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RESEARCH ARTICLE

# Service time and waiting time as predictors of patient satisfaction at Sozo Dental Clinic, Medan

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**ABSTRACT**

**Background:** Service quality in health care is increasingly important as public awareness rises. Waiting time is a key determinant of patient satisfaction, particularly in outpatient settings. Prolonged waiting times are a common complaint across health facilities and directly affect patient perceptions. This study aimed to analyze the effect of service time and waiting time on patient satisfaction during follow-up care at Sozo Dental Clinic, Medan.
**Method:** A quantitative cross-sectional study was conducted. The population consisted of all follow-up patients (at least two visits) at Sozo Dental Clinic. A sample of 100 respondents was selected using purposive sampling. Data were collected using modified questionnaires measuring service time (treatment duration), waiting time (queue duration), and patient satisfaction. Univariate and bivariate analyses were performed using the chi-square test ($\alpha = 0.05$).
**Results:** Most respondents were female (55.0%), aged >35 years (62.0%), and worked as private employees (45.0%). Waiting time was rated as poor by 52.0% of respondents, service time as good by 64.0%, and patient satisfaction as satisfied by 64.0%. Bivariate analysis showed significant associations between waiting time and satisfaction ($p < 0.001$) and between service time and satisfaction ($p < 0.001$).
**Conclusion:** Both waiting time and service time significantly influence patient satisfaction at Sozo Dental Clinic. Digital systems to predict service duration and proactive communication are recommended to transform waiting time from a weakness into a strength.

**Keywords:** service time, waiting time, patient satisfaction, dental clinic, follow-up care

## Introduction

High-quality health care is a key indicator of a successful health system. As public knowledge and living standards improve, awareness of the importance of health care quality continues to rise.[1] One critical aspect of health care quality is patient waiting time. Excessive waiting time is a frequent complaint at various health facilities, including hospitals, primary health centers, and clinics.[2] Waiting time is a potential source of dissatisfaction and directly affects patient perceptions and overall satisfaction with the services received.[3]

Waiting time in health care is influenced by multiple factors, including queue management systems, human resource availability, information technology utilization, and service flow efficiency.[4,5] The duration of waiting time reflects a health facility's ability to manage services efficiently and meet patient expectations.[6] Inefficiencies in waiting time management can lead to patient overcrowding, discomfort, and reduced quality of interaction between health workers and patients.[7]

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According to the Indonesian Minister of Health Decree No. 129/Menkes/SK/IV/2008 concerning minimum hospital service standards, the standard waiting time for outpatient services is ≤60 minutes.[8] Waiting time exceeding 60 minutes is considered long and noncompliant with established standards. However, prolonged waiting times remain a common patient complaint, reflecting weak managerial systems and insufficient attention to service quality. As public awareness of the right to quality health care increases, waiting time has become an increasingly important issue requiring systematic evaluation and improvement.[9]

Patient satisfaction is a subjective indicator that plays a crucial role in evaluating health care quality. Satisfaction is achieved when services meet patient needs and expectations, whereas dissatisfaction arises when a gap exists between expectations and perceived service quality.[10] Patient satisfaction is influenced by various service dimensions, including speed, accuracy, comfort, and communication quality between health workers and patients.6 Several previous studies have demonstrated significant relationships between waiting time and patient satisfaction, with longer waiting times associated with greater dissatisfaction and negative overall assessments of health facilities.[10,11] Previous research across various health facilities has shown considerable variation in average waiting times and satisfaction levels.[12] These differences reflect variations in managerial policies, infrastructure availability, and service systems. A systematic literature review is essential to understand common waiting time patterns, causative factors, and implications for patient satisfaction.[13]

Sozo Dental Clinic in Medan offers comprehensive dental services with modern treatment standards. Supported by experienced dentists and current medical facilities, the clinic provides various dental treatments ranging from basic to aesthetic procedures. The average daily patient volume is approximately 120 people, with an average waiting time of less than 60 minutes. However, patients sometimes experience delays before treatment procedures begin. To address this issue, an in-depth analysis of service waiting times at Sozo Dental Clinic is necessary. This study aimed to analyze the effect of service time (treatment duration) and waiting time (queue duration) on patient satisfaction during follow-up care at Sozo Dental Clinic, Medan.

## Method

This quantitative study employed a cross-sectional design, measuring independent and dependent variables simultaneously at a single time point without any intervention. The study was conducted at Sozo Dental Clinic, Medan, from May 2026 until completion. The population comprised all patients at Sozo Dental Clinic. The sample size was calculated using the Slovin formula with a 10% margin of error, yielding 100 respondents. Purposive sampling was used based on the following inclusion criteria: (1) patients registered as members of Sozo Dental Clinic; (2) follow-up patients with at least two previous visits; (3) able to communicate effectively; (4) able to assess service quality based on their experience. No exclusion criteria were specified.

Primary data were collected through structured questionnaires. Waiting time (queue duration) and service time (treatment duration) were measured using modified questionnaires with 5 items each, scored as "not good" (1) or "good" (2). Patient satisfaction was measured using a 5-item questionnaire scored as "not satisfied" (1) or "satisfied" (2). All questionnaires were administered via face-to-face interview. Univariate analysis described frequency distributions for all variables. Bivariate analysis used the chi-square test ($\alpha = 0.05$) to examine associations between independent variables (waiting time and service time) and the dependent variable (patient satisfaction).

