



JOURNAL OF CONTEXTUAL COMMUNICATION

Master of Communications Studies, University of Al Azhar Indonesia

Patient Journey Mapping as a Hospital Crisis Communication Strategy: Net Promoter Score (NPS) Analysis on Mobile Health Application

<http://dx.doi.org/10.36722/context.v1i1.6>

Yogi Friando^{1*}

¹University of Al Azhar Indonesia, Jl. Sisingamangaraja, Jakarta 12110, Indonesia

*Corresponding author: friandoyogi@gmail.com

Submitted: 7 March 2026, Revised: 29 May 2026, Published: 27 June 2026

Abstract

Digital transformation in healthcare services has shifted the pattern of interaction between hospitals and patients, where mobile health applications serve not only as a means of administrative service, but also as a strategic communication medium that influences the experience, trust, and reputation of the institution. This study aims to analyze patient journey mapping as a hospital crisis communication strategy through Net Promoter Score (NPS) measurement on the RSCMKu application. This study uses the patient journey mapping theory, which places the patient experience as a series of interconnected communicative interactions, and Situational Crisis Communication Theory (SCCT), which explains how organizations respond to potential crises based on responsibility attribution and public perception. This study uses a descriptive quantitative approach with data collection through questionnaires to RSCMKu application users who have accessed hospital services. The analysis was conducted by mapping the dimensions of the patient journey, identifying the determining factors of the experience, and calculating the NPS as an indicator of loyalty and service communication effectiveness. The results of the study showed an NPS value of +65.00, reflecting a high level of satisfaction and a high tendency for patient recommendations. These findings indicate that consistency of information and clarity of digital communication play an important role in building trust and reducing the potential for reputation crises. Thus, this study confirms that the integration of patient journey mapping and NPS in mobile health applications can serve as a preventive crisis communication instrument oriented towards patient experience and the sustainability of hospital reputation.

Keywords: Crisis Communication, Health Communication, Mobile Health Applications, Net Promoter Score, Patient Journey Mapping

Introduction

Digital transformation in the health sector has fundamentally changed interaction patterns, communication practices, and the formation of hospital-patient relationships. Mobile health applications have evolved from administrative support tools into strategic communication media that directly shape the overall patient experience. In this context, patient experience is understood as an

accumulation of clinical, emotional, informational, and communicative interactions throughout the entire service cycle (Bulto et al., 2024; Philpot et al., 2019). As dependence on digital health services grows, hospitals face challenges that are not merely technical but also communicative and reputational. System disruptions, service delays, platform inconsistencies, and negative user experiences can rapidly escalate in the digital space. In this context, healthcare crises often originate not from clinical failures but from communication breakdowns and low institutional responsiveness, requiring a proactive crisis management approach integrated with the hospital's digital ecosystem.

From an organizational communication perspective, patient complaints about digital services represent early crisis signals that, if unmanaged, can escalate into institutional reputation crises. Many organizational crises begin with issue management failure, which is the inability to recognize and respond to stakeholder complaints at an early stage (Coombs, 2011). In digital health, fragmented patient communication experiences risk triggering negative word-of-mouth that weakens hospital legitimacy and trust (Mahardhika & Setyawan, 2025).

One of approachment that is gaining attention in patient experience studies is patient journey mapping. This approach focuses on mapping the entire sequence of patient interactions with the healthcare system, from the pre-service phase, through the core service process, to the post-service stage, placing the patient's subjective perspective at the center of the analysis (Bulto et al., 2024; Voorheis et al., 2025). PJM enables organizations to identify critical points prone to dissatisfaction and communication escalation, with particular relevance in digital health ecosystems where most interactions are mediated by application interfaces (Canfell et al., 2024).

In parallel, the Net Promoter Score (NPS) has been widely adopted as a patient satisfaction and loyalty indicator, measuring propensity to recommend services that reflecting affective and cognitive assessments of the service experience (Adams et al., 2022; Bitencourt et al., 2023). In digital health, NPS is valued for its ease of integration into mobile applications and its ability to capture user sentiment as an early warning of potential crisis (Kohut et al., 2025). However, NPS must be understood within the framework of patients' multidimensional experiences rather than as a simplistic satisfaction metric (Adams et al., 2022). Therefore, NPS needs to be combined with empirical and contextual approaches, such as patient journey mapping, in order to provide a more comprehensive understanding of the dynamics of patient experience, especially at service points that are prone to triggering communication crises.

In Indonesia, the use of mobile health applications has become an integral part of the healthcare system, both in public and private hospitals. Various studies show that the presence of digital health applications does improve access to services, but at the same time poses new challenges related to communication quality, information clarity, and system responsiveness (Handayani & Mubarak, 2025; Oktalia et al., 2025). User dissatisfaction with digital features, technical glitches, and miscommunication in applications has the potential to trigger public frustration and, if not managed strategically, can escalate into a reputation crisis for hospitals.

National research also shows that NPS is beginning to be used as a tool for evaluating patient satisfaction and loyalty in various hospital service units (Diliasari & Sulistiadi, 2024; Ngongoloy & Astutik, 2025). However, most of these studies still position NPS merely as a service performance indicator or marketing tool, without directly linking it to crisis communication strategies or comprehensive patient journey mapping. As a result, the potential of NPS as an early warning system for communication crises has not been optimally utilized.

In the landscape of hospital digital transformation, communication no longer occurs linearly or unidirectionally, but rather develops within a dynamic and participatory digital ecosystem. Patient interactions through mobile health applications form a virtual public space where experiences, complaints, and perceptions are circulated rapidly and have the potential to influence the image of healthcare institutions more broadly (Aldoghiher & Halim, 2025; Nadiyah & Prayoga, 2024). This situation requires hospitals to design crisis communication strategies based on a deep understanding of the patient experience at every stage of the digital service journey.

In the national referral hospital context, RSUP Nasional Dr. Cipto Mangunkusumo (RSCM) has navigated a series of reputational challenges stemming from its digital service ecosystem. In May, 2026, Google Play Store reviews of the RSCMKu application with over 100K downloads. RSCMKu mobile

health application represents the concrete manifestation of the transformation of digital-based healthcare communication with strategic implications for shaping the patient experience. This application integrates various key service points, ranging from integrated online registration, medical service scheduling, queue monitoring, to pharmacy, laboratory, and radiology services, which directly form digital touchpoints in the patient's journey within the RSCM service ecosystem. The complexity of these features makes RSCMKu more than just an administrative tool; it serves as an institutional communication medium that mediates patient's expectations, perceptions, and emotional responses.

Those cases relate with the previous studies that explain of the consistently flagged three recurring issues: (1) discrepancies between queue status in the application and actual clinic conditions; (2) registration module failures causing duplicate or lost appointments; and (3) low responsiveness to in-app complaints, with response times exceeding 48 hours (Handayani & Mubarak, 2025; Oktalia et al., 2025). These breakdowns reflect an accidental cluster crisis in the Situational Crisis Communication Theory (SCCT) framework, where moderate organizational responsibility is amplified by digital visibility and rapid negative word-of-mouth circulation (Coombs, 2011; Coombs & Holladay, 2022). In response, RSCM progressively updated RSCMKu to integrate real-time queue monitoring, appointment notifications, and multi-service access that representing a strategic institutional response to preempt reputational escalation rather than merely an operational upgrade.

