

THE EFFECTIVENESS FACTOR OF RATA ID ORTHODONTIC ONLINE TREATMENT ON PATIENT SATISFACTION AT THE RATA ID PARTNER CLINIC MAKASSAR

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Abstract : Online orthodontic platforms like Rata ID offer innovative remote care solutions, yet their impact on patient satisfaction remains underexplored. This study evaluated the effectiveness of Rata ID's online orthodontic services in enhancing patient satisfaction at partner clinics in Makassar. A mixed-method approach was used, combining surveys and interviews among patients using Rata ID aligners. Significant associations were found between communication ($p = 0.029$), response time ($p = 0.019$), service quality ($p = 0.015$), privacy ($p = 0.026$), and continuity of care ($p = 0.025$) with satisfaction. Patients expressed high satisfaction with convenience and affordability, though some delays occurred. Overall, Rata ID's online consultations improved satisfaction, highlighting the need to optimize response time and administrative efficiency.

Keywords: Effectiveness Factors; Online Orthodontic Care; Patient Satisfaction; Rata ID; service quality

INTRODUCTION

Oral and dental health care, including medical consultations and orthodontic treatments, plays a crucial role in maintaining overall health and quality of life. Oral health is not merely a matter of aesthetics but is also closely linked to general well-being, as dental infections and oral disorders can affect systemic health and immune function. Orthodontic treatment provides benefits that go beyond esthetic improvement. It enhances oral function, increases self-confidence, and positively influences social interactions and career opportunities, reflecting its long-term contribution to patients' overall well-being (Mohammed et al., 2025). Orthodontic care, including the use of braces or aligners, helps correct dental alignment and improves facial aesthetics, which can significantly influence an individual's confidence (Tiro Garisi & ., 2018). Routine dental care, including professional cleaning, ensures teeth remain free from plaque and tartar buildup. Recent advances in dental technology have made treatments more efficient and comfortable. One of the innovations gaining popularity is the use of clear aligners, particularly those offered by *Rata ID*, a modern orthodontic platform that provides invisible, removable aligners designed to straighten teeth without traditional braces (Rata.id, 2020).

The Rata ID aligner system offers several advantages, including comfort, aesthetic appeal, and flexibility. The aligners can be removed during meals or brushing, allowing users to maintain normal oral hygiene

practices and dietary habits. The treatment process typically begins with a licensed dentist performing a 3D dental scan, which is then used to design a series of customized aligners. Patients replace their aligners periodically according to their treatment plan. Research has shown that when aligners are used according to standard protocols, they lead to faster and greater improvements (Al-Nadawi et al., 2021).

The rapid advancement of digital technology has profoundly transformed healthcare delivery, establishing online consultations as a viable and sustainable alternative to traditional in-person care. Specifically, online orthodontic consultations offer cost-effective solutions by minimizing unnecessary clinical visits and facilitating continuous remote monitoring (S et al., 2020). Nevertheless, the effectiveness of online consultations is influenced by multiple factors, including the adequacy of technological infrastructure, the quality of communication between practitioners and patients, the robustness of privacy protection, and the timeliness of responses (Cahyawati et al., 2021)(Yanti & Lusiana, Sagita Hokky Tsania, 2022). Ensuring optimal outcomes requires both patients and healthcare providers to possess reliable technological resources, while the platforms utilized must guarantee data security and strict compliance with established privacy regulations.

In the context of orthodontic care, effective communication and timely responses are essential for successful treatment outcomes. Patients expect flexibility and quick feedback, while doctors must be able to diagnose accurately and provide appropriate recommendations. Patient satisfaction thus becomes a key indicator of service quality and effectiveness in online healthcare delivery.

Rata ID collaborates with several partner clinics to support in-person dental procedures following online consultations. One such partner is Gia Dental Care Clinic in Makassar, which served 64 *Rata ID* aligner patients throughout 2023. Patients initially consulted online with *Rata ID* dentists and were later referred to Gia Dental Care for further procedures such as dental impressions or follow-up treatments. Considering Makassar's large population and geographical diversity, online consultations offer a practical alternative for patients who live far from dental clinics.

