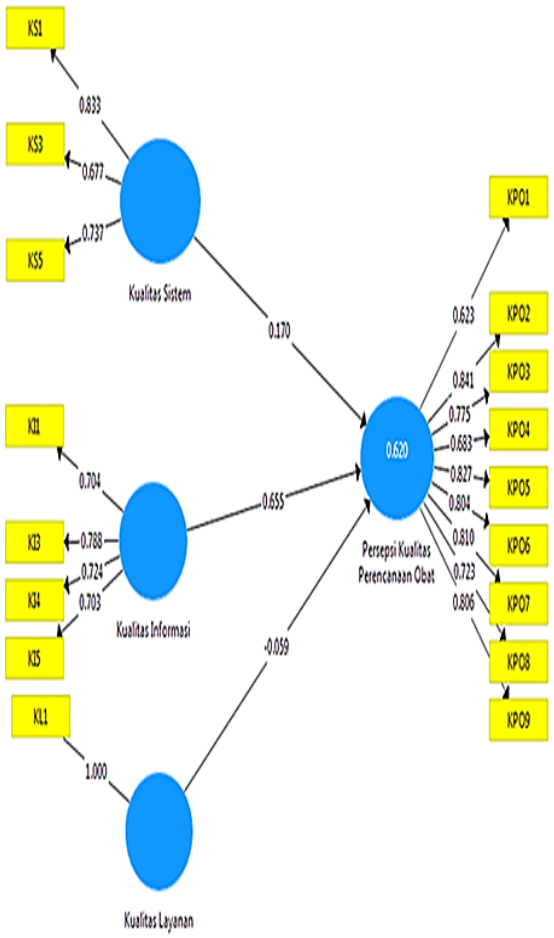

Figure 2. Outer Model Evaluation (After the Model is Fit)

Based on Figure 2, after the model is fit, SQ1(KS1) gets score 0.833 for loading factor, so the SQ1 variable is considered 'valid' to measure the System Quality construct. Overall, the variables of SQ1(KS1), SQ2 (KS2), and SQ5(KS5) are valid to measure the construct of the System Quality, and then , the variables of IQ1 (KI1), IQ3(KI3), IQ4(KI4), and IQ5(KI5), are valid to measure the information quality. SVQ1(KL1) is valid to measure the construct of Service Quality (Kualitas Layanan), and DPQ1-9(KPO1-9) variables are valid to measure the construct of drugs planning quality perception.

Table 5. Average Variance Extracted (AVE) Score

Variable	AVE
Information Quality	0.5340
Service Quality	1,0000
System Quality	0.5653
Drugs Planning Quality Perception	0.5913

Table 6. Composite Reliability

Variable	Composite Reliability	Result
Information Quality	0.8206	Fulfilled
Service Quality	1,0000	Fulfilled
System Quality	0.7947	Fulfilled
Drugs Planning Quality Perception	0.9281	Fulfilled

Table 5 shows the score of all AVE variables is ≥0.50, and it fulfills the discriminant validity criteria (each variable is considered different each other). Next step is testing the variable reliability which is showed by composite reliability > 0.60 and based on table 6, all of the constructs are reliable.

Inner Model Evaluation

Structural model can be evaluated through viewing the R2 value on endogen variable and path coefficient parameter. Inner model or structural model testing is done in order to view the correlation between variable, significance value, and R-square from research model, if the assumption is fulfilled. R-square is a determination coefficient and it has strong value > 0.67, moderate > 0.33, weak > 0.19. The R2 value for the variable of drugs planning quality perception is 0.6197, and it can be stated that this variable is able to be described by construct variable (system quality, information quality, and EMR service quality) 61.9%, and the rest (38.1%) is influenced by another variable which is not available in this research. The influence of correlation between exogenous latent variable and endogen latent variable (drugs planning quality perception) is explained on the table 7 below:

Table 7. Hypothesis Testing from Path Coefficient (Mean, STDEV, T-Values)

