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## Research Article



## The Implementation of Drug Auditing-Standard Operating Procedure in Prescription Service at Internal Medicine Ward of Dharma Yadnya Public Hospital for Medication Error Prevention and Patient Satisfaction Improvement

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### ABSTRACT

Drug use audit by pharmacists is regulated in the standard of pharmaceutical care at hospitals (Health Minister Regulation No. 72 the Year 2016). Based on this regulation, the hospital pharmacist has to perform the standard operating procedure (SOP) and become an assessment component for hospital accreditation. The influence of SOP-drug auditing application on the patient safety aspect has been studied. The aim of this study was to assess the influence of SOP-drug auditing on the potential occurrence of medication error, patients' level of satisfaction and pharmaceutical personnel's obedience in performing standardized pharmaceutical care. A prospective observational study using 2 questionnaires: validated patients satisfaction and pharmaceutical personnel's obedience. The assessment was performed before and after the application of drug auditing SOP at internal medicine ward of Dharma Yadnya Public (DYP) hospital in August-October 2017 period. The new-SOP increased patient's satisfaction level from -1.03 (very low) to -0.37 (medium). This also improved the pharmaceutical staff obedience to conduct standardized pharmaceutical care from 79.2% to 94.9%. The new-SOP suppressed the medication error (ME) occurrence from 20.8% to 5.1% with a significance level of  $p < 0.05$ . The implementing drug auditing SOP induced the improving of patient satisfaction, pharmaceutical staff obedience and patient safety.

**Keywords:** Pharmaceutical personnel, patient satisfaction, pharmaceutical personnel's obedience, medication error, SOP (standard operating procedure).

### INTRODUCTION

The standard of pharmaceutical services in hospitals is regulated in Health Minister Regulation No. 72 Year 2016<sup>1</sup>. Prescription assessment is the scope of pharmaceutical care involving the fulfillment of administrative, pharmaceutical and clinical requirements of the prescribed medicines<sup>1</sup>. Drug auditing is an examination and review performed by pharmacists toward a doctor's prescription to ensure drug safety, thereby preventing medication errors from occurring.

The hospital pharmacy installation has to implement the regulated standard pharmaceutical care and must be formed in the hospital policy of service, guidance for organizing and service, and manual for service or SOP<sup>2</sup>. The SOPs is a practical guide and should be equipped with clinical pathway, algorithm, protocol, procedure or standing order that must be performed by the pharmacy staff based on professional standards and become legal documents that will provide protection and legal certainty for pharmaceutical staff both in professional practices, as well as pharmaceutical work.

The ME may start to occur in every step of pharmaceutical care due to the neglecting the established SOPs, thereby leading to inappropriate use of drugs or endangering the patient<sup>3</sup>. The healthcare practitioners are required to comply with and implement SOP at the hospital to improve patient safety. Auditing is a relatively easy way to evaluate employees' performance;

comparing the existing SOP with actions performed in practice<sup>4</sup>. Audits are controlled internally and externally. Internal control is performed by hospital's management through an observation and assessment of health personnel's level of obedience in implementing the SOP, while external control is based on the level of patient satisfaction. Health personnel's obedience in performing SOP can suppress the incidence of medication error and improve patient satisfaction because high quality level of service may be provided if the implementation is done according to established SOP. The aim of this study was evaluate the influence the drug auditing SOP on patient satisfactory and the pharmaceutical personnel obedience to do the SOP and to reduce the ME occurrence.

