

EXPLORING THE SEQUENTIAL MEDIATION OF PATIENT EXPERIENCE AND SATISFACTION IN THE RELATIONSHIP BETWEEN DENTAL PRACTICE-RELATED FACTORS AND PATIENT LOYALTY

Halimah Hasan¹, Stephanie J. Kusnadi², Margaretha P. Berlianto^{3*}

^{1,2} Student Master of Management and Master of Health Administration, Universitas Pelita Harapan, Tangerang, Indonesia

³ Professor Master of Management, Universitas Pelita Harapan, Tangerang, Indonesia

*Corresponding Author Email: margaretha.berlianto@uph.edu

ABSTRACT

Aim and Objective: This study examines how dental-practice related factors influence patient loyalty through the sequential mediating roles of patient experience and patient satisfaction in dental clinics. **Method:** A quantitative cross-sectional survey was conducted among patients attending two franchise dental clinics in Depok, Indonesia. Data were collected using a structured self-administered questionnaire and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). **Results:** The findings show that facilities, dentist service, staff service, and safety have significant positive effects on patient experiences, while price fairness does not demonstrate a significant effect. Patient experience strongly predicts patient satisfaction, and patient satisfaction, in turn, has a substantial positive impact on patient loyalty. Mediation analysis confirms that patient experience mediates the effect of facilities, dentist service, staff service, and safety on patient satisfaction. In addition, patient satisfaction sequentially mediates the relationship between patient experience and patient loyalty. **Conclusion:** Patient loyalty in dental clinics is primarily shaped through experiential and interpersonal pathways rather than pricing considerations alone. Strengthening dentist-patient communication, staff responsiveness, safety practices, and facility quality appears critical for improving patient satisfaction and sustaining long-term patient loyalty.

KEYWORDS: dental services; patient experience; patient satisfaction; patient loyalty; PLS-SEM

1. INTRODUCTION

Oral healthcare needs in Indonesia remain high, while utilisation of professional dental services remains relatively low. The 2023 Indonesian Health Survey (Survei Kesehatan Indonesia, SKI) reported that 56.9% of residents aged three years and above experienced oral or dental problems, yet only around one in ten sought professional dental care within the previous year, indicating persistent underutilisation of dental services (Kementerian Kesehatan Republik Indonesia, 2024). At the same time, empirical evidence shows that the National Health Insurance system (Jaminan Kesehatan Nasional, JKN) has achieved approximately 95.7% population coverage and has substantially increased healthcare utilisation, as reflected in national claims data (Nugroho et al., 2023; Chairunisa et al., 2024). These patterns suggest that although unmet need and financial access may stimulate initial visits, they do not necessarily translate into continuity of care or sustained engagement with the same provider, highlighting the strategic importance of service quality in dental clinics.

Beyond the public health context, the dental sector in Indonesia represents a growing and increasingly competitive market. A recent market analysis estimates the Indonesia dental care market at approximately USD 250 million, indicating strong commercial growth and heightened competition among private dental providers (Ken Research, 2024). Rising utilisation under JKN further increases patient volumes, but in urban settings where dental clinics are increasingly dense, patients can easily switch providers after a single visit, reinforcing the managerial need to convert clinic visits into patient satisfaction and long term loyalty (Dewan Jaminan Sosial Nasional, 2024). Prior dental research consistently shows that satisfaction with dental services is a proximal determinant of loyalty to one's dentist, emphasising the importance of understanding how service delivery translates into repeat visits and recommendations (El Dalatony et al., 2023). In this context, retaining existing patients becomes as important as attracting new ones, as patient switching across clinics can quickly erode service volumes and revenue stability. Extant healthcare literature consistently links service quality to patient satisfaction and subsequent behavioural intentions, including revisit and recommendation behaviours (AlOmari and Hamid, 2022; Rauf et al., 2024). In dental care settings, key drivers of satisfaction and loyalty commonly include dentist communication and competence, staff responsiveness, cleanliness and adequacy of facilities, and perceptions of safety (Szabó et al., 2023; Keikavoosi-Arani et al., 2024). Perceived value and price fairness are also frequently discussed as contributors to satisfaction and loyalty in healthcare services, although their relative importance varies depending on context and patient cost exposure (Rauf et al., 2024). Together these findings indicate that dental service quality is multidimensional and that competitive advantage is unlikely to be achieved through a single service attribute alone.