	Original Sample	Sample Mean	Standard Deviation	T Statistics
System Quality -> Drugs Planning Quality Perception (H1)	0.1702	0.1829	0.1053	1.6159
Information Quality -> Drugs Planning Quality Perception (H2)	0.6551	0.6685	0.0824	7.9508
Service Quality -> Drugs Planning Quality Perception (H3)	-0.0591	-0.0718	0.0939	0.6297

The path parameter coefficient from the correlation between information quality variable and drugs planning quality perception is 0.6551 with T-statistics 7.9508 > 1.96on significance level α = 0.05 (5%) which states that there is a significant correlation between information quality and drugs planning quality perception. Positive value means if the information quality is getting better, the drugs planning quality perception will be increasing.

Path parameter coefficient from correlation between service quality variable and drugs planning quality perception is -0.0591 with T-statistics value 0.6297 < 1.96 with significance level α = 0.05 (5%) which states that there is insignificant correlation between service quality and drugs planning quality perception, and then, the negative value itself shows the better/worse of service quality will not influence the drugs planning quality perception.

Path parameter coefficient from the correlation between system quality variable and drugs planning quality perception is 1.702 with T-statistics value 1.6159 < 1.96 with significance level α = 0.05 (5%) and it states that there is insignificant correlation between system quality and drugs planning quality perception , but the positive value shows if the system quality is

getting better, it will influence the drugs planning quality.

Table 8. Hypothesis Testing Result

Hypothesis	Coefficient	Significant Level	t-table	t-statistic	Result
H1	0.1702	5%	1.96	1.6159	H1 rejected
H2	0.6551	5%	1.96	7.9508	H2 accepted
H3	0.0591	5%	1.96	0.6297	H3 rejected

According to the testing result on table 8, it can be concluded that the testing accepts H2. So, there is a correlation between EMR information quality and drugs planning quality. H1 and H3 are hypotheses about correlation between system quality and EMR service quality towards drugs planning perception quality, with significance level 5%, t-table 1.96, and t-statistics 1.6297 and 0.6297, so it is discovered that t-statistics is smaller than t-table, then, H1 and H3 are rejected (Table 8). Based on this research, the results are different than the previous researches, such as the system quality and the EMR service quality are considered 'not related' with the drugs planning quality perception, even though in the previous researches prove that those two are factors that influence the technology implementation and net benefit is reached. This research only assesses the technology component against net benefit which is assumed as drug planning quality perception which contains forecasting, logical/rational, comprehensive, flexible, definite purpose, effectiveness, participation, accuracy, human resources development, and alternative drafting.

EMR system quality does not correlate with the drugs planning quality perception (H1 rejected), it is assumed that the system quality aspect has not given perception that supports the enhancement of drugs planning quality. The causes are some mistakes in data entry by professional caregiver and these are not automatically corrected by the system, and the internet connection has not optimal yet and it interferes the services, and both cause inefficient time. The EMR feature has not facilitated drugs dosage calculation and it inflicts a problem during stock-taking calculation, because it leads to calculation errors and it will impact on the financing. It can be concluded that the EMR system quality has not accommodated the effectiveness aspect yet, so there is no cost savings, time and quantity of human resources that reflect a good quality of drugs planning.

This matter is not harmonious with the systematic review by Nguyen, et al., that states about the EMR system quality is reviewed from the ease of use, efficiency, and also data accuracy which is very useful especially for professional caregiver, and it should be very supportive to form a good quality of drugs planning. According to Johnson, all of the steps in the formulated planning must consider resources component, facility, infrastructure, and available budget, so the effectiveness aspect from the EMR system quality is needed in its planning (Nilsen, 2015). Steps to overcome the weakness of EMR system quality are improvement in the EMR feature and upgrading the internet connection. But, the attitude of the respondents who disagree with some indicators of easiness in using the EMR in this research is suitable with a study conducted by Waljil where 47% of professional caregiver wanted to enhance the easiness in using the EMR. Then, an anxiety arose on the privacy system and confidentiality of patients data in the EMR, because their data were saved electronically, but unfortunately, the cause of that anxiety was not explained yet especially about the data security (privacy and confidentiality) of EMR by the previous researchers (Nguyen et al, 2014; Nilsen 2015).