### METHODS AND MATERIAL

#### SOPs and Questionnaires Preparation

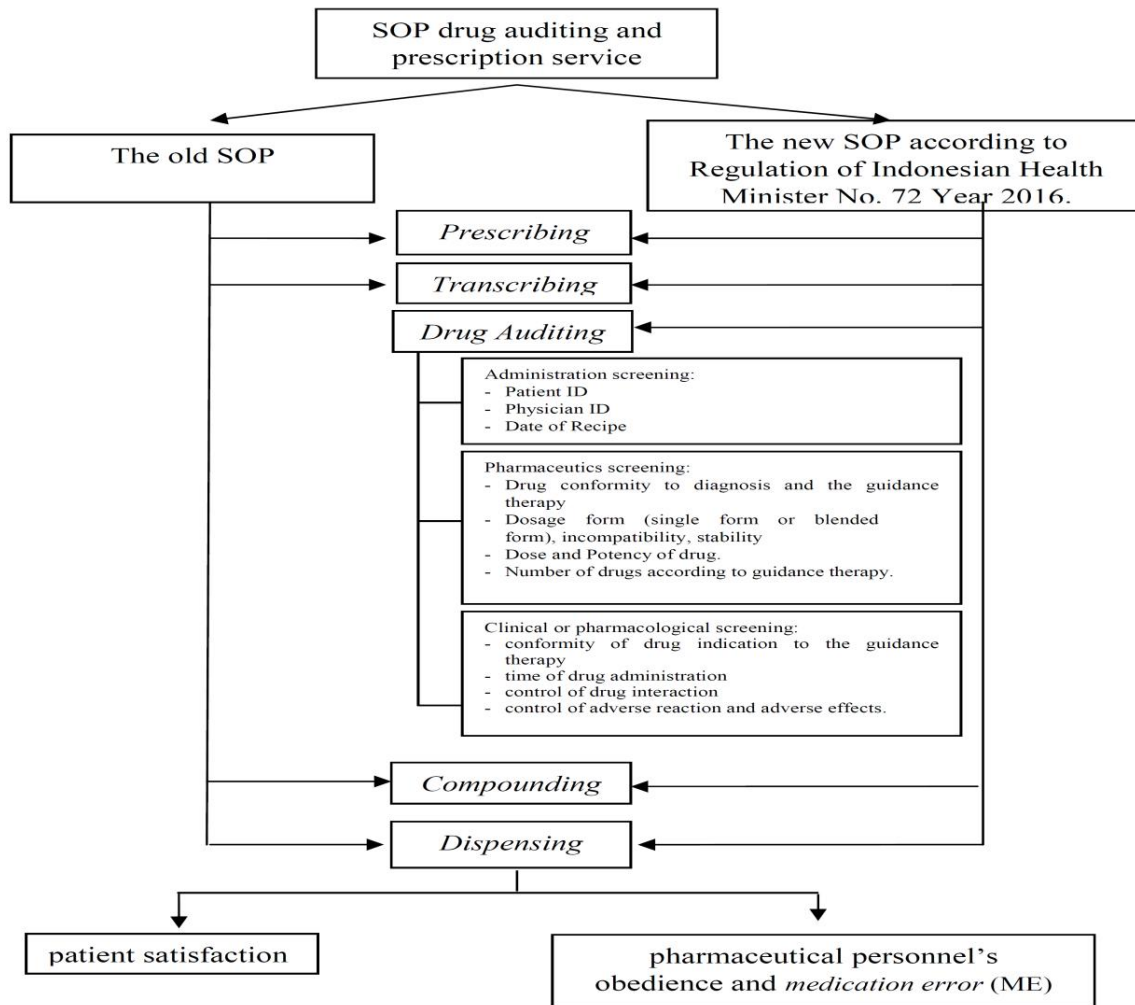
This research is a prospective observational research to obtain old- and new-SOP drug auditing data in prescription service<sup>5</sup>. The patient satisfaction questionnaire was performed based on Wirasuta et al. 2016<sup>6</sup> and based on SERVQUAL Model in which there were 29 questions grouping into five dimensions of service quality (Reliability, Responsiveness, Assurance, Empathy and Tangible)<sup>7</sup> (see Table 1). The flow card of implementation of drug auditing SOP and their evaluation was described in Figure 1. Data analysis methods used in this study were descriptive statistical analysis and Mann-Whitney inferential statistical analysis. The research was



conducted at Pharmacy Installation of DYP hospital during August-October 2017 period. Samples were generated by quota sampling technique and the sample size was calculated using Lwanga and Lemeshow formula and obtained 100 respondents of patients<sup>6</sup>. The old and new SOPs pharmaceutical care services described in Table 2. The supervisor filled in the SOP questioner check.

