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The Role of Risk Management in Improving Patient Safety at Budi Kemuliaan Hospital, Batam

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Abstract: The research investigates how risk management strategies contribute to enhanced patient safety in hospitals, with empirical evidence using data from a tertiary hospital in Indonesia. The study utilized a descriptive qualitative design supported by descriptive statistics. Primary data were collection involved in-depth interviews with four important informants, and qualitative secondary data were analysis included descriptive statistics, normality testing, and Spearman correlation analysis. Qualitative data were analyzed through thematic analysis and data triangulation. The study's results indicate that despite high ratings for service quality and patient satisfaction were rated very highly, no statistically significant correlation was identified between these variables ($r = -0.003$; $p = 0.984$). Qualitative data, however, suggests that patient safety is predominantly shaped by governance-based risk management systems, organizational safety culture, and strong leadership dedication. This research offer fresh empirical evidence that patient satisfaction cannot serve as a proxy indicator for patient safety. Instead, patient safety should be evaluated through systemic, preventive, and sustainable risk management frameworks. These results contribute to the theoretical discourse on healthcare quality management and offer practical implications for hospital leaders in strengthening patient safety governance in complex healthcare environments.

Keywords: Healthcare governance; Patient safety; Patient satisfaction; Risk management; Service quality

Introduction

Reflecting its vital role in influencing clinical outcomes, public confidence, and organizational viability, patient safety has become a key priority in modern healthcare systems (Babic et al., 2024; Hejazi et al., 2026; Mani et al., 2024). Despite notable improvements in medical technology and service delivery, avoidable harm continue to be widespread, causing ongoing difficulties for healthcare practitioners around the world, despite mayor advancements in medical technology and service delivery, preventable harm and bad outcomes continue to be widespread, presenting ongoing difficulites for healthcare professionals all around the world (Domer et al., 2022; Filip et al., 2022; Järvholm et al., 2021; Khan et al., 2024; Phiri et al., 2021). These obstacles highlight the critical requirement for strong governance mechnisms that systematically identify, and minimize risks associated with complicated healthcare procedures.

Patient safety has emerged as a central concern in contemporary healthcare systems, reflecting its critical role in determining clinical outcomes, public trust, and organizational sustainability (Ahmed et al., 2025; Souvatzi et al., 2024; Ullah et al., 2021). Despite significant advancements in medical technology and service delivery, adverse events and preventable harm remain prevalent, posing persistent challenges to healthcare providers worldwide. These challenges underscore the urgent need for robust governance mechanisms that systematically identify, analyze, and mitigate risks inherent in complex healthcare processes

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(Alqahtani et al., 2025; Debie et al., 2022; Schweizer, 2021).

Risk management has become more and more recognized as a strategic governance tool rather than merely an operational duty (Ogunsola et al., 2021). Modern risk management frameworks place a high priority on proactive risk identification, ongoing monitoring, learning from events, and organizational resilience (Balaji et al., 2024; Dahmen, 2023; Oko-Odion et al., 2025). Through these mechanisms, hospitals may establish safer treatment environments and cultivate a safety culture that prioritizes system-level advancement over individual performance and focuses on system-level improvement.

Figure 1. Exterior view of Budi Kemuliaan Hospital, Batam

Figure 2. Polyclinic general surgery room at Budi Kemuliaan Hospital

Figure 3. The waiting area of Budi Kemuliaan Hospital

In practice, hospital performance and safety outcomes are frequently assessed using patient satisfaction and perceived service quality indicators. While these metrics can provide valuable insights into patients' experiences, they are inherently subjective and influenced by diverse psychological, cultural, and contextual factors. As a result, high patient satisfaction does not necessarily reflect the effectiveness of patient safety systems. This conceptual ambiguity has generated ongoing debate in healthcare management literature regarding the validity of patient satisfaction as a proxy indicator for patient safety (Akinleye et al., 2019; Nguyen et al., 2021).

Patient safety implementation in Indonesia is mandated by national laws, and accreditation standards, requiring hospitals to establish structured and sustainable risk management systems. But there is still, empirical evidence examining the relationship between risk management, service quality, patient satisfaction, and patient safety remains limited. This study seeks to address this gap by providing empirical insights into how integrated risk management systems contribute to patient safety in a tertiary hospital setting, this research attempts to fill this gap.

This study's innovation lies in its empirical demonstration that patient satisfaction does not adequately capture patient safety performance. By integrating quantitative and qualitative evidence, this study offers a comprehensive understanding of patient safety as a governance-based, systemic outcome, thereby contributing to the theoretical advancement of healthcare risk management and patient safety research.

