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Evaluation Compliance Storage of Drugs Against Standard Service Pharmacy in Pharmacy In Palembang City

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Abstrak

Penyimpanan obat merupakan komponen penting pengelolaan sediaan farmasi yang menentukan mutu, keamanan, stabilitas, dan efektivitas obat sebelum diserahkan kepada pasien. Penelitian ini bertujuan mengevaluasi kesesuaian penyimpanan obat pada tiga apotek di Kota Palembang terhadap 19 parameter Peraturan Menteri Kesehatan Republik Indonesia Nomor 73 Tahun 2016. Penelitian deskriptif observasional dengan desain potong lintang dilakukan pada April 2026. Tiga apotek dipilih secara purposive berdasarkan status operasional dan perizinan, keberadaan apoteker penanggung jawab, kesediaan memberikan akses observasi, serta variasi lokasi dan karakteristik pelayanan. Data dikumpulkan oleh satu observer melalui observasi langsung menggunakan checklist yang dipetakan dari 19 parameter regulasi; butir yang tidak relevan secara operasional diberi kode not applicable (NA) dan dikeluarkan dari penyebut. Dari 18 parameter yang berlaku, tingkat kesesuaian Apotek A adalah 94,44% (17/18), Apotek B 88,89% (16/18), dan Apotek C 94,44% (17/18). Ketidaksesuaian meliputi belum optimalnya pemisahan obat mendekati kedaluwarsa pada Apotek A dan B, inkonsistensi FIFO/FEFO pada Apotek B, serta penyusunan yang belum berdasarkan kelas terapi pada Apotek C. Ketiga apotek tidak menyediakan vaksin sehingga parameter vaksin dikategorikan NA. Temuan ini menunjukkan bahwa skor agregat yang tinggi masih dapat menyembunyikan risiko operasional spesifik. Apotek perlu menyediakan area khusus obat mendekati kedaluwarsa, memperkuat penandaan visual dan rotasi stok, serta melakukan pemantauan terdokumentasi secara lebih rutin.

Kata kunci: penyimpanan obat; standar pelayanan kefarmasian; Permenkes Nomor 73 Tahun 2016; apotek; Kota Palembang

Abstract

Drug storage is an important component of pharmaceutical management because it determines the quality, safety, stability, and effectiveness of medicines before dispensing. This study evaluated drug storage compliance at three community pharmacies in Palembang City against 19 parameters derived from Regulation of the Minister of Health of the Republic of Indonesia Number 73 of 2016. A descriptive observational cross-sectional study was conducted in April 2026. Three pharmacies were purposively selected based on active licensing and operation, the availability of a pharmacist in charge, willingness to provide observational access, and variation in location and service characteristics. Data were collected by one observer through direct observation using a checklist mapped to the 19 regulatory parameters; operationally irrelevant items were coded as not applicable (NA) and excluded from the denominator. Among 18 applicable parameters, compliance was 94.44% (17/18) at Pharmacy A, 88.89% (16/18) at Pharmacy B, and 94.44% (17/18) at Pharmacy C. Non-compliance involved inadequate segregation of near-expiry medicines at Pharmacies A and B, inconsistent FIFO/FEFO implementation at Pharmacy B, and storage not fully arranged by therapeutic class at Pharmacy C. None of the pharmacies stocked vaccines; therefore, the vaccine parameter was classified as NA. These findings indicate that high aggregate scores may conceal specific operational risks. Pharmacies should establish designated near-expiry areas, strengthen visual labeling and stock rotation, and conduct more frequent documented monitoring.

Key words: *drug storage; pharmaceutical service standards; Permenkes No. 73 of 2016; community pharmacy; Palembang City*

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INTRODUCTION

Medicine is component strategic in effort service health, quality, safety and efficacy must always awake since produced until used by patients (Republik Indonesia, 2023). One of the stages crucial in chain management stock pharmaceuticals that determine awake quality the is storage medicine . Storage that is not in accordance standard, good from aspect temperature, humidity, lighting, and system expenditure goods, can accelerate the degradation process material active, lower efficacy therapy, even cause risk failure therapy in patients (WHO, 1999; Zulkarnain, 2014). Condition climate hot and humid tropical Indonesia the more enlarge risk instability stock pharmacy if condition room storage No controlled with good, as shown by various study stability medicine at temperature room tropical (Sari & Azhari, 2021).

