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The Impact of Physician Punctuality on Patient Satisfaction and Loyalty: A Mixed-Methods Study

Husna, Endy M. Astiwara[1], Mulyadi Muchtiar[1], Dicky Budiman[1,2], Muslikh[1], Hanny Handjaja Ronosulistyo[1]

[1]Master of Hospital Administration Study Program, Universitas Yarsi, Jakarta, Indonesia
[2]Global Health Security CEPH, Griffith University, Brisbane, Australia

Corresponding author: (husna.fk@gmail.com)

ABSTRACT Physician punctuality is a critical component of healthcare service quality that influences patients' experiences and their willingness to continue utilizing healthcare services. However, delays in physician arrival remain a persistent operational challenge in outpatient clinics, particularly in obstetrics and gynecology services, where continuity of care is essential. Although previous studies have demonstrated associations between physician punctuality, patient satisfaction, and loyalty, the underlying mechanism through which punctuality affects loyalty has not been adequately explored in the Indonesian healthcare context. Therefore, this study aimed to examine the effect of physician arrival punctuality on patient loyalty, with patient satisfaction serving as a mediating variable, at the Obstetrics and Gynecology Outpatient Clinic of Permata Bekasi Hospital. A sequential explanatory mixed-methods design was employed. Quantitative data were collected from 98 antenatal care patients using structured questionnaires measuring physician punctuality, patient satisfaction, and patient loyalty. Data were analyzed using linear regression and mediation analysis with the Sobel test. Subsequently, qualitative data were obtained through semi-structured interviews with patients, physicians, nurses, administrative staff, and hospital managers to provide contextual explanations for the quantitative findings. The quantitative analysis revealed that physician punctuality significantly influenced patient satisfaction ($R^2 = 57.3\%$, $p < 0.001$) and patient loyalty ($R^2 = 9.5\%$, $p = 0.002$), while patient satisfaction significantly predicted loyalty ($R^2 = 27.7\%$, $p < 0.001$). Mediation analysis demonstrated that patient satisfaction fully mediated the relationship between physician punctuality and patient loyalty, increasing the explanatory power of the model to 29.6%. Qualitative findings further indicated that empathetic communication, responsiveness, professional conduct, and clear information effectively reduced patients' negative perceptions of delays. These findings suggest that physician punctuality strengthens patient loyalty primarily by enhancing patient satisfaction, emphasizing the importance of integrating operational efficiency with patient-centered communication and service quality strategies to improve long-term patient retention.

INDEX TERMS Physician Punctuality, Patient Satisfaction, Patient Loyalty, Outpatient Services, Mixed-Methods Study.

I. INTRODUCTION

Patient loyalty has become a strategic indicator of healthcare quality because loyal patients are more likely to return for follow-up treatment, adhere to medical recommendations, and recommend healthcare providers to others [1], [2]. In outpatient services, particularly Obstetrics and Gynecology (ObGyn) clinics where continuity of antenatal care is essential, patient loyalty is strongly influenced by service experiences throughout the care process. One important operational factor affecting patient experience is physician punctuality. Delays in physician arrival prolong waiting times, reduce patients' perceptions of service reliability, and negatively influence satisfaction and revisit intention [3], [4]. Previous studies have shown that long waiting times remain a major source of patient dissatisfaction in specialist outpatient clinics and significantly decrease patients' willingness to return for future services [5], [6]. In Indonesia, physician punctuality is increasingly challenging because many specialists practice simultaneously at several healthcare facilities, resulting in scheduling conflicts and prolonged outpatient waiting times.

Recent advances in healthcare service research have shifted from merely measuring operational performance toward understanding the behavioral mechanisms that influence patient loyalty. Service quality models such as SERVQUAL and HEALTHQUAL remain widely applied to evaluate reliability, responsiveness, assurance, empathy, and communication as determinants of patient satisfaction and loyalty [7]–[10]. In addition, mediation analysis has become an important statistical approach for explaining indirect relationships between healthcare service attributes and behavioral outcomes [11], [12]. Mixed-methods research has also gained increasing attention because qualitative findings

provide contextual explanations for quantitative results, thereby producing a more comprehensive understanding of healthcare service quality [13], [14]. Collectively, these methodological advancements enable researchers to examine not only whether healthcare service attributes influence patient outcomes but also how and why these relationships occur within diverse healthcare settings.