Method

The methodology utilized in this study design was descriptive qualitative with descriptive statistical support. Qualitative data were collected through in-depth interviews with four important informants: the Chair of the Risk Management Subcommittee, the Secretary of the Patient Safety Subcommittee, the Secretary of the Quality Committee, and the Head of the Hemodialysis Unit. These informants were purposively selected based on their direct involvement in patient safety governance and operational risk management.

Descriptive statistical data were obtained from 66 outpatients attending specialist polyclinics using structured questionnaires measuring perceived service quality and patient satisfaction. Data analysis comprised descriptive statistics, Kolmogorov–Smirnov and Shapiro–Wilk normality testing, and Spearman correlation analysis made up the data analysis. Thematic analysis, involving transcription, coding, categorization, and triangulation across data sources was used to analyze qualitative. Ethical approval was obtained from

the institutional ethics committee, and all participants provided informed consent prior to data collection.

Population and Sample

a) Population: Outpatients at specialist clinics.
b) Sample: 66 respondents selected purposively.

Table 1. Respondent Characteristics

Category	Frequency
Male	30
Female	36
Age <25 year	15
Age 46-55 year	15
Age 26-45 year	23
Age 56- >65 year	13
general surgery polyclinic	17
Other Polyclinic	49
BPJS Patients	37
Non BPJS	29

Based on respondent characteristics: age, gender, type of specialist doctor polyclinic service and payment system, the majority of patients seeking outpatient treatment from specialist doctors at Budi Kemuliaan Hospital, were: Respondents in the age group <25 years were 15 people (22.73%) and elderly aged 46-56 years were 15 people (22.73%); Female respondents were 36 people (54.55%), male respondents were 30 people (45.45%), Respondents of specialist doctor polyclinic services for General Surgery were 17 people (25.76%), Internal Medicine were 16 people (24.24%) and Payment System with BPJS Health Insurance / JKN were 37 people (56.06%), Private Insurance / Company were 15 people (22.72%), cash / general patients were 13 people (19.70%), and with BPJS Employment there was 1 person (1.52%).

Instruments

a) SERVQUAL-based questionnaire measuring: tangibles, responsiveness, empathy.
b) Patient satisfaction questionnaire measuring: empathy, trust, control, self-disclosure, confirmation.
c) In-depth interview guidelines for four important informants.

Data Analysis

a) Descriptive statistics
b) Shapiro–Wilk normality test
c) Spearman correlation
d) Thematic analysis for qualitative data

This research was chosen to gain an in-depth understanding of the role of risk management in patient safety, and is supported by descriptive statistical data as a complement.

Result and Discussion

Result of Validity Test

Before data analysis was conducted, all research instruments (questionnaires) were tested for validity and reliability. Validity testing was conducted to ensure that each questionnaire item adequately measured the variables studied. Validity testing used a Pearson Product Moment correlation between item scores and the total score.

The test results showed that all items in the service quality variables (dimensions of Direct Evidence, Responsiveness, Empathy) and patient satisfaction variables (empathy, control, Trust, Self-Disclosure, Confirmation) had a calculated r value > r table (0.244) at the 5% significance level. This means that all questionnaire items were declared valid and suitable for use in research.

Service Quality Validity Test

Tangible, Responsiveness, and Empathy Dimensions

a) Test Method: Pearson Product Moment
b) Number of Respondents (n): 66 outpatients
c) Significance Level: $\alpha = 0.05$
d) Degrees of Freedom (df) = n-2 = 64
e) R table value (df=n-2=64): 0.244
f) Criteria: r count > r table → Valid; r count < r table → Invalid

Table 2. Results of the Tangible Dimension Validity Test for Service Quality

r count	R table ($\alpha = 0.05$)	Description
0.649	0.244	Valid
0.632	0.244	Valid
0.597	0.244	Valid
0.584	0.244	Valid
0.387	0.244	Valid
0.640	0.244	Valid
0.526	0.244	Valid
0.427	0.244	Valid
0.597	0.244	Valid
0.669	0.244	Valid

Table 3. Results of the Responsiveness Dimension Validity Test for Service Quality

r count	R table ($\alpha = 0.05$)	Description
0.642	0.244	Valid
0.593	0.244	Valid
0.585	0.244	Valid
0.580	0.244	Valid
0.388	0.244	Valid
0.640	0.244	Valid
0.534	0.244	Valid
0.443	0.244	Valid
0.601	0.244	Valid
0.665	0.244	Valid

