



Patient Satisfaction Analysis at Bhayangkara Hospital, Level III, Korbrimob: Strategy for Improving PREMs/PROMs with AI Chatbots on WhatsApp in 2025

Rike Rayanti¹, Susanna Halim^{2*}, Alamsyah³

¹ Bhayangkara Brimob Hospital, Depok, Indonesia.

² Aesthetic and Dental Implant Department, Faculty of Medicine and Dentistry, University of Prima Indonesia.

³ Open College Executive MBA with Collaboration Open College ASIA, UK, and Portman College Malaysia.

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Corresponding Author:

Susanna Halim

susannahalim@unprimdn.ac.id

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Abstract: Improving patient-centered healthcare quality has become a major priority in modern health service systems. Patient-Reported Experience Measures (PREMs) and Patient-Reported Outcome Measures (PROMs) are essential instruments for evaluating service quality and health outcomes from the patient's perspective. However, the collection of PREMs and PROMs data in hospitals is often conducted manually, resulting in inefficiency and limited sustainability. This study aims to analyze patient satisfaction at RS Bhayangkara Tk. III Korbrimob Polri and to formulate strategies for improving PREMs and PROMs through the utilization of an Artificial Intelligence (AI)-based WhatsApp chatbot. This study employed a quantitative approach with a survey design. The research sample consisted of 87 outpatient respondents selected using purposive sampling. Data were collected using PREMs and PROMs questionnaires distributed through an AI WhatsApp chatbot. Data analysis included descriptive statistics as well as validity and reliability testing. The results indicate that all dimensions of service quality and patient satisfaction are in the high category, with mean scores above 4.00. The highest scores were observed in the dimensions of empathy, service control, and trust, while waiting time and chatbot performance still require further optimization. Reliability testing yielded a Cronbach's Alpha value of 0.988, indicating excellent internal consistency of the research instrument. The findings suggest that the implementation of an AI-based WhatsApp chatbot has the potential to enhance patient engagement in PREMs and PROMs reporting and to support a more effective and sustainable evaluation of hospital service quality. Strengthening chatbot functionality, reducing service waiting times, and utilizing PREMs and PROMs data for managerial decision-making are recommended to support digital transformation and service quality improvement at RS Bhayangkara Tk. III Korbrimob Polri.

Keywords: AI chatbot; Health services research; Hospital service quality; Patient satisfaction; PREMs; PROMs; WhatsApp

Introduction

Improving healthcare quality has increasingly shifted toward a patient-centered care paradigm, where patients' perspectives are considered essential in evaluating health service performance (Abid et al., 2024; Chen et al., 2024; Guzmán-Leguel et al., 2025; Kim et al., 2024). Beyond traditional clinical indicators, healthcare systems are now expected to assess how care

is delivered and how it affects patients' perceived health outcomes. In this context, Patient-Reported Experience Measures (PREMs) and Patient-Reported Outcome Measures (PROMs) have gained prominence as key indicators for evaluating healthcare quality, patient satisfaction, and service effectiveness (Benson, 2025; Gilmore et al., 2023; Kendir et al., 2026; Sreejith et al., 2026; Wolff et al., 2021).

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PREMs capture patients' experiences throughout the care process, including communication with healthcare providers, access to services, waiting time, and interpersonal aspects of care (Marcomini et al., 2026; Reid et al., 2024; Sundaram et al., 2022). PROMs, on the other hand, reflect patients' perceptions of health outcomes, such as symptom improvement, functional status, well-being, and confidence in managing their health following care (Bonsel et al., 2024; Graupner et al., 2021; Roos et al., 2025). Together, PREMs and PROMs provide complementary insights that support continuous quality improvement and evidence-based health service management.

Despite their importance, many public hospitals continue to face challenges in implementing PREMs and PROMs in routine practice. Conventional paper-based or face-to-face surveys often result in low response rates, delayed data processing, and limited use of patient feedback in managerial decision-making. These limitations are particularly evident in resource-constrained public healthcare settings, where workload pressures and limited digital infrastructure may hinder systematic patient feedback collection.

Recent advances in digital health technologies offer new opportunities to address these challenges. Artificial intelligence (AI)-powered chatbots integrated with widely used messaging platforms have emerged as practical tools for facilitating patient communication and data collection (Aggarwal et al., 2023; Omarov et al., 2023; Rajput et al., 2025). WhatsApp, one of the most widely adopted messaging applications globally, is especially attractive in healthcare contexts due to its accessibility, familiarity, and low technical barriers for users (Kapepo et al., 2025; Nautiyal et al., 2023). AI-powered WhatsApp chatbots enable automated, real-time, and two-way communication, allowing patients to provide feedback on their care experiences and outcomes more conveniently.