Despite extensive research examining determinants of patient satisfaction in healthcare, prior studies have not reached consensus regarding which service quality exert the strongest influence on satisfaction and loyalty

outcomes. Findings remain inconsistent across settings, populations, and analytical models, limiting comparability and generalisability (AlOmari and Hamid, 2022; Ferreira et al., 2023). In dental healthcare settings, studies examining patient satisfaction and revisit intentions often employ heterogeneous service quality dimensions and conceptual frameworks, constraining understanding of how multiple attributes jointly shape patient outcomes (Othman and Kadasah, 2025). Moreover, patient's evaluations of oral healthcare are shaped by interactions between service quality attributes and experiential perceptions, indicating the need for more integrated analytical approaches (Levin et al., 2025). This study responds to these gaps by integrating multiple dental practice-related factors within a sequential experience to satisfaction to loyalty framework.

1.1. Conceptual Framework and Hypotheses

Service quality has long been recognised as a key determinant of patient perceptions and behavioural intentions in healthcare services. In dental care, service quality encompasses both technical and interpersonal aspects of service delivery, including clinical competence, communication, staff interactions, physical facilities, safety practices, and pricing perceptions. Prior studies show that multidimensional approaches to service quality provide more comprehensive explanations of patient evaluations than single attribute models, particularly in service intensive and experience sensitive settings such as dental clinics (Szabó et al., 2023; Othman and Kadasah, 2025; Fairaq et al., 2025).

Evidence across healthcare contexts suggest that service quality attributes influence patient outcomes primarily through experiential and evaluative processes. In dental clinic settings, effective communication between dentist and patient, staff responsiveness, adequate facilities, and visible safety practices enhance patients' comfort, reduce anxiety, and shape how care encounters are experienced (Ai et al., 2022; Keikavoosi-Arani et al., 2024; Ho et al., 2025). Perceptions of price fairness may also influence patient evaluations, particularly when patients are exposed to direct out-of-pocket payments (OOP), although its experiential relevance may vary across context (Konuk, 2019; Rauf et al., 2024). Collectively, these findings indicate that dental practice-related factors are expected to shape patient experience during service encounters.

H1a: *Price fairness has a positive effect on patient experience.*

H1b: *Facilities has a positive effect on patient experience.*

H1c: *Dentist service has a positive effect on patient experience.*

H1d: *Staff service has a positive effect on patient experience.*

H1e: *Safety has a positive effect on patient experience.*

Patient experience reflects patients perceptions of interactions, communications, and the care environment across the service encounter and functions as a critical bridge between service quality attributes and post-visit evaluations. Extensive evidence shows that more positive patient experiences are associated with higher levels of patient satisfaction in healthcare services, including dental care (Chen et al., 2022; Tian et al., 2024). In dental clinics, positive experiences stemming from clear explanations, empathetic communications, and efficient services consistently translate into more favourable satisfaction judgements (Park et al., 2021; Rao et al., 2025).

H2: *Patient experience has a positive effect on patient satisfaction.*

Patient satisfaction represents a consolidated evaluative judgment of the services and is widely recognised as the most proximal determinant of patient loyalty in dental services. Satisfied patients are more likely to revisit the same clinic and recommend their dentist to others, underscoring satisfaction's central role in sustaining long-term patient relationship (Park et al., 2021; AlOmari and Hamid, 2022; El Dalatony et al., 2023).

