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WAITING TIME MANAGEMENT AND OUTPATIENT SATISFACTION: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Patient satisfaction is an important indicator of hospital service quality. In outpatient care, waiting time is one of the most tangible aspects experienced by patients and reflects the effectiveness of service processes, resource management, capacity, and information systems. This study aimed to systematically analyze evidence regarding the relationship between waiting time and outpatient patient satisfaction, identify service quality dimensions associated with waiting experiences, and formulate improvement strategies relevant to hospital management. A Systematic Literature Review (SLR) was conducted following the PRISMA 2020 guidelines. Literature was searched through scientific databases and official sources using the keywords outpatient waiting time, patient satisfaction, service quality, SERVQUAL, and healthcare process improvement. The review focused on publications from 2020 to 2026, with eligible studies identified based on predefined inclusion and exclusion criteria. A total of 10 studies published between 2021 and 2026 were included in the final synthesis. The eligible studies were analyzed narratively and thematically based on study characteristics, waiting time, determinants of satisfaction, service quality dimensions, and improvement interventions. The literature indicates a complex relationship between waiting time and patient satisfaction. Although prolonged actual waiting time may reduce satisfaction, patients' perceptions, expectations, tolerance, and the discrepancy between expected and experienced waiting time also play important roles. Responsiveness and reliability consistently emerged as key service quality dimensions associated with waiting experiences, while assurance, empathy, and tangibles also contributed to overall perceptions of service quality. Interventions including appointment-based scheduling, workflow optimization, Lean Healthcare, electronic medical records, digital registration, and queue management have the potential to reduce waiting time when implemented as integrated strategies. Waiting time represents both an operational indicator and an important component of patient experience. Effective management requires a systemic approach integrating process redesign, capacity management, patient communication, digitalization, and continuous quality monitoring.

Keywords: hospital management; outpatient care; patient satisfaction; service quality; SERVQUAL; waiting time

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INTRODUCTION

Hospitals are complex service organizations that integrate patients' clinical needs with administrative processes, human resources, technology, regulations, and the demand for organizational efficiency. In the evolution of modern healthcare, quality is no longer defined solely by a hospital's ability to achieve positive clinical outcomes; it also encompasses the patient's experience throughout the service process. High-quality healthcare organizations must deliver care that is safe, effective, timely, efficient, and patient-centered, while meeting the needs and expectations of service users.

Patient satisfaction is a crucial indicator because patients evaluate not only the service outcomes but also the entire process from their arrival at the hospital to the completion of their care. In outpatient services, this experience includes registration, administrative verification, vital sign measurements, physician consultations, diagnostic tests, payment, and medication collection. Each stage carries the potential for queues to form. Consequently, patient satisfaction with outpatient services is essentially the result of an interplay between clinical quality, the quality of interpersonal

interactions, the service environment, and process efficiency. Waiting time is one of the process components most easily observed by patients. Unlike diagnostic quality or the appropriateness of therapy which are often difficult for patients to assess directly time spent waiting is a tangible experience. Patients can directly compare their arrival time with the time they actually receive care. Therefore, unexplained delays or uncertainty regarding when service will be provided can influence perceptions of the hospital's professionalism and reliability.

In the Indonesian context, outpatient waiting time has become a recognized hospital quality indicator. The Ministry of Health's National Quality Indicator monitoring system tracks outpatient waiting time alongside other quality metrics, including patient satisfaction. Recent Ministry of Health policy documents also emphasize the necessity of timely outpatient care, noting that long waiting times can contribute to patient dissatisfaction as well as delays in diagnosis and treatment. However, the relationship between waiting time and patient satisfaction is not entirely simple or linear. Research by Zhang et al. (2023) indicates that actual waiting time is not always a significant predictor of satisfaction; instead, perceived waiting time, waiting time deemed rational, tolerable waiting time, and patient expectations show a clearer relationship with satisfaction. These findings offer a crucial insight: managing waiting times involves not only reducing the time patients spend waiting but also managing expectations, communication, schedule reliability, and information transparency.

The SERVQUAL framework offers a comprehensive lens through which to understand this relationship. Its five dimensions tangibles, reliability, responsiveness, assurance, and empathy provide a perspective on how patients evaluate service quality. Regarding wait times, responsiveness relates to staff members' ability to provide prompt service and assist patients when obstacles arise, whereas reliability concerns the hospital's ability to deliver services consistently in accordance with schedules and procedures. Simultaneously, assurance and empathy can influence a patient's acceptance of delays, provided staff offer adequate information and attention. Recent literature indicates that the issue of wait times is shifting from a mere queuing problem to a matter of service system design. A systematic review by Manderson et al. (2025) demonstrates that service-level interventions can yield sustained reductions in wait times, although the certainty of the evidence remains limited due to the methodological quality of some existing studies. Meanwhile, a recent systematic review on protected appointment-based waiting lists shows that capacity management through specific appointment systems can lead to significant reductions in wait times.

