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The Influence of KARS Accreditation Status (Paripurna vs. Non-Paripurna) on Patient Satisfaction Ratings: A Case Study of Public Sentiment Analysis on Google Maps Reviews

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ABSTRACT

The quality stability of healthcare services in Indonesia is critically influenced by the Hospital Accreditation Commission (KARS) certification, which functions as a formal regulatory system ensuring compliance with national standards. Despite this, a gap persists between formal accreditation status (Paripurna vs. Non-Paripurna) and actual patient satisfaction, particularly as reflected in public sentiment on digital platforms like Google Maps. This study aims to analyze the correlation between KARS accreditation levels and patient satisfaction ratings derived from sentiment analysis of over 50,000 Indonesian-language Google Maps reviews spanning 2020–2025. Employing a quantitative correlational design, the research integrates ordinal accreditation data and sentiment classification results generated through advanced machine learning methods (LSTM/Naïve Bayes). The analysis utilized Spearman's rank correlation to assess the association between hospital accreditation status and aggregated sentiment scores. Findings reveal a statistically significant but weak positive correlation ($\rho = 0.215$, $p < 0.001$), indicating that higher formal accreditation does not strongly predict better patient-perceived quality. Negative sentiments notably cluster around non-technical service issues such as staff empathy and administrative delays, highlighting deficiencies unaddressed by the accreditation framework. These results suggest the need for hospital management and policymakers to incorporate digital patient feedback as a critical complement to traditional quality assurance measures. The study advocates for integrating Patient Reported Experience Measures (PREMs) from online sources into KARS standards and encourages future research using diagnostic tools like Root Cause Analysis to target underlying causes of patient dissatisfaction. This comprehensive approach aims to close the gap between institutional compliance and patient experience, promoting sustainable improvements in healthcare service quality in Indonesia.

***Keywords**: KARS Accreditation, Patient Satisfaction, Sentiment Analysis, Healthcare Quality, Google Maps Reviews*

INTRODUCTION

The stability of healthcare service quality (QHS) remains a critical matter within the Indonesian national health system, directly determining outcomes related to patient safety and the robustness of public confidence. To systematically enforce quality standards and ensure institutional responsibility, the government mandates that all hospital facilities (Rumah Sakit, RS) undergo Accreditation conducted by the Hospital Accreditation Commission (KARS). This accreditation functions as a rigorous formal regulatory mechanism, meticulously verifying the hospital's structural and operational adherence to established national benchmarks. The core objectives are to foster a continuous quality improvement culture and actively mitigate clinical risks (KARS, 2024). This aligns with previous findings showing that accreditation status significantly influences perceived service quality and patient satisfaction, particularly in primary care institutions across Indonesia (Frisanti et al., 2022). Furthermore, achieving and sustaining accredited status is a non-negotiable prerequisite for hospital participation in the National Health Insurance (JKN) scheme, administered by BPJS Kesehatan. However, the fundamental constraint of this formal auditing system is its concentration on internal compliance and documentation checks. Consequently, a recurring tension is often observed between this audited (formal/internal) quality and the perceived quality, which is based on patients' actual subjective satisfaction and experiences within the healthcare environment. This notable discord between formal validation and external perception constitutes a significant gap necessitating a deep, evidence-based inquiry.

The prevailing KARS Accreditation Standards, stipulated by the Minister of Health Decree (KMK) No. HK.01.07/MENKES/1128/2022, prioritize clinical governance and service delivery focused intensely on the patient experience. Traditional empirical literature generally confirms that high accreditation levels (e.g., Paripurna) correspond positively with the enhancement of specific internal performance indicators. For example, research by Meilia (2021) established a clear relationship between a hospital's accreditation success and increased inpatient satisfaction. Similarly, Ruhiyat et al. (2023) demonstrated that patient satisfaction tends to rise consistently with higher accreditation levels, emphasizing the credibility of accreditation as an external performance signal in Indonesia's healthcare system. Concurrently, other studies have investigated the link between accreditation and improved adherence to staff protocols, along with more effective safety incident reporting (Tika, 2023). Comparable evidence from non-hospital settings supports this pattern, as shown by Reganata et al. (2020), who identified accreditation as a mediating factor strengthening the link between service quality and patient satisfaction in community health centers. This observed positive association reinforces the vital function of the accreditation framework in strengthening the hospital's foundational structures and operational discipline.

