RESEARCH ARTICLE

The relationship between medication errors in prescribing phase and service quality on national health insurance patients of pharmacy unit in public hospital in Bandung city

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ABSTRACT

Background: Medication errors are adverse events for patients as a result of drug use while the medication is in the control of the healthcare professionals. Medication errors can occur in various processes one of which is in the prescription writing process. Most of prescribing errors arise from incomplete prescriptions. One way to prevent medication errors occurring is improve the service quality. **Aims and Objective:** This study aims to determine the relationship between medication errors in prescribing phase and service quality on national health insurance (NHI) patients in pharmacy unit in public hospital in Bandung city. **Materials and Methods:** Research design used was observational method through cross-sectional approach using 250 samples consisting of NHI outpatients and non-NHI outpatient prescription. Data were analyzed using statistical analysis of Spearman Correlation testing in R-Studio application. **Result:** The result of this study shows that there is a potency of medication errors in prescribing phase indicated by the absence of doctors' name 0.8%, patients' age 35.2%, patients' weight 4.4%, and patients' address 8%. The result of Spearman Correlation testing shows that the Sig (two-tiled) $P = 0.008 < 0.05$ with $rho = 0.001058$ (positive). **Conclusion:** There is a relationship between medication errors in prescribing phase and service quality on NHI patients of Pharmacy Unit in Public Hospital in Bandung City.

KEY WORDS: Medication Errors; Prescription; Pharmacy Unit Service Quality

INTRODUCTION

Patience safety is a means of effort to prevent any danger or injuries at the expense of the patient's life during treatment.[1] In general, it covers prevention of mistakes and elimination of the resulting effects, which could be done by health staff anytime during the treatment process.[2] The prevention can be done by running a hospital standard service at its minimum.

The standard of hospital health service has been regulated under the consent of Ministry of Health of the Republic of Indonesia Number 129 of 2008, one of which concerns pharmaceutical standard service at its minimum, where four indicators are considered the most important.[1]

One of those indicators is the absence of error in delivering drugs to the patients. This has become the cause of the fizzling of standard quality in pharmaceutical installation. It also endangers patients due to prolonged drug use during treatment, hich otherwise should be prevented.[3] According to Aronson,[4] medication error is a fatality and could be viewed as a failure during treatment that is prone to endanger patient's life. Therefore, a safe operating system needs to be developed and maintained to ensure patients receive the best service and correction at its peak, particularly when delivering drugs, casting aside any mistakes to occur. The factors

identified as the dimensions of latent variable formation of pharmaceutical service quality are reliability, assurance, empathy, physical appearance, and responsiveness.[5]

Medication error can occur in some processes, such as in the prescription process from writing prescriptions, reading prescription by pharmacists to delivering and using drugs by patients. Cochen said[6] that prescription is one of the factors that can increase the risk of medication errors. In addition, medication errors are closely related to practitioners, medicinal products, procedures, environment, or system.[7] Institute of medicine reported that about 44,000–98,000 people die due to a medical error that often occurs.[8] Even in America, about 7000 people per year die due to medical errors.[9] The research result of New York health department stated that the number of deaths caused by medication errors can reach 1000 people per year. Improper drug administration, wrong dosages, writing or sound similarity of drug names, usage errors and dosage calculation errors are some of the medication errors that often occur.[6]

Medication errors can occur at various phases including prescribing, dispensing, and drug administration. Results from various studies show that medication errors occur at various phases of use from prescribing (1.5–15%), dispensing by pharmacy (2.1–11%), drug delivery to the patient (5–19%), and drug usage by patients.[10,11] The result of Cohort study involving 1532 prescribing pediatric patients in American Hospital intensive care unit randomly sampled shows that about 14% of patients have a medication error consisting of prescribing error (10.1%) and drug administration error (3.9%).[12]

A study in Yogyakarta (2010) toward a private hospital showed that of 229 recipes, 226 contain medication errors. Of 226 medication errors, approximately 99.12% are prescription errors, 3.02% pharmaceutical errors, and 3.66% drug delivery errors. Moreover, most of the prescription errors occur due to an incomplete prescription issued.[13] A research by Dewi[14] regarding the completeness of drug prescription in Sukaharjo district in October-December 2008 shows that the presence of prescription incompleteness occurs in multiple elements, such as the name of the doctor (1.03%), the name of the patient (2.12%), age (13.69%), weight (97.13%), the address of the patient (91.70%), potency (41.04%), the amount of drug (2.89%), the rules of drug usage (2.46%), and dosage form (30.01%).[14] Furthermore, Fortescue *et al.* conducted a study of 10788 pediatric prescriptions and shows that more than 50% of the prescriptions (616 recipes) have a potency of medication errors.