**Patients and panelist selection**

The inclusion criteria in this study were patient prescriptions of Indonesia’s Universal Health Coverage (UHC) at internal medicine ward of DYP hospital in August-October 2017 period, who received direct pharmaceutical service at DYP hospital. The exclusion criteria in this study were general patients, private insurance patients, who were not in charge of supervision at DYP hospital. The patient was conducted according to the patient handling in ethical clearance document.



**Figure 1:** The flow card of implementation of drug auditing SOP and their evaluation

**Data collecting and analysis**

The patient satisfactory data was collected through the answered validated questioner by patients. The patient has been informed the consent, before fill in the questioner and agree to follow the pharmaceutical care services. The data was nominated according to Likert scale ranging from very positive to very negative; 4 (strongly agree), 3 (agree), 2 (disagree) and 1 (strongly disagree)<sup>5</sup>. The pharmaceutical personnel’s obedience was collected by pharmacist supervisor, who fill in the questioner control check of personnel performance and obedience to step of SOPs.

The obedience level of pharmacist and it’s assistance to the SOP was determinate Agung’s (2014) formula<sup>5</sup>. The

score of each item SOP step was 1 (yes) if the item step was performed and score 0 (no) was for the not performed item in the SOP. The mean score was the percent performed item SOP. This obedience level was divided into five score intervals: very low (0 - 0.2), low (0.2 - 0.4), medium (0.4 – 0.6); high (0.6 – 0.8) and very high (0.8 – 1.0). The chance medication error occurrences was formulated

$$ME_{occurrence} = (1 - The\ obedience\ level) * 100\%$$

To determine the level of ME, the formula used was 1 deducted by the score of pharmaceutical personnel's obedience in implementing every item in each stage of SOP assessment and prescription service<sup>5</sup>.



## RESULTS

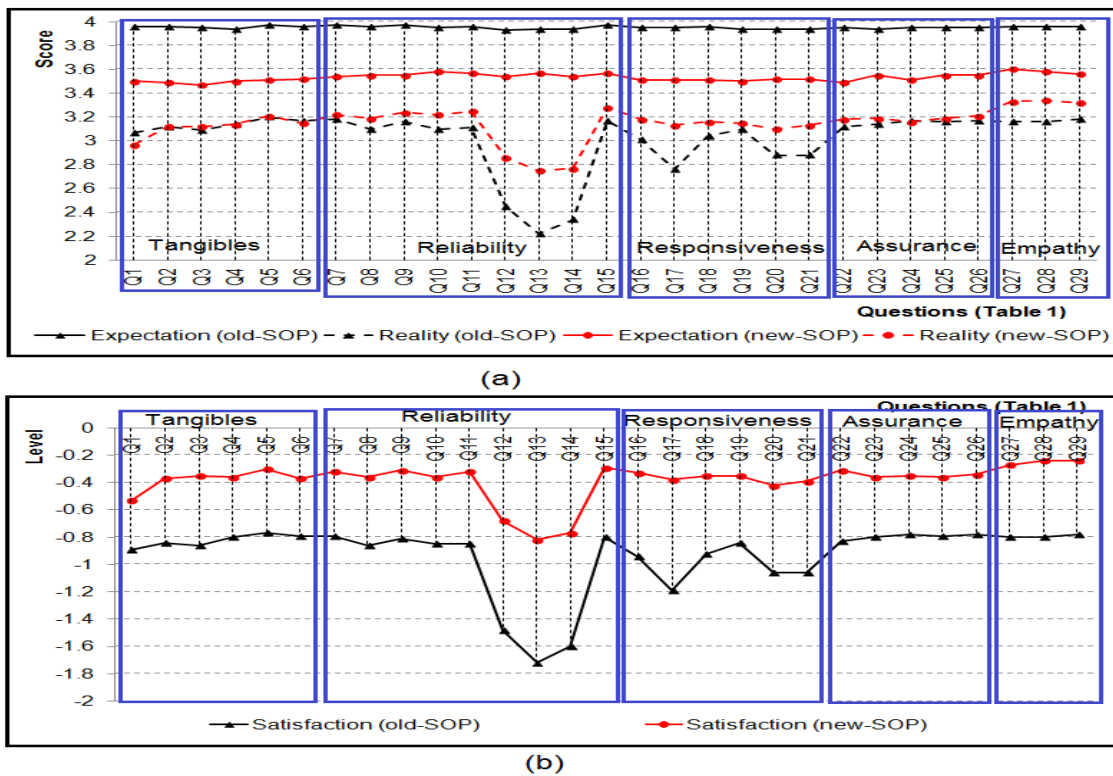
The table 1 presented the five dimension questioner of pharmaceutical services. The validity and reliability tests of patient satisfaction questionnaire items were valid ( $r$  count > 0.361) and the Cronbach's Alpha values obtained were 0.987 and 0.947, it was indicating that the questionnaire instrument used was reliable, acceptable, and utilized to retrieve the study's data. The expectation