Empirically, the relationship between PJM and crisis communication in healthcare is increasingly documented. In a scoping review of 47 digital health journey mapping studies, identified communication handover points, which particularly at the transition from digital scheduling to in-person care as the most structurally predictable pre-crisis signals (Voorheis et al., 2025). Other study showed in a cardiovascular care context that PJM had identified information gaps systematically escalated into trust deficits and heightened attribution of organizational responsibility as the core amplifiers of crisis severity in SCCT (Bulto et al., 2024). Then, PJM applied to digital service channels generated actionable communication insights that, once addressed, measurably improved NPS and patient loyalty (Philpot et al., 2019).

Based on the foregoing, three research gaps justify this study's contribution. First, existing PJM research in Indonesia treats PJM exclusively as a service design tool (Handayani & Mubarak, 2025; Oktalia et al., 2025), without integrating it with SCCT as a crisis communication lens. Second, NPS in the Indonesian healthcare context is not systematically linked to SCCT's variables of attribution of responsibility, reputational threat, and stakeholder trust (Diliyasi & Sulistiadi, 2024; Ngongoloy & Astutik, 2025). Third, evidence from Indonesian national referral hospitals are combining high patient volume, diverse demographics, and multi-channel digital ecosystems that remains scarce internationally.

Based on the description above, this research is important because previous studies still separate patient journey mapping as a tool for improving service quality and NPS as an indicator of satisfaction or loyalty, without integrating them into the framework of hospital crisis communication based on mobile health applications. The novelty of this study lies in its integration of PJM and SCCT as a crisis communication analytical framework to repositioning NPS as a diagnostic crisis indicator linked to SCCT's core variables of attribution of responsibility, reputational threat, and stakeholder trust then applied empirically in an Indonesian national tertiary referral hospital context. Therefore, this study aims to analyze how PJM on the RSCMKu application can function as a strategic hospital crisis communication framework, and how NPS operates as an evaluative indicator for identifying crisis-prone touchpoints based on real patient experiences.

Theoretical Framework

Crisis communication is a strategic mechanism that involves the planned management of information flow to minimize reputational damage and protect the interests of stakeholders from the negative consequences of a crisis event (Coombs, 2011). Within the framework of relationship management, crisis communication is positioned as a continuous interaction process between an organization and its public, aimed at maintaining legitimacy and institutional image before, during, and after the occurrence of a detrimental event (Fearn-Banks, 2016). In addition, this approach serves as an essential public perception management tool to maintain trust and strategic relationships with key

stakeholders when an organization is in a situation that threatens its reputational stability (Lerbinger, 2012). Therefore, it can be concluded that crisis communication is a strategic effort by organizations to systematically manage information and public perception in order to maintain their reputation and the sustainability of their relationships with stakeholders.

The characteristics of crisis communication are reflected in the demand for fast and accurate information delivery as an effort to reduce uncertainty when negative events have the potential to damage the organization's reputation (Coombs, 2011).). This approach is adaptive and planned, with the level of success largely determined by the consistency of the message and the organization's ability to show empathy and responsibility to stakeholders (Benoit, 2014). In the context of the digital environment, crisis communication is also characterized by a high intensity of interaction, so the organizations are required to monitor the dynamics of public opinion directly and respond to negative discourse quickly so that it does not develop into a more complex crisis in the online space (Sellnow & Seeger, 2021).

According to the Situational Crisis Communication Theory (SCCT) framework, crisis responses are formulated into a number of strategic dimensions aimed at controlling attribution of responsibility and maintaining the organization's reputation (Coombs, 2011). The first dimension is the denial strategy (deny), which tends to be defensive and is only relevant when the organization objectively has no direct connection to the cause of the crisis. The second dimension is the diminish strategy (diminish), which is an effort to mitigate negative public assessments through rational explanations or technical justifications for the disruption or failure that occurred (Coombs & Holladay, 2022). The third dimension is the most crucial for dealing with detractors, namely the rebuild strategy, in which the organization makes a public apology and provides compensation (victimage) for the losses suffered by users, such as loss of medical data or queue failures (Coombs, 2011). The fourth dimension, the reinforce strategy, focuses on reaffirming the organization's past contributions and positive performance in an effort to balance public perception of the current service failure (Coombs, 2007).

Patient journey mapping is understood as a comprehensive visual mapping approach to record all points of interaction between patients and the healthcare system with the aim of revealing gaps in the quality of services received (Wager et al., 2022). In managerial practice, this approach is used sequentially to trace the clinical service process as well as the dynamics of the patient's emotional experience, thereby enabling the identification of structural barriers that arise in the service flow (Wolstenholme et al., 2020). In addition, patient journey mapping provides a holistic evaluation framework for the relationship between patients and organizations, including communication dimensions and technical constraints, which significantly influence patient's decisions to maintain trust and loyalty to healthcare services (Agency for Healthcare Research and Quality, 2017). Therefore, it can be concluded that patient journey mapping serves as a systematic analytical framework for identifying service barriers and communication factors that shape patient experience and loyalty in the healthcare system.

The characteristics of patient journey mapping lie in its human-centered orientation, where the mapping process not only traces the service flow but also accommodates the emotional and psychological aspects at each stage of service (Marquez & Downey, 2016). This approach is multidimensional because it visualizes various points of interaction, obstacles experienced by patients, and the interrelationships between service units although not always recognized by patients, have a significant influence on the formation of their perceptions of the organization (Rosenbaum et al., 2017). Another important characteristic is the capacity of patient journey mapping to identify what are known as moments of truth, which are crucial phases in the service journey, both digital and physical, where healthcare institutions have the greatest opportunity to strengthen public trust or, conversely, trigger a reputation crisis (Lemon & Verhoef, 2016).

Patient journey mapping is built on a number of interconnected dimensions to represent the patient's entire experience throughout the healthcare cycle. The first dimension relates to the patient journey stage, which includes the pre-service stage, the core service process, and the post-service period, where each stage reflects the pattern of patient interaction with the healthcare system. The second dimension is service touchpoints, which are various forms of contact between patients and organizations through medical personnel, administrative mechanisms, or digital means such as health

applications, which serve as institutional communication channels. The third dimension covers patient actions and roles, which describe the actual activities of patients at each stage of the journey, from the registration process, searching for medical information, confirming services, to providing feedback. The fourth dimension is the patient's emotional experience, which reflects the patient's feelings, perceptions, and subjective evaluation of service quality, clarity of information, and system reliability, which are closely related to the formation of satisfaction and loyalty. The fifth dimension is barriers and pain points, which are structural, technological, or communicative obstacles that have the potential to trigger dissatisfaction and a reputation crisis if not handled strategically. The final dimension is experience outcomes, which are reflected in attitudes, levels of trust, and patient behavior tendencies, including the intention to recommend the hospital, which can be measured quantitatively (Joseph et al., 2020). Overall, this set of dimensions confirms that patient journey mapping serves not only as an instrument for evaluating services, but also as a strategic framework for managing communication and crisis prevention based on patient experience.