## Results

A total of 100 respondents participated. The majority were female (55.0%), aged >35 years (62.0%), with education level of senior high school (37.0%), and employed as private sector workers (45.0%). Table 1 presents the frequency distributions for all study variables. Waiting time was rated as poor by 52.0% of respondents. Service time was rated as good by 64.0%. Patient satisfaction was reported as satisfied by 64.0%.

The chi-square test showed a significant association between waiting time and patient satisfaction ($p < 0.001$). Among respondents who rated waiting time as good, 83.3% were satisfied; among those who rated waiting time as poor, only 46.2% were satisfied. A significant association was also found between service time and patient satisfaction ($p < 0.001$). Among respondents who rated service time as good, 95.0% were satisfied; among those who rated service time as poor, only 43.3% were satisfied (Table 2).

Table 1. Distribution of respondent characteristics and study variables (N=100)

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Sex | Male | 45 | 45.0 |
| | Female | 55 | 55.0 |
| Education | Junior high school | 19 | 19.0 |
| | Senior high school | 37 | 37.0 |
| | Diploma | 31 | 31.0 |
| | Bachelor | 13 | 13.0 |
| Age | <35 years | 38 | 38.0 |
| | >35 years | 62 | 62.0 |
| Occupation | Self-employed | 30 | 30.0 |
| | Private employee | 45 | 45.0 |
| | Civil servant | 6 | 6.0 |
| | Unemployed | 19 | 19.0 |
| Waiting time | Good | 48 | 48.0 |
| | Poor | 52 | 52.0 |
| Service time | Good | 64 | 64.0 |
| | Poor | 36 | 36.0 |
| Patient satisfaction | Satisfied | 64 | 64.0 |
| | Not satisfied | 36 | 36.0 |

Table 2. Bivariate associations between waiting time, service time, and patient satisfaction (N=100)

| Variable | Category | Satisfied n (%) | Not satisfied n (%) | Total | p-value |
|---|---|---|---|---|---|
| Waiting time | Good | 40 (83.3) | 8 (16.7) | 48 | <0.001 |
| | Poor | 24 (46.2) | 28 (53.8) | 52 | |
| Service time | Good | 38 (95.0) | 2 (5.0) | 40 | <0.001 |
| | Poor | 26 (43.3) | 34 (56.7) | 60 | |

## Discussion

This study found significant associations between waiting time, service time, and patient satisfaction at Sozo Dental Clinic. Both waiting time and service time had p-values <0.001, indicating strong statistical significance. The finding that longer waiting times are associated with lower satisfaction is consistent with previous research. A study showed that waiting time, along with work discipline and service quality, significantly influenced patient satisfaction at the dental and oral installation, contributing 93.4% to satisfaction variance.[14] Another study at RSUD Undata, Central Sulawesi, found that waiting time contributed 40.1% to patient satisfaction.[15] Shorter waiting times do not directly increase satisfaction but improve overall service quality perception (SERVQUAL), which then enhances satisfaction.[16] Therefore, waiting time management must be integrated into a holistic quality improvement strategy.[17]

Treatment service time is a core operational metric in dental care that directly dictates a clinic's capacity to meet patient expectations. At Sozo Dental Clinic, which positions itself within the premium modern aesthetic dental market, optimizing service time quality acts as a critical driver for building sustained patient satisfaction.[18] Consequently, patients who perceived service reliability as high were nearly three times more likely to report satisfaction compared to those experiencing poor reliability. As a private enterprise, Sozo Dental Clinic naturally commands higher reliability standards than public health facilities.[19] In this competitive landscape, the ability to execute clinical care exactly as promised—such as achieving efficient, rapid tooth movement utilizing advanced orthodontic appliances—serves as a distinct competitive advantage that elevates patient-reported aesthetic and functional outcomes.[20,21]

This study has several strengths, including the use of standardized questionnaires and direct data collection from patients at a single facility, allowing for specific insights into Sozo Dental Clinic's service quality. The sample size of 100 respondents was adequate for bivariate chi-square analysis. However, several limitations must be acknowledged. The cross-sectional design prevents causal inference; associations may be bidirectional. Data relied on self-reported perceptions, which are subject to recall and social desirability bias. Purposive sampling may limit generalizability to other dental clinics. The study did not measure actual waiting times in minutes but rather patient perceptions of waiting time categories. Future studies should include objective time measurements, larger sample sizes, and explore additional variables such as patient age, insurance type, and appointment scheduling systems.

These findings have several practical implications. Sozo Dental Clinic should develop or adopt a digital system capable of predicting service duration based on patients' treatment histories, thereby

transforming waiting time from a potential weakness into a strength through digitalization and proactive communication. The clinic should maintain and refine its existing advantages in service time quality through standardization and continuous staff training. Systematic measurement and evaluation using routine satisfaction surveys should be implemented to ensure data-driven, continuous improvement. At the policy level, dental clinics in Medan should adopt minimum waiting time standards and invest in queue management technologies. Collaboration with professional dental associations to establish best-practice guidelines for service time efficiency is recommended.

## Conclusion

This study found significant effects of both waiting time and service time on patient satisfaction at Sozo Dental Clinic, Medan ($p < 0.001$ for both associations). Poor waiting time was associated with lower satisfaction, while good service time was strongly associated with high satisfaction. These findings highlight the need for digital queue management systems, proactive communication about expected delays, and continuous quality improvement in treatment delivery. Future research should include objective time measurements and explore additional determinants of patient satisfaction in dental care settings.

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