This study aims to measure the potential for medication errors in prescribing phase on national health insurance (NHI) outpatients, as well as its relationship with the service quality in pharmacy unit in public hospital in Bandung city.

Table 1: Respondent characteristics	
Characteristic	Total *n*=250 (%)
Sex	
Male	58 (23.2)
Female	192 (76.8)
Age (Year)	
<20	17 (6.8)
21–35	55 (22)
36–50	66 (26.4)
>50	112 (44.8)
Academic degrees	
Elementary	72 (28.15)
Junior high school	63 (25.83)
Senior high school	81 (32.45)
Higher institutions	33 (13.25)
Did not finish elementary school	1 (0.33)
Occupations	
Civil worker/army/police	8 (3.2)
Private employee	16 (6.4)
Retiree	12 (4.8)
Entrepreneur	30 (12)
Student	12 (4.8)
Housewife	172 (68.8)
NHI membership status	
PBI (Jamkesmas, Jamkesda)	115 (46)
Non PBI	135 (54)
Visit number	
2–5 times	56 (22.4)
More than 5 times	194 (77.6)

NHI: National health insurance

MATERIALS AND METHODS

This cross-sectional study was conducted using questionnaires, using prescriptions from related hospital pharmacies to analyze or measure the potency of mistreatment from the prescriptions to create service quality figures of the hospital pharmacies. The two variables would be linked using a certain analytical method called Spearman Bank statistic test.

Inclusion Criteria

NHI patients or their guardians who are hospitalized in the related hospitals and willing to be respondents, hospitalized NHI patients who are able to read and write, NHI patients prescriptions from pharmacies.

Exclusion Criteria

Respondents with incomplete data were excluded from the study.

Data from questionnaires are summarized into tables which are analyzed using software R. The value gained from the measurement of prescription mistreatment is made into tables to simplify the calculation. It is then tabulated into a percent, and the median is calculated. The average of each response from questionnaires is also stated. Classifications are then made to simplify the interpretation of the responses median results into scores from 1 to 7. The interval range is: Interval = (highest score-lowest score)/total groups = (7–1)/5 = 1, 2.

Based on the results from questionnaires given to NHI patients who became respondents, a test is conducted to the questionnaires to measure their quality using validity analysis and questionnaire reliability.

Bivariate Analysis

This research uses bivariate analysis to find the relation of mistreatment in prescribing phase with the service quality of related hospital pharmacies. Data analysis method used in this research is Spearman's rank test. The analysis technique could be used if the two variables converted came from different data, and the data type is ordinal. The data are not required to be distributed normally.

RESULTS

This research was conducted in the pharmacy of one of the hospitals in Bandung. This research has been approved by the Nation's Health and Community Empowerment Agency number 070/2112/BKBPM and also by Health Research Ethics Committee, Faculty of Medicine, Universitas Padjadjaran number 1218/UN6.C1.3.2/KEPK/PN/2016.

Total number of respondents is 250 (Table 1). The respondents are NHI patients who go to hospitals to get routine medical treatment. The data collection was conducted from 5th to January 30th, 2017 by spreading questionnaires. The questionnaires describe the opinions and patients' or their guardians' feelings regarding the service quality in the related pharmacies and also potency of mistreatment in prescribing phase which is analyzed from the prescriptions given to hospitalized patients. Data from the questionnaires are primary data taken directly by the researcher without any mediators, whereas prescriptions are secondary data which is not directly taken by the researcher. The analyzed prescriptions were made in January 2017.

VALIDITY AND RELIABILITY TEST RESULTS

The result of validity test from 30 questionnaires shows the value of df = 28 with the significance of 0.05. Consequently, the obtained value of r-table is 0.361. The result of validity test from 30 questionnaires has a value where r-count > r-table, so that it can be said that the 21 questions contained in the questionnaire are valid. As for the reliability test can be

seen from the table above that the value of Cronbach Alpha of the 30 questionnaires tested has a value >0.6 is equal to 0.889. It can be said that the 30 questionnaires are reliable.