The theoretical integration of PJM and SCCT rests on a shared premise, both frameworks treat organizational-public communication quality as the primary determinant of institutional legitimacy. SCCT identifies three crisis severity variables (1) the level of crisis responsibility attributed to the organization; (2) the degree of reputational threat; and (3) prior crisis history (Coombs, 2011). PJM, in a digital health context, maps where these variables are produced at the level of individual patient interactions: attribution of responsibility is shaped by information consistency across touchpoints; reputational threat is signaled by emotional friction at pain-point stages; and the stakeholder trust buffer is built or eroded through cumulative experience outcomes. This integration is operationally grounded in SCCT's three-stage timeline, there are pre-crisis, crisis, and post-crisis, which maps directly onto PJM's journey stage dimension. In the pre-crisis stage, PJM proactively identifies communication vulnerabilities before escalation, it is consistent with digital health journey maps reliably surface information handover failures as structurally predictable crisis signals (Voorheis et al., 2025). During the crisis stage, PJM's pain points dimension guides the selection of targeted SCCT response strategies calibrated to perceived organizational responsibility. In the post-crisis stage, PJM's experience outcomes and NPS together evaluate whether rebuild and reinforce strategies have restored stakeholder trust.

NPS bridges PJM and SCCT by translating patient experience data into measurable crisis severity signals. Detractors (scores 0–6) index organizational responsibility attribution for patients with unresolved pain points who hold the institution accountable for service failures; the Detractor proportion captures reputational threat magnitude, as an increasing Detractor share empirically precedes declining organizational reputation scores (Korneta, 2018); and Promoters (scores 9–10) constitute the stakeholder trust buffer that absorbs isolated failures before crisis escalation. Passives (scores 7–8), excluded from the NPS formula, represent a latent risk segment whose conversion to Detractors signals emerging reputational vulnerability. Monitoring NPS trends disaggregated by PJM dimension therefore provides hospital management with a theoretically grounded early warning mechanism for communication crises prior to critical escalation (Coombs, 2011; Reichheld & Markey, 2011).

Methodology

This study applied a quantitative descriptive design, with primary data gathered through structured survey instruments administered in the field (Ghozali & Latan, 2015; Sugiyono, 2022). Respondents were selected using accidental sampling, a convenience-based approach in which individuals who satisfied predefined eligibility criteria and were accessible at the time of data collection were recruited as participants. Although this technique offers practical efficiency and is well-suited to exploratory investigations, its capacity for broader generalization remains limited (Golzar & Noor, 2022; Sugiyono, 2022). Consistent with the recommendation that a minimum of 30 participants is sufficient for preliminary psychometric evaluation of Likert-scale instruments (Johanson & Brooks, 2009), a total of 37 outpatients at RSCM were enrolled. Eligibility requirements included confirmation of outpatient status during the data collection period, active use of the RSCMKu mobile application, and at least one documented clinical visit facilitated through the application within the preceding three months. Individuals receiving inpatient or emergency care, as well as those without RSCMKu

application access, were systematically excluded. Data collection was conducted at RSUP Nasional Dr. Cipto Mangunkusumo (RSCM), January 5–15, 2026.

The measurement instrument consisted of 30 items structured across two modules. The first module contained 29 items assessing six Patient Journey Mapping (PJM) dimensions using a 1–10 Likert-type response scale, with each item anchored to observable interactions within the RSCMKu platform. The dimensions assessed were Journey Stage (JS; 5 items addressing registration clarity, schedule transparency, appointment confirmation, post-visit follow-up, and service flow coherence); Service Touchpoints (TP; 5 items covering informational accuracy, interface navigability, notification responsiveness, queue status updates, and cross-channel consistency), Patient Actions (PA; 5 items encompassing registration ease, health information retrieval, schedule confirmation, complaint reporting, and feedback submission), Emotional Experience (EE; 5 items measuring perceived trust, anxiety management, emotional comfort, satisfaction with institutional responsiveness, and confidence in the application), Pain Points (PP; 5 items evaluating technical error frequency, severity of information discrepancies, adequacy of error notifications, service disruption costs, and perceived organizational responsiveness), and Experience Outcomes (EO; 4 items capturing overall satisfaction, recommendation intention, revisit intention, and perceived service reliability). The second module comprised a single Net Promoter Score (NPS) item, through which respondents were classified as Promoters (scores 9–10), Passives (scores 7–8), or Detractors (scores 0–6) (Reichheld and Markey (2011). The collected data were subsequently mapped onto the four strategic response dimensions of Situational Crisis Communication Theory (SCCT) are deny, diminish, rebuild, and reinforce to derive empirically grounded insights into the role of PJM as a crisis communication instrument within the RSCMKu digital health context.

Table 1. Representative Instrument Items by PJM Dimension

PJM Dimension	Item Code	Representative Item Statement
Journey Stage	JS1	The initial information in the RSCMKu application helped me understand the hospital service procedures before arriving
	JS2	RSCMKu application provides sufficient explanation when changes or adjustments to the service
	JS3	If there are service disruptions, the information in the RSCKu application helps prevent misunderstandings on my part as patient
	JS4	After the service is complete, the RSCMKu application continues to provide the additional information that I need
	JS5	Overall, the service flow delivered through the application feels organized and reliable
Service Touchpoints	TP1	The information in the RSCMKu application is consistent with the information I receive at the hospital
	TP2	Notifications from RSCMKu application help me understand the service situation when there are schedule changes
	TP3	The RSCMKu application is my primary source for verifying the accuracy of service information
	TP4	The messages delivered through the RSCMKu application feel clear and not confusing
	TP5	The RSCMKu application helps the hospital maintain the open communication with patients
Patient Actions	PA1	I can use the RSCMKu application independently to access hospital services
	PA2	The information in the RSCMKu application helps me be more patient when there are service delays
	PA3	The RSCMKu application makes it easier for me to make decision during the service process
	PA4	I feel actively involved through the information and features available in the RSCMKu application
	PA5	The RSCMKu application helps me understand my role as a patient in the service process
Emotional Experience	EE1	The information provided through the RSCMKu application makes me feel more at ease
	EE2	I feel disappointed when there are changes to the service without a clear explanation in the RSCMKu application
	EE3	The RSCKu application helps reduce my anxiety while at the hospital
	EE4	The style of information delivery in RSCMKu application makes me feel valued as a patient
	EE5	My emotion experience using the app affects my trust to RSCM
Pain Points	PP1	I have experienced technical difficulties when using the RSCMKu application
	PP2	The explanation in the RSCMKu application help me understand the causes of service disruptions
	PP3	Service changes are not always accompanied by sufficient information in the RSCMKu application
	PP4	When problems occurred, I felt that the RSCMKu application did not fully helped provide a solution
	PP5	Problems with the RSCMKu application affected my assessment of the quality of hospital communication
Experience Outcomes	EO1	Overall, I am satisfied with the communication of the hospital's services through the RSCMKu application
	EO2	The way the hospitals communicates information through the RSCKu application increases my trust
	EO3	I am willing to continue using the RSCMKu application even though I have experienced problems
	EO4	I am willing to recommend the use of the RSCMKu application to other patients

Source: Instrument adapted from Joseph et al. (2020), Bulto et al. (2024), and Philpot et al. (2019)

Instrument validity was tested using Pearson's Product Moment correlation (Flora, 2017) on 29 items with 30 pilot respondents.

