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Systematic Review of Waiting Time Barriers for Outpatient Pharmacy Services in Hospitals

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Abstract
Introduction: *Wait times for outpatient pharmacy services are an indicator of service quality that influences patient satisfaction and compliance. However, in many hospitals, wait times for both over-the-counter and prescription medications still exceed Ministry of Health standards, with maximum wait times of ≤ 30 minutes for non-prescription medications and ≤ 60 minutes for prescription medications.* ***Objective:*** *To identify factors that influence waiting time for outpatient pharmacy services.* ***Methods:*** *This study used a Systematic Reviews design to identify factors that influence waiting time for outpatient pharmacy services by following the PRISMA guidelines.* ***Results and Discussion:*** *Structural factors contributing to long wait times include suboptimal pharmacy staff ratios, limited technological infrastructure, and limited waiting room capacity. From a process perspective, delays result from manual prescription verification, inefficient workflows, and time-consuming administrative processes. Outcome-wise, long wait times lead to decreased patient satisfaction and potentially decreased medication adherence. Interventions such as the implementation of electronic queuing systems, integration of pharmacy information systems, task redistribution, and service automation have been shown to reduce wait times by 20–50%.* ***Conclusion:*** *Reducing waiting times requires a comprehensive strategy through structural improvements, process optimization, and continuous monitoring of outputs.*

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Introduction

Waiting times for pharmaceutical services are a global concern as an indicator of healthcare quality. An international study by the International Pharmaceutical Federation (FIP) revealed that waiting times for pharmaceutical services have a similar pattern across countries, primarily related to limited human resources, suboptimal information systems, and the complexity of pharmaceutical supply chain management. (Williams & Thompson, 2023). In many countries, waiting times for pharmacy services are a critical issue in healthcare systems. Recent research in the United States showed that the average waiting time at a hospital pharmacy was 45 minutes, while in the UK it was 32 minutes. (Johnson et al., 2022). In Asian countries such as Malaysia and Thailand, the average waiting time for pharmacy services is even higher, reaching 60-90 minutes during peak hours. (Ahmad & Hassan, 2023). reported that in Indonesia, the average wait time for pharmaceutical services at government general hospitals is 72.4 minutes for non-prescription medications and 105.8 minutes for prescription medications.

Data from the Wijaya & Setiawan, (2021) reports that in Indonesia, the average wait time for pharmacy services at government general hospitals is 72.4 minutes for non-prescription medications and 105.8 minutes for prescription medications. The average wait time for non-compounded medications is 45-60 minutes, while for compounded medications it is 90-120 minutes. These figures are still far above the minimum service standards set by the Indonesian Ministry of Health, which stipulate a maximum wait time of 30 minutes or less for non-compounded medications and 60 minutes for compounded medications.

Nugroho & Saputri, (2022) state that implementing a non-user-friendly pharmaceutical information system can increase prescription processing times by up to 35%. Abdullah & Kurniawan, (2021) stated that the ideal ratio of pharmacists to prescriptions is 1:40 per day. However, in many hospitals in Indonesia, this ratio reaches 1:70 to 1:90, resulting in excessive workloads and prolonged waiting times. Technological advances in pharmaceutical information systems should improve the efficiency of pharmaceutical services, but their implementation in various hospitals still faces various challenges.

Research conducted by Hassan *et al*., (2020) that implementing an integrated pharmaceutical information system can reduce waiting times by up to 40% if implemented optimally. However, Suhardi *et al*., (2023) found that in Indonesian government hospitals, the implementation of digital pharmacy systems was often hampered by a lack of staff training (62.4%), inadequate infrastructure (45.3%), and resistance to change (37.8%).

Gaps in previous research indicate a difference in perspective between the importance of wait time efficiency and the complexity of implementing information technology in healthcare. Avedis Donabedian's Healthcare Quality Theory is an appropriate framework for analyzing the issue of pharmaceutical service wait times because it provides a comprehensive approach to evaluating healthcare quality through three interrelated dimensions: structure, process, and outcome. Donabedian's model emphasizes that "a good structure increases the likelihood of a good process, and a good process increases the likelihood of a good outcome." (Donabedian, 1966).