Table 4. Results of the Empathy Dimension Validity Test for Service Quality

r count	R table (α = 0.05)	Description
0.647	0.244	Valid
0.545	0.244	Valid
0.573	0.244	Valid
0.569	0.244	Valid
0.395	0.244	Valid
0.641	0.244	Valid
0.542	0.244	Valid
0.446	0.244	Valid
0.600	0.244	Valid
0.657	0.244	Valid

Patient Satisfaction Validity Test
Dimensions: Empathy, Control, Trust, Self-Disclosure, and Confirmation

a) Test Method: Pearson Product Moment Correlation
b) Number of Respondents (n): 66 outpatients
c) Significance Level: α = 0.05
d) Degrees of Freedom (df) = n-2 = 64
e) R table value (df=n-2=64): 0.244
f) Criteria: r count > r table → Valid; r count < r table → Invalid

Table 5. Results of the Validity Test for the Empathy Dimension of Patient Satisfaction

r count	R table (α = 0.05)	Description
0.626	0.244	Valid
0.618	0.244	Valid
0.684	0.244	Valid
0.778	0.244	Valid
0.749	0.244	Valid

Table 6. Results of the Validity Test for the Control Dimension for Patient Satisfaction

r count	R table (α = 0.05)	Description
0.607	0.244	Valid
0.628	0.244	Valid
0.687	0.244	Valid
0.772	0.244	Valid
0.736	0.244	Valid

Table 7. Results of the Validity Test for Trust Dimension for Patient Satisfaction

r count	R table (α = 0.05)	Description
0.605	0.244	Valid
0.632	0.244	Valid
0.676	0.244	Valid
0.771	0.244	Valid
0.735	0.244	Valid

Table 8. Results of the Validity Test for Self -Disclosure for Patient Satisfaction

r count	R table (α = 0.05)	Description
0.654	0.244	Valid
0.639	0.244	Valid
0.697	0.244	Valid
0.780	0.244	Valid
0.739	0.244	Valid

Table 9. Results of the Validity Test for Confirmation for Patient Satisfaction

r count	R table (α = 0.05)	Description
0.645	0.244	Valid
0.566	0.244	Valid
0.679	0.244	Valid
0.765	0.244	Valid
0.740	0.244	Valid

Reliability Test Results for Service Quality and Patient Satisfaction

The reliability test used the Cronbach's Alpha method, with the criterion for instrument reliability if it has a Cronbach's Alpha value > 0.70. The purpose of the reliability test in this study was to assess how consistently and reliability of the questionnaire instrument used to measure service quality and patient satisfaction. Reliability indicates the extent to which a research instrument can provide stable, consistent, and reliable measurement results when used under relatively similar circumstances.

Table 10. Results of the Reliability Test for Service Quality and Patient Satisfaction

Variable	Dimension	Number of items	Cronbach's Alpha	Description
Service Quality	Tangible	10	0.773	Reliable
Service Quality	Responsiveness	10	0.769	Reliable
Service Quality	Empathy (Service Quality)	10	0.763	Reliable
Patient Satisfaction	Empathy (Patient Satisfaction)	5	0.728	Reliable
Patient Satisfaction	Control	5	0.720	Reliable
Patient Satisfaction	Trust	5	0.716	Reliable
Patient Satisfaction	Self -Disclosure	5	0.744	Reliable
Patient Satisfaction	Confirmation	5	0.711	Reliable

Reliability testing was carried out in the context of this study to make sure that each item in the questionnaire consistently measures the same construct in each dimension, both for service quality variables (direct evidence, responsiveness, and empathy) and for patient satisfaction variables (empathy, control, trust, self-disclosure, and confirmation).

Result Data Analysis

Descriptive statistics: the descriptive analysis revealed that both perceived service quality and patient satisfaction were rated in the very high category are Very Good for Service Quality and Very Satisfied for Patient Satisfaction. This analysis includes the calculation of the Mean, Median, Standard Deviation, Minimum Value and Maximum Value.

Table 11. Results of Descriptive Statistical Tests of Service Quality (n=66)

Variable	Total Score	Mean	Median	SD	Min	Max	Interpretation
Tangible	2592	39.27	40	4,636	27	47	Very Good
Responsiveness	2588	39.21	40	4,616	27	47	Very Good
Empathy	2584	39.15	39.5	4,598	27	47	Very Good

Descriptive Statistics Results of Service Quality

The results of descriptive statistical analysis of 66 respondents, the quality of service measured through the dimensions of direct evidence, responsiveness, and empathy showed very good assessments across all dimensions. This is reflected in the relatively high average (mean) value (39.15-39.27) and is in the upper score range, as well as the median value (39.5-40) which is close to the maximum score, and the relatively small standard deviation value (ranging from 4.598-4.636) when compared to the high average (mean) value in each dimension. Most respondents gave a relatively uniform assessment of the quality of service or patient perception of the quality of service is consistent and there is variation but does not show any extreme differences.