Table 2. Interpretation of Questionnaire Validity Test Results

Statement	Calculated r (Pearson's Correlation)	r table (N=30, $\alpha=0.01$)	Interpretation
Q1	.972**	0.463	Valid
Q2	.723**		Valid
Q3	.905**		Valid
Q4	.664**		Valid
Q5	.926**		Valid
Q6	.636**		Valid
Q7	.813**		Valid
Q8	.723**		Valid
Q9	.678**		Valid
Q10	.911**		Valid
Q11	.881**		Valid
Q12	.972**		Valid
Q13	.654**		Valid
Q14	.972**		Valid
Q15	.881**		Valid
Q16	.972**		Valid
Q17	.884**		Valid
Q18	.933**		Valid
Q19	.972**		Valid
Q20	.865**		Valid
Q21	.933**		Valid
Q22	.552**		Valid
Q23	.502**		Valid
Q24	.933**		Valid
Q25	.933**		Valid
Q26	.972**		Valid
Q27	.905**		Valid
Q28	.956**		Valid
Q29	.972**		Valid

Source: IBM SPSS Statistics 27 Data Processing Results

Based on Table 2, the Pre-Test validity test shows that the calculated r is greater than the r table, thus indicating that all statement items are valid and suitable to proceed to the next stage.

Table 3. Instrument Validity Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.751	30

Source: IBM SPSS Statistics 27 Data Processing Results

Based on Table 3, it can be concluded that the Pre-Test reliability test results for the Patient Mapping Journey variable were 0.751, which means that the reliability coefficient was >0.60 , indicating that the indicators had a high level of reliability, meaning that the statements in the questionnaire were reliable for the respondents.

For data analysis techniques, this study used the Net Promoter Score (NPS), which divides respondents into three categories based on a rating range of 0–10, namely Promoters (scores of 9–10) as a group of supporters who tend to be loyal and advocate, Passives (scores of 7–8) who show moderate satisfaction but do not yet have strong ties, and Detractors (scores of 0–6) who have the potential to voice dissatisfaction through the spread of negative perceptions or negative word-of-mouth (Reichheld & Markey, 2011). NPS is understood as a managerial instrument that designed to assess user loyalty levels while projecting an organization's growth potential through a single key question regarding an individual's willingness to recommend a service to others (Reichheld, 2003). The main advantage of NPS lies in its ability to simplify user experience assessment by translating qualitative responses into a numerical index between -100 and $+100$, making it easier for organizations to detect potential reputation risks early and measurably (Baehre et al., 2022). NPS is considered positive if it is above zero, while a score above 50 reflects a very high level of performance, and a score above 70 indicates that the quality of service has reached world-class standards (Reichheld, 2003).

In the context of digital-based healthcare services, the use of NPS as a crisis communication strategy is highly relevant, as an increase in the proportion of Detractors can indicate service disruptions or system failures that require a quick response to prevent crisis escalation and maintain public trust in healthcare institutions (Korneta, 2018). The application of NPS calculations is aimed at objectively measuring user loyalty by calculating the difference in proportion between the group willing to recommend the service and the group expressing dissatisfaction with the service (Reichheld, 2003). Conceptually, the NPS is formulated as follows:

$$\text{NPS} = \% \text{Promoters} - \% \text{Detractors}$$

Scores in the positive range reflect strong user support and advocacy, while negative scores indicate reputational risks that require rapid and targeted service improvements (Reichheld & Markey, 2011). The uniqueness of this formula lies in the exclusion of the Passives group in the final calculation, so that the analysis focuses on the group of users with the most significant emotional impact on the formation of public image and trust in hospitals (Fisher & Kordupleski, 2019). When integrated into the digital service ecosystem, the NPS metric serves as a dynamic monitoring tool that allows management to observe changes in patient satisfaction on an ongoing basis in response to fluctuations in system performance and reliability (Baehre et al., 2022).

Results and Analysis

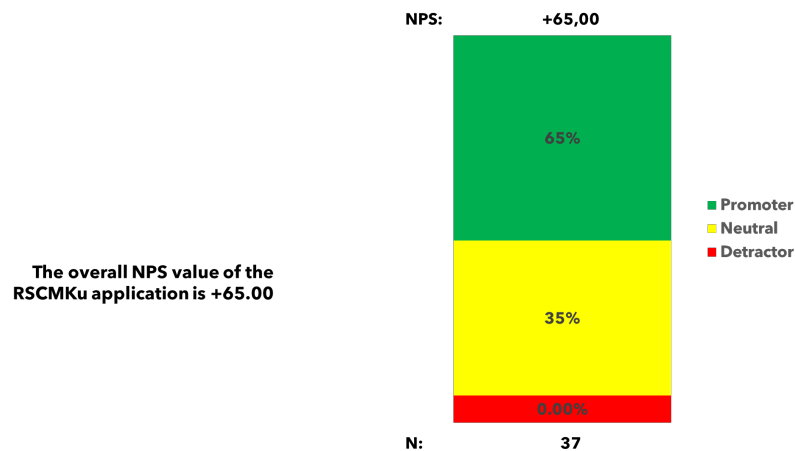
Table 4. Demographic Profile of Respondents (N=37)

Characteristic	Category	Count (N)	Percentage
Gender	Male	15	41%
	Female	22	59%
Total		37	100%
Age	18-30 years old	8	22%
	31-45 years old	14	38%
	46-60 years old	9	24%
	>60 years old	6	16%
Total		37	100%
Education	Senior High School	21	57%
	Bachelor	14	38%
	Postgraduate	2	5%
Total		37	100%
Visit Frequency (3 months)	1-2 visits	11	30%
	3-5 visits	18	49%
	>5 visits	8	21%
Total		37	100%
RSCMKu Usage Duration	<6 months	10	27%
	6-12 months	17	46%
	>12 months	10	27%
Total		37	100%

Source: Primary Data

The majority of respondents were female (59%), aged 31-45 years (38%), and held at least senior high school (57%). Most reported 3-5 visits in the reference period (49%), indicating sufficient repeated engagement to evaluate multiple PJM touchpoints. 46% had used RSCMKu for 6-12 months. The underrepresentation of respondents upper 60 years old (16%) may introduce upward bias in NPS and PJM scores, as older and less digitally proficient patients face greater application barriers and are likely underrepresented in this convenience sample. These demographics are broadly consistent with the outpatient profile at Indonesian national referral hospitals (Oktalia et al., 2025).