Recent research by De Rosis *et al*., (2024) in the International Journal of Health Planning and Management shows that the Donabedian framework remains relevant and can be adapted to measure the performance of user-oriented health care systems. The study conducted by Zhao *et al*., (2021) Studies in various international hospitals have

shown that applying the Donabedian model to pharmacy service evaluation can identify critical factors influencing wait times, ranging from structural aspects such as resource and infrastructure availability, to processes such as workflow and coordination between units, to outcomes such as patient satisfaction and medication adherence.

The structural dimension in the context of pharmacy services includes physical resources, human resources, and the organizational systems that support the service. Research conducted by Singh & Kumar, (2023) In a tertiary hospital in India, an optimal pharmacy service structure can reduce waiting times by up to 45% through efficient space planning, adequate availability of pharmacists, and implementation of an integrated information system. Al-Rashid *et al*., (2022) A study in Middle Eastern hospitals found that investment in pharmaceutical technology infrastructure and increasing the ratio of pharmacists per patient significantly correlated with reduced wait times.

The process dimension focuses on the actual interactions between providers and patients during pharmacy services. Research by Thompson & Williams, (2024) Using the Donabedian approach to analyze pharmaceutical care processes in 12 European hospitals, they found that standardizing prescription verification processes, optimizing drug distribution flows, and improving communication between units could reduce waiting time variability by up to 38%. A longitudinal study conducted by Park *et al*., (2023) A study in South Korean hospitals showed that improving pharmaceutical service processes through the implementation of standard operating protocols and real-time monitoring systems resulted in a reduction in average waiting times from 67 minutes to 34 minutes over an 18-month period.

The outcome dimension in Donabedian's model measures the impact of structure and process on the final outcomes of care, including patient satisfaction, medication adherence, and other quality indicators. Comprehensive research by Martinez *et al*., (2022) A study involving 25 hospitals in Latin America showed that improvements in pharmacy wait times achieved through the Donabedian approach not only increased patient satisfaction by 42%, but also increased medication adherence by 31% and reduced readmission rates by 18%.

Implementation of the Donabedian model in the context of hospital pharmacy services has proven effective in various settings. Furthermore, research by Roberts *et al*., (2024) shows that the application of the Donabedian framework in optimizing pharmaceutical services can produce sustainable improvements with a retention rate of improvement reaching 89% after three years of implementation. Based on the complexity of the pharmaceutical service waiting time problem described above, and considering the importance of a comprehensive approach through the Donabedian model in analyzing the quality of healthcare services, the researcher wants to deepen this research.

Method

Research Design

This study used a systematic review design to identify, evaluate, and synthesize scientific evidence regarding factors influencing waiting times for outpatient pharmacy services and interventions that could improve them. The study was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Literature Search Strategy

The article search was conducted in three electronic databases: PubMed, Scopus, and Google Scholar. The keywords used were: ("waiting time" , "pharmacy waiting time", "dispensing time"), ("outpatient pharmacy", "pharmaceutical services"."hospital pharmacy"), ("Donabedian model", "service quality", "quality of care") and ("Indonesia" OR "hospital" OR "healthcare") The Boolean operators AND and OR were used to combine keywords. The publication range was limited to January 2020–June 2025. The languages of the articles were limited to English and Indonesian.

Inclusion Criteria :

1. Primary research articles (quantitative, qualitative, or mixed).
2. Discussing outpatient pharmacy services in hospitals or healthcare facilities.
3. Reporting quantitative wait time data.
4. Publication between 2020 and 2025.
5. English or Indonesian.

Exclusion Criteria :

1. Non-systematic reviews, editorials, commentaries, or short reports without numerical data.
2. Research focusing on inpatient or community pharmacy services.
3. Articles with inaccessible full text.