Therefore, this study aimed to evaluate the effectiveness of *Rata ID*'s online orthodontic care in influencing patient satisfaction at its partner clinic, Gia Dental Care, in Makassar.

METHODS

Study Design

This study employed a mixed-method design that integrated quantitative and qualitative approaches to obtain comprehensive, valid, and reliable data. The study aimed to evaluate the effectiveness of *Rata ID*'s online orthodontic consultations on patient satisfaction at *Rata ID*'s partner clinic. The research was conducted between January and February 2025.

Population and Sampling

The study population consisted of patients who used *Rata ID* aligner products at Gia Dental Care Clinic and other *Rata ID* partner clinics. A total of 52 patients were included in the study, comprising 51 patients who used *Rata ID* aligners and completed the questionnaire, and 6 informants who participated in in-depth interviews (5 patients and 1 dentist from Gia Dental Care Clinic). Participants were selected using purposive sampling based on the following inclusion criteria: (a) willingness to participate, (b) availability of complete clinical records, (c) current or previous use of *Rata ID* aligners, and (d) accessibility for follow-up communication.

Data Collection Instruments and Procedures

Primary data were collected through structured questionnaires and in-depth interviews, while secondary data were obtained from clinic documents, records, and relevant media materials. The quantitative data collection instrument consisted of a questionnaire assessing the effectiveness factors of online orthodontic consultations, including communication, response time, service quality, privacy protection, cost efficiency, and continuity of care. The qualitative component involved semi-structured interviews with both patients and dental practitioners to explore perceptions and experiences regarding online orthodontic services. Documentation, including photographs and audio recordings, was also used to support data validity.

Data Analysis

Quantitative Analysis

Data were analyzed using univariate, bivariate, and multivariate techniques. Univariate analysis was performed to describe the distribution and frequency of variables. Bivariate analysis was conducted using Pearson's correlation test to examine the relationships between effectiveness factors and patient satisfaction, with a significance level set at $p < 0.05$. Multivariate analysis was performed using logistic regression to identify the most influential factors affecting patient satisfaction.

Qualitative Analysis

Qualitative data were analyzed using the Miles and Huberman framework, which consisted of data reduction, data display, and conclusion drawing. This approach facilitated the integration of qualitative insights with

quantitative findings to ensure a comprehensive interpretation of the results. In addition, the data were organized, coded, and thematically analyzed using NVivo software to systematically identify emerging themes and patterns.

Instrument Validity and Reliability

Instrument validity was assessed through content, construct, and criterion validity testing to ensure that each item accurately measured the intended variables. Reliability testing was conducted using internal consistency analysis to confirm the stability of the instrument across items. The normality of quantitative data was tested using the Shapiro–Wilk test at a significance level of 0.05 to verify the suitability of the data for parametric analysis.

Ethical Consideration

This study received ethical approval from the Faculty of Public Health, Hasanuddin University (Protocol No. 271224052396; Letter No. 018/UN4.14.1/TP.01.02/2024). All participants signed informed consent forms, with confidentiality and voluntary participation ensured. The researchers applied a reflective approach to minimize bias, and one team member had extensive experience in qualitative methods. The study's purpose and objectives were explained to participants before the activity began.

RESULTS

TABLE 1 Distribution of Patient Perceptions on Online Orthodontic Consultation Services at Rata ID Clinic Makassar, 2025

Variables	Frequency (N)	%
Doctor-patient communication		
High	36	70.6
Low	15	29.4
Response time		
Very good	21	41.2
Fairly good	30	58.8
Service quality		
Very good	36	70.6
Fairly good	15	29.4
Security and privacy		
Very good	28	54.9
Fairly good	23	45.1
Cost efficiency		
Very good	32	62.7
Fairly good	19	37.3
Continuity of care		
Very good	24	47.1
Fairly good	27	52.9
Patient satisfaction		
Satisfied	27	52.9
Dissatisfied	24	47.1