H3: *Patient satisfaction has a positive effect on patient loyalty.*

Beyond direct effects, prior research indicates that loyalty develops through sequential evaluative processes. Patient experience shapes satisfaction, which subsequently translates into loyalty intentions such as revisiting and recommending healthcare providers (Gün and Söyük, 2025; Chen et al., 2025). Although this sequential mediation mechanism has been examined in broader healthcare contexts, empirical evidence remains limited in dental clinic settings. Accordingly, patient experience and patient satisfaction are expected to function as sequential mediators in the relationship between dental practice-related factors and patient loyalty.

H4a: *Patient experience mediates the relationship between price fairness and patient satisfaction.*

H4b: *Patient experience mediates the relationship between facilities and patient satisfaction.*

H4c: *Patient experience mediates the relationship between dentist service and patient satisfaction.*

H4d: *Patient experience mediates the relationship between staff service and patient satisfaction.*

H4e: *Patient experience mediates the relationship between safety and patient satisfaction.*

H5: *Patient satisfaction mediates the relationship between patient experience and patient loyalty.*

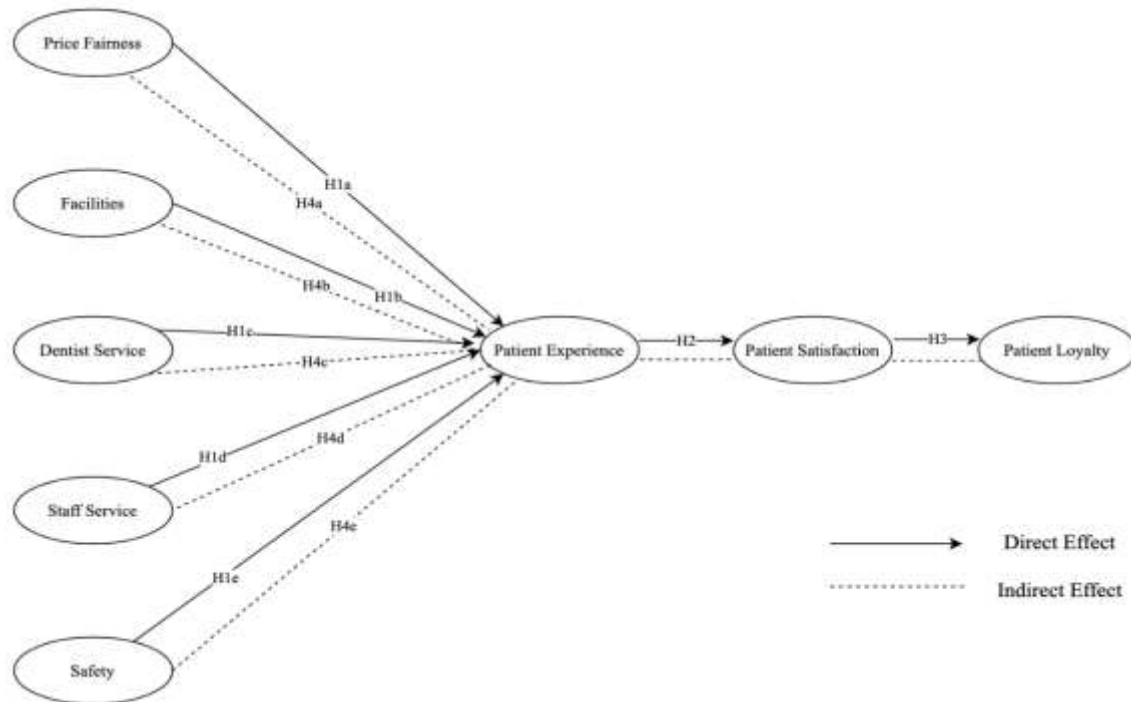


Figure 1. Research Model

1.2. Objective

Accordingly, this study investigates how multiple Dental Practice-Related Factors (price fairness, facilities, dentist service, staff service, and safety) affect patient loyalty through the sequential mediating roles of patient experience and patient satisfaction. By clarifying these relationships, the study contributes to service quality and patient-centered care literature while offering practical insights for dental clinics seeking to translate increasing service utilization into sustained patient loyalty within Indonesia’s evolving healthcare landscape.