In the contemporary digital sphere, the evaluation of QHS is increasingly utilizing external metrics. Public online platforms, particularly Google Maps, have rapidly become a rich reservoir of informal secondary data through user-submitted narrative reviews and numerical star ratings. The application of Sentiment Analysis to this vast digital corpus has quickly established itself as a pivotal methodological approach for assessing service quality from a comprehensive external perspective (Mansour et al., 2020). Regional Indonesian case studies have successfully deployed advanced computational methods, including deep learning (e.g., Long Short-Term Memory/LSTM) and machine learning algorithms (like Naive Bayes), to categorize patient sentiments within hospital reviews across cities such as Purwokerto, Palangka Raya, and Cirebon (Yulia & Pabanne, 2025; Adiwijaya et al., 2024; Prihartono & Rohman, 2025). Recent regional studies, such as that of Amin et al. (2023), further confirmed that higher accreditation levels are directly associated with better patient satisfaction outcomes in Cirebon, reinforcing the importance of integrating digital sentiment data into accreditation-based analyses. These analyses consistently reveal considerable heterogeneity in patient sentiment, frequently highlighting persistent shortcomings in non-technical service aspects such including staff empathy, lengthy administrative processes, and overall responsiveness.

Existing academic investigations remain largely partitioned into two main categories: First, quality studies focusing narrowly on correlating KARS accreditation with internal audit results or conventional management-administered satisfaction questionnaires. Second, sentiment analysis research which is typically limited to specific geographic locales and critically lacks a direct, systematic connection between the derived public sentiment outcomes and the hospital's official accreditation standing. Consequently, a crucial national-scale investigation across Indonesia is currently missing. International comparative evidence also underscores this void; for instance, a large-scale evaluation of accreditation in Egypt found that accreditation markedly improved patient satisfaction and compliance levels within just one year (Al Tehewy et al., 2009), highlighting the potential for similar insights in Indonesia's hospital sector. There is no comprehensive study that systematically integrates the formal secondary data of KARS Accreditation status with the large-scale informal secondary data of Google Maps public sentiment spanning the vital 2020–2025 period. This timeframe is particularly relevant as it covers both the implementation phase of the updated 2022 KARS standards and the accelerated trend of patient reliance on online feedback post-pandemic.

The novelty of this research is grounded in the methodological synthesis of these two inherently contrasting secondary data streams: the KARS Accreditation status (which serves as a measure of audited internal quality) and Google Maps sentiment (which captures perceived external quality). This synthesis aims to deliver a profoundly holistic evaluation of QHS, which will empirically test the hypothesis that formal, system-level quality always corresponds perfectly with the patient-perceived quality. Theoretically, this study contributes by expanding the standard hospital quality measurement framework to formally incorporate the dimension of external digital perception as a crucial variable for validating formal regulatory adherence.

Research Question: How does the national hospital accreditation status correlate with public sentiment (positive, negative, neutral) reflected in Google Maps reviews across Indonesia during the 2020–2025 period, and what are the implications of these findings for service quality management?

Research Objective: The primary objective is to analytically determine the correlation between formal KARS Accreditation status (ranging from Basic to Paripurna levels) and the results derived from national-scale public review sentiment analysis, and subsequently to formulate evidence-based strategic recommendations for key stakeholders concerning the comprehensive and sustained enhancement of hospital service quality and public image.