Although previous studies consistently reported positive relationships among physician punctuality, patient satisfaction, and patient loyalty [15]–[18], several research gaps remain. First, most studies evaluate waiting time as a general service quality indicator without specifically examining physician arrival punctuality as the primary operational variable. Second, limited studies have investigated whether patient satisfaction fully mediates the relationship between physician punctuality and patient loyalty using formal mediation techniques such as the Baron and Kenny approach combined with the Sobel test. Third, existing studies predominantly employ quantitative cross-sectional designs, limiting understanding of the contextual factors underlying patients' perceptions of physician delays. Furthermore, evidence from Indonesian maternity outpatient services remains scarce despite differences in healthcare systems, physician practice patterns, and patient expectations compared with developed countries.

Recent literature also emphasizes that improving healthcare quality requires integrating operational management, patient engagement, and technological innovation. Multi-criteria decision-making approaches have been proposed to optimize hospital operational efficiency and resource allocation [19]. Likewise, encouraging patient participation has been shown to strengthen trust, communication, and patient satisfaction [20]. Sustainable healthcare systems further require effective organizational coordination, knowledge management, and adaptive service delivery to address operational challenges, including physician scheduling and waiting-time management [21]. Moreover, digital health technologies and smart hospital services have demonstrated considerable potential to improve communication efficiency, patient experience, and long-term patient loyalty [22].

Therefore, this study aims to examine the effect of physician arrival punctuality on patient loyalty through the mediating role of patient satisfaction at the Obstetrics and Gynecology Outpatient Clinic of Permata Bekasi Hospital using a sequential explanatory mixed-methods approach. The integration of quantitative mediation analysis with qualitative exploration is expected to provide a more comprehensive understanding of the mechanisms linking physician punctuality to patient loyalty.

This study offers four major contributions. First, it empirically verifies the mediating role of patient satisfaction in the relationship between physician punctuality and patient loyalty. Second, it extends the application of the SERVQUAL perspective by positioning physician punctuality as a measurable operational determinant of healthcare outcomes. Third, it contributes empirical evidence from an Indonesian private hospital, where physician scheduling characteristics differ from those reported in developed countries. Fourth, it provides practical recommendations for hospital managers to improve physician scheduling, service recovery, and patient communication strategies.

The remainder of this article is organized as follows. Section II describes the research methodology. Section III presents the research findings. Section IV discusses the results and their theoretical and managerial implications. Finally, Section V concludes the study, presents its limitations, and suggests future research directions.

II. METHOD

A. STUDY DESIGN

This study employed a sequential explanatory mixed-methods design, consisting of a quantitative phase followed by a qualitative phase. This design was selected because quantitative findings alone were insufficient to explain the mechanisms underlying the relationship between physician punctuality, patient satisfaction, and patient loyalty. The subsequent qualitative phase was conducted to provide contextual explanations for the statistical findings and to strengthen the interpretation of the quantitative results. The integration of both approaches enabled a comprehensive understanding of operational and behavioral factors influencing patient loyalty in outpatient healthcare services [23], [24].

B. STUDY SETTING AND POPULATION

The study was conducted at the Obstetrics and Gynecology (ObGyn) Outpatient Clinic of Permata Bekasi Hospital, Indonesia. This department was selected because antenatal care requires repeated patient visits, making physician punctuality an important determinant of patients' service experiences and continuity of care.

The quantitative population comprised all antenatal care (ANC) patients attending the outpatient clinic during the study period. Eligible participants were women aged 18 years or older who had completed at least one physician consultation and were willing to participate by providing informed consent. Patients with emergency conditions, severe cognitive impairment, or incomplete questionnaire responses were excluded from the analysis.

For the qualitative phase, purposive sampling was employed to recruit participants capable of providing rich information regarding physician punctuality and outpatient service delivery. The participants included patients, obstetricians and gynecologists, nurses or midwives, administrative personnel, and hospital managers involved in outpatient operational management.

C. SAMPLE SIZE AND SAMPLING TECHNIQUE

The quantitative sample consisted of 98 patients, determined using statistical requirements for multiple regression analysis with medium effect size, a significance level of 5%, and statistical power of 80%, ensuring adequate power to detect significant relationships among study variables [25]. Participants were selected using consecutive sampling, whereby every eligible patient attending the clinic during the data collection period was invited to participate until the required sample size was achieved. The qualitative phase involved 20 participants, comprising five patients, five physicians, five nurses or midwives, and five administrative or managerial staff members. Recruitment continued until

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thematic saturation was achieved, indicating that no substantially new themes emerged from additional interviews [24].