2. METHODS

This study employed a quantitative, cross-sectional survey design to examine the relationship among dental practice-related factors, patient experience, patient satisfaction, and patient loyalty. The study population included patients aged 18 years or older who had received at least one dental treatment visit at franchise dental clinics in Depok, Indonesia. Data were collected from two clinics operating under the same franchise system with identical standard operating procedures and treatment pathways, thereby minimising operational variation across sites.

The minimum sample size was determined using G*Power 3.1 (linear multiple regression, medium effect size $f^2 = 0.155$, $\alpha = 0.05$, power = 0.95), indicating a minimum requirement of 138 respondents. The final sample exceeded this threshold. Data collection was conducted October – December 2025 using an online questionnaire administered via Google Forms in Bahasa Indonesia. All participants provided informed consent prior to participation.

Data were collected using a structured self-administered questionnaire adapted from several studies (Siripatthanakul and Vui, 2021; Al-Abdallah and Ababakr, 2023; Sun and Moon, 2024). The instrument measured dental practice-related factors (price fairness, facilities, dentist service, staff service, and safety), patient experience, patient satisfaction, patient loyalty, using a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The final questionnaire comprised 39 items representing eight reflective constructs. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4.1.1.4. The analysis followed a two-stage approach, including assessment of the measurement model for reliability and validity, followed by evaluation of the structural model to test the proposed hypotheses. Mediation and sequential mediation effects were examined using bootstrapping procedures, focusing on the significance of indirect effects linking dental practice-related factors to patient loyalty through patient experience and patient satisfaction.

2.1. Ethical Consideration

This study was conducted in accordance with ethical principles for research involving human participants. Ethical approval was obtained from the **relevant institutional ethic committee** prior to data collection. Participation was voluntary, informed consent was obtained from all respondents, and data were collected anonymously to ensure confidentiality and privacy.

3. RESULTS

A total of 239 valid questionnaires were included in the final analysis. As shown in Table 1, most respondents were female (70.3%) and aged 29-44 years (71.5%). The majority held a bachelor's degree (53.1%) and more than half reported dental expenditures of less than IDR 1,000,000 per visit (56.9%).

Table 1. Respondent Profile

Variables		Number	%
Gender	Male	71	29.7
	Female	168	70.3
Age	18-28 y	42	17.6
	29-44 y	171	71.5
	45-60 y	26	10.9
	>60 y	0	0
		0	0
Education Level	Senior High School / Equivalent	44	18.4
	Diploma (D1- D3)	42	17.6
	Bachelor's Degree (S1)	127	53.1
	Postgraduate Degree (S2/S3)	26	10.9
Expenditure for Dental Treatment (per visit)	< IDR 1,000,000	136	56.9
	IDR 1,000,000 – IDR 3,000,000	78	32.6
	IDR 3,000,000 – IDR 7,500,000	21	8.8
	> IDR 7,500,000	4	1.7

3.1. Measurement Model Assessment

The measurement model demonstrated satisfactory reliability and validity. Composite reliability (CR) values for all constructs exceeded the recommended threshold of 0.70, while Average Variance Extracted (AVE) values were above 0.50 indicating adequate convergent validity (Table 2). Although several indicators within the facilities construct showed loadings slightly below 0.70, they were retained due to their theoretical relevance and acceptable contribution to construct reliability, consistent with prior PLS-SEM guidelines.