As facility service direct pharmacy touch with community, pharmacy own not quite enough answer big For ensure that drugs administered to patient is at in condition quality, safe and efficacious . Storage drug is an integral part of standard service pharmacy Because related direct with activity management stock pharmacy, tools health, and materials medical finished use, start from planning, procurement, receipt, storage, distribution, destruction, control, up to recording and reporting (Republik Indonesia, 2016a). Management good storage participate support implementation service pharmacy clinic optimally because availability quality medicine become prerequisite success therapy patient, in line with principle Good Pharmacy Practice is formulated together by the organization profession pharmacy international and world health organizations (International Pharmaceutical Federation & World Health Organization, 2011).

In Indonesia, the standard technical storage medicine at the pharmacy arranged in a way details in Regulation of the Minister of Health of the Republic of Indonesia Number 73 of 2016 concerning Standard Service Pharmacy in Pharmacies . Regulations This arrange condition means storage like adequacy shelves / cupboards, minimum distance between goods with ceiling, condition the ceiling that is not porous and free leaks, control temperature and humidity room, availability cupboard cooler as well as thermometer calibrated system expenditure drug First In First Out (FIFO) and First Expired First Out (FEFO), preparation based on form supplies, class therapy, and alphabetical, marking special for drugs that are close expired, until procedure inspection periodically to place storage (Republik Indonesia, 2016a). Provisions the in line with principles of Good Drug Distribution Practices (CDOB) established by the Food and Drug Monitoring Agency For ensure quality drug throughout chain distribution (BPOM RI, 2020; BPOM RI, 2025) and consistent with guidelines storage stock pharmaceuticals published by (WHO, 1999; WHO, 2023).

Various study previously has evaluate suitability storage medicine at the pharmacy to Minister of Health Regulation Number 73 of 2016 in various regions of Indonesia. In Mataram City, the management of stock pharmacy reported has fully implemented although aspect service pharmacy clinic Still own lack (Anjani et al., 2021). Research in the Regency Pamekasan also reported implementation standard service various pharmaceuticals between pharmacies (Alrosyidi & Kurniasari, 2020). At the Pharmacy Restu Farma, level suitability storage in space service reached 85% and in the warehouse 75% (Afqary & Ishfahani, 2018), while Kimia Farma GKB Pharmacy also shows implementation system relative storage organized (Putra, 2021). Studies the in a way consistent show that point recurring weakness lies in the aspect separation drug approach expired as well as consistency implementation system FIFO/FEFO (Pramestutie et al., 2021; Puspasari & Puspita, 2024).

Search introduction on Google Scholar and Garuda to publication 2025 with the keyword " storage " medicine ", " pharmacy ", "Palembang", and " Ministry of Health Regulation Number 73 of 2016" found research in two pharmacies in Palembang City which evaluated service pharmacy in a way area ; storage only reported as one of

the component aggregate without mapping mismatch in each parameter(Sriwijaya et al., 2022). With Thus, the gap study No lies in the absence studies pharmacy in Palembang, but not yet availability evaluation comparatively which is special map compliance between pharmacies against 19 storage parameters, including proper treatment against parameters that are not applies.

Novelty study This lies in comparative audit based grains to three pharmacies in Palembang City use a uniform checklist that is mapped direct of the 19 storage parameters in the Minister of Health Regulation Number 73 of 2016. Approach This No only compare total score, but also identify pattern mismatch specific, distinguishing the parameters "not according to" of "not applies", and produces recommendation more improvements directed than evaluation service pharmacy in a way aggregate.

Based on description said, research This aim For evaluate level suitability storage medicine on three pharmacies in Palembang City against standard service pharmacy as arranged in Regulation of the Minister of Health of the Republic of Indonesia Number 73 of 2016, as well as identify parameters that have not been in accordance as base recommendation repair quality service pharmacy in pharmacies.