The descriptive statistical test's findings indicate that the services provided have met and even exceeded patient expectations at the descriptive level, and also show that the quality of hospital services is considered very good by patients, both in terms of physical evidence of service, responsiveness of officers, and empathy of health workers.

Table 12. Results of Descriptive Statistical Tests of Patient Satisfaction (n=66)

Variable	Total Score	Mean	Median	SD	Min	Max	Interpretation
Empathy	1339	20.29	21	3.022	12	25	Very Satisfied
Control	1340	20.30	21	3.002	12	25	Very Satisfied
Trust	1340	20.30	21	2.982	12	25	Very Satisfied
Self-Disclosure	1336	20.24	21	3.064	12	25	Very Satisfied
Confirmation	1339	20.29	21	2.986	13	25	Very Satisfied

The results of descriptive statistical analysis show that all dimensions of patient satisfaction are in the "very satisfied" category, which is reflected in the relatively high mean value (20.24-20.30), the median approaching the maximum value (21) and the relatively low standard deviation (range 2.982-3.064) when compared with the mean value in the "very satisfied" category. The low standard deviation value indicates that the respondents' answers tend to be homogeneous, which means that most of them have a relatively similar level of satisfaction with the services received, identifying that the service experience felt by patients is consistent.

The results of this study indicate that the service experience felt by patients is consistent, patients are not only satisfied with the service received technically, but also with aspects of officer attention, trust, patient involvement, psychological aspects and service communication.

In general, the results of the descriptive statistical test of Service Quality and Patient Satisfaction confirm that the hospital has been able to provide services that are assessed Very good by patients, and creating a high level of patient satisfaction. However, these descriptive results need to be followed up with inferential analysis to understand the relationship between service quality and patient satisfaction more deeply.

Normality Test: Shapiro–Wilk normality test

To ascertain the distribution pattern of supporting quantitative data gathered from the questionnaire, a normality test of the data was performed in this study. The normality test was conducted using the Kolmogorov–Smirnov test and Shapiro–Wilk, considering the number of research samples as many as 66 respondents.

Normality testing was carried out on the total score of each dimension using the test Kolmogorov–SmirnovAnd Shapiro–Wilk, with a total of 66 respondents with the following conditions: -Sig > 0.05→ normally distributed data or the data is typically distributed.

Based on the results of the normality test, the service quality variables consisting of the dimensions of direct evidence, responsiveness, and empathy showed varying results. In the Kolmogorov-Smimov normality test, all service quality dimensions had significance values above 0.05, but in the Shapiro-Wilk test, some dimensions showed significance values below 0.05.

Table 13. Results of the Normality Test for Research Data on Service Quality Variables (3 Dimensions) and Patient Satisfaction (5 Dimensions)

Variables	Sig.(K-S) Kolmogorov-Smirnov	Description	Sig Shapiro-Wilk	Interpretation
Tangible	0.194	Normal	0.047	Abnormal
Responsiveness	0.008	Normal	0.046	Abnormal
Empathy (Service Quality)	0.189	Normal	0.065	Normal
Empathy (Patient Satisfaction)	0.008	Abnormal	0.010	Abnormal
Control	0.004	Abnormal	0.008	Abnormal
Trust	0.011	Abnormal	0.011	Abnormal
Self -Disclosure	0.004	Abnormal	0.008	Abnormal
Confirmation	0.011	Abnormal	0.011	Abnormal

According to the normality test table, in detail the direct evidence dimension has a Shapiro-Wilk significance value of 0.047, for the responsiveness dimension it has a significance value of 0.046, for the empathy dimension it has a significance value of 0.065. Based on the Shapiro-Wilk Test criteria, two of the three service quality dimensions do not meet the normality assumption (Direct evidence 0.047, responsiveness 0.046).Dimension of Empathy (Empathy) has a Shapiro–Wilk significance value of 0.065 (> 0.05), then the data is normally distributed.

Therefore, the normality assumption ($\alpha = 0.05$) is not completely satisfied by service quality overall, as not all aspects of service quality have a normal distribution.

