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Examining the Relationship Between Health Service Quality and Patient Satisfaction in Cambodian Public Hospitals: A SERVPERF-Based Study

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ABSTRACT

The quality of health services in Cambodia continues to face multiple challenges. Despite ongoing reforms, gaps remain in meeting the expectations of key stakeholders. The purposes of this study were threefold: (1) to find out the level of service quality practice; (2) to determine the relationship between health service quality and patient satisfaction; (3) to examine the effect of each dimension of service quality on patient satisfaction. A quantitative approach was adopted, with structured questionnaires used to collect data, with a reliability between 0.82 and 0.96. A total of 220 patients visiting 11 public hospitals across Cambodia participated in this study, which used a purposive sampling method. The collected data were analyzed using descriptive and inferential statistics in SPSS. The results showed that overall service quality practice was perceived at a high level (M = 4.22, S.D. = 0.60). Among all SERVPERF dimensions, empathy and assurance had the highest mean scores (4.26 and 4.25, respectively), followed by reliability, tangibles, and responsiveness. The results also showed that all dimensions are positively and significantly associated with patient satisfaction at the 0.01 level, with overall correlation coefficients ranging from r = 0.62 to r = 0.89. This finding provides empirical validation of the SERVPERF model in Cambodian public hospitals, with empathy and assurance as key dimensions for enhancing patient satisfaction. Policymakers and health educators working in Cambodia are given recommendations. The Ministry of Health and international health partners may find this study useful.

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1. INTRODUCTION

Patients assess the quality of healthcare services based on interpersonal and environmental aspects, which are often considered less significant by medical professionals. Additionally, many patients struggle to differentiate between the caring (functional) and

curing (technical) aspects of healthcare provided by medical professionals [1]. Compared to other consumer service sectors, healthcare services possess distinctive characteristics, including complex service levels, production processes, and intangible aspects. Financial considerations and the inadequate quality of human resources have the potential to give rise to numerous complaints [2]. Satisfaction of hospital patients has become a crucial measure for assessing the effectiveness of healthcare service providers over the last ten years [3], [4].

1.1 Background of the Study

The beautiful country of Cambodia has a difficult past, but there is increasing optimism for a brighter future. Although the history of Cambodia is lengthy, it is characterized by genocide, foreign invasion, and civil war. Unfortunately, Pol Pot and the Khmer Rouge regime that took over in 1975 are what people associate with Cambodia. About 1.7 million people perished from starvation, torture, execution, and health issues during the four years of Pol Pot's communist rule. Health improvements over the last century have been impressive, but health systems have reached a crucial turning point. Despite increasing health expenditures and unprecedented advances in modern medicine, people today are not necessarily healthier in mind and body. Neither are they more content with the healthcare they receive. Access, along with patient safety and quality, responsiveness, and especially satisfaction with healthcare, is an important and pressing global issue [5].

In the Cambodian context, ensuring healthy lives and well-being for all Cambodian people depends on the health system's ability to prepare for and effectively respond to anticipated negative health impacts that may affect individuals, families, communities, and the population at large. The most important factor, therefore, is to avoid substantial ill-health among the population. This potential health challenge can be managed through comprehensive planning for strong health system performance, with a focus on delivering health education and promotion, primary and secondary prevention, and effectively managing acute events, alongside the enhancement of a multi-sectoral and multidisciplinary response to address social, economic, and environmental determinants of health. In this context, a well-functioning health system is essential throughout the journey towards achieving Cambodia's universal health coverage objective by 2035.

1.2 Statement of the Problem

Despite ongoing efforts to improve the healthcare system in Cambodia, the quality of services delivered among hospitals remains inconsistent and continues to face multiple challenges. Patients often evaluate healthcare quality based on interpersonal interactions and environmental conditions, which may differ from the technical priorities emphasized by healthcare providers [1], [2]. This gap of perception creates difficulties in ensuring that healthcare services meet patient expectations. In addition, healthcare services are inherently complex, involving intangible elements, diverse service processes, and varying levels of human resource capacity. Limitations in workforce quality and service delivery systems may contribute to patient dissatisfaction and frequent complaints [2]. Although patient satisfaction has become a key indicator of performance globally, there is still limited

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empirical evidence in Cambodia examining how different dimensions of service quality influence patient satisfaction [3], [4].