RESEARCH METHODS

Types and Design of Research

Study This is study descriptive with approach observational and design cut *cross - sectional*, which aims describe condition suitability storage medication at the time study done without give intervention to object research . Approach descriptive observational This common used in research evaluation storage medicine at the pharmacy (Afqary & Ishfahani, 2018; Putra, 2021).

Location and Time of Research

Study implemented on three pharmacy in Palembang City, South Sumatra Province, in April 2026. For guard confidentiality location, all three given code Pharmacy A, Pharmacy B, and Pharmacy C.

Population and Sample

Target population is all over operating pharmacies in a way officially in Palembang City. Within the framework of studies exploratory-comparative, three pharmacy set as sample Because fulfil all over criteria selection and giving access observation in the period research. Number the intended For get comparison beginning interlocation, not For produce representative estimate all over pharmacies in Palembang City.

Sampling Techniques

Sample selected with purposive sampling. Criteria inclusion includes : (1) pharmacy licensed and active operate ; (2) have pharmacist guarantor answer ; (3) have means storage drugs that can observed ; (4) willing give permissions and access observation ; and (5) selected with consider variation location and characteristics service. Pharmacy issued if currently closed while, undergoing renovation or arrangement repeat big change normal storage conditions, or No give access to the storage area. Third suitable location criteria Then given codes A, B, and C for guard confidentiality.

Instrument Study

Instrument study in the form of a 19- item observation checklist compiled through mapping direct to provision storage in Minister of Health Regulation Number 73 of 2016 (Republik Indonesia, 2016a). Every grains equipped definition operational and evidence the necessary observations, then reviewed from aspect suitability content, clarity editorial and consistency interpretation before used. Because the checklist is regulatory audit instruments whose items lowered direct from standard, validity content guarded through traceability every grains to source regulations ; instruments This No intended For measure construct psychometrics. The results of each grains classified as "Appropriate", "Not Applicable", or "Not Applicable/NA" if condition No relevant with available services..

Data collection technique

Data collected through observation direct to room storage, infrastructure, and practices management medicine. All evaluation carried out

by one observer, namely researchers, using definition the same operational and recording formats in all three location. Before observation, observer studies instruction filling and equalizing interpretation every grains with source regulations. Interview short with pharmacist guarantor answer or power technical pharmacy only used For confirm findings that are not can confirmed through observation. Because the whole location assessed by one observer, suitability test interobserver No done.

Aspect Ethics and Licensing

Object study is storage facilities and processes medicine; research No give intervention and not gather identity, record medical, or clinical data patient. On the basis of characteristics said, research No submitted for ethical clearance of research subject human. Before data collection, researchers get permission access from manager or pharmacist guarantor each pharmacy's answer as well as guard confidentiality identity location through coding.

Assessment Parameters

Assessment parameters used includes 19 variables which include aspect adequacy means storage, conditions buildings and rooms, control temperature and humidity, system expenditure drugs (FIFO/FEFO), method compilation stock pharmacy based on form supplies, class therapy, and alphabetical, handling drug approach expiration, terms storage vaccines, procedures emergency at the time blackout electricity, as well as inspection and calibration thermometer in a way periodically, according to with attachment Minister of Health Regulation Number 73 of 2016 (Republik Indonesia, 2016a).

Data Analysis Techniques

Data analyzed in a way descriptive quantitative with count frequency and percentage suitability For every pharmacy. Parameters coded NA are not entered to in denominator for the score No increase in a way artificial. Because the sample chosen purposively and only covers three location, analysis No directed For inference statistics or generalization population.

$$\%\ Compliance = \frac{\text{number of parameters according to}}{\text{number of applicable parameters}}\ x10\%$$

For interest interpretation descriptive, percentage grouped in a way operational to be : 90–100% = very good ; 80–<90% = good ; 70–<80% = sufficient ; 60–<70% = less ; and <60% = very less. In addition to the total score, each mismatch analyzed in a way qualitative based on notes observation, regulation, and study beforehand so that the risk important No covered by value aggregate.