Table 2. Validity And Reliability Testing

Item and Constructs		Outer Loading	
Price Fairness (CR= 0.872, AVE= 0.611)			
PR1	Dental fees are not high.	0.791	
PR2	Dental fees are fair.	0.813	
PR3	Dental fee costs are rational.	0.796	
PR4	The prices are charged fairly.	0.784	
PR5	Dental service fees are consistent with the quality provided.	0.693	
PR6	Dental fees are acceptable.	0.805	
Facilities (CR= 0.802, AVE=0.504)			
FA1	The clinic provides up-to-date equipment	0.594	
FA2	The clinic provides waiting times that are appropriate to the appointment schedule.	0.650	
FA3	The materials used in the clinic are clean.	0.778	
FA4	The clinic's equipment is clean.	0.723	
FA5	The clinic's waiting room is clean and comfortable.	0.763	
FA6	The clinic's floors are clean and comfortable at all times.	0.735	
Dentist Service (CR=0.878, AVE=0.577)			
DS1	The doctor clearly explains my treatment plan.	0.762	
DS2	The doctor asks patient opinion and encourages them to participate in the decisions.	0.809	
DS3	The doctor considers the patients' expectations and needs.	0.719	
DS4	The doctor meets patients' expectations and needs.	0.764	
DS5	The doctor has sufficient skills and is good at his/her job.	0.713	
DS6	The doctor has interpersonal skills to reduce the patient's anxiety.	0.781	

DS7	The reputation of the doctor is important for me	0.764	
Staff Service (CR= 0.866, AVE= 0.599)			
SS1	The clinic staff are always willing to help patients.	0.797	
SS2	The clinic staff work together for patients' best interests.	0.789	
SS3	The clinic staff give each patient personal attention.	0.732	
SS4	The clinic staff provides prompt service to patients.	0.718	
SS5	The clinic staff understand patients' needs.	0.829	
Safety (CR= 0.825, AVE= 0.656)			
SF1	Services provided by the staff were reliable	0.798	
SF2	The clinic pays sufficient attention to patients' privacy and confidentiality.	0.810	
SF3	The clinic has adequate facilities to protect patients from infections.	0.814	
SF4	The overall clinic environment is conducive to patient comfort.	0.818	
Patient Experience (CR= 0.812, AVE= 0.638)			
PE1	The interior design and decorations of this dental practice appeal to my visual sense.	0.770	
PE2	The background music in the waiting room and the dental room appeals to my sense of hearing.	0.795	
PE3	The sympathetic attitude of the staff creates a strong emotional attachment to this clinic.	0.819	
PE4	The level of professionalism in this dental practice makes me feel confident.	0.809	
Patient Satisfaction (CR= 0.832, AVE= 0.749)			
PS1	Overall, I am satisfied with the clinic service.	0.844	
PS2	I feel good about visiting the clinic whenever I need any dental treatment.	0.883	
PS3	The overall feeling about prices, facilities, and services in the clinic is better than I expected.	0.869	
Patient Loyalty (CR= 0.911, AVE= 0.789)			
PL1	I share positive experiences about the clinic with others.	0.879	
PL2	I encourage friends and relatives to use the clinic.	0.896	
PL3	I consider the clinic to be my first choice.	0.864	
PL4	I recommend the clinic to others.	0.914	
<i>Notes: CR= Composite Reliability; AVE= average variance extracted.</i>			

Discriminant validity was assessed using Heterotrait-Monotrait (HTMT) ratio. All HTMT values were below the conservative threshold of 0.90, confirming adequate discriminant validity among constructs (Table 3).

Table 3. Discriminant Validity Htmt

	Dentist Service	Facilities	Patient Experience	Patient Loyalty	Patient Satisfaction	Price Fairness	Safety	Staff Service
Facilities	0.751							
Patient Experience	0.716	0.696						
Patient Loyalty	0.736	0.625	0.774					
Patient Satisfaction	0.803	0.699	0.774	0.887				
Price Fairness	0.513	0.548	0.488	0.504	0.569			
Safety	0.805	0.799	0.760	0.664	0.694	0.528		
Staff Service	0.845	0.756	0.792	0.759	0.823	0.574	0.849	

3.2. Structural Model and Hypothesis Testing

The structural model was evaluated using bootstrapping procedures in SmartPLS. The results of direct and indirect effects are summarised in Table 4.