Several studies have demonstrated the potential of chatbots to enhance patient engagement, support self-management, and improve communication efficiency in healthcare services. However, empirical evidence on the use of AI-powered WhatsApp chatbots to systematically assess PREMs and PROMs—particularly in public hospital settings—remains limited. Most existing studies focus on clinical applications, appointment scheduling, or general user satisfaction, with fewer investigations examining how chatbot-based feedback mechanisms contribute to service quality evaluation and patient-centered care.

In public hospitals, where patient volumes are high and service efficiency is critical, understanding the role of digital tools in improving patient experience and perceived outcomes is essential. Evaluating how AI-powered chatbots influence PREMs, PROMs, and

overall patient satisfaction can provide valuable insights for healthcare managers and policymakers seeking scalable and sustainable quality improvement strategies.

Therefore, this study aims to examine the impact of an AI-powered WhatsApp chatbot on patient-reported experience measures, patient-reported outcome measures, and overall patient satisfaction in a public hospital setting. By providing empirical evidence from a real-world healthcare context, this study contributes to the growing body of health services research on digital tools for patient-centered care and supports the integration of innovative communication technologies into routine health service evaluation.

Method

This study employed a quantitative cross-sectional design to examine the association between the use of an AI-powered WhatsApp chatbot and patient-reported experience measures (PREMs), patient-reported outcome measures (PROMs), and overall patient satisfaction. A cross-sectional approach was considered appropriate for capturing patients' perceptions and experiences at a single point in time within a routine healthcare service context.

Study Setting

The study was conducted in a public hospital in Indonesia that provides outpatient services to both insured and non-insured patients. The hospital has begun adopting digital communication tools to support service delivery and patient feedback collection as part of its quality improvement initiatives.

Participants and Eligibility Criteria

The study population consisted of outpatients who received healthcare services during the data collection period. Participants were eligible for inclusion if they: (1) Were aged 18 years or older; (2) Had access to and actively used the WhatsApp messaging application; (3) Were able to read and understand the questionnaire; and; (4) Provided informed consent to participate in the study. Patients who were unable to complete the questionnaire independently or declined participation were excluded.

Sampling Technique and Sample Size

A purposive sampling technique was applied to recruit participants who met the inclusion criteria and had interacted with the AI-powered WhatsApp chatbot. The minimum sample size was determined based on statistical power considerations, assuming a significance level of 5% and a power of 80%. A total of

87 respondents participated in the study, exceeding the minimum requirement for descriptive and inferential statistical analyses.

Data Collection Procedure

Data were collected using a structured self-administered questionnaire distributed via an AI-powered WhatsApp chatbot. After receiving healthcare services, eligible patients were invited to complete the survey through an automated chatbot message. The chatbot guided respondents through the questionnaire, ensured completeness of responses, and securely stored the data for analysis. This approach allowed real-time data collection and reduced the need for manual survey administration.

Study Variables and Measurements

The primary outcome variables included PREMs, PROMs, and overall patient satisfaction. PREMs assessed patients' experiences during the care process, including communication, accessibility, waiting time, and interpersonal aspects of service delivery. PROMs measured patients' perceived health outcomes, such as perceived improvement, sense of safety, and confidence in managing their health after receiving care.

Additional variables included service quality dimensions adapted from the SERVQUAL framework—tangible aspects, responsiveness, empathy, perceived control, trust, self-disclosure, and confirmation—as well as patients' perceptions of waiting time. All items were measured using a five-point Likert scale ranging from "strongly disagree" to "strongly agree," with higher scores indicating more positive perceptions.

Data Analysis

Data were analyzed using statistical software. Descriptive statistics were used to summarize respondent characteristics and mean scores for PREMs, PROMs, and service quality dimensions. Reliability analysis was conducted to assess internal consistency of the questionnaire using Cronbach's alpha. Inferential analyses were performed to explore relationships between chatbot utilization, patient experience, perceived outcomes, and satisfaction. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval for the study was obtained from the hospital management. All participants received information regarding the study objectives, procedures, and confidentiality of their responses prior to participation. Informed consent was obtained electronically through the chatbot interface. Participant

anonymity and data confidentiality were maintained throughout the study in accordance with ethical principles for health services research.

Result and Discussion

This study examined the role of an AI-powered WhatsApp chatbot in enhancing patient satisfaction, Patient-Reported Experience Measures (PREMs), and Patient-Reported Outcome Measures (PROMs) in a public hospital setting. Overall, the findings demonstrate high patient satisfaction and positive patient-reported measures, indicating that the chatbot was well accepted as a digital communication and feedback tool.