Table 14. Results of the Normality Test of Research Data on Service Quality and Patient Satisfaction

Variable	Sig.(K-S) Kolmogorov-Smirnov	Description	Sig Shapiro-Wilk	Description
Service Quality	0.080	Normal	0.053	Abnormal
Patient Satisfaction	0.008	Normal	0.011	Abnormal

Based on the results of the normality test in Table 14, service quality variables show significant values Kolmogorov–Smirnovof 0.080 (> 0.05), which indicates that the data is normally distributed according to the test Kolmogorov–Smirnov. However, the test result Shapiro–Wilk shows a significance value of 0.053, this is determined as not meeting the normality assumption. Thus, in general all service quality variables are not completely normally distributed. Meanwhile, for the patient satisfaction variable, the Kolmogorov–Smirnov test showed a significance value of 0.008, and the Shapiro–Wilk test showed a significance value of 0.011. Both values are less than 0.05, so it can be concluded that the patient satisfaction data is not normally distributed.

Because one of the research variables (patient satisfaction) was not normally distributed, the analysis of the relationship between service quality and patient satisfaction was continued using a non-parametric statistical test, namely the Spearman Correlation test.

Spearman Correlation Test

However, Spearman correlation analysis revealed no statistically significant relationship between these variables ($r = -0.003$; $p = 0.984$). .This finding challenges the prevailing assumption that improvements in service quality automatically translate into enhanced patient satisfaction and, by extension, improved patient safety outcomes.

The Spearman correlation test between the overall service quality score and the total satisfaction score the patient displayed a correlation coefficient value of r= -0.003 with a significance value of 0.984 (p >0.05). These results indicate that there is a statistically significant relationship between service quality and patient satisfaction.

Table 15. Results of Spearman Correlation Test for Total Service Quality and Patient Satisfaction

Variable Relationship	ρ (Spearman)	Sig.(2-tailed)	Description
Total Score Service Quality – Patient Satisfaction	-0.003	0.984	Not Significant

Table 16. Results of Spearman Correlation Test of Direct Evidence Dimension (Service Quality) with Patient Satisfaction (n=66)

Variable	ρ (Spearman)	Sig.(2-tailed)	Description
Tangible- Empathy (Patient Satisfaction)	-0.021	0.869	Non Significant
Tangible - Control	-0.017	0.895	Non Significant
Tangible- Trust	-0.015	0.904	Non Significant
Tangible-Self-Disclosure	-0.014	0.910	Non Significant
Tangible Confirmation	-0.044	0.727	Non Significant

Table 17. Results of Spearman Correlation Test of Responsiveness Dimension (Service Quality) with Patient Satisfaction (n=66)

Variable	ρ (Spearman)	Sig.(2-tailed)	Description
Responsiveness- Empathy (Patient Satisfication)	0.002	0.984	Non Significant
Responsiveness - Control	0.005	0.971	Non Significant
Responsiveness- Trust	0.006	0.960	Non Significant
Responsiveness-Self-Disclosure	0.010	0.937	Non Significant
Responsiveness -Confirmation	-0.021	0.869	Non Significant

Table 18. Results of Spearman Correlation Test of Empathy Evidence Dimension (Service Quality) with Patient Satisfaction (n=66)

Variable	ρ (Spearman)	Sig.(2-tailed)	Description
Empathy(Service Quality)- Empathy (Patient Satisfication)	0.028	0.821	Non Significant
Empathy (SQ) - Control	0.029	0.814	Non Significant
Empathy (SQ)- Trust	0.031	0.803	Non Significant
Empathy(SQ)-Self-Disclosure	0.036	0.776	Non Significant
Empathy -Confirmation	0.008	0.949	Non Significant

The fact that the correlation coefficient is close to zero suggests that the link between the two variables is quite weak, so that an increase or decrease in the overall quality of service is not followed by a significant change in the level of patient satisfaction. In general, the results of the Spearman correlation test per Dimension of Service Quality and Patient Satisfaction show that both the total score and all dimensions of service quality have a significant relationship with patient satisfaction. All correlation coefficient values are in the very weak category, and all significance values are above the 0.05 significance level. The findings of this study suggest that patient satisfaction is not only affected by the perceived quality of service, but also by other more systemic factors, such as patient safety, sense of security, and the effectiveness of hospital risk management implementation.

Qualitative results offer more insightful explanations. Informants consistently emphasized that patient safety is primarily driven by integrated risk management systems encompassing risk identification, incident reporting, compliance with standard operating procedures, continuous quality evaluation, and leadership commitment. These mechanisms function as latent controls that operate beyond direct patient perception, thereby explaining the weak association between perceived service quality and patient satisfaction.