Table 1 shows the distribution of patient perceptions regarding various dimensions of the online orthodontic consultation services at Rata ID Clinic Makassar. The majority of respondents rated doctor–patient communication and service quality as high (70.6%), indicating effective interaction and clear information delivery between patients and dentists. In terms of response time, most respondents (58.8%) rated it as fairly good, suggesting that while the response was generally satisfactory, there was still room for improvement in timeliness. More than half of the respondents assessed security and privacy (54.9%) and cost efficiency (62.7%) as very good, reflecting confidence in data protection and transparency in treatment costs. Meanwhile, continuity of care received balanced ratings, with 47.1% indicating very good and 52.9% fairly good perceptions. Overall, patient satisfaction was relatively high, with 52.9% of respondents reporting satisfaction with the online orthodontic consultation service.

Doctor–Patient Communication

Most patients described effective and clear communication with their dentists through the Rata ID platform. *“In my experience, communication with the dentist through Rata ID was quite effective, especially for emergency consultations or simple questions... The doctor responded quickly and even scheduled a video call for a detailed check-up.”* (WM, 34 years)

Patients also appreciated the clarity of explanations provided by the doctors.

"I'm not very good with technology, but the Rata ID system made everything easy. From consultation to using the aligner, everything was clear. The teleconsultation was very helpful because the doctor patiently explained everything." (MY, 41 years)

Dentists confirmed that the platform improved communication efficiency.

"The digital platform helps us reach patients efficiently... Integrated record-keeping facilitates coordination among the medical team." (Dr. FD, 29 years)

Response Time

While most patients found the response time satisfactory, some reported delays when communication went through the administrative team.

"There's an online admin as an intermediary... sometimes the response was slow, and I had to wait, especially when I had a toothache." (JD, 19 years)

However, patients noted that automatic reminders and digital follow-ups helped maintain treatment continuity.

"I started my aligner treatment online... all information was connected in their system, so my treatment progress was not interrupted." (SJ, 18 years)

A dentist acknowledged that improving response coordination remained a challenge.

"We are aware that admin delays can affect the patient experience, so we are working to enhance coordination between admin and doctors." (Dr. FD, 29 years)

Service Quality

Patients highlighted that information regarding aligner use and treatment stages was clearly explained from the beginning.

"The information about how to use and clean the aligner and about future treatment was explained clearly by the dentist." (SS, 29 years)

Dentists emphasized that the system allowed efficient monitoring and personalized responses.

"The integrated monitoring system helps us give timely guidance and maintain treatment consistency." (Dr. FD, 29 years)

Security and Privacy

Patients expressed confidence in the clinic's data protection system.

"I feel confident about data privacy because before treatment, there was a written agreement that the clinic would not disclose any patient information." (SJ, 18 years)

Cost Efficiency

Several patients felt that the cost of treatment was reasonable and transparent.

"As someone with a limited budget, I chose Rata ID because it's more affordable than other clinics in Makassar. My teeth became aligned without extra charges—it's a good investment for my confidence." (MY, 41 years)

Continuity of Care and Patient Satisfaction

Patients appreciated the flexibility of hybrid (online–offline) consultations that allowed consistent treatment progress.

"Since I'm busy working, I often use online consultations for routine checkups, but I visit the clinic when adjustments are needed. Rata ID allows me to schedule hybrid sessions conveniently." (SS, 29 years)

The dentist also highlighted that digital monitoring supports continuity of care and patient comfort.

"We maintain service quality with strict medical protocols and an encrypted system. The monitoring system enables timely feedback and ensures continuous care." (Dr. FD, 29 years)

TABLE 2 Factors Associated with Patient Satisfaction at Mitra Rata Clinic ID Makassar