D. RESEARCH VARIABLES AND MEASUREMENT

The independent variable was physician arrival punctuality, defined as the extent to which physicians attended scheduled outpatient consultations according to predetermined appointment times. This construct was measured using indicators of actual waiting time and patients' perceived punctuality.The mediating variable was patient satisfaction, measured using adapted SERVQUAL dimensions, including reliability, responsiveness, assurance, and empathy. These dimensions have been widely validated for evaluating healthcare service quality and patient perceptions [26].

The dependent variable was patient loyalty, assessed through patients' intention to revisit the hospital, willingness to continue receiving healthcare services, and likelihood of recommending the hospital to family members or friends [27]. All questionnaire items were assessed using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Prior to data collection, the questionnaire underwent content validation by healthcare management experts and pilot testing to evaluate clarity and reliability.

E. DATA COLLECTION PROCEDURE

Quantitative data were collected through structured self-administered questionnaires distributed immediately after patients completed their outpatient consultations. Respondents received information regarding the study objectives, confidentiality, voluntary participation, and informed consent procedures before completing the questionnaire.

Following quantitative analysis, qualitative data were collected through semi-structured interviews lasting approximately 30–45 minutes. Interview guides explored participants' experiences regarding physician punctuality, communication during service delays, operational constraints affecting physician attendance, and strategies for maintaining patient satisfaction despite waiting times. All interviews were audio-recorded with participants' permission and subsequently transcribed verbatim for analysis.Secondary data, including physician attendance records, appointment schedules, and outpatient service reports, were reviewed to support data triangulation and improve the credibility of the findings.

F. DATA ANALYSIS

Quantitative data were analyzed using IBM SPSS Statistics. Descriptive statistics were first performed to summarize respondents' demographic characteristics and study variables. Instrument quality was evaluated through validity and reliability testing, while classical assumption tests including normality, multicollinearity, and heteroscedasticity were conducted before regression analysis [28].

Hypothesis testing employed simple and multiple linear regression analyses. The mediating effect of patient satisfaction was examined using the Baron and Kenny mediation procedure, followed by the Sobel test to determine the statistical significance of indirect effects [29]. Statistical significance was established at $p < 0.05$.

Qualitative data were analyzed using thematic analysis following the six-step framework proposed by Braun and Clarke. The analytical process consisted of familiarization with interview transcripts, initial coding, theme development, theme review, theme definition, and report preparation. To enhance trustworthiness, member checking, investigator triangulation, and comparison with quantitative findings were performed throughout the analysis [30].

Finally, quantitative and qualitative findings were integrated during the interpretation stage to explain how physician punctuality influenced patient loyalty through patient satisfaction. This integration facilitated a deeper understanding of both statistical relationships and contextual experiences within outpatient healthcare services.

G. ETHICAL CONSIDERATIONS

This study received ethical approval from the Institutional Health Research Ethics Committee before data collection commenced. Written informed consent was obtained from all participants, and participation was entirely voluntary. Respondents were informed of their right to withdraw from the study at any stage without consequences. All collected data were anonymized, securely stored, and used exclusively for research purposes in accordance with international ethical principles governing human-subject research [31].

III. RESULTS

Permata Bekasi Hospital is a type C private hospital that has been operating since 2008 and serves as a comprehensive healthcare provider for the people of Bekasi and its surrounding areas. With complete diagnostic facilities and professional healthcare staff, this hospital provides basic to specialist medical services, including an Obstetrics and Gynecology Polyclinic that has a high number of visits. The hospital's vision is to be a modern and innovative provider of superior services in Bekasi, while its mission focuses on providing excellent healthcare services in a family atmosphere, increasing value for stakeholders, and developing the competence and welfare of human resources on an ongoing basis, in line with its commitment to quality and patient safety.