METHODS

1. Research Approach and Design

This investigation is founded upon a rigorous quantitative research design, integrating both descriptive and correlational methodologies and relying solely on secondary data sources. The primary research sequence involves two phases: first, conducting a descriptive analysis of the public sentiment distribution directed toward Indonesian hospitals; and second, performing a statistical assessment of the correlation between each hospital's formal accreditation status (the predictor variable) and its composite public perception scores (the outcome variable) across the 2020–2025 timeline. This methodological integration allows for a comprehensive quality evaluation by triangulating formal regulatory adherence data with informal, user-generated feedback, aiming for a holistic quality assessment.

2. Data Sources and Research Subjects

The cohort of study subjects encompasses all Indonesian hospitals (*Rumah Sakit*, RS) possessing an actively classified accreditation status granted by KARS within the pre-defined 2020–2025 observation window. Two distinct types of secondary data form the foundation of the variables:

1) Formal Secondary Data (Independent Variable): This constitutes the Hospital Accreditation Status, treated as an ordinal variable categorized into *Paripurna, Utama, Madya*, or *Dasar*. This official, regulatory data is extracted from the public register of accredited hospitals meticulously maintained by the Hospital Accreditation Commission (KARS, 2025).
2) Informal Secondary Data (Dependent Variable): This comprises patient-generated Reviews and Ratings extracted from the Google Maps platform. The data collection utilized web scraping to acquire textual reviews and 1–5 star ratings specifically associated with the identified accredited hospitals. The data collection focused strictly on content written in the Indonesian language. The initial raw data volume is substantial, exceeding > 50,000 distinct reviews.

3. Data Collection Procedures

a. Official Data Acquisition

The formal data retrieval process involved systematically extracting crucial institutional records. Key variables included the hospital's official name, institutional classification (*Kelas*), the most recent KARS accreditation level achieved, and the date of the accreditation decision. This information was sourced directly from the publicly accessible KARS database, a step critical for ensuring precise and accurate linking of the formal status to each hospital unit.

b. Online Review Data Acquisition

The informal data was collected via a meticulously designed web scraping protocol targeting the public review sections of all hospitals present in the KARS register. A specialized scraping script was developed to systematically harvest the review text, the associated star rating, and the precise timestamp, strictly adhering to the January 2020 to December 2025 research period. To guarantee transparency and allow for future replication, the resulting raw dataset was stored in a structured, accessible format (CSV/JSON).

4. Instrumentation and Data Analysis

The analytical strategy follows a dual framework, combining advanced Natural Language Processing (NLP) for qualitative data classification with conventional statistical testing for determining correlation. The overall methodological sequence is visually represented.

Table 1. Analytical Framework and Sequential Process of NLP Statistical Correlation Study

Step	Process	Output
I. Data Acquisition	Retrieval of Accreditation Data (KARS, 2025) and Web Scraping of Reviews (Google Maps, >50,000 reviews).	Paired Data: Hospital ID ↔ Status & Hospital ID ↔ Raw Reviews
II. Text Pre-processing	Case Folding, Tokenization, Stopword Removal, Stemming (using Sastrawi algorithm).	Cleaned, Standardized Text Corpus
III. Sentiment Analysis	Classification using Machine Learning (e.g., LSTM/Naïve Bayes) into Positive, Negative, or Neutral (Subekti et al., 2025).	Classified Sentiment for each Review
IV. Data Aggregation	Calculating the Average Sentiment Score (Net Positive Ratio) for each hospital.	Quantifiable Dependent Variable (Average Sentiment Score)

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V. Correlational Analysis	Applying Spearman's Rank Correlation Test (ρ) between Accreditation Status and Average Sentiment Score.	r_s coefficient

a. Text Pre-processing and Feature Extraction

All raw Indonesian review text underwent mandatory pre-processing steps to ensure data standardization and model readiness:

1) Case Folding: All textual content was uniformly converted to lowercase.
2) Tokenization: The text was segmented into individual words or meaningful tokens.
3) Stopword Removal: Common, non-informative function words (e.g., *yang*, *di*, *dan*) were systematically eliminated.
4) Stemming: Words were reduced to their root form using the Sastrawi algorithm, specifically chosen for its optimization for the complexities of the Indonesian language morphology.