Thematic Analysis for Qualitative Data

Results of Qualitative Research with In-Depth Interviews

Qualitative research with in-depth interviews with 4 key informants, namely: Head of the Risk Management Subcommittee, Secretary of the Patient Safety Subcommittee, Secretary of the Quality Committee and Head of the Hemodialysis Unit Room.

Five major themes came out of the topic analysis, including: 1) Implementation of Risk Management is systemic and multi-layered; 2) Incident Reporting System is not yet operational; 3) Internal Barriers (HR and workload); 4) Management commitment as a key factor; 5) System-based patient safety improvement strategies.

Data triangulation revealed that while patients rate the service as safe and satisfactory, patient safety is primarily supported by the internal risk management system. The results of triangulation based on this method indicate that although the risk management system is not considered optimal internally, patients consider the services at Budi Kemuliaan Hospital safe and satisfactory. High levels of patient trust and positive perceptions reinforce the interview findings that the patient safety system works effectively as an internal mechanism, although it is not always directly recognized by patients.

Triangulation Results Source: A Comparison between Four Informants

a) Implementation of Risk Management: risk management has been implemented in layers starting from the policy level to service practice.
b) Patient Safety Incident Reporting System: Obstacles in the patient safety culture aspect and implementation consistency affect the effectiveness of risk management.
c) Internal obstacles in the implementation of risk management: similar findings of internal obstacles, limited Human Resources, high workload, time constraints, and uneven training are the main obstacles.
d) Management Commitment to Patient Safety: All informants agreed that leadership support for patient safety and risk management is very important.
e) Patient Safety Improvement Strategy: that improving patient safety requires a systemic approach that

involves all lines of the hospital organization.

The Overall findings of source triangulation indicate that risk management plays a role as an core system that supports patient safety. Differences in perspective between informants do not indicate conflict, but rather describe the function of risk management from various organizational perspectives.

Thus, the effectiveness of patient safety in hospitals is highly influenced by the synergy between policies, organizational culture, service quality, safety culture and clinical practices at the unit level.

From a governance perspective, patient safety emerges as an organizational property shaped by leadership engagement, safety culture, and continuous learning. High ratings in tangible, responsiveness, and empathy dimensions primarily reflect service delivery attributes rather than the robustness of safety governance structures. This distinction highlights the fundamental difference between patient experience metrics and systemic safety performance.

The present findings align with contemporary systems-based theories of healthcare safety, which emphasize resilience engineering, organizational learning, and adaptive capacity. By empirically demonstrating the limitations of patient satisfaction as a safety indicator, this study contributes novel insights to the international discourse on healthcare quality management. For this reason, Hospital administrators should prioritize risk management frameworks based on governance that promote lasting safety improvements over indicators based only on perception.

Discussion

According to the study's results, confirm that high service quality does not automatically linked with patient satisfaction. The statistically insignificant relationship between service quality and patient satisfaction indicates that patient satisfaction is not a sufficient measure of patient safety effectiveness and suggests that patient safety and security factors play a more complex role. Patient safety is the result of the synergy of risk management systems, service quality and organizational culture.

The study findings show that the quality of service at Budi Kemuliaan Hospital, Batam, is in the excellent category, and the degree of outpatient satisfaction is in the very satisfactory category. These findings are supported by descriptive analysis of questionnaires with 66 respondents and in-depth interviews with four key informants. However, the Spearman correlation test showed no significant relationship between service quality and patient satisfaction.

In Qualitative, in-depth interviews indicated that patient safety is largely determined by internally implemented risk management systems and processes, such as risk identification, incident reporting, quality evaluation, and the implementation of standard operating procedures. The role of risk management is latent and preventative, so it is not always directly perceived by patients and is not always reflected in satisfaction scores.

In the dimension of direct evidence (tangible) Physical facilities, service environments, and infrastructure availability were rated very good. From a risk management perspective, these aspects serve as controls for physical and environmental risks, such as falls and infection. However, high tangible ratings do not automatically translate to significant increases in patient satisfaction.

The responsiveness dimension also received a very good rating, reflecting the readiness of healthcare workers to respond to patient needs. From a risk management perspective, responsiveness serves as an operational control to prevent delays in medical procedures. However, speed of service alone is not sufficient to determine overall patient satisfaction.

The empathy dimension indicates a positive interpersonal relationship between healthcare professionals and patients. Empathy contributes to patients' sense of security and trust, and also serves to mitigate non-technical risks, particularly the risk of miscommunication. Despite its importance, empathy did not demonstrate a statistically significant relationship with patient satisfaction, confirming that patient satisfaction is influenced by broader systemic factors.