The research findings depict a respondent profile predominantly consisting of patients in the productive age group (26-35 years old), with higher education backgrounds (mostly university graduates), and occupations as housewives or private employees at the Obstetrics and Gynecology Polyclinic of Permata Bekasi Hospital. In-depth interviews with six experienced obstetricians and gynecologists complement the qualitative perspective [24]. Descriptive statistical analysis indicates that the Patient Satisfaction

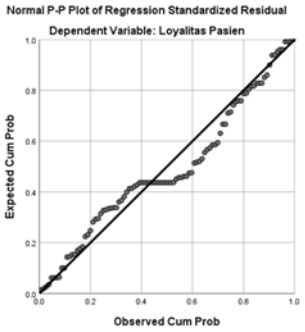

Figure 1. Normality Test

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variable has the highest mean value with the most varied response distribution, while Doctor Arrival is in the fairly good but not yet optimal category, and Patient Loyalty records the highest consistency with the most homogeneous answer distribution among the three variables.

Based on FIGURE 1 of the normality test using the Normal P–P Plot of Regression Standardized Residuals, it can be seen that the distribution of residual points follows and approaches the diagonal line. This indicates that the residuals in the regression model are normally distributed, thus meeting the normality assumption and making the regression model suitable for further analysis.

TABLE 1
Hypothesis Testing Results

Hypothesis	Sig.	R^2
H1: X → Y Doctor Arrival → Patient Loyalty (Direct)	0.002	0.095 (9.5%)
H2: X → Z Doctor Arrival → Patient Satisfaction	0.000	0.573 (57.3%)
H3: Z → Y Patient Satisfaction → Patient Loyalty	0.000	0.277 (27.7%)
H4: X → Z → Y Mediation of Patient Satisfaction	Z→Y: 0.000 X→Y: 0.112	Model: 0.296 (29.6%)

As presented in TABLE 1, physician arrival punctuality had a significant positive effect on patient loyalty ($p = 0.002$) and patient satisfaction ($p < 0.001$). Patient satisfaction also significantly influenced patient loyalty ($p < 0.001$). Furthermore, the mediation analysis demonstrated that the direct effect of physician punctuality on patient loyalty became statistically insignificant ($p = 0.112$) after patient satisfaction was incorporated into the model, whereas the indirect effect remained significant. These findings indicate that patient satisfaction fully mediates the relationship between physician arrival punctuality and patient loyalty, supporting all proposed hypotheses.

IV. DISCUSSION

A. INTERPRETATION OF THE MAIN FINDINGS

This study investigated the influence of physician arrival punctuality on patient loyalty through the mediating role of patient satisfaction in the Obstetrics and Gynecology Outpatient Clinic of Permata Bekasi Hospital. The findings demonstrate that physician punctuality has a statistically significant positive effect on both patient satisfaction ($p < 0.001$) and patient loyalty ($p = 0.002$). More importantly, the mediation analysis revealed that the direct relationship between physician punctuality and patient loyalty became statistically insignificant after patient satisfaction was incorporated into the regression model. This finding confirms that patient satisfaction functions as a full mediator, indicating that physician punctuality influences patient loyalty primarily by improving patients' overall service experiences rather than directly affecting their intention to revisit the hospital.

The coefficient of determination further supports these findings. Physician punctuality explained 57.3% of the variance in patient satisfaction, whereas its direct contribution to patient loyalty was only 9.5%. After introducing patient satisfaction as a mediating variable, the explanatory power of the model increased to 29.6%, highlighting that satisfaction constitutes the principal psychological mechanism linking operational performance with patients' behavioral intentions. These findings reinforce the argument that operational indicators such as physician punctuality should not be viewed merely as administrative performance measures but rather as service quality attributes that shape patients' perceptions and subsequent healthcare decisions.

From a theoretical perspective, the present findings extend the SERVQUAL framework by demonstrating that the reliability dimension, represented by physician punctuality, does not independently generate patient loyalty. Instead, punctuality contributes to loyalty only when patients perceive the overall healthcare experience as satisfactory. This observation is also consistent with the Stimulus–Organism–Response (S–O–R) theory, in which physician punctuality acts as an external stimulus, patient satisfaction represents the internal cognitive and emotional response, and patient loyalty reflects the resulting behavioral outcome [32]. Consequently, improvements in operational efficiency alone may not guarantee patient retention unless accompanied by positive interpersonal interactions and high-quality service delivery.