Table 4. Hypothesis Testing Result

HYPOTHESIS	PATH	Original sample	p-value	RESULT
H _{1a}	Price Fairness → Patient Experience	0.047	0.198	Not supported
H _{1b}	Facilities → Patient Experience	0.159	0.009	Supported
H _{1c}	Dentist Service → Patient Experience	0.145	0.021	Supported
H _{1d}	Staff Service → Patient Experience	0.299	0.000	Supported
H _{1e}	Safety → Patient Experience	0.193	0.006	Supported
H ₂	Patient Experience → Patient Satisfaction	0.647	0.000	Supported
H ₃	Patient Satisfaction → Patient Loyalty	0.774	0.000	Supported
H _{4a}	Price Fairness → Patient Loyalty (Indirect)	0.023	0.201	Not supported
H _{4b}	Facilities → Patient Loyalty (Indirect)	0.079	0.011	Supported
H _{4c}	Dentist Service → Patient Loyalty (Indirect)	0.073	0.027	Supported
H _{4d}	Staff Service → Patient Loyalty (Indirect)	0.149	0.001	Supported
H _{4e}	Safety → Patient Loyalty (Indirect)	0.097	0.008	Supported
H ₅	Sequential mediation (Experience → Satisfaction)	0.501	0.000	Supported

3.3. Direct Effects

Price fairness showed a positive but non-significant effect on patient experience ($\beta = 0.047$, $p = 0.198$), leading to the rejection of H_{1a}. In contrast, facilities ($\beta = 0.159$, $p = 0.009$), dentist service ($\beta = 0.145$, $p = 0.021$), staff service ($\beta = 0.299$, $p = 0.000$), safety ($\beta = 0.193$, $p = 0.006$) all had significant positive effects on patient experience, thus supporting H_{1b}-H_{1e}. Patient experience had a strong positive effect on patient satisfaction ($\beta = 0.647$, $p = 0.000$) supporting H₂. Patient satisfaction, in turn, significantly influenced patient loyalty ($\beta = 0.774$, $p = 0.000$), supporting H₃.

3.4. Indirect and Sequential Mediation Effects

Mediation analysis revealed that patient experience did not significantly mediate the relationship between price fairness and patient satisfaction ($\beta = 0.023$, $p = 0.201$), leading to rejection of H_{4a}. However, patient experience significantly mediated the effects of facilities ($\beta = 0.079$, $p = 0.011$), dentist service ($\beta = 0.073$, $p = 0.027$), staff service ($\beta = 0.149$, $p = 0.001$), and safety ($\beta = 0.097$, $p = 0.008$) on patient satisfaction, supporting H_{4b}-H_{4e}. Furthermore, patient satisfaction significantly mediated the relationship between patient experience and patient loyalty ($\beta = 0.501$, $p = 0.000$), thus supporting H₅. These findings support a sequential evaluative process, whereby dental practice-related factors influence patient loyalty indirectly through patient experience and subsequent satisfaction.

4. DISCUSSION

This study examined how dental practice-related factors influence patient loyalty through patient experience and patient satisfaction. The results indicate that facilities, dentist service, staff service, and safety significantly predicted patient experience, whereas price fairness did not, leading to rejection of H_{1a}. The strong effect of facilities aligns with prior dental research highlighting the role of tangible and sensory cues, such as cleanliness, equipment condition, and waiting area comfort in shaping patient perceptions of professionalism and comfort during dental visits (Aldossary et al., 2023; Emami et al., 2024; Javadi, 2025). These findings reinforce the view that the physical environment remains a salient experiential component in dental care.