RESULTS AND DISCUSSION

Evaluation results suitability storage medicine on three pharmacies in Palembang City against 19 parameters of the Minister of Health Regulation Number 73 of 2016 is presented in Table 1 and Table 2.

Table 1. Comparison Compliance of 19 Drug Storage Parameters in Three Pharmacies

No	Summary parameters	A	B	C	Notes main
1	Adequacy shelves / cupboards	S	S	S	
2	Distance between item and ceiling ≥50 cm	S	S	S	C: 55 cm
3	ceiling tight / leak-proof	S	S	S	
4	Free insects / animals nuisance	S	S	S	
5	System cooler room	S	S	S	
6	Free location flood	S	S	S	
7	Refrigerator drug certain	S	S	S	
8	Thermometer space and cupboard cooler	S	S	S	
9	Implementation of FIFO and FEFO	S	TS	S	B: arrangement Not yet consistent

No	Summary parameters	A	B	C	Notes main
10	Arrange according to form, class therapy, alphabet	S	S	TS	C: not yet according to class therapy
11	Neatness and cleanliness	S	S	S	
12	Storage in receptacle original	S	S	S	
13	Separation / marking drug approach expired	TS	TS	S	A: marked, not yet separated ; B: not yet separated
14	Guard stability material active	S	S	S	
15	Storage vaccine special	NA	NA	NA	Third pharmacy No provide vaccine
16	Security moment electricity outage	S	S	S	B and C have generators
17	Inspection / monitoring periodically	S	S	S	B: quarterly ; C: monthly and quarterly
18	Monitoring temperature with thermometer calibrated	S	S	S	
19	Thermometer external /internal	S	S	S	

Table 1 shows that part large parameters have been filled by the three pharmacy. Vaccine parameters given NA code because No any location provide vaccine, whereas mismatch specific contained in management drug approach expiration, FIFO/FEFO implementation, and preparation based on class therapy.

Table 2. Summary of Conformity Level Based on Applicable Parameters

Pharmacy	Valid	In accordance	It is not in accordance with	Compliance	Category
Pharmacy A	18	17	1	94.44%	Very good
Pharmacy B	18	16	2	88.89%	Good
Pharmacy C	18	17	1	94.44%	Very good

After the vaccine parameters issued from denominator, Pharmacy A and Pharmacy C are in the very good category, while Pharmacy B is in the category good. Similarity score Pharmacies A and C do not means profile the risks same : mismatch Pharmacy A is related with drug approach expired, while Pharmacy C has not yet fulfil element compilation based on class therapy. Pharmacy B has two discrepancies, namely FIFO/FEFO and management drug approach expired.

In a way general, results evaluation show that compliance high aggregate Not yet always identical with control adequate risk. Every grains represent function different security ; because that, one mismatch in rotation stock or separation drug approach expired still can impact directly on quality medicine and safety patient. Interpretation study This furthermore focus on patterns mismatch and possibility mechanism operational, not just repeat score on the section results.

Conformity to facilities physique like shelf, condition room, control pests, cooling, and monitoring temperature, shows that prerequisite base For maintain stability drug has available. This is important to the climate tropical and humid Because exposure temperature as well as humidity that is not under control can speed up degradation stock (Sari & Azhari, 2021; Zulkarnain, 2014). However, the existence of means need accompanied by recording and verification periodic ; available thermometers, for example, new effective as control quality if results monitoring reviewed and deviations quick followed up (WHO, 1999; WHO, 2023).

FIFO/FEFO inconsistencies are visible at Pharmacy B. from arrangement stock that is not always follow order receipt and date expired. Compared Pharmacy C which does monitoring monthly at the level rack besides inspection quarterly, Pharmacy B recorded routine monitoring every three month. Difference frequency control This in a way operational can reduce chance For quick organize repeat stock after acceptance, return, or displacement goods. Because of research No measure burden work, amount personnel, availability of SOPs, and compliance individual in a way structured, factors the No can stated as cause ; all of them need tested on follow-up audits. Immediate action can implemented is marker date easy expiration visible, FEFO priority list, and inspection rack documented monthly (Siyamto, 2022; Ummah & Siyamto, 2022).