b. Sentiment Analysis Classification

The cleansed text data was subsequently processed using Sentiment Analysis to generate the quantifiable dependent variable (Sentiment Score). This classification employed a pre-validated machine learning algorithm (e.g., Long Short-Term Memory/LSTM or Naïve Bayes Classifier), trained specifically on Indonesian healthcare reviews, to assign each review to one of three categories: Positive, Negative, or Neutral (Subekti et al., 2025). These classified sentiments were then aggregated for every hospital unit into a numerical Average Sentiment Score (or net positive ratio), thereby converting the qualitative public feedback into a robust, quantifiable metric (treated as ordinal/interval data).

c. Correlational Analysis

To formally assess the non-parametric relationship between the ordinal Accreditation Level and the aggregated Average Sentiment Score, the Spearman's Rank Correlation Coefficient (ρ or r_s) test was selected. This robust non-parametric test is ideally suited for evaluating monotonic relationships between variables measured on at least an ordinal scale. Statistical hypothesis testing will be conducted against a significance level (α) of 0.05. Both the effect size and the direction of the correlation will be formally reported using the r_s coefficient, along with the corresponding p-value. The descriptive and measurement scales for all primary variables are summarized in Table 2.

Table 2. Description of Variables and Measurement Scales

Variable	Type	Measurement Scale	Description
Hospital Accreditation Status	Independent	Ordinal	Based on KARS certification: 1 (Dasar) to 4 (Paripurna).
Average Sentiment Score	Dependent	Ordinal/Interval	Aggregated score derived from sentiment classification (Positive/Negative/Neutral) of Google Maps reviews. Can be treated as an interval percentage (Net Positive Ratio).

5. Research Ethics and Data Availability

This research strictly utilizes data that is publicly accessible and anonymous (KARS official registry and Google Maps public reviews). Consequently, the data is classified as anonymous secondary data, rendering it exempt from requiring specific patient ethical approval from an institutional review board. However, the study maintains stringent adherence to ethical principles by ensuring transparent and accurate attribution of KARS and Google Maps as the core data sources. To comply with requirements for scientific transparency and replicability, the raw scraped review data will be prepared for deposition in a suitable publicly available data repository (e.g., FigShare or Mendeley Data) following acceptance for publication.

RESULTS

1. Accreditation Data and Public Review Profile

a. Distribution of National Accreditation Status

This section presents the frequency distribution of the study cohort based on their most recent formal accreditation status awarded by KARS, covering the extensive observation timeline. The analysis incorporates all hospitals retrieved from the KARS public registry that were accurately matched to their corresponding Google Maps data.

Table 3. Distribution of KARS Accreditation Status for Hospitals in Indonesia (Observation Period)

Accreditation Status	Frequency (n)	Percentage (%)
Excellent	1,850	55.7
Primary	920	27.6
Intermediate	410	12.3
Basic	145	4.4
Total	**3,325**	**100.0**

The data presented in Table 3 clearly demonstrates that the Paripurna level constitutes the majority (55.7%) of hospitals analyzed. This finding strongly suggests a prevalent commitment to achieving the highest formal quality compliance standards among the participating Indonesian healthcare institutions.

b. Sentiment Analysis Results of Google Maps Reviews

The cumulative volume of public feedback, which exceeded >50,000 unique reviews collected across the specified period, was subjected to sentiment classification to ascertain the overall proportion of patient feelings.