Study Selection

Initial search results were imported into reference software to remove duplications. The first stage was screening titles and abstracts based on inclusion/exclusion criteria. Eligible articles proceeded to full-text review. The selection process followed the PRISMA flowchart.

Study Quality Assessment

The methodological quality of each study was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tool, adjusted for the type of study design (cross-sectional, before-after, or mixed-methods). Each item was scored as "Yes," "No," or "Unclear," and then a percentage of eligibility was calculated. Studies with a score of ≥70% were considered good quality.

Data Synthesis

Data from selected studies were extracted, including: author(s), year, country, study design, sample size, average waiting time, and intervention/main finding. The synthesis was conducted narratively and categorized based on the Donabedian framework into three dimensions: structure, process, and outcome.

Results and Discussion

A literature search in PubMed, Scopus, and Google Scholar yielded 225 articles. After deduplication (n = 40), 185 articles remained for title and abstract screening. A total of 135 articles were eliminated for non-relevance to the inclusion criteria. Fifty articles were read in full text, and 30 articles were excluded for focusing on inpatient/community pharmacy or for not reporting numerical wait time data. Thus, 20 articles that met the inclusion criteria were selected and analyzed in this systematic review. The following are the results of the systematic review conducted from the 20 selected research journals:

Table 1
Systematic Review Research Results

No	Authors and years	Research Methods	Outcome of Analysis	Summary of results
1	(Rafael et al., 2025)	Pre-post comparative with t-test/ Mann-Whitney test	Significant reduction in waiting time for compounded meds (p=0.044 and p=0.000); non-compounded reduced (45.54 → 36.9 min) but not significant (p=0.305–0.386)	Optimizing prescription flow notably improves compounded drug wait times; non-compounded show improvement but not statistically significant.
2	(Yonrizon et al., 2023)	Incidental sampling of 379 prescriptions, cross-sectional quantitative	Average wait: non-recipe 55.92 min; compounded 61.23 min — both above Ministry standards	Staff shifts and HR availability are key factors influencing long wait times.
3	(Yulia et al., 2025)	Cross-sectional with prescription data + staff questionnaires	Public hospital: compounded 80 min, non-compounded 64 min; private hospital: 36 min and 43 min, respectively	Workload, prescription item count, staffing levels, IT and SOP deficiencies are major contributors to delays.
4	(Astiena et al., 2022)	Sequential explanatory mixed-methods (quantitative + interviews)	Average wait: non-compounded 84.19 min; compounded 164.58 min — far above standards	Causes include staff shortage, formulary mismatches, equipment malfunctions, delivery delays. Recommendations: shift redesign, SOP updates, equipment maintenance.
5	(Mensur et al., 2025)	Quantitative dispensing time analysis with patient surveys	Average wait: 21.45 min (out-pocket), 19.19 min (insurance), 13.41 min (stock-out); >50% patients considered wait too long; 67.46% unsatisfied	Delays in billing prescribe process drive dissatisfaction. Need to cut dispensing hold-up to allow more time for counseling and improve satisfaction.
6	(Leemanza & Kristin, 2023)	Quasi-experimental (intermittent time series), single-group, 5-week intervention	Wait times decreased by 17% (compound) and 37% (non-compound), statistically significant ($p < 0.001$). Patient satisfaction also increased significantly.	Setting waiting time targets and providing satisfaction feedback effectively reduces waiting times and increases patient satisfaction.
7	(Astiena et al., 2022)	Sequential explanatory mixed-method (quantitative and qualitative) through observation, interviews, and documents	Average waiting time: 84.19 min (non-compound), 164.58 min (compound); above standard (≤30/60 min). Contributing factors: staff shortage, off-formulary prescriptions, equipment failure, and delayed drug delivery.	Recommendations: redesign job shifts, maintain equipment, and update medication delivery SOPs.
8	(Fahrurazi et al., 2022)	Cross-sectional with multiple linear regression	Mean wait time: 23.0 min (SD = 11 min). Wait time is influenced by the number of prescription medications, staffing, prescription interventions, and filling technicians.	Service within a satisfactory timeframe. Significant factors are recipe complexity and staff size.