Management drug approach expired showing two levels weakness control. Pharmacy A has give description, but Not yet provide separation physical ; Pharmacy B has not apply adequate separation. This pattern show that visual control only No Enough without a special area that prevents drug risky mixed with stock regular. In the situation service busy, mixing the enlarge possibility of taking the wrong one and slowing it down identification stock that must be prioritized, returned, or destroyed. Because of the Minister of Health Regulation Number 73 of 2016 requires marking at a time separation, repair need covers receptacle or rack special, prominent label, watch list three until six month before expired, as well as action continued by pharmacist guarantor answer (Republik Indonesia, 2016a; Pramestutie et al., 2021; Puspasari & Puspita, 2024).

At Pharmacy C, item compilation corrected becomes "Not Suitable" because proof observation only show grouping based on form stock and alphabetical, not yet based on class therapy. Correction This remove conflict between marks on the checklist and their descriptions. In substantive, consistent grouping help speed up search and reduce the risk of making a wrong decision, especially For drug by name or packaging similar. Findings this also shows binary checklist weaknesses: one grains can load a number of elements, so that all over element should filled before given "Appropriate" value (Satibi, 2017).

Vaccine parameters classified as NA on all location Because vaccine No including preparations provided. Treatment This more appropriate than give " Appropriate " point, because facilities that are not operate service the Not yet show fulfillment standard storage vaccine. On the other hand, preparedness blackout electricity still relevant for other medications that require temperature under control. The availability of generators at Pharmacies B and C strengthens continuity chain cold, whereas every pharmacy still need procedure written For transfer or security stock when source electricity main disturbed (Republik Indonesia, 2016a; BPOM RI, 2020).

Comparison frequency inspection show importance close control with activity daily. Monitoring monthly per shelf and evaluation quarterly comprehensive at Pharmacy C provides opportunity more big For detect misplacement, changes temperature, or stock approach expired before cause problem. Practice This reflect culture better quality proactive than examination that only carried out at long intervals. To be effective, inspections need own guarantor answer, proof recording, deadline action continue, and verify settlement (WHO, 2023).

Implications main study is the need shift focus from compliance administrative going to control risk based evidence. Pharmacist guarantor answer need prioritize three action : separating and marking drug approach expired, ensure FIFO/FEFO rotation through inspection regular shelves, as well as complete grouping drug in accordance provisions. Health Department can use grains the as focus coaching and inspection, while manager pharmacy can put it in to in internal audit indicators. With Thus, the total score is used as summary, but decision repair still based on the type and consequences every mismatch (International Pharmaceutical Federation & World Health Organization, 2011; Satibi, 2017).

Study This own a number of limitations. Selection three pharmacy purposively limiting representation and not allows generalization to all over pharmacies in Palembang City. Cutting design latitude only record conditions on one period and not yet evaluate consistency practice from time to time. All evaluation carried out by one observer so that suitability interobserver No can tested. Binary checklists can also be simplify compliance partial, whereas possible factors explain non-conformity, such as burden work, amount personnel, availability of SOPs, capacity shelves, and the intensity of supervision that is not measured in a way structured research advanced need involving more samples area, observation repetitive, instrument with score per element, as well as analysis factor operational so that the cause mismatch can tested

CONCLUSION

Evaluation show that third pharmacy has fulfil part big standard storage, but Still there is risk different operations in each location. Priority repair covers separation physical and marking drug approach expired at Pharmacies A and B, strengthening FIFO/FEFO rotation at Pharmacy B, as well as compilation drug based on class therapy at Pharmacy C. Use NA category in vaccine parameters prevent score compliance increase Because services that are not available. Findings This confirm that score aggregate must always read together type non-conformity. Pharmacist guarantor answer recommended designate a special area drug approach expired, using visual control, running inspection rack documented monthly, and follow up every findings with a clear time limit. Coaching periodically by the service health and research advanced with coverage more wide required For strengthen quality and safety storage drug.

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