score, reality score, and satisfaction level of the patients on the pharmaceutical care services showed on Fig. 2.

The table 2 presented the old and new SOPs of pharmaceutical care services. The obedience level of of pharmacists and it's assistants to the SOP is presented in table 3 with a significance value of 0.041. The ME occurrence is showed in table 4, a significance value of 0,041.

**Table 1:** The five dimension questioner of pharmaceutical services.

Dimension of service quality	No	Question
Tangibles	1.	The lounge area was spacious and clean.
	2.	The appearance of the pharmacy staff is neat and clean.
	3.	Setup counters are good and easy to reach.
	4.	The television facilities in the lounge area were good.
	5.	Medicines provided by pharmacists are still in good packaging.
	6.	Every medicine delivered by a pharmacist contains clear and readable medicine etiquette.
Reliability	7.	The pharmacy service is open 24 hours
	8.	The pharmacy service is easy and uncomplicated
	9.	The pharmacist informs the medicine name
	10.	Pharmacists provide information on medicine doses
	11.	Pharmacists provide information on how to use the medicine
	12.	Pharmacists provide information on how to store medicines
	13.	The pharmacist informs you about what to do with the remaining medicine
	14.	Pharmacists provide information on side effects arising after taking the medicine
	15.	Pharmacy officials provide medicine information services in a language that the patient understands
Responsiveness	16.	The pharmacist responded quickly and responded while serving the patient
	17.	The pharmacist gives the medicine information in writing if the patient is not very well informed
	18.	Every patient's complaint is overcome quickly
	19.	pharmacist have sufficient knowledge and ability to provide medicine information
	20.	Non-concoction medicine service <30 minutes
	21.	Medicine service concoction <60 minutes
Assurance	22.	Appearance and knowledge of the pharmacist assured.
	23.	pharmacist give patients and families an opportunity to ask questions.
	24.	The pharmacist matches the patient's name to the prescription barcode with the barcode attached to the patient / accompanist
	25.	The pharmacist asks for the name and patient / companion as a sign of medicine has been received
	26.	Medicines provided by the pharmacist in good condition (not damaged)
Empathy	27.	Service clerk is polite and friendly
	28.	Clerk service is the same, does not distinguish the patient
	29.	The pharmacist listens patiently if there are any questions and complaints



**Figure 2:** The expectation, reality, and satisfaction score of patient on pharmaceutical care services in DYP – hospital after applied old and new SOP

**Table 2:** The old and new SOPs of pharmaceutical care services in DYP hospital

SOP	step	Question
Prescribing	1.	The prescription is prescribed by physician of DYP hospital
	2.	Date of the prescription
	3.	Prescription have name, license of practice, and physician sign
	4.	Prescription contain barcode of patient identity
	5.	The prescription contained the name of the medicine
	6.	Prescription contain dosage form of medicine
	7.	Prescription contain amount of medicine
	8.	Prescription contain a dose of medicine
	9.	Prescription contain drug administration
	10.	The prescribed medicine covered by UHC
Transcribing	11.	The front desk pharmacy fills the time (hours) of accepted prescription, name, and sign
	12.	Pharmacist assistance fill time (hours) of prescriptions, names, and sign has been finish transcribed.
	13.	(new SOP) Pharmacist assistance has finished the prescription screening administration
	14.	(new SOP) Prescription contains the component of pharmaceuticals screening parameters.
	15.	(new SOP) Each prescribed medication is in accordance with UHC medicines and national formulary
	16.	Pharmacist assistance records the medicine, which should be ordered into the defecta book
	17.	Pharmacist assistance logged the non-UHC medicine, which was prescribed into the book
(New SOP)	18.	Pharmacist ensured the correctness of the prescription administration screening