Variables	Patient satisfaction		Total	p-value
	Satisfied	Dissatisfied		
	N (%)	N (%)	N (%)	
Doctor-patient communication				
High	23 (63.9)	13 (36.1)	36 (100.0)	0.029
Low	4 (26.7)	11 (73.3)	15 (100.0)	
Response time				
Very good	7 (33.3)	14 (66.7)	21 (100.0)	0.025
Fairly good	20 (66.7)	10 (33.3)	30 (100.0)	
Service quality				
Very good	23 (63.9)	13 (36.1)	36 (100.0)	0.029
Fairly good	4 (26.7)	11 (73.3)	15 (100.0)	
Security and privacy				
Very good	19 (67.9)	9 (32.1)	28 (100.0)	0.026
Fairly good	8 (34.8)	15 (65.2)	23 (100.0)	
Cost efficiency				
Verv good	22 (68.8)	10 (31.3)	32 (100.0)	0.004

Fairly good	5 (26.3)	14 (73.7)	19 (100.0)	
Continuity of care				
Very good	17 (70.8)	7 (29.2)	24 (100.0)	0.025
Fairly good	10 (37.0)	17 (63.0)	27 (100.0)	

Based on the results of the bivariate analysis (table 2), all factors related to the effectiveness of online consultation showed a statistically significant association with the level of patient satisfaction. This finding aligns with the experiences shared by several patients. One patient stated:

"From my experience, communication through RATA ID is quite effective. We can directly consult via chat, so we don't have to go to the clinic just to ask simple questions. However, sometimes there are issues like poor internet connection or delayed notifications. Also, some admins or doctors might take a bit longer to reply, maybe because they are busy with other patients. But overall, this platform really helps make communication easier, especially for those living far from the clinic. If they could improve the notification system a little, it would be even better." (SJ, 18 years old)

Another patient shared a positive experience:

"My experience with RATA ID has been very positive, especially because of the highly responsive customer service. One night, my aligner felt uncomfortable, and I sent a WhatsApp message. Within a few minutes, the dental team responded and provided a solution. They also regularly monitor my dental condition. It feels like having a personal dentist who's always ready to help." (MY, 41 years old)

The factors of doctor–patient communication ($p = 0.641$), cost efficiency ($p = 0.620$), and security and privacy ($p = 0.572$) also showed strong positive correlations, indicating that interaction quality, information clarity, data protection, and cost-effectiveness play important roles in determining patient satisfaction with aligner services. In addition, the variables of continuity of care ($p = 0.571$) and service quality ($p = 0.540$) significantly contributed to overall satisfaction levels.

These quantitative results are supported by qualitative findings from several patient interviews. One patient described:

"During my aligner use, communication with the dentist wasn't done directly at first—it went through the RATA admin, who then passed it to the doctor. Sometimes there was a slight delay in response from the admin, especially when I complained about tooth pain, so I had to wait." (JD, 19 years old)

However, another patient appreciated the convenience of chat and video call consultations, as well as the clarity of information provided:

"In terms of communication through RATA ID, I think the system is quite organized. Usually, the admin handles all inquiries or consultation schedules first, and then the dentist follows up. For example, when I wanted to check or ask about symptoms, the admin helped arrange the schedule and confirmed the dentist's availability. Sometimes it's a bit delayed because both sides need to confirm, but the advantage is that the admin makes the process neat—no need to call the clinic directly. If there were a feature to chat directly with the doctor for urgent cases, the response would probably be faster. Overall, the intermediary system helps, but interaction with the dentist could be optimized so patients don't feel too 'distant' from their own doctor." (WM, 34 years old)

Data security support was also highlighted as an important factor, with patients feeling confident that their privacy and treatment data were protected due to signed consent forms and secure storage systems:

"I believe my personal and treatment data are well protected and won't be leaked." (JD, 19 years old)

From a cost perspective, patients considered the aligner treatment efficient despite the high initial cost, since it required a one-time payment with no additional monthly fees compared to conventional orthodontic care:

"The initial cost of aligner installation is quite high, but it already includes all treatments and devices. There are no additional monthly fees like traditional braces, so overall it's more cost-efficient." (SS, 29 years old)

Continuity of care was also appreciated, as patients could replace their aligners independently according to schedule while receiving online monitoring:

"I don't need to visit the clinic for follow-up treatments because I'm used to changing the aligners myself with online consultation support from the RATA ID admin and doctors. The reminder system for check-up schedules really helps me stay disciplined." (SS, 29 years old)