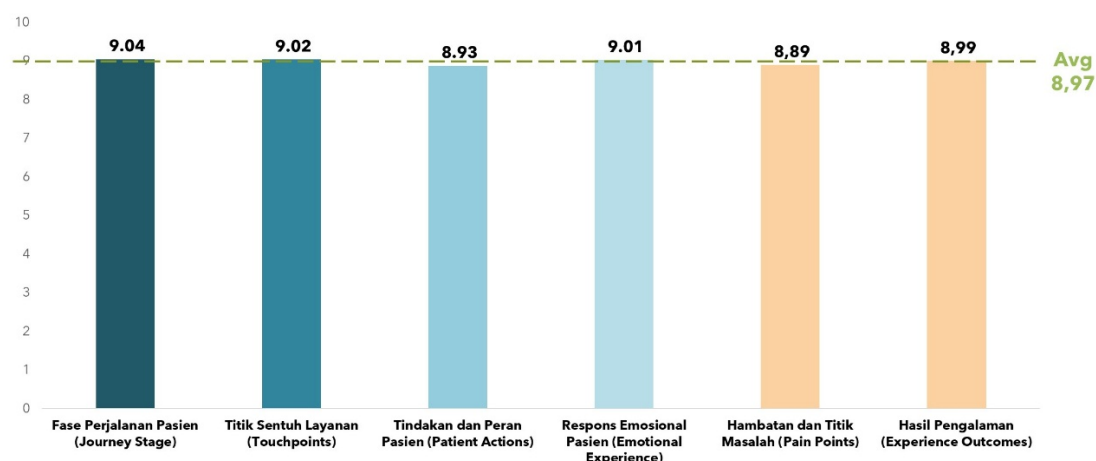
After distributing questionnaires to 37 outpatient respondents at Cipto Mangunkusumo National Hospital (RSCM) who used the RSCMKu mobile health application, the results were analyzed using the Net Promoter Score (NPS) technique with the following results :



Source: Net Promoter Score (NPS) Results for RSCMKu

Figure 1. Net Promoter Score (NPS) Results for the RSCMKu Application

The data processing results show that the RSCMKu application obtained a Net Promoter Score (NPS) of +65.00, which came from a proportion of 65% of respondents in the Promoter category, 35% in the Neutral or Passive group, and no respondents in the Detractor category. This composition reflects a relatively high level of satisfaction and recommendation tendency among application users. Conceptually, an NPS score of +65.00 can be classified as excellent, as scores above +50 indicate a strong and stable level of user loyalty (Reichheld & Markey, 2011). The absence of the Detractor group indicates that during the data collection period, the RSCMKu application did not face significant digital service failures or communication crises that triggered negative sentiment from users.

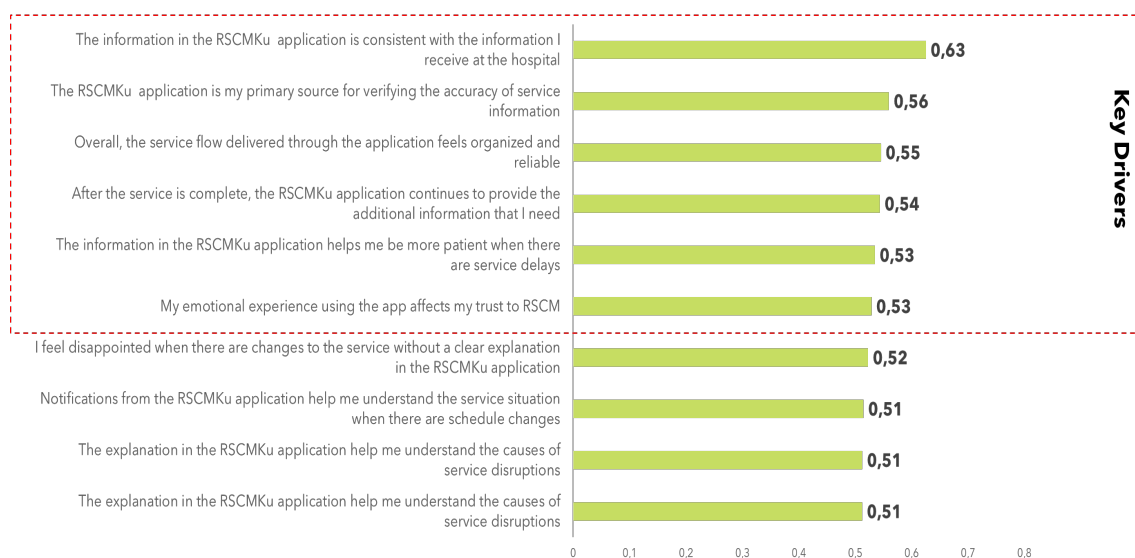


Source: Results of the Net Promoter Score (NPS) Analysis for RSCMKu

Figure 2. Attribute Performance Patient Mapping Journey Score on the RSCMKu Application

Based on Figure 2, the analysis results indicate that the RSCMKu application shows the consistent and strong performance across all dimensions of the patient journey, with an average score of 8.97. The patient journey stage dimension ranked highest with a score of 9.04, followed by the service touchpoints dimension with 9.02, the patient emotional experience dimension with 9.01, and then the experience outcomes dimension with 8.99. This achievement reflects that the service flow and digital service interaction points provided in the application have been designed and implemented in accordance with user expectations from a functional and technical perspective.

However, the scores for patient actions (8.93) and pain points (8.89) did not meet the average score. Although still in the good category, these below-average scores indicate obstacles or discomfort in the user experience that need managerial attention so that they do not potentially develop into reputational issues. This finding is consistent with the results for the patient emotional response dimension, which scored 9.01, indicating that the level of user comfort and psychological satisfaction is greatly influenced by the organization's effectiveness in managing and resolving technical obstacles that arise during service interactions.

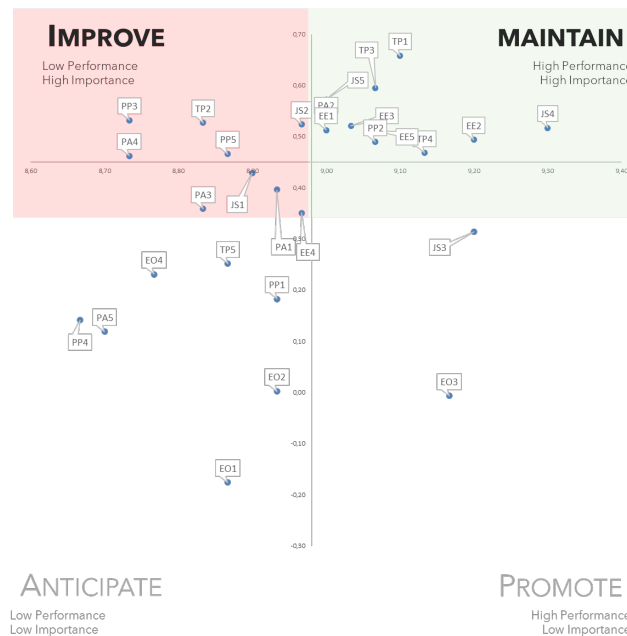


Source: Results of Net Promoter Score (NPS) Analysis for RSCMKu

Figure 3. Analysis of Key Drivers of the Patient Mapping Journey

Analysis of key drivers of patient perception of the RSCMKu application in the red box are the main key drivers. These factors include consistency of information with a correlation value of 0.63. The alignment between the data displayed in the application and the service conditions at the hospital is the main foundation of patient trust, where inconsistencies in information have the potential to significantly reduce perceptions of credibility. In addition, trust in the application as the main source of information also plays an important role with a correlation value ranging from 0.55 to 0.56, reflecting that a well-organized digital service flow can build a sense of security while strengthening the hospital's professional image and reliability. On the other hand, emotional aspects and experience outcomes make a relevant contribution with a correlation value of 0.53–0.54, particularly through the availability of additional information and transparency that helps manage patient expectations and even increases tolerance for service delays.