Drug Auditing	19.	Pharmacist ensured the correctness of pharmaceutical screening.
	20.	Pharmacist perform clinical / pharmacological screening: - conformity of drug indication to the guidance therapy - time of drug administration - control of drug interaction - control of adverse reaction and adverse effects
	21.	Pharmacist fills the prescription screening checklist in behind the prescription
	22.	Pharmacist fills the cross checklist from.
Compounding	23.	Pharmacist assistance prepare medications, that passed the drug auditing process.
	24.	Pharmacist assistance provide drug etiquette and label
	25.	Pharmacist assistance fills the compounding cross checklist
	26.	(new SOP) Pharmacist assistance inputs the medication data to patient medication record
Dispensing	27.	Pharmacist checked the medicine, etiquette, label, according to the passed drug auditing SOP, before dispense to the patient.
	28.	Pharmacist performs the final check by filling checklist on the check sheet
	29.	Pharmacist called the patient name according to barcode
	30.	Pharmacist provide information on medicines, usefulness, usage, side effects, medicine storage, and residual medications supported by sufficient knowledge
	31.	(New SOP) Pharmacist asked again the patient's clarity on the medicine information and asked the patient to repeat the explanation that had been delivered. If the patient is less well understood then the Pharmacist writes on the paper
	32.	(New SOP) The clerk patiently hears if there are any questions and complaints of the patient
	33.	Pharmacist fills the prescribed hour, name, & sign
	34.	The patient fills the name & sign in the medicine receiving column
	35.	Pharmacist performs service R / non concoction (<30 minutes) & R / concoction (<60 minutes)
	36.	Pharmacist keeps prescriptions at the prescriptions

**Table 3:** The obedience level of pharmacist and its assistance to the SOPs

	Step	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	mean
		Prescribing	old	65	100	46	100	100	100	100	100	100
	new	100	88	100	100	100	100	100	100	100	80	96.8
Transcribing	Step	<b>S11</b>	<b>S12</b>	<b>S13</b>	<b>S13</b>	<b>S14</b>	<b>S15</b>	<b>S16</b>	<b>S17</b>			mean
	old	74	83	96				2		1		51.2
	new	99	99	100	88	100	80	1		100		83.4
Drug Auditing	Step	<b>S18</b>	<b>S19</b>	<b>S20</b>	<b>S21</b>	<b>S22</b>					mean	
	old	-	-	-	-	-					-	
	new	100	71	100	100	100					94.2	
Compounding	Step	<b>S23</b>	<b>S24</b>	<b>S25</b>	<b>S26</b>						mean	
	old	100	100	75	-						91.7	
	new	100	100	100	100						100.0	
Dispensing	Step	<b>S27</b>	<b>S28</b>	<b>S29</b>	<b>S30</b>	<b>S31</b>	<b>S32</b>	<b>S33</b>	<b>S34</b>	<b>S35</b>	<b>S36</b>	mean
	old	100	86	100	54		45	84	92	84	100	82.8
	new	100	100	100	97	100	100	100	100	97	100	99.4

**Table 4:** The occurrence level of ME on prescription service and drug auditing

Prescribing	Step	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	mean
	old	35	0	54	0	0	0	0	0	0	0	8.9
	new	0	12	0	0	0	0	0	0	0	20	3.2
Transcribing	Step	S11	S12	S13	S13	S14	S15	S16	S17		mean	
	old	26	17	4	-	-	-	98	99		48.8	
	new	1	1	0	12	0	20	99	0		16.6	
Drug Auditing	Step	S18	S19	S20	S21	S22				mean		
	old	-	-	-	-	-						
	new	0	29	0	0	0				5.8		
Compounding	Step	S23	S24	S25	S26				mean			
	old	0	0	25	-				8.3			
	new	0	0	0	0				0.0			
Dispensing	Step	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	mean
	old	0	14	0	46		55	16	8	16	0	17.2
	new	0	0	0	3	0	0	0	0	3	0	0.6