Dr. FD emphasized that integrated communication and coordination between admins and doctors are crucial to maintaining service quality and patient satisfaction:

"We recognize the importance of quick coordination between admins and doctors to avoid delays in responding to patients, especially in urgent cases. The integrated digital system allows us to monitor patient progress and provide proper education and instructions." (Dr. Fadhil)

TABLE 3 Results of Logistic Regression Analysis of Doctor-Patient Communication, Response Time, Security, and Privacy Variables on Patient Satisfaction at Mitra Rata Clinic ID Makassar

Variables	B	S.E.	Wald	Df	Sig	Exp(B)	CI 95%	
							lower	upper

Doctor-patient communication	.355	1.510	.055	1	.814	1.426	.074	27.500
Response time	-1.445	.727	3.950	1	.047	.236	.057	.980
Service quality	.355	1.510	.055	1	.128	1.426	.074	27.500
Security and privacy	1.278	.839	2.317	1	.547	3.589	.692	18.600
Cost efficiency	.920	1.526	.363	1	.933	2.509	.126	49.982
Continuity of care	-.075	.891	.007	1	.324	.927	.162	5.316

Based on the results of the logistic regression analysis presented in Table 3.4, it was found that among the six variables tested, only response time showed a significant relationship with patient satisfaction at Mitra Rata ID Clinic Makassar ($p = 0.047$). The $\text{Exp}(B)$ value of 0.236 indicates that respondents who rated the response time as very good were 0.236 times less likely to feel dissatisfied compared to those who rated it as fairly good, after controlling for other variables.

These findings indicate that, within this model, response time is the most influential factor affecting patient satisfaction in online consultation services. This result is further supported by interviews conducted with several patients, who stated that:

"In general, communication via RATA ID is very smooth in my opinion. The dentist can explain the patient's dental issues clearly. What's convenient is that patients can consult anytime without the hassle of waiting in line." (SJ, 18 years old)

Another patient also stated:

"Well, in my opinion, it's pretty effective for quick consultations or basic questions. The best part is the quick response, so you don't have to wait for hours like at the clinic. Especially if you're busy or don't feel like going out, you can just open your phone and consult. The appointment reminder also reminds me not to be late for check-ups, so the treatment doesn't get interrupted. Overall, I like using the RATA ID aligner because it's practical." (WM, 34 years old)

DISCUSSION

This study emphasizes that the effectiveness of online consultations plays a highly significant role in determining patient satisfaction among those undergoing orthodontic treatment using aligner products at Rata ID Partner Clinic in Makassar. This finding aligns with previous research indicating that effective communication in digital health services is a key factor in building patient trust and enhancing satisfaction (Tarifu et al., 2023). Clear and consistent communication allows patients to feel more engaged and secure throughout their treatment process. Similarly, other studies have reported that most respondents rated the quality of telemedicine services as excellent and were satisfied with the services provided (Muhlizardy Muhlizardy et al., 2023). A significant association between service quality and patient satisfaction was found, with high-quality services markedly increasing satisfaction levels. Beyond its effectiveness, telemedicine has also proven efficient, offering convenience, practicality, and flexibility in accessing care at affordable costs. High levels of patient satisfaction are further supported by a systematic review and meta-analysis showing that patient satisfaction with teleconsultation ranged from 38 to 100 on a scale of 0–100, with most studies reporting satisfaction levels above 75% (Vinadé Chagas et al., 2024). A study in East Midlands, UK, revealed that patients gave an average satisfaction score of 4.15 out of 5 for online consultation platforms (Nijhof et al., 2021). Similarly, research conducted among COVID-19 patients in Moscow revealed that 76.4% were satisfied with telemedicine consultations, with higher satisfaction observed among men, younger individuals, and those with good health status (Polunina et al., 2020).