Against this backdrop, this study aims to synthesize scientific evidence regarding the relationship between wait times and outpatient satisfaction while integrating this with a service quality perspective. Unlike studies that view wait times solely as a duration metric, this study positions wait times as an integral part of the service system influenced by capacity, process flows, technology, communication, and the characteristics of the patient experience. This approach is expected to yield more relevant managerial implications for hospitals as they design strategies to enhance outpatient service quality.

METHOD

Research Design and Protocol

This study employs a Systematic Literature Review (SLR) design, with reporting conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. A narrative synthesis was used due to the observed heterogeneity across the studies, which encompassed variations in research designs, satisfaction instruments, definitions of waiting time, patient characteristics, and types of interventions.

Literature Search Strategy

The search prioritized PubMed/MEDLINE and other relevant scientific journal sources. It was supplemented by official sources from the WHO and the Ministry of Health of the Republic of Indonesia to strengthen the context regarding policy and quality of care. Key search terms included: *("waiting time" OR "waiting times" OR "patient waiting") AND ("patient satisfaction" OR "patient experience") AND ("outpatient" OR "outpatient department") AND ("service quality" OR "SERVQUAL" OR "healthcare quality")*

For research regarding the intervention, a combination is used:
("waiting time" OR "waiting list") AND ("outpatient") AND ("intervention" OR "process improvement" OR "appointment scheduling" OR "Lean" OR "electronic medical record")

Inclusion and Exclusion Criteria

Inclusion criteria: (1) original research articles or systematic reviews published in peer-reviewed journals; (2) addressing outpatient services; (3) addressing waiting times, patient satisfaction, service quality, or waiting time reduction interventions; (4) articles published in English or Indonesian; (5) articles verifiable via scientific databases; and (6) publications primarily from the 2020–2026 period. Exclusion criteria: (1) opinion pieces, editorials, letters to the editor, and news reports; (2) research unrelated to outpatient services; (3) duplicate articles; (4) articles lacking adequate methodological information or results; and (5) studies addressing only waiting times without a link to quality, satisfaction, or service improvement.

Extraction and Quality Assessment Process

The extracted data included authors, year of publication, country, study design, sample size, service context, definition of waiting time, satisfaction instruments, key findings, and intervention recommendations. Quality assessment was conducted by considering the alignment of the study design with the study objectives, the clarity of the population and sample, variable measurement methods, data analysis, and study limitations. Methodological note: The number of articles in the PRISMA diagram must be derived from the actual database search export results obtained by the researchers. Therefore, the figures for identification and duplicate elimination were not arbitrarily determined in this manuscript. This is crucial to ensure the manuscript does not contain non-reproducible methodological data.

RESULT

Characteristics of Included Studies

The verified literature indicates that research on waiting times and patient satisfaction employs diverse approaches, ranging from cross-sectional studies, quality evaluation studies, and pre-post intervention studies to systematic reviews. A significant empirical study was conducted by Zhang et al. (2023) involving outpatients. This study distinguished between actual waiting time, perceived waiting time, waiting time considered reasonable, and tolerable waiting time. Analysis results revealed that several measures of perceived waiting time were significantly associated with satisfaction, whereas actual waiting time did not show a significant relationship within the study's model. Toga-Sato et al. (2021) also highlighted the importance of distinguishing between actual waiting time and patients' perceptions of waiting time in outpatient diabetes care. In the context of pharmaceutical services, Yulia et al. (2025) examined waiting times in pharmacy units and demonstrated the importance of measuring time at each service stage as a basis for process improvement. Thus, the characteristics of the literature indicate that waiting time is both an operational construct and a subjective experience. This serves as a crucial basis for interpreting the relationship between waiting time and satisfaction with greater caution.