EMR service quality at Pharmacy Department is assessed from its reliability, pharmacy services guarantee, support and empathy from the additional staff (IT employee). This assessment can be used to improve the drugs planning quality. Good drugs planning is drugs vacancies or disturbing condition during services is avoided (blackout, server disruption, slow

internet connection). The EMR itself is used to ensure the amount of medicines monitored in real-time, system can run 24 hours, and if technical disruption appears, the IT staff is needed to repair and make sure the service runs smoothly. The EMR service quality dimension in this research is regarded 'not maximal', because the IT staff is assumed sluggish and he/she has not given the feedback during the repair.

It is contrast with the previous research where the information system service quality at Pharmacy Department can be used in drugs planning process. It happens because the utilization of the EMR depends on the staff capability especially in operating the computer system (EMR). If the staff gets adequate training followed by appropriate training frequency to create positive habit and restoration of supporting facilities, the service quality will be more optimized (nguyen et al., 2014; Timorini, Woro, Handayani, Sri, & Rahayu, 2020). During its implementation, the program's efficiency and effectiveness are depending on the quality of human resources' capability and existence (Hasana & Mukarromah, 2019; Wijaya & Soesanto, 2017). This research shows that the staffs of pharmacy department in the Hospital 'X' still have high dependency on the IT staff especially if they meet problems during working on the EMR. It can be solved by organizing EMR training routinely, as stated on the previous research. Building good communication between pharmacy department and information technology department is needed, so the feedback after the reparation will be done immediately. Experience shows that routine and corrective feedback is the best way to enhance the information data quality and obedience of pharmacy management reporting (Embrey, 2012).

This research points that the EMR information quality is related to the drugs planning quality perception, and it can be stated that the dimension of information quality that focuses on information completeness, accuracy, easiness to be understood, brevity, and relevancy, is regarded 'facilitated the drugs planning needs.' Dimension of information completeness emphasizes on the accuracy of data entry based on the drugs consumption and the pattern of Top 10 most disease treated by the Hospital 'X', it is suitable with the guidelines of drugs planning that considers on the importance of drugs consumption data for forecasting priority plan and pharmacy department development plan in the Hospital 'X'. This fact is parallel with the previous 23 researchers conducted by Nguyen, et al., that good information quality leads to the accuracy improvement on patient data and it affects on the improvement of overall data at the Pharmacy Department. A quality planning is determined by good data accuracy so it can be as the foundation that will determine the purpose of definite planning and easy to be implemented, especially by the pharmacists (Nesi & Kristin, 2018; Rosmania & Supriyanto, 2015).

The respondents also give their good rate on easy to understand dimension which is needed for the utilization of EMR at the Pharmacy Department. Based on the study conducted by Shachack and Walji, the information quality is influenced by data capability to be reread especially the doctor's writing which is hard to be read in the manual medical record. The use of EMR enhances the improvement of documentation quality and it impacts on the drugs planning process which needs valid data, so there will be no mistakes or errors in ordering, admission, and drugs expenditure to the unit or patient, in accordance with the Moody et al.'s research (Nguyen, et al., 2014). The research result also shows that the information as the product of EMR is complete and gives positive impact on the process of clinical decision taking for the patient by the professional caregiver, such as drugs substitution, if the drugs stock is vacant the staff does not need to wait for long, because it is suitable with the indicator from the information completeness. The EMR relevance dimension accommodates sudden data modification, it is suitable with the needs of the quality drugs planning implementation, where the program monitoring and evaluation is run based on the real-time service condition. The dimension of EMR brevity is reflected on the easiness in taking the information data on each period. This is

suitable with the needs of pharmacy management planning where the summary of operational data (e.g. monthly or quarterly) used periodically to monitor the unit's performance, measure the management effectiveness to reach the mission, change the planning strategy, or EMR data analysis based on the needs or trend in their part and it can be used for decision taking in local level (Embrey, 2012). These all EMR information quality dimensions in the Hospital 'X' from this research play in the process of drugs planning.