Furthermore, Cambodia's commitment to achieving universal health coverage by 2035 places additional pressure on public hospitals to improve service quality and to meet patient expectations [6]. Without a clear understanding of how specific service quality dimensions, such as reliability, responsiveness, assurance, tangibles, and empathy, which affect patient satisfaction, policymakers and healthcare providers may struggle to implement effective improvements.

Therefore, this study is a SERVPERF-based study that addresses the critical need to examine service quality practices and investigate the relationship between service quality and patient satisfaction in public hospitals in Cambodia.

1.3 Purposes of the Study

The primary purposes of this study were threefold: (1) to find out the level of service quality practice in public hospitals in Cambodia; (2) to determine the relationship between health service quality and patient satisfaction; and (3) to examine the effect of each dimension of service quality on patient satisfaction.

1.4 Research Questions

Based on the purposes of the study, the following research questions were formulated:

1. What is the level of service quality practice in public hospitals in Cambodia?
2. Is there a relationship between service quality and patient satisfaction?
3. Is there an influence of service quality on patient satisfaction?

1.5 Theoretical and Conceptual Framework

The research mainly focused on patients' perceptions of service quality and satisfaction, examining patients visiting public hospitals in Cambodia. The theoretical framework of the SERVPERF model was used to determine differences in patients' perceptions of service quality and satisfaction [7], [12]. The SERVPERF model consists of five dimensions:

1. Reliability refers to the ability to perform promised services accurately and dependably [8], [9], [10]. This is considered the foundation of every service quality and is involved in delivering services on time, correctly the first time, and without errors [20]. In healthcare services, reliability reflects the precision and consistency of service delivery [21].
2. Responsiveness is the willingness and readiness of employees to help customers and provide prompt services [9], [10], [11]. This dimension reflects how service staff manage requests, complaints, inquiries, and problems. Customers or patients expect healthcare workers to be helpful, respectful, competent, and able to provide accurate and comprehensive information [17], [22]. From a managerial perspective, responsiveness is critical for organizational competitiveness and performance metrics [18], [19].
3. Assurance encompasses employees' knowledge, courtesy, and ability to inspire trust and confidence among customers [13], [14], [15]. While trust is primarily conveyed through

frontline employees, who first and directly interact with customers or patients, strong internal relationships between management and staff enhance service credibility and contribute to organizational competitive advantage.

4. Tangibles refer to the physical facilities, equipment, personnel appearance, and communication materials associated with service delivery [10], [23]. In a healthcare environment, tangibility includes waiting spaces, accommodation, technology, and physical infrastructure [16], [24]. Customers or patients evaluate service quality by comparing their perceived services with their expectations, making tangibles a key strategic component of service reputation for healthcare settings [23].
5. Empathy consists of providing personalized care, individualized attention to customers and understanding their specific needs [19]. When customers receive respectful, personalized service, strong relationships form, leading to satisfaction and long-term loyalty. Service loyalty emerges when organizations consistently deliver high-quality, customer-centered services [25].

Customer satisfaction is commonly defined as a person's overall evaluation of a product or service based on the comparison between expectations and actual performance [26]. Whether the experience meets or exceeds expectations, satisfaction is a psychological state resulting from the expectation–performance comparison [27], [28].

In the healthcare setting, patient satisfaction is currently the primary criterion for evaluating the performance of the healthcare delivery system. Patient satisfaction also plays a crucial role in engaging patients in their own healthcare plans. Different measurement tools worldwide prioritize diverse facets of the healthcare experience, including interactions with medical professionals, ease of access to hospitals, the quality of essential medical equipment, and waiting times [29]. According to Noviyani and Viwattanakulvanid [30], who conducted a study on perceived service quality, perceived value, patient satisfaction, and revisit intention, service quality was assessed based on factors such as staff appearance, facility conditions, responsiveness, professional competence, courtesy, and empathy. According to Agami et al. [31], who conducted a study in public hospitals to examine patient loyalty and patient satisfaction, service quality was measured within the framework of tangibles, responsiveness, assurance, reliability, and empathy. Similarly, Gani et al. [32] investigated how health services meet patient expectations by assessing service quality dimensions, including responsiveness, reliability, and administrative efficiency.