Other supporting factors outside the red box, with a correlation range of 0.51–0.52, are not key drivers. These factors include sensitivity to schedule changes without adequate explanation and notification functions that help patients understand service disruptions, although their influence is relatively lower than the consistency of core information in shaping patient perceptions and recommendations.



Source: Results of Net Promoter Score (NPS) Analysis by RSCMKu

Figure 4. Analysis of Performance and Importance of Patient Journey Mapping

To explain Figure 4 above, the attributes that constitute the questionnaire statements in Patient Journey Mapping are as follows:

ATTRIBUTES		ATTRIBUTES	
Maintain		Improve	
JS4	After the service is complete, the RSCMKu application continues to provide the additional information that I need	JS2	RSCMKu application provides sufficient explanation when changes or adjustments to the service
JS5	Overall, the service flow delivered through the application feels organized and reliable	TP2	Notifications from RSCMKu application help me understand the service situation when there are schedule changes
TP1	The information in the RSCMKu application is consistent with the information I receive at the hospital	PA4	I feel actively involved through the information and features available in the RSCMKu application
TP3	The RSCMKu application is my primary source for verifying the accuracy of service information	EE3	The RSCMKu application helps reduce my anxiety while at the hospital
TP4	The messages delivered through the RSCMKu application feel clear and not confusing	PP3	Service changes are not always accompanied by sufficient information in the RSCMKu application
PA2	The information in the RSCMKu application helps me be more patient when there are service delays	PP5	Problems with the RSCMKu application affected my assessment of the quality of hospital communication
EE1	The information provided through the RSCMKu application makes me feel more at ease	Anticipate	
EE2	I feel disappointed when there are changes to the service without a clear explanation in the RSCMKu application	JS1	The initial information in the RSCMKu application helped me understand the hospital service procedures before arriving
EE5	My emotion experience using the app affects my trust to RSCM	TP5	The RSCMKu application helps the hospital maintain the open communication with patients
PP2	The explanation in the RSCMKu application help me understand the causes of service disruptions	PA1	I can use the RSCMKu application independently to access hospital services
Promote		PA3	The RSCMKu application makes it easier for me to make decision during the service process
JS3	If there are service disruptions, the information in the RSCMKu application helps prevent misunderstandings on my part as patient	PA5	The RSCMKu application helps me understand my role as a patient in the service process
EO2	The way the hospitals communicates information through the RSCMKu application increases my trust	EE4	The style of information delivery in RSCMKu application makes me feel valued as a patient
EO3	I am willing to continue using the RSCMKu application even though I have experienced problems	PP1	I have experienced technical difficulties when using the RSCMKu application
		PP4	When problems occurred, I felt that the RSCMKu application did not fully helped provide a solution
		EO1	Overall, I am satisfied with the communication of the hospital's services through the RSCMKu application
		EO4	I am willing to recommend the use of the RSCMKu application to other patients

Source: Results of the Net Promoter Score (NPS) analysis for RSCMKu

Figure 5. Analysis of Performance and Importance of Patient Mapping Journey

The attributes highlighted in bold in Figure 5 are defined as the main key drivers referring to the Patient Mapping Journey key driver analysis in Figure 3. Based on the mapping results using the Importance–Performance Analysis (IPA) matrix in Figure 4, the direction of the RSCMKu application development can be classified into several strategic priorities to strengthen the patient experience. In the Improve quadrant, improvement efforts need to focus on increasing the transparency and responsiveness of digital services, particularly in providing clear explanations when service adjustments occur (JS2) and strengthening the change notification system to be more informative and easier to understand (TP2). In addition, these findings confirm the urgency of optimizing features that encourage active patient engagement (PA4) and strengthening the application's function as a means of managing anxiety (EE3), given that a number of technical obstacles that still arise (PP3, PP5) have been proven to have a significant effect on patients' perceptions of the overall quality of hospital communication.

On the other hand, the RSCMKu application shows relatively strong performance in the Maintain quadrant, as reflected in the consistency of information between the application and the actual conditions at the hospital (TP1) and the regularity of the service flow as perceived by patients (JS5), so these two aspects need to be maintained continuously. Patients also positively assessed the availability of post-service follow-up information (JS4) and the application's ability to create emotional calm (EE1, EE5). Meanwhile, attributes in the Anticipate and Promote areas, such as ease of independent access (PA1) and prevention of information misunderstandings (JS3), are perceived as having a relatively lower level of importance, so resource allocation can be prioritized on attributes in the main quadrant to optimize overall patient satisfaction and experience.

The results of the study show empirical findings that the Net Promoter Score (NPS), patient journey mapping, and analysis of key drivers in the RSCMKu mobile health application, which were analyzed using the Situational Crisis Communication Theory (SCCT) framework, provide a more share conceptual understanding of hospital digital crisis communication practices. This approach positions patient journey mapping not merely as an instrument for evaluating service experiences, but as an integrated crisis communication strategy throughout the stages of patient interaction with the digital health service system.

In the context of a denial strategy, the NPS score of +65.00, accompanied by the absence of respondents in the detractor category, indicates that RSCMKu is not in a situation of acute reputational crisis. The absence of significant negative sentiment indicates that the hospital is not facing direct accusations or strong attribution of blame from users. Within the SCCT framework, this condition does not require the explicit use of a denial strategy, but rather reflects the effectiveness of the digital communication system in preventing the escalation of issues from the early stages. The consistency of information between the application and the actual conditions at the hospital serves as a preventive mechanism that minimizes the potential for misinformation, thereby significantly reducing the scope for a reputation crisis to develop. This is consistent with who emphasizes that the denial posture is only legitimate when there is demonstrably no direct attribution of organizational responsibility as a condition confirmed here by the zero-detractor outcome (Coombs, 2011).

Meanwhile, the diminish strategy is reflected in how the application manages patients's expectations and perceptions of service disruptions. Although the barriers and pain points dimensions received relatively lower scores than the other dimensions, patients's emotional experience responses remained in the high category. These findings indicate that technical disruptions or system limitations are not directly interpreted as hospital failures by patients, because the application is able to present contextual and easy-to-understand information. From an SCCT perspective, the diminish strategy is implemented by framing the problem as an understandable and limited situation, without denying the existence of obstacles, so that the perception of negative impacts can be minimized. This findings showed a systematic review of digital hospitals that platforms proactively communicating the causes of service disruptions significantly reduced patient attribution of organizational responsibility (Canfell et al., 2024).

The rebuild strategy dimension appears dominant in the results of the key drivers analysis and Importance–Performance Analysis matrix. The consistency of information as the factor with the highest correlation to recommendation tendencies, as well as the high level of patient trust in the application as the main source of information, confirms that the reliability of digital communication is the main

foundation for restoring and strengthening the relationship between hospitals and patients. The priority for improvement in the aspects of transparency in service adjustments, notification systems, and increased active patient involvement reflects the hospital's commitment to continuously improving the user experience. Within the SCCT framework, the rebuild strategy is realized through accountable and responsive efforts aimed at restoring and deepening public trust. This findings relate with the PJM interventions targeting precisely these communication dimensions produced measurable NPS improvements and sustained patient loyalty gains (Philpot et al., 2019).