Service effectiveness and telemedicine utilization were identified as key factors influencing satisfaction. In Semarang City, most respondents rated service effectiveness as good, and a significant relationship was found between service effectiveness and patient satisfaction (Andar et al., 2023). Furthermore, patient activeness during online consultations—such as initiating conversations and reducing waiting time—was positively correlated with satisfaction (Andar et al., 2023).

Ease of access and accessibility of telemedicine were also important factors contributing to high satisfaction. Telemedicine ensures continuity of healthcare services and is considered a valuable tool for consultation with healthcare providers (Ahirwar & Singh, 2022). However, despite its advantages, telemedicine faces several challenges, including inadequate equipment, technical difficulties, and poor audio or video quality, all of which can reduce satisfaction (Polunina et al., 2020). A comparative study between telehealth and face-to-face consultations in a urologic oncology clinic revealed that patients preferred telehealth for its efficiency and flexibility, though they still considered in-person care to be of higher quality (Armany et al., 2025). Concerns about the reliability of telemedicine consultations, such as difficulty obtaining high-quality images and connectivity problems, were also frequently reported by healthcare providers (Viswanathan et al., 2023). Hence, although online consultations effectively enhance patient satisfaction, technical challenges and perceived differences in care quality compared to in-person consultations remain areas requiring improvement.

This study reaffirms that doctor–patient communication is the primary factor influencing patient satisfaction. Effective communication is not merely an exchange of information but a complex relationship that plays a critical role in building trust, ensuring accurate diagnoses, and encouraging adherence to treatment plans. Interactive and open communication between healthcare providers and patients greatly contributes to patient understanding of treatment procedures and adherence during therapy. The use of digital platforms that facilitate communication via chat and video calls helps overcome distance and time barriers, allowing patients to feel closely supported throughout their treatment (Bernadette & Loisa, 2025). Hence, doctor–patient communication serves as the cornerstone for creating a high-quality and satisfying healthcare experience.

The importance of communication in healthcare cannot be overstated, as effective communication is directly linked to higher patient satisfaction and loyalty. Evidence shows that when physicians communicate with empathy and clarity, patients report greater satisfaction and demonstrate stronger loyalty to their providers (Lampus & Wuisan, 2024). Furthermore, effective communication improves understanding of treatment plans and adherence, particularly in managing chronic conditions requiring long-term care (Gangopadhyay, 2024)(Ledo Barros & Leardi, 2024). It also reduces medical errors that may arise from miscommunication, especially during complex procedures or in vulnerable populations (Gangopadhyay, 2024).

Empathy and interpersonal skills are key elements of effective communication. Empathy fosters trust and strengthens the doctor–patient relationship, improving both satisfaction and treatment outcomes (Lampus & Wuisan, 2024). Non-verbal communication—such as body language and eye contact—further reinforces verbal messages and enhances the therapeutic relationship (Munro, 2016). A patient-centered communication approach that respects individual preferences, needs, and values is essential for effective healthcare delivery and encourages patient participation (Munro, 2016).

Nevertheless, several barriers can hinder effective communication, including linguistic and cultural differences that may lead to misunderstandings and reduced satisfaction. Addressing these barriers through the use of interpreters and culturally sensitive communication strategies is therefore essential (Munro, 2016). Furthermore, time constraints and heavy workloads often limit opportunities for effective communication, resulting in rushed interactions and lower levels of engagement. Emotional factors such as anxiety or fear may also impede communication; consequently, healthcare providers must recognize and manage these factors appropriately (Ledo Barros & Leardi, 2024). To strengthen communication, structured training should be integrated into medical education and professional development programs⁽²⁰⁾. The utilization of educational media such as brochures, instructional videos, and mobile applications can also enhance patients' understanding of complex information (Munro, 2016). Additionally, implementing patient feedback systems is useful for identifying communication gaps and areas requiring improvement (Ledo Barros & Leardi, 2024).