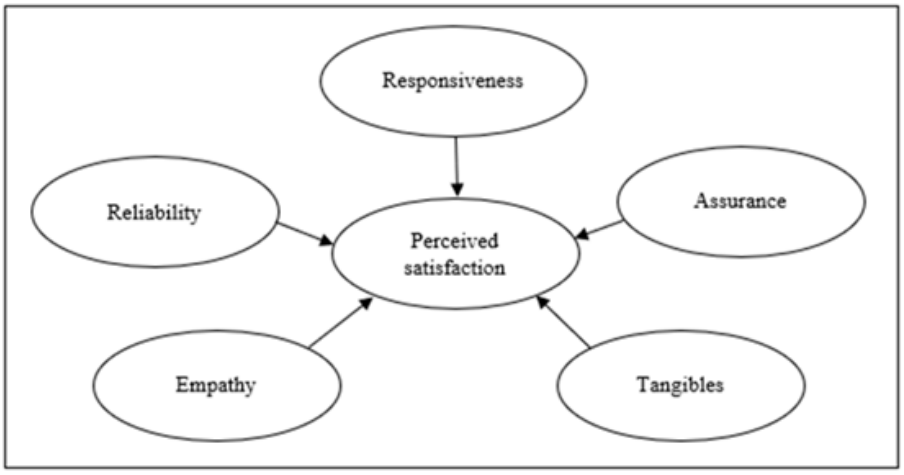

Figure 1. Conceptual Framework Used in the Study

1.6 Significance of the Study

The importance of service quality in the healthcare setting, especially its impact on patient satisfaction, to promote trust and loyalty and support universal health coverage, highlights the study's significance. This study aims to provide insights into enhancing service quality dimensions to improve user satisfaction by examining the relationship between service quality practices and satisfaction. It also aims to offer guidance on how to support healthcare administrators in tailoring service quality to meet patient satisfaction and community needs.

2. METHODS

2.1 Research Design

The current study uses a quantitative correlational research design that aims to explore the relationship between health service quality and patient satisfaction in a sample of public hospitals in Cambodia [33], [34], [35], [36]. This design is based on a positivist worldview, which favors objective, scientific ways of producing knowledge through measurement and systematic empirical research. This approach includes formulating hypotheses, collecting quantifiable, observable data from a population or sample, and using statistical and mathematical methods to test relationships among variables [37]. Like other quantitative studies, the study employed a deductive approach that aimed to test relationships among quantified variables rather than to test causality. This research approach is associated with positivist epistemology, which uses a systematic process, numerical data, and statistical analysis to ensure the objectivity, reliability, and generalizability of the study findings [38], [39].

2.2 Research Participants

A survey was administered to 220 patients visiting 11 public hospitals across Cambodia to collect data for the study. The purposive sampling method was used to select participants: 20 from each hospital, based on their availability and willingness to participate [38] in this study. This sampling technique may have affected the sample's representativeness, a consideration to keep in mind when evaluating and interpreting the findings, even though it is feasible and effective given the study's geographical and logistical scope.

2.3 Research Instrument and Data Collection

The instrument for this study was a questionnaire adapted from Tan et al. [40]. Since the questionnaire was an adapted one, the researchers conducted a validity check with three experts and established both content validity and construct validity. To test the questionnaire's reliability, the researchers conducted a pilot study with 30 respondents. As seen in Table 1, the alpha value indicated that the questionnaire was highly reliable. Meanwhile, this study also showed that Cronbach's alpha for respondents ranged from 0.82 to 0.96; therefore, the questionnaire's reliability was confirmed.

Table 1. Reliability of Service Quality and Patient Satisfaction Constructs

Variable	Cronbach's Alpha	Remark
Reliability	0.86	Reliable
Responsiveness	0.86	Reliable
Assurance	0.86	Reliable
Tangibles	0.82	Reliable
Empathy	0.90	Reliable
Patient Satisfaction	0.96	Reliable

The research used a modified questionnaire with three parts: demographic data, health service quality, and patient satisfaction [40], [41], [42], with responses measured on a five-point Likert scale. Quantitative data analysis was conducted using SPSS, employing descriptive and inferential statistical analyses [43].

The interpretation criteria were used to analyze the service quality and satisfaction: range between 1.00 – 1.50, which is interpreted as extremely low; range between 1.51 – 2.50, which is interpreted as low; range between 2.51 – 3.50, which is interpreted as moderate; range between 3.51 – 4.50, which is interpreted as high; range between 4.51 – 5.00, which is interpreted as extremely high [43]. The interpretation criteria for correlation coefficient (r) values for relationships are based on the following: 0.10– 0.29 (weak), 0.30–0.49 (moderate), and 0.50+ (strong) [44].

The researcher initially contacted the hospital director to formally request permission to collect data. Upon obtaining authorization from the hospital director, the researcher scheduled a meeting with the participant to outline the research objectives and subsequently organized the distribution of the questionnaire.