Results of Pharmacy Service Quality in Bandung Public Hospital

Table 2: Percentage of respondents regarding service quality assessment

Category	Amount (%)
Very low	0 (0)
Low	0 (0)
Average	18 (7.2)
High	153 (61.2)
Very high	79 (31.6)

Results of Pharmacy Service Quality in Bandung Public Hospital

Table 3: Tabulation results of prescribe completeness during prescription phase

Completeness	Prescribe amount (%)
Appropriate	137 (54.8)
Inappropriate	113 (45.2)

Analytical Coherence Results of Medicine Errors Regarding Service Quality

Statistical analysis of Spearman Rank test on prescription medication errors phase for the quality of patient care in the NHI in Bandung Public Hospital pharmacy shows the probability value Siq. (2-tiled) where the $P = <0.05$ is 0.001058, which means H0 failed to be accepted. These results indicate that there is a relationship between the potential prescription medication errors phase regarding NHI service quality to patients in Bandung Public Hospital pharmacy with the value of rho: 0.205 (positive).

DISCUSSION

The increasing demands of the community regarding the service quality makes the functions of healthcare services including hospital services are gradually to be increased. The objective is to make the hospital services become more effective, efficient, and satisfying to patients, families, and communities. Hospital pharmacy services are integral parts of the intact system of hospital services which are service-oriented to patients. One way to improve pharmacists' service quality is by evaluating their service to the patient. The study shown that the service quality is high (Table 2) and the results of prescribe completeness during prescription phase is 137 prescribe appropriate (Table 3). The improvement ways can be varied by both doing direct interviews and using questionnaires so that the pharmacists will be able to

improve service quality in accordance with the results of the evaluation from the patients.

According to Table 4, the most potential prescription medication errors phase occurs because there is absence information of age from 35.2% of patients. Then, there is absence information of an address from 8% of patients; of weight from 4.4% of patients; and of physician name from 0.8% patients. At prescription phase, there are eight components that will be assessed. Based on these results, there are several components found in prescription medication errors phase, which is: There is absence information of physician name, prescription date, age, weight, and address of the patients.

In writing the prescription completeness, age, and weight of the patients are important. Based on the data, there are 11 out of 250 pieces of prescription or about 4.4% which do not included the weight of the patient, and there are 88 pieces of prescription or about 35.2% that do not specify the age of the patient. For example, the information of weight from a child or pediatric patients is an important basis for the calculation of the dose of medication. If the weight does not include in the prescription, the calculation of medication dose is difficult to establish. The accuracy of medication dose also cannot be guaranteed. Dose calculation can be done using the patients' age then converted to the weight. However, the fact shows that every child has a different weight in spite of the same age. In addition, age is also quite important for elderly patients, due to elderly patients' physiological function of the body starts to decrease, then the dose should also be smaller than the maximum dose.[16] Therefore, when there is an absence information of patients' age in the prescription, it is possible to cause medication error. Fortunately, it can be prevented with the involvement of pharmacists.

The potential prescription medication errors phase can be prevented by screening the prescription carefully. Pharmacists should also provide a better service to the patients. For examples, when pharmacists found that there is absence information of age of weight of the patients while screening the pharmaceutical prescription, the pharmacists

should immediately contact the doctors. It is because the two components are indispensable for determining the medication dose. Moreover, the information about the direction to use the medicine should also be conveyed more clearly by the pharmacist. It is because not all patients can understand it easily.[15]

From the results of this study, it can be concluded that the relationship between the prescription medication errors phase regarding the service quality to the NHI patients in Bandung Public Hospital pharmacy is low. The coefficient of positive rho shows the harmonious relationship between these two variables. It means that if the components of the completeness of prescription are high or the potential medication errors are low, then the service quality is also high.

CONCLUSION

The results of the research show that the potential prescription medication errors phase characterized by the absence of 0.8% physician's name; 35.2% age of the patients; 4.4% weight of the patients; and 8% address of the patients. There is also a relationship between the prescription medication errors phase regarding the service quality to the NHI patients in Bandung Public Hospital pharmacy.

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Table 4: Analytical result distribution of potential prescription medication errors phase in Bandung public hospital pharmacy

Type of assessment	Number of events (%)
No physician name	2 (0.8)
No prescription date	0 (0)
Wrong of medicine name	0 (0)
No direction of use	0 (0)
No patient's name	0 (0)
No patient's age	88 (35.2)
No patient's weight	11 (4.4)
No patient's address	20 (8)

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