Dentist service also significantly influenced patient experience, supporting evidence that patients evaluate dentists not only on technical competence but also on communication quality and interpersonal behaviour. Effective communication between dentist and patient has been consistently linked to trust, understanding, and adherence which enhance patient experience and downstream evaluations (Hamasaki and Hagihara, 2024; Ho et al., 2025; Öz and Saygili, 2025). Staff service exhibited the strongest relationship with patient experience, which is plausible

given that non clinical staff interact with patient across multiple touchpoints throughout the care process. Prior studies show that staff responsiveness and empathy are prominent drivers of patient evaluations in dental and outpatient settings (Tibeica et al., 2024; Fairaq et al., 2025; Hu et al., 2026).

Safety was also a significant predictor of patient experience, consistent with the importance of infection prevention and safe service delivery in dentistry. Visible hygiene practice and adherence to safety protocols reduce anxiety and enhance trust, thereby improving patient experiential perceptions (Javadi, 2025; Almirza et al., 2025; Pingsuthiwong et al., 2025). In contrast, price fairness did not significantly influence patient experience. A likely explanation is the predominance of privately insured patient in the study context, which reduces direct out-of-pocket (OOP) exposure and diminishes price salience. Health economics research suggests that lower cost exposure attenuates price sensitivity, shifting patient evaluations toward non price attributes such as interpersonal quality and responsiveness (Johansson et al., 2023; Graf et al., 2024). While price fairness may be influential in more cost-sensitive dental settings (Poormoosa et al., 2025), the present findings indicate that it does not function as a primary experiential driver in this context (Othman and Kadasah, 2025).

Consistent with H2, patient experience strongly predicted patient satisfaction. This supports the conceptual distinction that experience reflects what patients live through during service encounters, whereas satisfaction represents a consolidated evaluative judgement formed after comparing experiences with expectations (Chen et al., 2025; Samir et al., 2025). Clear communications and patient-centred interactions appear particularly important in translating positive experiences into satisfaction. In line with H3, patient satisfaction had a strong positive effect on patient loyalty. This finding aligns with dental service literature identifying satisfaction as the most proximal determinant of loyalty behaviour, including revisit intention and recommendation (El Dalatony et al., 2023; Szabó et al., 2023).

The mediation analysis supports the view that loyalty emerged through layered evaluative processes rather than the direct effects of individual service attributes. Patient experience significantly mediated the effect of facilities, dentist service, staff service, and safety on patient satisfaction (H4b-H4e), while the mediation effect on price fairness was not supported (H4a). Furthermore, patient satisfaction significantly mediated the relationship between patient experience and patient loyalty confirming the sequential mediation mechanism (H5). These findings are consistent with prior evidence showing that satisfaction functions as a key conduit through which experiential perceptions are translated into loyalty outcomes in healthcare services (Siripipatthanakul and Vui, 2021; Rauf et al., 2024).

Theoretically, this study reinforces a sequential mediation framework in which patient experience contributes to patient loyalty primarily through patient satisfaction. The findings extend dental service quality literature by demonstrating that experiential evaluations alone are insufficient to sustain loyalty unless they are converted into positive satisfaction judgments. Moreover, the results highlight the dominant role of human-related and safety-related attributes over economic considerations such as price fairness in shaping patient experience within insured dental care contexts.

From a managerial perspective, the findings suggest that dental clinics should prioritise service elements that patients directly experience during clinic visits. Enhancing dentist communication, staff responsiveness, and visible safety practices appears more effective in fostering satisfaction and loyalty than pricing adjustment alone. Investments in clinic cleanliness, equipment condition, and waiting area comfort also remain important supporting elements of the patient experience. Pricing strategies should therefore be complemented by clear value communication rather than relied upon as the primary competitive lever.

5. CONCLUSION

This study demonstrates that patient loyalty in dental clinics is driven primarily by patient satisfaction, with patient experience exerting its influence largely through satisfaction. Facilities, dentist service, staff service, and safety were key practice-related factors shaping patient experience, whereas price fairness played a limited role within the experiential pathway. These findings suggest that strengthening interpersonal care, visible safety practices, and the overall clinic environment is more effective for fostering patient loyalty than pricing adjustments alone.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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