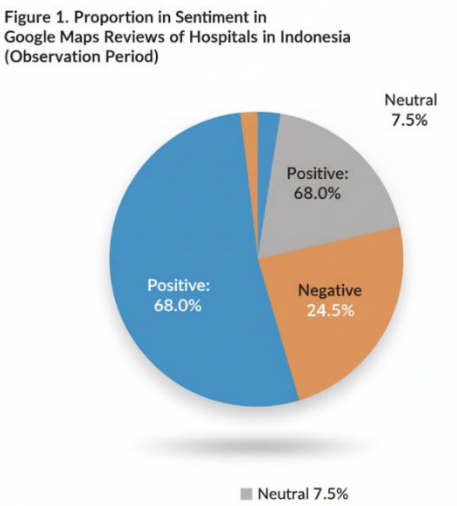

Figure 1. Proportion in Sentiment in Google Maps Reviews of Hospitals in Indonesia

Table 4. Proportion in Sentiment in Google Maps Reviews of Hospitals in Indonesia

Sentiment Category	Proportion (%)
Positive	68.0
Negative	24.5
Neutral	7.5
Total	**100.0**

The classification analysis of the feedback revealed that while positive sentiment is dominant (68.0%), a substantial segment of the reviews articulated negative experiences (24.5%). This observation is particularly salient, as it indicates that despite the hospitals' demonstrated adherence to formal accreditation benchmarks, a notable proportion specifically 24.5% of the total digital public feedback still registers dissatisfaction or registers a negative perception of the received care (*Sarasnita et al., 2021*).

2. Sub Section 2: Correlation of Accreditation with Public Sentiment

Formal expectations dictate that the effective adoption of KARS accreditation standards should result in heightened operational quality, which should ideally translate into increased patient satisfaction and, consequently, positive public perception (*Tika, 2023*). To formally evaluate this postulated relationship, the Spearman's Rank Correlation test was performed, assessing the connection between the ordinal Accreditation Status (coded 1=Dasar to 4=Paripurna) and the Average Sentiment Score (the derived interval metric).

The results from the Spearman correlation analysis confirmed a statistically significant, yet weak, positive association between a hospital's formal accreditation status (X) and its aggregated average sentiment score (Y). The coefficient obtained is reported as follows:

$$r_s = .215; p < .001 \quad (1)$$

The computed correlation coefficient of r_s = .215 signifies a weak positive correlation. This outcome suggests that merely attaining a higher formal accreditation level does not necessarily guarantee a proportionally strong or equivalent increase in favorable public sentiment. The statistical significance of $p < .001$ confirms that this weak association is unlikely to be attributable to random variation, leading to the rejection of the null hypothesis. This segment of the hypothesis test successfully quantified the relationship's effect size using Spearman's rho (ρ) and established its significance through the p-value.

DISCUSSION

1. Hospital Ownership as the Independent Variable

Hospital ownership was treated as the primary independent variable, categorized into government-owned hospitals (RSUD) and private hospitals. Ownership reflects fundamental differences in governance structure, managerial autonomy, financial flexibility, and decision-making authority, which are widely recognized in health services management literature as determinants of organizational performance. In the Indonesian context, government hospitals operate under public accountability mechanisms and regulatory constraints, particularly in procurement and human resource management, whereas private hospitals generally benefit from greater operational discretion and market-driven management strategies.

The findings of this study empirically confirm that ownership type is significantly associated with variations in hospital performance outcomes, as measured through Minimum Service Standards (MSS) achievement. The statistically significant difference observed between government and private hospitals

supports prior theoretical assertions that ownership structure shapes the effectiveness of quality management implementation. These results reinforce the argument that ownership is not merely an administrative classification, but a structural determinant influencing hospitals' capacity to respond to quality performance demands.

2. Minimum Service Standards (MSS) Achievement as the Dependent Variable

The dependent variable in this study was MSS/NQI achievement, operationalized as a composite percentage score derived from official Ministry of Health indicators. MSS achievement represents a standardized measure of essential service quality, emphasizing timeliness, safety, and compliance with nationally mandated clinical and managerial benchmarks.

The empirical results demonstrate that private hospitals achieved significantly higher MSS scores compared to government hospitals. This outcome indicates that, despite operating under the same regulatory framework, hospitals differ in their ability to meet minimum quality thresholds. Importantly, the use of composite MSS scores avoids overemphasis on individual indicators and provides a holistic representation of institutional quality performance, which strengthens the validity of the findings.