## DISCUSSION

The statistical comparison of the expectation and reality score introduced a significant difference between the applied old and new-SOP. The negative satisfaction levels indicated demand of patient for better service. Applying the drug auditing SOP on the new SOP increased the overall patient-satisfaction (Fig. 2.b). The new SOP governed higher reality score than the old SOP. Implementing the drug auditing SOP increased patient satisfaction.

The Q12, Q13, and Q14 of reliability aspect possessed lowest satisfaction level in compare to other questions. Q12 asked information on how to store medicines, Q13 asked what the patients do with the remaining medicine, and the Q14 informed side effects arising after taking the medicine by pharmacist. The patients assigned height expectation score but in the reality, but they didn't have adequate information according to their background knowledge. The pharmacist should informed the patient how to store the medicine, handle the remained medicine and adverse reaction or effect and side effect in the common language and the pharmacist should re-ask, whether the patient understands the information that has been given.

The Q17, Q20, and Q21 of responsiveness aspect of old SOP possessed low level satisfaction in compare to other questions. These were delivered a lack services felt by the patients, such as: long waiting time for the medicine and minimum patient-information for the UHC-pharmacy services. The DYP hospital is the second line for the UHC-pharmacy services. According to the second line UHC regulation, the DYP hospital allowed to prepare the medication for 7 days treatment. The patients obtained addition prescription for the future 21 days and they

should take the future medication in the first line UHC-Pharmacy. The other factor was a peak time service. This time was between 7 pm and 10 pm. On this peak time induced high ratio of prescription number to the pharmacy personals and it introduced delay time service. To reduce the delay and increase patient satisfaction, the opening time UHC services was divided into 4 sections (10am, 2pm, 4pm, and 7pm).

The mean obedient pharmacist to do the old SOP was 79.2% (high) and this governed 20.8% of accordance ME. This level reflected the obedient of pharmaceutical personnel<sup>3</sup> and the risk of medication error would emerge if pharmaceutical personnel did not comply with the SOP<sup>3</sup>. The lowest obedient on the old transcribing SOP due to not logged non-UHC medicine in the log book by pharmacist. The transcribing SOP instructed, if the non-UHC medicine prescribed, the pharmacist should log the medicine in the book and informs the physician to follow UHC prescription.

The obedience mean of new-SOP was 94.9% and the old-SOP was 79.2%. The increasing obedient level of pharmaceutical personnel's during new-SOP due to the workshop preparation before implementing the new-SOP. The workshop provided a guidance, understanding and awareness on patient safety. Their obedient was controlled regularly by supervisor for 2 months to ensure that staffs implement new-SOP well as a means to produce service orientation toward patient safety. In addition, pharmaceutical personnel were given motivation through the provision of monthly rewards. This program aimed to improve the quality of service and gain public's trust through improvement in the accreditation of DYP Hospital. For the pharmaceutical staffs, who did not heed the SOP instruction, obtained a

punishment from the management. The increased obedient to the SOP and the safety habit of pharmaceutical staff minimized the risk of ME.

The mean of medication error in old-SOPs were 20.8% for old-SOP and 5.1% for new-SOP, respectively. The providing information of covered drug UHC regularly to physician suppressed the transcribing error. The non-complete patient diagnoses information on patient medical record governed misleading clinical/ pharmacological screening by pharmacist. This induced increase of ME occurrence on the drug auditing. The control of implementing new-SOP by expert-supervisor reduced the ME occurrence. The expert-supervisor also conducts as advisor during the prudent use of drug auditing.

### CONCLUSION

The workshop preparation before implementing drug auditing SOP on new-SOP and regularly control by expert-supervisor increased the obedient pharmaceutical staffs and suppressed the ME occurrence.

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