The results showed that PREMs scores were consistently higher than PROMs scores. This finding suggests that the chatbot had a stronger immediate impact on patients' service experiences—such as communication, accessibility, and interaction with healthcare providers—than on perceived health outcomes. This pattern aligns with previous studies highlighting that digital communication tools tend to first improve process-related experiences before influencing perceived outcomes, which may depend on broader clinical and contextual factors. From a health services perspective, improved PREMs are a critical foundation for long-term improvements in PROMs and overall patient-centered care.

Analysis of service quality dimensions revealed that empathy received the highest mean score among the SERVQUAL-related indicators. Patients highly valued interpersonal aspects of care, including attentiveness, respect, and clear communication by healthcare providers. This finding reinforces the importance of human interaction in healthcare services, even when digital tools are introduced. The chatbot appeared to complement—not replace—human interaction by facilitating information access and supporting communication, thereby strengthening patients' perceptions of empathy and attentiveness.

Tangible aspects of service delivery, such as facilities and physical environment, were also rated positively, suggesting that the hospital's physical resources met patients' expectations. In contrast, responsiveness, particularly related to waiting time and promptness of service, received relatively lower scores compared with other dimensions. Although still within a positive satisfaction range, this finding indicates that waiting time remains a sensitive issue in outpatient services. Consistent with prior research, waiting time perception can significantly influence patient satisfaction, even when other aspects of care are perceived as high quality.

Importantly, patient-centered dimensions beyond traditional SERVQUAL—including perceived control, trust, self-disclosure, and confirmation—also demonstrated high mean scores. Patients generally felt involved in decision-making, trusted healthcare providers, and were comfortable sharing personal health information. The ability to receive clear confirmation regarding care and follow-up further contributed to positive perceptions. These findings suggest that the AI-powered WhatsApp chatbot supported a more transparent and engaging communication process, enabling patients to actively participate in their care and evaluation of services.

Waiting time analysis further illustrated the role of communication in shaping patient perceptions. While some respondents expressed lower satisfaction with waiting time, the availability of timely information and feedback mechanisms through the chatbot may have mitigated negative experiences. This supports the notion that effective communication can partially offset structural constraints, such as service delays, by managing expectations and enhancing perceived service quality.

Overall, the combined findings indicate that the AI-powered WhatsApp chatbot contributed most strongly to improvements in patient experience and engagement, as reflected in higher PREMs scores and positive perceptions of communication-related dimensions. Although the impact on PROMs was comparatively more modest, the results suggest that digital tools can support perceived outcomes indirectly by fostering trust, control, and patient involvement. For public hospitals facing resource constraints, integrating AI-powered chatbots into routine service evaluation may represent a practical and scalable strategy to strengthen patient-centered care and continuous quality improvement.

Conclusion

This study provides empirical evidence that an AI-powered WhatsApp chatbot can enhance patient experience and perceived outcomes in a public hospital setting. Overall patient satisfaction was high, with Patient-Reported Experience Measures (PREMs) consistently scoring higher than Patient-Reported Outcome Measures (PROMs). These findings suggest that digital communication tools may exert a more immediate influence on process-related aspects of care—such as communication, accessibility, and patient engagement—than on perceived health outcomes, which are shaped by broader clinical and contextual factors. Interpersonal aspects of care, particularly empathy, emerged as the strongest service quality dimension, underscoring the continued importance of

human interaction in healthcare delivery. The chatbot appeared to complement existing services by facilitating access to information, supporting communication, and strengthening patient-centered dimensions including perceived control, trust, self-disclosure, and confirmation of care. While responsiveness and waiting time perceptions were relatively lower than other dimensions, effective communication through the chatbot may have mitigated negative perceptions associated with service delays. From a health services perspective, integrating AI-powered WhatsApp chatbots into routine service evaluation represents a practical and scalable approach to strengthening PREMs assessment and supporting PROMs evaluation, particularly in resource-constrained public hospitals. Such tools can facilitate timely patient feedback, enhance engagement, and inform continuous quality improvement initiatives aimed at delivering more patient-centered care.

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Author Contributions

RR conceived and designed the study, developed the research framework, conducted data collection, and performed data analysis and interpretation. RR drafted the original manuscript and led the revision process. SH and A provided academic supervision, contributed to the conceptual development of the study, and critically reviewed the manuscript for important intellectual content. SH and A also provided methodological guidance and ensured the academic rigor of the research. All authors read and approved the final manuscript.

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Conflicts of Interest

No conflict interest.

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