Response time to patient inquiries and complaints emerged as a key determinant of satisfaction, supported by the strongest statistical correlation in this study. Previous research has demonstrated that prompt responses in teleconsultations significantly improve patient satisfaction, whereas delays tend to erode trust and reduce willingness to continue treatment (Amelia, 2024)(Alexandro & Antonio, 2021). In gynecologic oncology, most patients waited less than ten minutes for teleconsultations, resulting in a satisfaction rate of 88.35% (Aguilar-Ramos et al., 2022). During the COVID-19 pandemic, the rapid expansion of telemedicine contributed to higher satisfaction levels by enabling timely access to healthcare (Garcia-Huidobro et al., 2020). In orthopedic telemedicine, although some patients required in-person follow-ups, an average consultation duration of 4.9 minutes yielded a satisfaction rate of 77.9% (Jain et al., 2024). Convenience and accessibility, particularly the reduction in travel time and associated costs, were major contributors to these positive outcomes.

Service quality also plays an essential role in enhancing satisfaction, encompassing clarity of information, appropriateness of care, and professionalism of healthcare providers. Recent studies have shown that patients' perceptions of online healthcare services are strongly influenced by the ability of professionals to provide understandable explanations and promptly respond to complaints (Mariyam et al., 2025). Other evidence confirms that response speed and frequency of interaction are crucial determinants of satisfaction, with faster responses and more frequent communication associated with higher satisfaction levels (Yang et al., 2015). Moreover, disease risk has been found to moderate this relationship, as high-risk patients place greater value on prompt responsiveness (Yang et al., 2015).

The adoption of digital medicine and teledentistry has also demonstrated a significant positive effect on patient satisfaction, with service quality identified as the dominant factor. In teledentistry, younger patients tend to report higher satisfaction (Alifa Ilmazura, 2024). Similarly, the quality of hospital websites has been positively correlated with both patient satisfaction and intention to recommend services, shaping consumer expectations and perceptions (Ford et al., 2013). Across healthcare settings, service dimensions such as assurance, empathy, and responsiveness are consistently associated with satisfaction, while service quality and waiting time remain significant predictors (Khoirunnisa & Ramadhika, 2024)(Dhiantoro & Megawati, 2024).

Data security and privacy are additional major determinants of patient satisfaction in online consultations. The present study confirmed that confidentiality agreements and secure data management systems enhance

patient comfort and perceived safety during online orthodontic treatment. Ensuring data integrity in e-consultation platforms strengthens confidentiality, accuracy, and reliability, thereby improving patient safety and overall quality of care (Varun et al., 2024). Security measures such as access control and pseudonymization are critical for protecting electronic medical records (Rai, 2022). However, maintaining robust data security in eHealth systems remains a major challenge that requires ongoing refinement of protection mechanisms (Denkovski et al., 2024). Patients' perceptions of vulnerability to privacy breaches may influence their willingness to use online medical services; nonetheless, adequate provider support can alleviate these concerns (Tazi et al., 2024).

In terms of cost efficiency, this study found that although the initial installation of aligners is relatively expensive, transparent payment structures without monthly fees make the service more economical and valuable. This finding aligns with previous research suggesting that transparent and integrated payment systems enhance perceived service quality and trust (Kane & Harvey, 2015). The continuity of care achieved through remote progress monitoring and patient-managed aligner adjustments also contributes to greater flexibility and satisfaction. Moreover, active patient involvement in the treatment process promotes stronger commitment and improved treatment outcomes (Kane & Harvey, 2015).

Patient satisfaction with Rata ID's online orthodontic services reached 52.9%, a result consistent with previous studies on teleconsultation for mandibular orthosis adjustments, which reported satisfaction scores of 4.3 out of 5 despite relatively low acceptance rates (Vincent et al., 2022). Another study found that tele-orthodontics improved adherence, with appointment compliance increasing by 30% and device wear time extending from 14 to 22 hours per day (Almoammar, 2024). Convenience and cost savings were especially advantageous for patients residing in remote areas (Emami et al., 2022).

Key factors influencing satisfaction in tele-orthodontics include the doctor–patient relationship, treatment outcomes, and technological or administrative convenience. A strong doctor–patient relationship significantly enhances satisfaction, even in teleconsultation contexts (Almasri et al., 2024). Treatment success, particularly in achieving the desired dental alignment, is another important determinant of satisfaction (Lyros et al., 2019). Additionally, the ease of scheduling and attending online consultations contributes to patient comfort and preference (Vincent et al., 2022).