The qualitative findings further strengthen this interpretation. Interview participants acknowledged that physician delays were often acceptable when healthcare professionals communicated proactively, provided clear explanations regarding waiting times, demonstrated empathy, and maintained professional attitudes throughout the consultation process. These findings indicate that patients evaluate healthcare quality holistically rather than focusing exclusively on waiting time. In other words, effective communication and compassionate care can substantially mitigate the negative perceptions associated with physician delays.

The present findings are consistent with previous studies reporting that operational efficiency influences patient loyalty indirectly through patient satisfaction rather than through a direct causal pathway [33], [34]. Similar evidence has also been reported in healthcare settings where communication quality, trust, and perceived service reliability collectively shape patients' intentions to continue utilizing healthcare services [35]. Therefore, hospital administrators should prioritize not only physician scheduling optimization but also communication protocols and service recovery strategies that preserve patient satisfaction during unavoidable delays. Such integrated quality improvement initiatives are expected to strengthen long-term patient loyalty while enhancing overall healthcare service performance.

B. COMPARISON WITH PREVIOUS STUDIES

The findings of this study are generally consistent with previous research demonstrating that physician punctuality and healthcare service quality are important determinants of patient satisfaction and loyalty. However, this study contributes additional evidence by demonstrating that patient satisfaction fully mediates the relationship between physician punctuality and patient loyalty within the context of an Indonesian obstetrics and gynecology outpatient clinic. While many previous studies have reported significant direct relationships between operational performance and patient loyalty, relatively few have comprehensively examined the

psychological mechanism through which physician punctuality translates into patients' behavioral intentions.

The significant positive relationship between physician punctuality and patient satisfaction observed in this study is consistent with the findings reported by Moslehpour et al. [36], who concluded that effective physician communication and professional interactions substantially improve patients' healthcare experiences despite operational constraints. Likewise, Ferreira et al. [37], in their systematic review of patient satisfaction assessment, emphasized that service reliability including timely healthcare delivery is one of the strongest predictors of patients' evaluations of healthcare quality. These studies support the present findings by indicating that punctuality represents not only an operational performance indicator but also a critical component of patients' perceived service quality.

The present study also confirms that patient satisfaction significantly influences patient loyalty, supporting previous evidence reported by Rohita and Nurkholik [38], who found that satisfied patients are considerably more likely to revisit healthcare facilities, maintain long-term relationships with healthcare providers, and recommend healthcare services to others. Similar conclusions were reported by Cahyati et al. [39], who demonstrated that patient satisfaction mediates the influence of healthcare service quality on loyalty in Indonesian hospitals. The consistency between these findings and the present study reinforces the importance of patient-centered healthcare delivery as the foundation for sustainable patient retention.

Despite these similarities, the current study also reveals several distinctive findings. Unlike many previous studies that reported both direct and indirect effects of service quality on patient loyalty, the present analysis identified full mediation, indicating that physician punctuality alone is insufficient to establish patient loyalty without first improving patient satisfaction. This finding suggests that operational efficiency should not be considered an isolated determinant of patient behavior. Instead, patients interpret punctuality as part of their overall healthcare experience, which includes communication quality, empathy, professional competence, and responsiveness during service delivery.

This difference may be explained by the unique characteristics of maternity outpatient services. Obstetric patients generally require repeated consultations throughout pregnancy, making interpersonal relationships with healthcare providers more influential than single service encounters. Consequently, patients tend to evaluate healthcare quality holistically rather than focusing exclusively on physician arrival time. Even when delays occur, patients may remain satisfied if physicians provide clear explanations, demonstrate empathy, and maintain effective communication during consultations. The qualitative findings of this study strongly support this interpretation, as participants consistently emphasized the importance of respectful communication and compassionate care in shaping their overall satisfaction.

Another notable contribution of this study is its methodological approach. Most previous investigations examining healthcare service quality have relied exclusively on quantitative cross-sectional surveys, limiting their ability to explain the reasons underlying statistical relationships. By integrating quantitative regression analysis with qualitative interviews, the present study provides richer evidence regarding how physician punctuality influences patient satisfaction from multiple stakeholder perspectives, including patients, physicians, nurses, administrative personnel, and hospital managers. This sequential explanatory mixed-methods design enhances the credibility and practical relevance of the findings because statistical evidence is complemented by real-world experiences and organizational context.