2.4 Data Analysis and Statistical Procedure

The data analysis used SPSS version 25. The analysis included descriptive and inferential statistical methods. The descriptive statistical analysis used means and standard deviations. The inferential statistical analysis included Pearson's correlation coefficient and regression analysis. The statistical methods used in the analysis, as in the case of the research design, facilitated the measurement and analysis of the data in a correct manner, as the research design followed the principles of the quantitative correlational research.

2.5 Ethical Considerations

All ethical considerations were strictly adhered to throughout the study. The respondents were asked for their written consent, and the right to voluntary participation, the right to withdraw, and the confidentiality and anonymity of the information they provided were guaranteed. All this ensured the integrity and validity of the collected information, as respondents were encouraged to be honest during the research [45]. Besides, a cover letter outlining the title, purpose, significance, and the expected time for completing the study was attached to the questionnaire. Approval was obtained from the respective hospitals before data collection, and ethical considerations were strictly adhered to during data handling and analysis.

3. RESULTS

The results of the statistical analyses done to address the research questions are presented in this session. Specifically, the analysis aims to answer the research questions presented in the introduction.

3.1 Results for the Research Question One

The first research question was asked: "*What is the level of service quality practice in public hospitals in Cambodia?*" A descriptive analysis was conducted to answer the questions posed in this study.

Table 2. Overall Rating of Patients based on Quality Dimension (n = 220)

Dimension	M	S.D.	Meaning	Rank
Reliability	4.24	0.56	High	3
Responsiveness	4.13	0.62	High	5
Assurance	4.25	0.63	High	2
Tangibles	4.23	0.54	High	4
Empathy	4.26	0.65	High	1
Overall	4.22	0.60	High	

As shown in Table 2, the overall level of service quality practice was high (M = 4.22, S.D. = 0.60). Among the various aspects of service quality, empathy ranked highest with a mean score of 4.26 (S.D. = 0.65), followed by assurance (M = 4.25, S.D. = 0.63). Reliability comes in third place (M = 4.24, S.D. = 0.56), followed by tangibles (M = 4.23, S.D. = 0.54) and responsiveness (M = 4.13, S.D. = 0.62).

Table 3. Overall Rating of Patient Satisfaction (n = 220)

Dimension	M	S.D.	Meaning	Rank
Overall Satisfaction	4.20	0.58	High	1

As shown in Table 3, patient satisfaction with healthcare services at national hospitals was high (M = 4.20, S.D. = 0.58).

3.2 Results for the Research Question Two

The second research question was asked: "*Is there a relationship between health service quality and patient satisfaction?*" A correlation analysis was used to examine the relationship between health service quality and patient satisfaction.

Table 4. Correlation among the Variables

Variable	1	2	3	4	5	6
1. Reliability	-					
2. Responsiveness	0.73**	-				
3. Assurance	0.70**	0.79**	-			
4. Tangibles	0.62**	0.71**	0.80**	-		
5. Empathy	0.67**	0.77**	0.79**	0.75**	-	
6. Satisfaction	0.72**	0.83**	0.89**	0.84**	0.88**	-

***Correlation is significant at the 0.01 level (2-tailed)*

As revealed in Table 4, all five dimensions of health service quality, including reliability, responsiveness, assurance, tangibles, and empathy, are positively and significantly associated with patient satisfaction at the 0.01 level. This indicates that improvements in any service quality dimension are strongly linked to higher patient satisfaction in public hospitals. Overall correlation coefficients range from r = 0.62 to r = 0.89, reflecting a strong relationship based on the interpretation of the correlation coefficient by Aberson [44].

3.3 Results for the Research Question Three

The third research question was asked: "*Is there an influence of health service quality on patient satisfaction?*" A multiple linear regression analysis was used to determine how health service quality influences patient satisfaction.