The reinforcement strategy is reflected in attributes that demonstrate high performance and need to be maintained, such as regularity of service flow, availability of after-service information, and the application's ability to create a sense of emotional security and calm. These attributes serve as reputation capital that strengthens the hospital's positive image in the eyes of patients. Within the SCCT framework, the reinforcement strategy serves to affirm the hospital's positive track record, so that the loyalty and trust that has been established can become a reputational buffer in the event of a potential crisis in the future. Empirical studies have demonstrated that information consistency and emotional reassurance are among the strongest determinants of high Net Promoter Scores (NPS) in telemedical platforms (Kohut et al., 2025). Similarly, (Voorheis et al., 2025) found that strengthening touchpoints with already high performance generated more sustainable patient loyalty outcomes compared to focusing solely on improving low-performing service experiences.

This study's findings are further contextualized through comparison with prior empirical literature. Net Promoter Score values ranging from +42 to +71 across telemedical platforms in the United States (Kohut et al., 2025), with the highest scores consistently associated with real-time queue transparency and proactive notification systems attributes that correspond directly to RSCMKu's strongest key driver, namely information consistency between the application and actual clinic conditions (TP1; $r = 0.63$). RSCMKu's NPS of +65.00 occupies the upper-middle range of this international benchmark, indicating competitive digital communication performance relative to comparable platforms, particularly given the substantially greater institutional complexity of a national tertiary referral hospital.

The proposition that PJM and NPS together constitute a preventive crisis communication instrument must, however, be qualified to preserve scholarly precision. The evidence presented in this study supports this claim at the level of diagnostic utility which is the integrated analytical framework successfully identified reputational assets are high-performing touchpoints aligned with SCCT's reinforce strategy alongside latent vulnerabilities corresponding to the rebuild requirements and structural information-consistency mechanisms that reduce the likelihood of organizational responsibility attribution (Coombs, 2011; Korneta, 2018). What this study cannot substantiate has given its cross-sectional, single-institution design and convenience sample of 37 respondents is whether the observed NPS of +65.00 will remain stable over time, whether the identified pain points will inevitably escalate into reputational crises absent intervention, or whether these findings are transferable to other mobile health platforms and hospital settings across Indonesia. Longitudinal research employing probabilistic sampling across diverse institutional contexts is therefore recommended to establish the predictive validity of this integrated PJM-NPS framework as an operational early warning system for hospital communication crises (Reichheld & Markey, 2011; Voorheis et al., 2025).

Overall, the classification of research findings based on the SCCT dimensions shows that patient journey mapping on the RSCMKu application operates as a preventive and adaptive crisis communication strategy. Through the integration of information consistency, communication transparency, patient emotion management, and positive experience reinforcement, this application not only mediates digital health services but also functions as a strategic instrument in maintaining the hospital's reputation stability in the digital space. These findings confirm that in the context of mobile health, crisis communication does not always present itself as a reactive response to major incidents, but is internalized in user experience design that is capable of building and maintaining public trust in a sustainable manner.

Conclusion

This study examines the role of patient journey mapping as a hospital crisis communication strategy through Net Promoter Score (NPS) analysis on the RSCMKu mobile health application. The findings show that patient journey mapping provides a comprehensive overview of interaction patterns, emotional experiences, and communication barriers that arise throughout the digital service process. Thus, patient journey mapping not only functions as service quality assessment instrument, but also as an analytical framework that enables hospitals to detect and anticipate potential communication crises arising from patient experiences.

The NPS measurement results, which reached a score of +65.00, reflect high levels of patient satisfaction, trust, and recommendation tendencies towards RSCM's digital services. This achievement indicates that service communication through the RSCMKu application has generally been effective and has not given rise to any significant indications of a reputation crisis. However, further analysis shows that the consistency of information between the application and the implementation of services in the field is the most decisive factor in shaping patient perceptions. Inconsistent information, technical disruptions, and limited clarity of communication have the potential to develop into issues that can affect public trust if not managed systematically.

Within the framework of Situational Crisis Communication Theory (SCCT), the crisis communication strategies identified in the management of the RSCMKu application tend to focus on a rebuild and reinforce approach. This strategy is reflected in efforts to increase information transparency, digital systems sustainability improvement, and maintain aspects of service that have been positively evaluated by patients. Therefore, this study concludes that the integration of patient journey mapping with NPS in mobile health applications demonstrates diagnostic utility as a preventive crisis communication instrument oriented toward patient experience.

The NPS and PJM dimension analysis together successfully mapped the SCCT risk topography of RSCMKu's digital service ecosystem to identifying both reputational assets requiring reinforcement and communication vulnerabilities requiring proactive intervention for providing actionable intelligence for pre-crisis management grounded in real patient experience data. However, given the cross-sectional design and convenience sample of this study, these conclusions should be understood as exploratory rather than confirmatory. Longitudinal research with probabilistic sampling across multiple hospital settings is recommended to validate the predictive function of NPS as an early warning system for institutional reputational crises in the era of digital transformation of health services.

References

- Adams, C., Walpol, R., Schembri, A. M., & Harrison, R. (2022). The ultimate question? Evaluating the use of Net Promoter Score in healthcare: A systematic review. *Health Expectations*, 25(5), 2328–2339. <https://doi.org/10.1111/hex.13577>
- Agency for Healthcare Research and Quality. (2017). *CAHPS ambulatory care improvement guide: Practical strategies for improving patient experience. Section 4: Ways to approach the quality improvement process* (Updated, Vol. 2017, Issue May). U.S. Department of Health & Human Services. <https://www.ahrq.gov/cahps/quality-improvement/index.html>
- Aldoghiher, A., & Halim, Y. T. (2025). Customer Engagement in Digital Health Transformation as Strategic Change: Evidence from Saudi Arabia's Vision 2030. In *Sustainability* (Vol. 17, Issue 18, p. 8468). <https://doi.org/10.3390/su17188468>
- Baehre, S., O'Dwyer, M., O'Malley, L., & Lee, N. (2022). The use of Net Promoter Score (NPS) to predict sales growth: insights from an empirical investigation. *Journal of the Academy of Marketing Science*, 50(1), 67–84. <https://doi.org/10.1007/s11747-021-00790-2>
- Benoit, W. L. (2014). *Accounts, Excuses, and Apologies, Second Edition: Image Repair Theory and Research* (2nd ed.). State University of New York Press.
- Bitencourt, V. N., Crestani, F., Peuckert, M. Z., Andrades, G. R. H., Krauzer, J. R. M., Cintra, C. de C., Cunha, M. L. da R., Eckert, G. U., Girardi, L., Santos, I. S., & Garcia, P. C. R. (2023). Net