From an international perspective, the findings also suggest that cultural and healthcare system characteristics may influence the relationship between physician punctuality and patient loyalty. In countries with universal healthcare systems and greater provider availability, patients may perceive punctuality as a minimum service standard rather than a distinguishing feature. Conversely, in developing healthcare systems such as Indonesia, where physician shortages and multiple practice locations remain common, punctuality becomes an important indicator of organizational commitment and service professionalism. Nevertheless, this study demonstrates that maintaining patient satisfaction remains the primary pathway through which operational improvements translate into sustainable patient loyalty.

Overall, the findings strengthen previous literature while extending current knowledge by emphasizing that operational improvements should be integrated with patient-centered communication and interpersonal care. Hospitals seeking to improve patient retention should therefore adopt comprehensive quality improvement strategies that combine efficient physician scheduling with effective communication, empathy, and responsive service delivery, rather than focusing exclusively on reducing waiting times.

C. LIMITATIONS, THEORETICAL IMPLICATIONS, PRACTICAL IMPLICATIONS, AND FUTURE RESEARCH

Despite providing valuable evidence regarding the relationship between physician arrival punctuality, patient satisfaction, and patient loyalty, this study has several limitations that should be acknowledged when interpreting the findings. First, the study employed a cross-sectional design, in which all quantitative data were collected at a single point in time. Consequently, although the mediation analysis demonstrated statistically significant relationships among the variables, the temporal sequence required to establish causal inference cannot be fully confirmed. Longitudinal studies following patients across multiple outpatient visits would provide stronger evidence regarding how physician punctuality influences patient satisfaction and loyalty over time [40].

Second, the quantitative findings relied primarily on self-reported questionnaire data, making the results susceptible to common method bias and social desirability bias. Respondents may have overestimated their satisfaction or loyalty because of gratitude toward healthcare providers or reluctance to provide unfavorable evaluations. Although anonymity and confidentiality were assured during data collection, future studies should incorporate objective operational indicators, such as electronic physician attendance records, actual waiting times extracted from hospital information systems, and longitudinal patient revisit data, to complement subjective patient perceptions [41].

Third, this research was conducted exclusively at the Obstetrics and Gynecology Outpatient Clinic of a single private hospital in Indonesia. The organizational characteristics, patient expectations, physician scheduling practices, and healthcare resources may differ substantially from those of public hospitals, primary healthcare centers, or tertiary referral hospitals. Therefore, caution should be exercised when generalizing the findings to other healthcare settings or different clinical specialties. Comparative studies involving multiple hospitals with varying ownership types and geographical locations would improve the external validity and generalizability of the proposed mediation model.

Notwithstanding these limitations, this study offers several important theoretical implications. The findings extend the SERVQUAL framework by demonstrating that physician punctuality should not be regarded solely as an operational indicator of service reliability but also as a strategic determinant of patients' psychological evaluations of healthcare quality. The full mediation identified in this study indicates that physician punctuality affects patient loyalty indirectly through patient satisfaction rather than through a direct behavioral pathway. This finding supports the Stimulus–Organism–Response (S–O–R) framework, where physician punctuality functions as the external stimulus, patient satisfaction represents the internal cognitive and emotional state, and patient loyalty reflects the resulting behavioral response [42]. Accordingly, future service quality models should incorporate operational efficiency and patient experience as complementary constructs rather than treating them as independent determinants of healthcare outcomes.

From a managerial perspective, the findings emphasize that improving physician punctuality alone is unlikely to maximize patient loyalty unless hospitals simultaneously strengthen patient-centered communication and service recovery strategies. Hospital administrators should implement integrated scheduling systems that minimize physician delays while ensuring that patients receive timely information regarding unavoidable schedule changes. Real-time notification systems, transparent queue management, and standardized communication protocols may substantially reduce patients' negative perceptions of waiting time. Furthermore, healthcare professionals should receive continuous training in empathetic communication, responsiveness, and interpersonal skills, enabling them to maintain positive patient experiences even when operational constraints cannot be completely eliminated [43].

The findings also have implications for healthcare policy. Hospital accreditation agencies and policymakers should consider expanding service quality indicators beyond waiting-time compliance alone. Evaluating patient-reported experience measures, communication quality, and satisfaction alongside operational performance may provide a more comprehensive assessment of healthcare quality. Such multidimensional performance indicators could facilitate more effective quality improvement initiatives while encouraging hospitals to balance operational efficiency with patient-centered care.