Table 5. Results of Regression Coefficients for Service Quality on Patient Satisfaction (n=220)

Variable	Unstandardized coefficients		Standardized coefficients	*t*	Sig.
	B	Std. Error	Beta		
	0.417	0.147		2.842	0.005
Reliability	0.035	0.046	0.037	0.748	0.456
Responsiveness	0.124	0.052	0.148	2.396	0.019
Assurance	0.269	0.057	0.321	4.685	0.000
Tangibles	0.204	0.057	0.209	3.594	0.001
Empathy	0.264	0.049	0.327	5.428	0.000

Source SPSS: R = 0.950, R-square = 0.902, Adjusted R-square= 0.897, S.E. Est.= 0.16964, Durbin-Watson = 2.011

As revealed in Table 5, empathy, an important dimension of service quality, demonstrated the strongest positive association with patient satisfaction, with a t-value of 5.428 at the 0.000 level, securing first place. Followed by the assurance with a t-value of 4.685 at the 0.000 level, and the second-place predictor. The tangibles dimension comes in third place with a t-value of 3.594 at 0.001, and the responsiveness dimension comes in

fourth place with a t-value of 2.396 at 0.019, respectively. The reliability dimension, contrary to expectations, does not significantly influence patient satisfaction.

4. Discussion

Based on the findings, the following aspects are discussed: the level of service quality practice, the relationship between the two variables, and the influence of service quality on patient satisfaction in a public hospital setting.

4.1 Discussion on the Level of Service Quality Practice

The analysis of data obtained from a questionnaire revealed that the overall level of service quality in Cambodian public hospitals is perceived as high, with a mean value of 4.22. This suggests that, from the patients' perspective, public hospitals are generally performing well in delivering healthcare services across the five SERVPERF dimensions. This result aligns with prior studies that emphasize the growing attention to service quality as a key performance indicator in healthcare systems worldwide [3], [4]. Among the five dimensions, empathy (M = 4.26) and assurance (M = 4.25) were ranked highest. This finding is consistent with previous research, which highlights that interpersonal aspects of care, including compassion, respect, and communication, play a crucial role in shaping patients' perceptions of service quality [30]. The prominence of empathy in this study supports the argument by Adamson et al. [50], who found that emotional support significantly enhances patient satisfaction. The dimensions of reliability (M = 4.24) and tangibles (M = 4.23) were rated highly, indicating that patients perceive services are delivered accurately and that the hospital environment, medical equipment and other facilities used to provide services are satisfactory. This finding supports the study by Vandamme and Leunis [20], which emphasized that reliability is fundamental to service quality, while accuracy and service consistency are critical in healthcare settings. Likewise, tangible factors such as infrastructure, cleanliness, and medical equipment serve as visible cues that influence patients' perceptions of service quality [23], [24].

The responsiveness dimension (M = 4.13) is rated lowest among all dimensions. This indicates that there may be delays in service delivery, insufficient prompt responses, or challenges in efficiently addressing patient needs. This finding is consistent with Chowdhary and Prakash [22], who found that responsiveness is a critical challenge in service provision due to a shortage of healthcare workers and operational inefficiencies. In Cambodian public hospitals, this is likely linked to workforce constraints and high patient volumes, which can directly affect healthcare workers' ability to provide timely services [2].

Globally, the high level of service quality practice observed in this study is comparable to findings from similar studies conducted in other developing countries, where improvements in healthcare systems have led to better patient perceptions of service quality [30], [31].

4.2 Discussion on the Relationship Between Service Quality and Patient Satisfaction

The analysis of the obtained data revealed that all dimensions of service quality are significantly and positively associated with patient satisfaction at the 0.01 level. The

correlation coefficients range from r = 0.62 to r = 0.89. This finding supports the argument that service quality is a key determinant of patient satisfaction in hospital settings. This finding is consistent with earlier studies by Vogus and McClelland [3] that emphasize that patient satisfaction is closely tied to patients' evaluations of service experiences, particularly in terms of how care is delivered. Similarly, Tan et al. [40] found that improvements in service quality dimensions significantly enhance patient satisfaction in healthcare systems. The strong correlations observed in this study reinforce the notion that service quality is a primary predictor of overall satisfaction.

The assurance (r = 0.89) and empathy (r = 0.88) dimensions indicated the strongest relationships with patient satisfaction. The findings align with prior studies, which indicate that interpersonal aspects of care contribute more to patient satisfaction than technical aspects in shaping patient experiences [30]. Patients tend to value communication, comprehensive information provided and individual attention, which are included in assurance and empathy. The result indicates that when healthcare providers demonstrate professionalism, courtesy, and genuine concern, patients are more likely to report positive experiences after receiving care services.

The dimensions of tangibles (r = 0.84) and responsiveness (r = 0.83) also showed strong positive relationships with patient satisfaction. The results are consistent with Ulziibadrakh et al. [23] and Moslehpour et al. [24], who argued that physical facilities and service environments influence customers' perceptions and satisfaction. This finding suggests that the responsiveness reflects how promptly and effectively healthcare workers respond to patient needs, which has been identified as a critical factor in improving service experiences and satisfaction [22].