Integration of Service Quality, Patient Satisfaction, Risk Management and Patient Safety - The results of the Spearman correlation test show that there is no significant relationship between service quality and patient satisfaction, and patient satisfaction cannot be used as the sole indicator of patient safety.

In-depth interviews revealed that risk management and patient safety operate at the system level through patient safety policies, procedures, and culture. This role is latent and not always directly perceived by patients, so it is not directly reflected in patient satisfaction scores.

This research confirms that patient safety is the result of implementing integrated risk management, and service quality is one of the supporting instruments in this system.

In coclusion, this study's results support the idea that patient safety cannot be measured solely through patient satisfaction., but rather it is the result of implementing integrated risk management in the hospital service system.

Triangulation Results Source: Comparison between Four Informants

a) Implementation of Risk Management: risk

management has been implemented in layers starting from the policy level to service practice.

b) Patient Safety Incident Reporting System: Obstacles in the patient safety culture aspect and implementation consistency affect the effectiveness of risk management.
c) Internal obstacles in the implementation of risk management: similar findings of internal obstacles, limited Human Resources, high workload, time constraints, and uneven training are the main obstacles.
d) Management Commitment to Patient Safety: All informants agreed that leadership support for patient safety and risk management is very important.
e) Patient Safety Improvement Strategy: that improving patient safety requires a systemic approach that involves all lines of the hospital organization.

Overall, the results of source triangulation indicate that risk management plays a role as an core system that supports patient safety. Differences in perspective between informants do not indicate conflict, but rather describe the function of risk management from various organizational perspectives.

So the success of patient safety in hospitals is highly dependent on the synergy between policies, organizational culture, service quality, safety culture and clinical practices at the unit level.

Conclusion

The following conclusions can be drawan from the research findings: 1) The quality of service at Batam Hospital is in the very good category.as indicated by the dimensions of tangible, responsiveness, and empathy; 2) The level of outpatient satisfaction is in the very satisfied category, which reflects a sense of security, comfort and patient trust in hospital services; 3) There is no statistically significant relationship between service quality and patient satisfaction; 4) Risk management plays an important role in improving patient safety systematically through the process of risk identification, risk analysis, risk mitigation, and continuous monitoring and evaluation. And the integration of the quality approach and questionnaire data provides a more comprehensive picture that patient safety cannot be measured only through patient satisfaction, but through the effectiveness of the risk management system and patient safety culture.

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Author Contributions
Conceptualization: J.S. and S.H.; Methodology: J.S.; Data Collection: J.S.; Formal Analysis: J.S. and A.; Investigation: J.S.; Resources: S.H.; Writing – Original Draft: J.S.; Writing – Review & Editing: S.H. and A.; Supervision: S.H.; Project Administration: J.S. All authors have read and approved the final manuscript.

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References

Ahmed, R., & Tanzimur, R. T. (2025). Enhancing Medication Safety: The Role of Community and Hospital Pharmacists in Modern Healthcare Systems. *Randika Journa of Health Science*, *2*(3), 328–355. Retrieved from https://rjupublisher.com/ojs/index.php/RJHS/article/view/418

Akinleye, D. D., McNutt, L.-A., Lazariu, V., & McLaughlin, C. C. (2019). Correlation between hospital finances and quality and safety of patient care. *PLOS ONE*, *14*(8), e0219124. https://doi.org/10.1371/journal.pone.0219124

Alqahtani, F. S. A., Belal, A. A., & Zakri, N. I. (2025). Impact of Governance, Risk Management and Compliance on Healthcare System: A Systematic Review. *The Journal of Contemporary Dental Practice*, *26*(9), 904–911. https://doi.org/10.5005/jp-journals-10024-3943

Babic, S. G., Krsek, A., & Baticic, L. (2024). Voluntary Blood Donation in Modern Healthcare: Trends, Challenges, and Opportunities. *Epidemiologia*, *5*(4), 770–784. https://doi.org/10.3390/epidemiologia5040052

Balaji, S., Shreshta, L., & Sujatha, K. (2024). A Study on Risk Management in Corporate Business. *Involvement International Journal of Business*, *1*(3), 197–209. https://doi.org/10.62569/iijb.v1i3.26

Dahmen, P. (2023). Organizational resilience as a key property of enterprise risk management in response to novel and severe crisis events. *Risk Management and Insurance Review*, *26*(2), 203–245. https://doi.org/10.1111/rmir.12245