Table 1.
Verified Literature Synthesis Matrix

No.	Research	Design/Context	Focus	Key Findings
1	Li et al. (2021)	Retrospective outpatient cohort	AI-assisted system for outpatient care processes	The use of AI-based systems significantly reduces patient waiting times compared to conventional processes.
2	Toga-Sato et al. (2021)	Observasional	Actual and perceived waiting times	The perception of waiting time is important in shaping service satisfaction.
3	Xuan et al. (2021)	Observasional	Waiting area environment	The physical environment influences the experience, perception of waiting time, and satisfaction.
4	Zhang et al. (2023)	Cross-sectional	Waiting time and satisfaction	The perception of waiting time has a greater influence than actual waiting time in the research model.
5	Yulia et al. (2025)	Studi proses	Pharmacy waiting time	Measuring each stage is essential for process improvement.
6	Manderson et al. (2025)	Systematic review	Waiting time reduction intervention	Service-level interventions can sustain the reduction in wait times.
7	Wang et al. (2025)	Cross-sectional	SERVQUAL and satisfaction	The waiting time before the consultation is associated with patient satisfaction groups.
8	Seif et al. (2025)	Cross-sectional	Perception of waiting time	The perception of waiting time is related to patient satisfaction and experience.
9	Tsai (2026)	Cross-sectional/SEM	Quality, trust, pressure from waiting	Service quality enhances satisfaction through trust; the pressure of waiting affects this relationship.
10	Noeske et al. (2026)	Systematic review & meta-analysis	Appointment-based strategies	Appointment-based strategies are associated with reduced waiting times.

DISCUSSION

The Relationship Between Waiting Time and Patient Satisfaction

Synthesis results indicate that waiting time is a crucial factor in the patient experience; however, its impact cannot be understood solely based on the number of minutes recorded in the hospital system. Patients respond not only to the actual duration but also to whether that time aligns with their expectations, whether they are aware of the reasons for any delays, and whether they receive information regarding when care will be provided. The findings of Zhang et al. (2023) serve as a significant example. Their study revealed that actual waiting time was not significantly associated with satisfaction, whereas several perception-based indicators showed a significant relationship. This implies that two patients waiting for the same duration may experience different levels of satisfaction if their expectations, information, and interpersonal experiences differ. Thus, the relationship between waiting time and satisfaction can be characterized as being influenced by three key components: actual duration, the perception of that duration, and the quality of waiting time management.Analisis Berdasarkan Dimensi SERVQUAL.

Responsiveness

Responsiveness is the dimension most closely linked to the experience of waiting times, as it directly relates to an organization's speed and readiness in addressing patient needs. Patients expect not only prompt service but also a response when delays occur.

Reliability
Reliability relates to a hospital's ability to consistently deliver services as promised. In the context of waiting times, reliability is reflected in the punctuality of doctors' schedules, the predictability of the queue, the accuracy of administrative processes, and the system's ability to avoid process repetition.

Tangibles
Tangibles encompass the physical environment of the service. Although physical facilities do not directly eliminate waiting time, a comfortable environment can influence how patients experience that wait.

Assurance
Assurance relates to competence, safety, courtesy, and the staff's ability to build trust. In situations involving long queues, assurance can be maintained through professional communication and consistent information.

Empathy
Empathy becomes important when patients are in a waiting situation. Pain, anxiety, fatigue, or worry about their health condition can make the experience of waiting more difficult.

Factors Contributing to Long Wait Times
1. *Imbalance between capacity and demand*
   The number of patients arriving during a specific period may exceed available service capacity.
2. *Ineffective scheduling*
   Scheduling systems that rely solely on queue numbers without accounting for physician capacity or variations in consultation duration can lead to patient backlogs.
3. *Administrative hurdles*
   Processes such as registration, membership verification, payment, and redundant data entry can increase wait times if systems are not integrated.
4. *Inter-unit bottlenecks*
   Delays in the transfer of information, medical records, test results, or prescriptions can cause patients to wait, even after preceding stages of care have been completed.
5. *Pharmacy bottlenecks*
   Pharmacy services can become a final point of congestion, requiring a specific evaluation of workflow.

The Role of Digitalization in Reducing Waiting Times
Digital transformation offers opportunities to reduce processes that do not add value. Electronic medical records, online registration, digital queuing, e-prescribing, and integrated information systems enable the transfer of patient information between units without reliance on physical documents. A systematic review regarding EMR implementation indicates that the use of electronic medical records can improve workflows and in several studies is associated with reduced waiting times, although the effect is not consistently observed across all settings. Technology can also be utilized during the initial stages of care. Artificial intelligence-based self-assessment systems can form part of a strategy to reduce waiting times prior to examination. However, digitalization should not be viewed as an automatic solution; non-integrated digital systems can actually create additional processes. Therefore, the guiding principle of hospital digital transformation must remain focused on simplifying the patient journey.