Although the reliability dimension (r = 0.72) showed the lowest correlation among the five dimensions, it still demonstrated a strong and significant relationship with patient satisfaction. The finding supports previous studies suggesting that accurate and comprehensive service delivery remains a fundamental dimension for improving the quality of the healthcare system [20]. However, reliability may have a comparatively lower influence because patients primarily find it difficult to evaluate technical accuracy and instead rely more on observable and experiential aspects of care [1], [2]. The findings are also supported by Agami et al. [31], who found that multiple service quality dimensions collectively contribute to patient satisfaction and loyalty in hospital settings.

4.3 Discussion on the Influence of Service Quality on Patient Satisfaction

The result demonstrates that service quality has a significant influence on patient satisfaction, with an adjusted R^2 of 0.897. This indicates that the five dimensions of service quality can explain 89.7% of the variance.

Among the five dimensions, empathy ($\beta = 0.327$, $p < 0.001$) was identified as the strongest predictor of patient satisfaction. This result is in line with previous studies emphasizing the importance of patient-centered care and emotional support in healthcare delivery. Adamson et al. [50] found that emotional support significantly improves overall patient satisfaction, while Al-Omar [47] and Hussain et al. [48] highlighted that caring behaviors and interpersonal interactions are critical in shaping patients' experiences. This

suggests that patients place a high value on communication, comprehensive information, respect and understanding of their needs from healthcare workers to enhance their satisfaction.

The assurance dimension was the second strongest predictor ($\beta = 0.321$, $p < 0.001$), indicating that patients' trust and confidence in healthcare providers significantly influence their satisfaction. The result emphasizes the work of Zeithaml et al. [15], who argued that professionalism, competence, and courtesy are essential for building customer trust and perceived service quality. In addition, Almadana et al. [49] confirmed that assurance plays a significant role in determining patient satisfaction in healthcare settings. The result suggests that by improving communication, customer service skills and staff competence, better patient outcomes and experiences can result. Additionally, tangibles ($\beta = 0.209$, $p = 0.001$) and responsiveness ($\beta = 0.148$, $p = 0.019$) were also found to significantly influence patient satisfaction. Ulziibadrakh et al. [23] emphasized that tangible elements such as facilities and equipment serve as important indicators of service quality.

In contrast, the reliability dimension ($\beta = 0.037$, $p = 0.456$) was found to have no significant influence on patient satisfaction, contrary to traditional service quality theories, which consider reliability as a key dimension [20]. This finding, however, is supported by previous research suggesting that patients may have difficulty evaluating technical aspects of care and therefore place less emphasis on reliability compared to interpersonal factors [1], [2]. [46] also highlighted those soft skills and human interactions often outweigh technical performance in determining patient satisfaction. This implies that while reliability remains essential for clinical outcomes, it may not be a decisive factor in patients' subjective evaluation of satisfaction.

5. Conclusion

This study suggests that service quality in Cambodian public hospitals has a significant impact on patient satisfaction in Cambodian public hospitals. High ratings for empathy and assurance were the most significant predictors of patient satisfaction. A significant, positive correlation between service quality and patient satisfaction was found, indicating that improvements in service quality are strongly linked to patient satisfaction. Overall, it can be seen that the performance in service quality and patient satisfaction is good, but responsiveness and reliability need further improvement.

Based on these findings, hospital administrators should therefore focus on developing empathy and assurance by enhancing the interpersonal aspects of care, such as communication, professionalism, comprehensive information, patient-centered service, and respect. It is also suggested that hospitals should institutionalize patient feedback and prompt responses to further better outcomes and patient experiences.

For instance, this research has several limitations, such as the use of a purposive sampling method and a relatively small sample size, which may limit the generalizability of the findings. In addition, the study focused solely on public hospitals by excluding private healthcare facilities. Thus, the different service quality experiences may occur. Furthermore, the cross-sectional design of the study limits the ability to establish causal relationships between service quality and patient satisfaction.

Future research should address these limitations by including a larger, more diverse population across different regions, as well as including private hospitals in the study. Furthermore, the longitudinal studies are recommended to better understand causal relationships and changes in patient satisfaction over time. Finally, future studies could also explore other factors contributing to patient satisfaction, such as service accessibility, by developing and testing context-specific service quality models tailored to the Cambodian healthcare system to provide deeper insights and improve the healthcare system in Cambodia.

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