This study employed a mixed-methods approach that combined quantitative and qualitative data, providing a comprehensive understanding of patient experiences and the factors influencing satisfaction. This methodological approach aligns with prior recommendations for investigating complex healthcare phenomena (Bell et al., 2022). Qualitative findings revealed communication and administrative challenges, such as delayed responses and dependence on intermediaries, which are consistent with earlier studies identifying similar barriers in teleconsultation (Revilla & Prado, 2024).

Trust also emerged as a critical factor. Patients reported greater confidence in using Rata ID due to transparent communication and strong data protection measures, supporting previous evidence that trust increases the likelihood of choosing digital healthcare platforms (Catapan et al., 2025). Well-integrated information systems were likewise shown to improve operational efficiency and patient satisfaction, in accordance with prior findings (Jimmy Triputra et al., 2023).

This study contributes to the literature by extending the application of online consultation beyond general medical practice to orthodontic care, demonstrating its suitability for aligner-based treatments that require continuous monitoring and intensive communication. Conceptually, the findings reinforce the theoretical framework linking communication, responsiveness, and data security with patient satisfaction in digital health services (Gangopadhyay, 2024). Practically, enhancing administrative communication efficiency, particularly in urgent cases, can further strengthen patient satisfaction and loyalty within Rata ID Partner Clinics. The clinic is also encouraged to strengthen patient education by providing more comprehensive and interactive usage guides to help patients feel more prepared and motivated to adhere to treatment protocols. Furthermore, developing automated reminder and follow-up features within the app could minimize negligence and reinforce treatment continuity.

However, several limitations should be acknowledged when interpreting and applying these results. First, the relatively small sample size and the study's focus on a single clinic limit the generalizability of findings to a broader population. Variations in patient characteristics and clinic conditions elsewhere may lead to different experiences. Second, the cross-sectional design only captures patient satisfaction at a single point in time, failing to account for changes throughout the treatment process. Factors influencing satisfaction may evolve as treatment progresses or as the system improves. Third, the use of questionnaires as a data collection tool may introduce subjective bias from respondents. Although qualitative interviews were used to enrich contextual understanding, perceptions may still be influenced by emotional, social, or desirability biases, potentially affecting data validity. Fourth, technical and resource limitations restricted the range of variables analyzed—especially those related to digital platform usability, internet quality, and technical support—which could play significant roles in the effectiveness of online orthodontic care. Finally, sociocultural dynamics influencing patient perceptions of online consultations were not explored, even though such factors may significantly impact satisfaction and experience, particularly in the context of technology-based healthcare in Indonesia.

CONCLUSIONS

In an era where digital healthcare services are rapidly transforming patient experiences, this study highlights that all tested variables had a positive and significant influence on patient satisfaction among users of Rata ID aligners at Rata ID Partner Clinic Makassar. The doctor–patient communication factor was found to be the most dominant aspect in enhancing satisfaction, where clear, responsive, and effective interactions built trust and comfort throughout the treatment process. In addition, response time played an important role in creating a satisfactory consultation experience, although a few patients reported minor delays in administrative responses. High service quality including the professionalism of dentists, clarity of information, and procedural accuracy was a key determinant of patients' positive perceptions of the effectiveness of this online orthodontic service.

Furthermore, the aspect of patient safety and privacy also contributed significantly to overall satisfaction. The protection of personal data through confidentiality agreements strengthened patients' trust in the clinic's service system. Meanwhile, cost efficiency and continuity of care demonstrated that Rata ID successfully provided both economic value and greater accessibility compared to conventional orthodontic treatment. Transparent payment systems, affordable costs, and consistent monitoring through reminders and online consultations made patients feel continuously supported and well-guided throughout their treatment. These findings emphasize that the combination of effective communication, service quality, data security, and cost efficiency are key determinants in shaping patient satisfaction with digital orthodontic services.

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