Debie, A., Khatri, R. B., & Assefa, Y. (2022). Successes and challenges of health systems governance towards universal health coverage and global health security: a narrative review and synthesis of the literature. *Health Research Policy and Systems*, *20*(1), 50. https://doi.org/10.1186/s12961-022-00858-7

Domer, G., M. Gallagher, T., Shahabzada, S., Sotherland,

J., N. Paul, E., Kumar, K.-N., Wilson, B., Salpekar, S., & Kaur, P. (2022). Patient Safety: Preventing Patient Harm and Building Capacity for Patient Safety. In *Contemporary Topics in Patient Safety - Volume 1*. IntechOpen. https://doi.org/10.5772/intechopen.100559

Filip, R., Gheorghita Puscaselu, R., Anchidin-Norocel, L., Dimian, M., & Savage, W. K. (2022). Global Challenges to Public Health Care Systems during the COVID-19 Pandemic: A Review of Pandemic Measures and Problems. *Journal of Personalized Medicine*, *12*(8), 1295. https://doi.org/10.3390/jpm12081295

Hejazi, M. E., Alizadeh-Dizaj, G., Khoshsirat, S., Raoofi, S., & Javan Biparva, A. (2026). Exploring collaborative strategies to improve patient safety in healthcare organizations: A qualitative study. *PloS One*, *21*(1), e0341022. https://doi.org/10.1371/journal.pone.0341022

Järvholm, K., Olbers, T., & Engström, M. (2021). Patients' views of long-term results of bariatric surgery for super-obesity: sustained effects, but continuing struggles. *Surgery for Obesity and Related Diseases*, *17*(6), 1152–1164. https://doi.org/10.1016/j.soard.2021.02.024

Khan, H. T. A., Addo, K. M., & Findlay, H. (2024). Public Health Challenges and Responses to the Growing Ageing Populations. *Public Health Challenges*, *3*(3). https://doi.org/10.1002/puh2.213

Mani, Z. A., & Goniewicz, K. (2024). Transforming Healthcare in Saudi Arabia: A Comprehensive Evaluation of Vision 2030's Impact. *Sustainability*, *16*(8), 3277. https://doi.org/10.3390/su16083277

Nguyen, N. X., Tran, K., & Nguyen, T. A. (2021). Impact of Service Quality on In-Patients' Satisfaction, Perceived Value, and Customer Loyalty: A Mixed-Methods Study from a Developing Country. *Patient Preference and Adherence*, *Volume 15*, 2523–2538. https://doi.org/10.2147/PPA.S333586

Ogunsola, K. O., & Balogun, E. D. (2021). Enhancing Financial Integrity Through an Advanced Internal Audit Risk Assessment and Governance Model. *International Journal of Multidisciplinary Research and Growth Evaluation*, *2*(1), 781–790. https://doi.org/10.54660/.ijmrge.2021.2.1.781-790

Oko-Odion, C., & Angela, O. (2025). Risk management frameworks for financial institutions in a rapidly changing economic landscape. *International Journal of Science and Research Archive*, *14*(1), 1182–1204. https://doi.org/10.30574/ijsra.2025.14.1.0155

Phiri, P., Ramakrishnan, R., Rathod, S., Elliot, K., Thayanandan, T., Sandle, N., Haque, N., Chau, S. W., Wong, O. W., Chan, S. S., Wong, E. K., Raymont, V., Au-Yeung, S. K., Kingdon, D., & Delanerolle, G. (2021). An evaluation of the mental health impact of SARS-CoV-2 on patients, general public and healthcare professionals: A systematic review and meta-analysis. *EClinicalMedicine*, *34*. https://doi.org/10.1016/j.eclinm.2021.100806

Schweizer, P.-J. (2021). Systemic risks – concepts and challenges for risk governance. *Journal of Risk Research*, *24*(1), 78–93. https://doi.org/10.1080/13669877.2019.1687574

Souvatzi, E., Katsikidou, M., Arvaniti, A., Plakias, S., Tsiakiri, A., & Samakouri, M. (2024). Trust in Healthcare, Medical Mistrust, and Health Outcomes in Times of Health Crisis: A Narrative Review. *Societies*, *14*(12). https://doi.org/10.3390/soc14120269

Ullah, Z., Sulaiman, M. A. B. A., Ali, S. B., Ahmad, N., Scholz, M., & Han, H. (2021). The Effect of Work Safety on Organizational Social Sustainability Improvement in the Healthcare Sector: The Case of a Public Sector Hospital in Pakistan. *International Journal of Environmental Research and Public Health*, *18*(12), 6672. https://doi.org/10.3390/ijerph18126672