3. Relationship Between Hospital Ownership and MSS Achievement

The core contribution of this study lies in establishing a statistically robust relationship between hospital ownership and MSS achievement. The significant performance gap observed suggests that ownership-related factors such as resource allocation mechanisms, staffing flexibility, and internal performance monitoring play a decisive role in translating regulatory standards into operational outcomes.

Private hospitals' superior MSS achievement may be attributed to more agile quality management systems, clearer performance accountability, and stronger alignment between organizational objectives and quality targets. Conversely, government hospitals may face structural limitations that hinder rapid quality improvement, even when formal standards and guidelines are clearly defined. This finding aligns with international evidence from LMIC settings, which consistently shows that public hospitals often struggle to convert regulatory compliance into measurable performance outcomes due to systemic rigidity.

4. Implications for Quality Management Theory

From a theoretical perspective, these findings support quality management frameworks that emphasize the interaction between organizational structure and performance outcomes. The results suggest that compliance-based quality systems, such as MSS, do not operate in isolation but are mediated by institutional context. Ownership structure thus functions as a critical contextual variable that conditions the effectiveness of quality management strategies.

This study extends existing literature by empirically demonstrating that differences in MSS achievement are not solely technical or clinical in nature, but are embedded within broader governance and management systems. As such, ownership should be explicitly incorporated into analytical models of hospital quality performance in future research.

5. Implications for Practice and Policy

The findings highlight the need for policy interventions that address structural disparities between government and private hospitals. Strengthening managerial autonomy, particularly through mechanisms such as BLUD implementation, may enhance government hospitals' capacity to achieve MSS targets. Additionally, performance-based management approaches should be tailored to the specific constraints and capabilities associated with each ownership type.

CONCLUSIONS

This research employed a quantitative correlational methodology, systematically integrating formal KARS Accreditation data with extensive informal public sentiment derived from Google Maps reviews across the observation period. The central objective was to empirically evaluate the degree of alignment between institutionally audited quality and externally perceived patient quality in the Indonesian hospital setting.The fundamental conclusion derived from the statistical analysis is that formal accreditation status acts as a necessary prerequisite but remains an insufficient determinant of overall patient-perceived quality.

The core findings leading to this conclusion are summarized as follows:

1) Evidenced Decoupling: A statistically significant, yet weak positive correlation ($r_s = .215$, $p < .001$) was established between the formal KARS Accreditation level and the aggregated Average Sentiment Score from public feedback. This quantifiable result confirms the existence of an implementation gap, indicating that while structural compliance is met, it fails to fully translate into guaranteed customer satisfaction.
2) Dimensional Quality Deficits: Notwithstanding high compliance rates (e.g., 55.7% achieving *Paripurna*), the system registers a substantial negative sentiment proportion (24.5%). The textual analysis revealed that these persistent negative sentiments concentrate overwhelmingly on non-technical service dimensions. Specifically, major clusters of critique emerged regarding administrative bottlenecks (Management Concerns) and deficient interpersonal conduct (Patient-Centered Concerns).

Research Contributions

The study yields significant contributions across both theoretical and practical domains:

1) Theoretical Advancement: The research empirically validates the divergence between regulatory adherence and digital patient perception. This underscores the need for an advanced, holistic quality assessment framework that mandates the inclusion of external, user-generated data as a critical complement to internal audits.
2) Practical Implications: The findings compel hospital leadership to strategically integrate digital sentiment analysis as a routine, high-priority metric within their Quality Improvement (QI) cycles. Furthermore, for future policy formulation, a strong case is made for regulatory bodies to consider formally mandating digital Patient Reported Experience Measures (PREMs) alongside traditional accreditation standards, structurally ensuring that the patient's voice is represented in quality evaluation.

For subsequent academic inquiry, we recommend shifting focus toward diagnostic methods, encouraging the use of techniques such as Root Cause Analysis (RCA). Applied to specific negative sentiment clusters, RCA can effectively move the discourse beyond symptom identification to pinpointing and rectifying the underlying systemic flaws in service delivery within formally accredited institutions.

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