Finally, several opportunities exist for future research. Longitudinal studies are recommended to examine changes in patient satisfaction and loyalty across repeated outpatient visits and to establish stronger causal relationships among the study variables. Future investigations should also evaluate the proposed mediation model across different clinical departments, including internal medicine, surgery, pediatrics, and emergency services, where patient expectations regarding physician punctuality may differ considerably. In addition, comparative studies involving public and private hospitals, different regions, and various healthcare systems would determine the consistency of the present findings across diverse organizational and cultural contexts. Future researchers may further enrich the model by incorporating additional variables, such as patient trust, perceived service value, physician communication quality, hospital reputation, and digital health service utilization, to develop a more comprehensive explanation of patient loyalty in contemporary healthcare environments [44].

Overall, the present study demonstrates that physician punctuality represents an important operational indicator; however, its influence on patient loyalty is realized primarily through enhanced patient satisfaction. Consequently, hospitals should integrate operational management, patient-centered communication, and service quality improvement into a unified strategy for achieving sustainable patient loyalty and improving organizational performance.

V. CONCLUSION

This study aimed to examine the influence of physician arrival punctuality on patient loyalty through the mediating role of patient satisfaction among patients attending the Obstetrics and Gynecology Outpatient Clinic at Permata Bekasi Hospital using a sequential explanatory mixed-methods approach. The findings demonstrate that physician punctuality significantly influences both patient satisfaction ($p < 0.001$) and patient loyalty ($p = 0.002$). Quantitative analysis revealed that physician punctuality explained 57.3% of the variance in patient satisfaction ($R^2 = 0.573$), while its direct contribution to patient loyalty was relatively modest ($R^2 = 0.095$, or 9.5%). Furthermore, patient satisfaction significantly predicted patient loyalty ($p < 0.001$; $R^2 = 0.277$), and mediation analysis showed that incorporating patient satisfaction increased the explanatory power of the overall model to 29.6% ($R^2 = 0.296$). The direct relationship between physician punctuality and patient loyalty became statistically insignificant ($p = 0.112$) after patient satisfaction was introduced into the model, confirming that patient satisfaction functions as a full mediator. The qualitative findings further reinforced these statistical results by demonstrating that empathetic communication, responsiveness, clear information regarding delays, and professional interactions substantially reduced patients' negative perceptions of physician lateness and strengthened their overall service experience. These findings indicate that physician punctuality should not be considered solely as an operational performance indicator but rather as an essential component of patient-centered healthcare quality that contributes to patient loyalty through enhanced satisfaction. Accordingly, hospitals should integrate physician scheduling optimization with effective communication strategies, service recovery protocols, and interpersonal care to improve both operational efficiency and patient experience. Future research should employ longitudinal and multicenter study designs involving diverse hospital settings to strengthen causal inference and improve the generalizability of the findings. In

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addition, incorporating objective operational indicators, such as electronic physician attendance records, actual waiting times, hospital information system data, and digital patient experience measures, together with additional constructs including patient trust, perceived service value, hospital reputation, and digital health utilization, would provide a more comprehensive understanding of the determinants of patient loyalty in contemporary healthcare services.

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DATA AVAILABILITY

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request. Data are not publicly available because they contain information that could compromise participant confidentiality.

AUTHOR CONTRIBUTION

Husna conceived and designed the study, collected and curated the data, performed the statistical analysis, interpreted the findings, and prepared the original manuscript draft. Endy M. Astiwara contributed to the study conceptualization, research methodology, data interpretation, validation of the findings, manuscript review, and overall supervision of the research. Mulyadi Muchtiar contributed to the research design, methodology development, critical revision of the manuscript, validation of the results, and academic supervision. Dicky Budiman, Muslikh, and Hanny Handjaja Ronosulistyo contributed to the interpretation of the findings, critically reviewed the manuscript for important intellectual content, and provided constructive suggestions to improve the quality of the study. All authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

DECLARATIONS

ETHICAL APPROVAL

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the appropriate Institutional Health Research Ethics Committee prior to data collection. All study procedures involving human participants complied with applicable institutional and national ethical standards.

CONSENT FOR PUBLICATION PARTICIPANTS

Written informed consent was obtained from all participants before their inclusion in the study. Participation was voluntary, and respondents were informed of the study objectives, procedures, confidentiality measures, and their right to withdraw from the study at any time without any consequences.

COMPETING INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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