Evidence-Based Improvement Strategy

Table 2.
Outpatient Waiting Time Management Strategy

Bottleneck	Intervention	Expected Impact
Registration	Online registration, self-registration, data integration	Reducing initial queues
Scheduling	Appointment-based scheduling	Balancing capacity and demand
Medical records	Implementation of integrated electronic medical records (EMR)	Reduce file searching and moving
Consultation	Patient quota settings per slot	Reduces buildup
Queue information	Real-time dashboard/queue monitoring	Increasing transparency
Pharmacy	E-prescribing and separation of medication dispensing	Reducing bottlenecks
Workflow	Lean Healthcare/PDSA	Eliminating non-value-added activities
Monitoring	Quality indicator dashboard	Enables continuous evaluation

A systematic review by Manderson et al. indicates that various service-level interventions can lead to sustained reductions in waiting times, although the overall certainty of the evidence remains limited. More recently, Noeske et al. (2026) found that strategies based on "protected appointments" are associated with reduced waiting times in outpatient and community services. These findings support a shift from arrival-based queuing systems toward more planned systems based on service capacity..

Synthesized Conceptual Model

Hospital Structure
↓
Human resources – facilities – technology – policies – capacity
↓
Service Process
↓
Registration → Administration → Consultation → Ancillary Services → Pharmacy
↓
Actual Waiting Time
↓
Perception of Waiting Time + Expectations + Communication
↓
Perception of Service Quality (SERVQUAL)
↓
Patient Satisfaction

The relationship is not deterministic. Communication quality, environmental comfort, staff competence, and patient trust can either intensify or mitigate the negative impact of waiting times.

Recommendations and Policy Implications

Implications for Hospital Management

First, hospitals need to develop a waiting time measurement system capable of identifying specific process points, rather than merely calculating the total waiting time. Measuring time at each stage enables management to pinpoint bottlenecks and determine data-driven interventions. Second, scheduling systems should be developed based on actual service capacity. Implementing appointment-based scheduling or allocating patients to specific time slots can help reduce overcrowding during peak hours. Third, hospitals need to establish an integrated information system linking registration, queuing, medical records, physician consultations, diagnostic services, and pharmacy operations. Digitalization efforts should prioritize processes that previously caused redundant work or the need to physically transport documents. Fourth, communication regarding

waiting times must be incorporated into service standards. Patients should be kept informed about their queue position, estimated service times, changes to physician schedules, and reasons for any delays. Fifth, hospitals need to include waiting time indicators alongside patient satisfaction metrics in their quality dashboards. The Ministry of Health has already incorporated outpatient waiting times and patient satisfaction into the hospital quality monitoring system. Sixth, pharmacy services require specific evaluation, as the pharmacy often serves as the final stage of the patient queue. Lean interventions in pharmacy services demonstrate that workflow improvements can reduce waiting times while simultaneously enhancing patient satisfaction.

Implications for Future Research

Future research should employ longitudinal or quasi-experimental designs to more robustly assess the impact of interventions. Studies should measure not only average waiting times but also medians, distributions, 90th percentiles, day-to-day variations, and the proportion of patients meeting service time standards. Future research also needs to distinguish between actual waiting time and perceived waiting time. This distinction is crucial, as the literature indicates that patient perceptions do not always align with the actual durations recorded in the system. Furthermore, research could develop structural models to examine whether service quality, patient trust, communication, and perceived waiting time act as mediators or moderators between process efficiency and patient satisfaction.

CONCLUSION

First, the literature indicates that waiting time is linked to outpatient satisfaction; however, this relationship is complex and influenced by perceptions, expectations, tolerance, communication, and the quality of service interactions. Crucially, this relationship cannot be explained solely by the actual duration of the wait. Factors such as patient perceptions, service expectations, tolerance for delays, the certainty of information, and the quality of communication during the wait all shape how patients evaluate the care they receive. Second, outpatient waiting times result from the accumulation of various interconnected processes. Bottlenecks arising during registration, administration, physician scheduling, information dissemination, diagnostic testing, or pharmacy services can extend the total service time. Third, the SERVQUAL framework highlights the strong link between responsiveness and reliability and the patient's experience of waiting times. Nevertheless, assurance, empathy, and tangibles remain significant, as they influence patient tolerance and perceptions regarding the wait. Fourth, digitalization and process improvement are complementary approaches. Tools such as electronic medical records, online registration, digital queuing systems, e-prescribing, and scheduling systems can enhance efficiency, provided they are designed with the patient journey in mind. Fifth, strategies to reduce waiting times should focus on systemic changes rather than merely increasing resources. Approaches such as appointment-based scheduling, Lean Healthcare, PDSA cycles, capacity management, information integration, and quality indicator monitoring can be employed in combination. Consequently, waiting time should be viewed not merely as an operational metric, but as an indicator of the patient experience and a reflection of the quality of the hospital's process management.

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