CONCLUSION

The EMR information quality produces accurate and definite data, it helps the drugs planning activity and also development of the Pharmacy Department in the Hospital 'X'. System quality and EMR service quality need some improvements start from supporting devices aspect, stabilization of internet connectivity, enhancement of EMR operational training for pharmacists, and improvement in the feedback, so it can help the process of drugs planning. The limitations of this research is in the data analysis, this research still encloses less valid question, and it is expected that the questions should be developed through running some improvements.

ACKNOWLEDGEMENT

Our deepest gratitude to the Faculty of Public Health, Diponegoro University Semarang that gives the support during this research.

REFERENCES

Altuwaijri, M., Bahanshal, A., & Almehaid, M. (2011). Implementation of computerized physician order entry in National Guard hospitals: Assessment of critical success factors. Journal of Family and Community Medicine, vol. 18(3),143-151.

Appari, A., Carian, E. K., Johnson, M. E., & Anthony, D. L. (2012). Medication administration quality and health information technology: A national study of US hospitals. Journal of the American Medical Informatics Association, 19(3), 360–367.

Black, A. D., Car, J., Pagliari, C., Anandan, C., Cresswell, K., Bokun, T., Sheikh, A. (2011). The impact of ehealth on the quality and safety of health care: A systematic overview. PLoS Medicine, 8(1), 1–16.

Buntin, M. B., Burke, M. F., Hoaglin, M. C., & Blumenthal, D. (2011). The benefits of health information technology: A review of the recent literature shows predominantly positive results. Health Affairs, vol. 30(3), 464–471.

Embrey, Martha. (2012). MDS-3:Managing Access to Medicines and Health Technologies. Arlington, VA : Management Sciences for Health.

Faturahmah, E., & Raharjo, B. B. (2017). Analisis Tingkat Kepuasan Pasien BPJS Terhadap Kualitas Pelayanan Petugas Medis Medis Melalui Faktor Assurance di Ruang Rawat Inap RSUD Bima, NTB. Public Health Perspective Journal, 2(3), 254–261.

Hasana, D., & Mukarromah, S. B. (2019). The Evaluation of the Success about House Nutrition in Improvement Nutrition Status in Semarang. Public Health Perspective Journal, 4(2), 94–103.

Hidayat, D.I., Agushybana, F., Nugraheni, S,A. (2020). Early Warning System pada Perubahan Klinis Pasien terhadap Mutu Pelayanan Rawat Inap. Higeia Journal of Public Health Reseach and Development. Vol. 4 (3):506-519

Inquilla, C. C., Szeinbach, S., Seoane-Vazquez, E., & Kappeler, K. H. (2007). Pharmacists' perceptions of computerized prescriber-order-entry systems. American Journal of Health-System Pharmacy, 64(15), 1626–1632.

Jahanbakhsh, M., Tavakoli, N., & Mokhtari, H. (2011). Challenges of EHR implementation and related guidelines in Isfahan. Procedia Computer Science, 3,1199–1204.

Legese, Nanati. (2017). Pharmaceutical expenditure analysis and assessment of pharmaceutical inventory control management practices in Saint Paul Hospital Millennium Medical College. Addis Ababa University

Mangindara, Darmawansyah, Nurhayani. (2012). Analisis pengelolaan obat di puskesmas kampala kecamatan sinjai timur kabupaten sinjai tahun 2011. Jurnal AKK Universitas Hasanudin, 1(1), pp. 58–78.