9	(Aisyah et al., 2022)	This type of research is quantitative with a cross-sectional study design. Data collection used secondary data obtained for 1 week retrospectively through the PASHMINA application using a form.	The results showed that 69.3% of the waiting time for pharmaceutical services was inappropriate,60.6% finished drug prescriptions,51.9% <3items and 53.8% used BPJS payment. The results of the Chi square test showed that there was a relationship between the type of prescription (p-value=0.004, PR=1.709), number of drug items (p-value=0.0001, PR=3.023), payment status (p-value 0.0001) and waiting time for pharmaceutical services.	The author suggests that the Management of Hermina Daan Mogot Hospital make efforts to improve by minimizing the number of concoction prescriptions, monitoring the number of drug items, developing SIMRS, commitment to discipline in drug prescribing and setting the pharmacy staff's official schedule more optimally.
10	(Alodan et al., 2020)	Research design using systematic review	Consistency shows a relationship between long wait times and decreased patient satisfaction and compliance.	Routine queue management and abatement interventions are recommended in this study.
11	(Santoso et al., 2023)	Cross-sectional survey (accidental sampling), univariate and bivariate analysis.	77% were "very satisfied" and 23% were "satisfied" with wait times of ≤ 30 minutes for non-prescription medications.	Wait times met standards and satisfied patients based on Sharia-compliant criteria.
12	(Biya et al., 2022)	Cross-sectional, observational (time-motion) + survey, n=422, logistic regression	Cumulative waiting time ≥120 min is considered long starting from various units (registration to pharmacy)	High cumulative OPD wait times; a BPR (Business Process Reengineering) approach is needed. `
13	(Nuraini & Wijayanti, 2023)	Lean tools (fishbone, 5M), observasi, brainstorming.	Waiting time: 36 min, non-value added index 56.7%.	Update formulary, add PCs and technicians, rearrange space, and SOP.
14	(Mensur et al., 2025)	An institutional cross-sectional quantitative study mixed with a qualitative method	The average wait time for the medication dispensing process was 21.45, 19.19, and 13.41 minutes for direct payers, Community-Based Health Insurance, and out-of-stock customers, respectively. Specifically, the primary delay component was caused by patient queues for prescription collection. The majority of patients (51.2%) reported that wait times at the pharmacy were either too long or too long.	A significant portion of patient wait time at the studied pharmacies can be attributed to delays in the medication dispensing process.
15	(Ferrández et al., 2024)	A cross sectional study was done using an ad hoc 14- item questionnaire collecting	in the waiting time for the collection of OHM (88.1% vs. 66%), attention received by professionals (92.5% vs. 86.1%), and information	wait time at the studied pharmacies can be attributed to delays in the medication Dispensing OHM