- Promoter Score (NPS) as a tool to assess parental satisfaction in pediatric intensive care units. *Jornal de Pediatria*, 99(3), 296–301. <https://doi.org/https://doi.org/10.1016/j.jpmed.2022.11.013>
- Bulto, L. N., Davies, E., Kelly, J., & Hendriks, J. M. (2024). Patient journey mapping: emerging methods for understanding and improving patient experiences of health systems and services. *European Journal of Cardiovascular Nursing*, 23(4), 429–433. <https://doi.org/10.1093/eurjcn/zvae012>
- Canfell, O. J., Woods, L., Meshkat, Y., Krivit, J., Gunashanhar, B., Slade, C., Burton-Jones, A., & Sullivan, C. (2024). The Impact of Digital Hospitals on Patient and Clinician Experience: Systematic Review and Qualitative Evidence Synthesis. *J Med Internet Res*, 26, e47715. <https://doi.org/10.2196/47715>
- Coombs, W. T. (2007). Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. *Corporate Reputation Review*, 10(3), 163–176. <https://doi.org/10.1057/palgrave.crr.1550049>
- Coombs, W. T. (2011). *Ongoing Crisis Communication: Planning, Managing and Responding*. SAGE Publications Inc.
- Coombs, W. T., & Holladay, S. J. (2022). *The Handbook of Crisis Communication: Second Edition* (2nd ed.). John Wiley & Sons.
- Diliasari, K., & Sulistiadi, W. (2024). Use of Net Promoter Score (NPS) in hospital marketing strategy to increase patient satisfaction and loyalty. *International Journal of Social Service and Research*, 04(3), 907–911.
- Fearn-Banks, K. (2016). *Crisis Communications: A Casebook Approach* (5(rev)). Routledge.
- Fisher, N. I., & Kordupleski, R. E. (2019). A critical review of Net Promoter Score for measuring customer loyalty. *International Journal of Market Research*, 35(1), 213–230. <https://doi.org/10.13140/RG.2.2.20661.93928>
- Ghozali, I., & Latan, H. (2015). Konsep, teknik, aplikasi menggunakan Smart PLS 3.0 untuk penelitian empiris. *BP Undip. Semarang*, 290.
- Golzar, J., & Noor, S. (2022). [Research Method Convenience Sampling 3] [2022] Sampling Method Descriptive Research - Convenience Sampling. *Ijels*, 1(2), 1.
- Handayani, T. R., & Mubarak, D. A. A. (2025). Customer Journey Mapping Pada Pengguna Aplikasi Mobile Jkn di Rumah Sakit X. *RIGGS: Journal of Artificial Intelligence and Digital Business*, 4(3 SE-Articles), 2531–2537. <https://doi.org/10.31004/riggs.v4i3.2363>
- Johanson, George A, & Brooks, Gordon P. (2009). Initial Scale Development: Sample Size for Pilot Studies. *Educational and Psychological Measurement*, 70(3), 394–400. <https://doi.org/10.1177/0013164409355692>
- Joseph, A. L., Kushniruk, A. W., & Borycki, E. M. (2020). Patient journey mapping: Current practices, challenges and future opportunities in healthcare. *Knowledge Management & E-Learning*, 12(4), 387–404. <https://doi.org/https://doi.org/10.34105/j.kmel.2020.12.021>
- Kohut, M., Jalbuena, T., Alfiero, R., DiPalazzo, J., Anderson, E., & Bishop, J. (2025). Net Promoter Score as a Reflection of Patients' Opinions About Telemedical Visits: A Mixed Methods Analysis. *Telemedicine and E-Health*, 31(5), 634–642. <https://doi.org/10.1089/tmj.2024.0300>
- Korneta, P. (2018). Net promoter score, growth, and profitability of transportation companies. *International Journal of Management and Economics*, 54. <https://doi.org/10.2478/ijme-2018-0013>

- Lemon, K. N., & Verhoef, P. C. (2016). Understanding Customer Experience Throughout the Customer Journey. *Journal of Marketing*, 80(6), 69–96. <https://doi.org/10.1509/jm.15.0420>
- Lerbinger, O. (2012). *The Crisis Manager: Facing Disasters, Conflicts, and Failures*. Routledge.
- Mahardhika, R., & Setyawan, A. A. (2025). The Role of Word of Mouth and Digital Reviews on Selection Decision: Study on The Private Hospital In central Java. *Jurnal Bisnis Dan Kewirausahaan*, 2(2), 157–166. <https://doi.org/10.71154/ketpach89>
- Marquez, J. J., & Downey, A. (2016). *Library Service Design: A LITA Guide to Holistic Assessment, Insight, and Improvement*. Bloomsbury Publishing.
- Nadiyah, S. N. A., & Prayoga, D. (2024). Transformasi digital sebagai bagian dari strategi pemasaran rumah sakit: Literature review. *Media Publikasi Promosi Kesehatan Indonesia*, 7(2), 265–272. <https://doi.org/https://doi.org/10.56338/mppki.v7i2.4283>
- Ngongoloy, H. F., & Astutik, R. Y. (2025). Peningkatan Kualitas Pelayanan melalui Evaluasi Kepuasan Pasien di Unit Gawat Darurat dengan Pendekatan Net Promoter Score. *Kolaborasi: Jurnal Pengabdian Masyarakat*, 5(6), 938–946. <https://doi.org/https://doi.org/10.56359/kolaborasi.v5i6.711>
- Oktalia, S., Tjokro, S. H., & Kurniawan, A. (2025). Kepuasan pasien rawat jalan terhadap fitur pendaftaran online aplikasi Mobile JKN di RS PKU Muhammadiyah Surabaya. *Jurnal Kesehatan Tambusai*, 6(3), 12075–12083.
- Philpot, L. M., Khokhar, B. A., DeZutter, M. A., Loftus, C. G., Stehr, H. I., Ramar, P., Madson, L. P., & Ebbert, J. O. (2019). Creation of a Patient-Centered Journey Map to Improve the Patient Experience: A Mixed Methods Approach. *Mayo Clinic Proceedings. Innovations, Quality & Outcomes*, 3(4), 466–475. <https://doi.org/10.1016/j.mayocpiqo.2019.07.004>
- Reichheld, F. (2003). The one number you need to grow. *Harvard Business Review*, 81(12), 46-54,124. <https://hbr.org/2003/12/the-one-number-you-need-to-grow>
- Reichheld, F. F., & Markey, R. (2011). *The ultimate question 2.0: How Net Promoter companies thrive in a customer-driven world*. Harvard Business Press.
- Rosenbaum, M. S., Otalora, M. L., & Ramírez, G. C. (2017). How to create a realistic customer journey map. *Business Horizons*, 60(1), 143–150. <https://doi.org/https://doi.org/10.1016/j.bushor.2016.09.010>
- Sellnow, T. L., & Seeger, M. W. (2021). *Theorizing Crisis Communication* (2nd ed.). John Wiley & Sons.
- Sugiyono. (2022). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D – MPKK: Vol. Cetakan 4 (2nd ed.)*. Alfabeta.
- Voorheis, P., Wong, J. V., Lazarevic, N., Imtiaz, B., Bhuiya, A., & Steele Gray, C. (2025). Using Journey Mapping and Service Blueprinting to Design Digital Health Behavior Change Innovations: A Scoping Review. *Journal of Diabetes Science and Technology*, 19(5), 1196–1214. <https://doi.org/10.1177/19322968251334396>
- Wager, K. A., Lee, F. W., & Glaser, J. P. (2022). *Health Care Information Systems: A Practical Approach for Health Care Management* (5th ed.). John Wiley & Sons.
- Wolstenholme, D., Ross, H., Crick, T., & Bowen, S. (2020). Using patient journey mapping to improve health care services. *Journal of Health Design*. <https://doi.org/https://doi.org/10.21853/JHD.2020.94>