Nelson, S. D., Poikonen, J., Reese, T., Halta, D. El, & Weir, C. (2017). The pharmacist and the EHR. Journal of the American Medical Informatics Association, 24(1), 193–197.

Nesi, G., & Kristin, E. (2018). Evaluasi Perencanaan Dan Pengadaan Obat di Instalasi Farmasi RSUD Kefamenanu Kabupaten Timor Tengah Utara. Jurnal Kebijakan Kesehatan Indonesia : JKKI, 07(04), 147–153.

Nguyen L, Belluci E, Nguyen LT. (2014). Electronic health records implementation: An evaluation of information system impact and contingency factors. International journal medical informatics. Vol. 83(11): 779-796

Niknam, F., Khammarnia, M., Zand, F., & Fallahnejad, E. (2018). Physicians and Nurses' Satisfaction with Computerized Physician Order Entry. Journal of Health Management and Informatics, (April).

Nilsen P. (2015). Making sense of implementation theories, models and frameworks. Implementation Science. Vol.10(1):1-13.

Qureshi, Q., Shah, B., Khan, N., Miankhel, K., & Nawaz, A. (2013). Determining the Users'Willingness To Adopt Electronic Health Records (Ehr) in Developing Countries. Gomal University Journal of Research, 28(2), 140–148.

Radley, D. C., Wasserman, M. R., Olsho, L. E. W., Shoemaker, S. J., Spranca, M. D., & Bradshaw, B. (2013). Reduction in medication errors in hospitals due to adoption of computerized provider order entry systems. Journal of the American Medical Informatics Association, 20(3), 470–476. https://doi.org/10.1136/amiajnl-2012-001241

Rosmania, F. A., & Supriyanto, S. (2015). Analisis Pengelolaan Obat Sebagai Dasar Pengedalian Safety Stock Pada Stagnant dan Stock Out Obat. Jurnal Administrasi Kesehatan Indonesia, 3(1), 1–10.

Salmon, J. W., & Jiang, R. (2012). E-Prescribing: History, Issues, Potential. Online Journal of Public Health Informatics,4(3).

Satrianegara, M. F., & Bujawati, E. (2018). Analisis Pengelolaan Manajemen Logistik Obat Di Instalasi Farmasi Rsud Lanto Daeng Pasewang Kabupaten Jeneponto. Public Health Science Journal, 10, 37–47.

Tikoo, M., & Langton, C. R. (2014). Evaluating Connecticut's Health Information Technology Exchnge Pharmacy Survey Report.

Timorini, Y. A., Woro, O., Handayani, K., Sri, R., & Rahayu, R. (2020). the Influence of Integrated Management Neonatal and Childhood Illness Training on Knowledge, Attitude, Motivation and Compliance of Midwife Neonatal Visit. Public Health Perspective Journal, 5(1), 56–66.

Widayanti, N. A. (2015). Evaluasi Implementasi Sistem Electronic Health Record (EHR) Di Rumah Sakit Akademik Universitas Gadjah Mada. Jurnal Manajemen Informasi Kesehatan Indonesia, ISSN:2337-585X, Vol.3, No.1, Maret 2015, 17–30

Widodo, A.P., Agushybana, F., Jati, S.P. (2018). Pengukuran Penerimaan Sistem Informasi EWSKIA Berdasarkan Persepsi Pengguna dengan Menggunakan Technology Acceptance Model. JSINBIS (Jurnal Sistem Informasi Bisnis), vol. 8, no. 2, pp. 166-173, Oct. 2018.

Wijayantiningrum, T., Wijayanti, Y., & Raharjo, B. B. (2019). Analysis of The Individual Health Efforts Quality After Accreditation

Assessment at Public Health Centers of Semarang City in 2019. Public Health Perspective Journal, 5(5), 36–46.

Wijaya, P. S., & Soesanto, S. S. (2017). Kajian Implementasi Kebijakan Ruang Laktasi Di Sektor Pemerintah Dan Swasta. Public Health Perspective Journal, 6(3), 196.