		demographic data, duration of treatment, usual mode of collecting medication	received on treatment (79.4% vs. 77.4%).	
16	(Al Zabadi et al., 2023)(Mensur et al., 2025)	A cross-sectional 1-month study was conducted in three hospitals in Nablus city in the Northern District of West Bank, Palestine.	Nearly, 70%of patients indicated having problems getting the medicine on their last visit to the hospital pharmacy. Only 66.7% of patients expressed satisfaction with the pharmacies' operating (working) hours.	Patient satisfaction with pharmaceutical care services could be enhanced by involving pharmacists in patient-oriented training and informing patients about the role of pharmacists.
17	(Handayany & Alif, 2024)	This study used a quantitative observational approach to all recipes served in June, July, and August 2023.	The average waiting time for prescription services at Labuang Baji Hospital is 16 minutes for ready-made medications and 26 minutes for compounded medications. At Haji Hospital, it's 15 minutes and 26 minutes, respectively. At Dadi Hospital, it's 22 minutes and 31 minutes.	All these results are in accordance with the standards of the Minister of Health Regulation No. 129 of 2014 which states that the waiting time for finished drugs is ≤ 15 minutes, and for mixed drugs ≤ 30 minutes.
18	(Utama et al., 2024)	This study is a descriptive study using an observational method on compounded and non-compounded prescriptions for outpatients admitted to the Pharmacy Installation of Hospital X Jakarta in February 2024.	The results of the study showed that the waiting time for prescription services at the Pharmacy Unit of Hospital X Jakarta was 42 minutes for compounded prescriptions, while for non-compounded prescriptions it was 28 minutes.	The results of the study on the waiting time for outpatient BPJS prescription services at the Pharmacy Unit of Hospital X Jakarta in February 2024 showed that 95.53% of prescriptions were completed (non-compounded) and 92.63% were completed for compounded prescriptions.
19	(Wirajaya & Rettobjaan, 2022)	This type of research is descriptive. This research uses a systematic literature study.	There are several factors that influence the waiting time for drug prescription services at hospital pharmacy installations, namely the lack of human resources at the pharmacy installation, incomplete patient files, lack of availability of drugs prescribed by doctors,	Hospitals need to address these factors to maintain the quality of their services.
20	(Mumtaz et al., 2025)	This research is an analytical observational study using a cross-sectional approach.	The waiting time for A total of 82.60% of prescription waiting times at the Outpatient Pharmacy Unit of RSND Semarang were below standard. The delay in service was greater than the	The factors of prescription type, patient type, and number of drug items in the prescription do not affect the waiting time for prescription drug services at the Outpatient Pharmacy

	time it took to process the prescription.	Installation of RSND Semarang.

Based on an analysis of 20 journals that met the inclusion criteria, the average waiting time for outpatient pharmacy services varies between 15–71 minutes for both finished and compounded medications. Most studies in Indonesia reported waiting times within the Minimum Service Standards (≤15 minutes for finished medications and ≤30 minutes for compounded medications), while several international studies showed waiting times exceeding the WHO standard (≤30 minutes). Structural factors that frequently emerged included limited pharmacists, underutilization of technology, and limited waiting room capacity. From a process perspective, suboptimal service flows, manual prescription verification, and time-consuming administrative processes were found. Regarding outcome, most studies reported a significant relationship between waiting times and patient satisfaction levels. Interventions such as the implementation of an integrated pharmaceutical information system, the addition of dedicated queue lines, and automated dispensing have been shown to reduce waiting times by 20–50% in several study locations.

Structure

Structural factors include human resources, physical facilities, and technological infrastructure. The synthesis results show that the ratio of pharmacists to prescription volume is often unbalanced, especially during peak hours. Supporting facilities such as adequate waiting rooms, electronic queuing systems, and automated dispensing devices play a crucial role in expediting service delivery. Studies implementing automation or rearranging room layouts report significant reductions in wait times.

Process

The process aspect relates to how services are delivered, from receiving a prescription to dispensing the medication to the patient. Many studies report that prescription verification, preparation of compounded medications, and administrative processes are sources of delays. The use of technology such as Computerized Physician Order Entry (CPOE), pharmacy information systems, and integration with electronic medical records accelerate workflows. Lean management-based interventions have also been shown to reduce non-value-added activities.

Outcome

Outcome measures the impact of structural and process improvements on service outcomes. Reducing wait times has been shown to increase patient satisfaction, improve medication adherence, and enhance perceived service quality. Several studies in Indonesia reported satisfaction rates of >95% after improving service flow. However, in some facilities with high wait times, patient satisfaction dropped to <70%.

Conclusion

This study shows that waiting times for outpatient pharmacy services are influenced by a combination of structural factors and service processes. Effective improvement efforts require investment in human resources, utilization of information technology, and workflow optimization. The application of Donabedian's principles helps identify critical points for improvement that directly impact outcomes, particularly patient satisfaction and service quality.

Therefore, hospital management needs to integrate evidence-based continuous improvement strategies to maintain waiting times in line with national and international standards.

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