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Original Article

Calibrating Patient Trust Through Dentist Communication in AI-Assisted Dental Imaging: A Qualitative Study

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ABSTRACT

Background: Artificial intelligence is increasingly used to support interpretation of dental radiographic images, but diagnostic performance alone does not determine whether patients consider AI-supported recommendations trustworthy. Trust may depend on how visual outputs, uncertainty, professional accountability, privacy, and treatment consequences are communicated. Qualitative investigation is needed to understand how patients interpret these factors during AI-assisted dental care. Objective: To explore how adults perceive trust in AI-assisted dental imaging, how dentist communication shapes confidence and willingness to act, and which contextual factors influence acceptable reliance on AI-supported recommendations. Methods: An interpretive qualitative study informed by a constructivist orientation was conducted in an urban dental-care setting in Medan, Indonesia, between January and May 2026. Twelve adults aged 24–58 years with previous experience of AI-assisted dental imaging participated in semi-structured individual interviews. Purposive variation sampling sought diversity in gender, education, AI awareness, imaging experience, and dental anxiety. Data were examined using reflexive thematic analysis. Results: Three interconnected themes were developed: seeing strengthens belief but does not prove correctness; the dentist remains the trusted interpreter; and trust is conditional on accountability, privacy, and consequence. AI-supported visualization helped participants understand where to focus but did not replace clinical explanation. Trust increased when dentists contextualized findings, acknowledged uncertainty, invited questions, discussed alternatives, and retained responsibility for recommendations. Privacy, fairness, commercial motives, and treatment reversibility also influenced acceptable reliance, with participants seeking stronger human verification before irreversible care. Conclusion: Patient trust in AI-assisted dental imaging was conditional rather than automatic. Appropriate implementation should emphasize transparent clinician interpretation, uncertainty communication, professional accountability, patient choice, and proportionate human verification for higher-consequence decisions. Keywords: artificial intelligence, dental imaging, patient trust, dentist communication, explainability, qualitative research

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INTRODUCTION

Artificial intelligence (AI) is increasingly being applied to dental radiographic imaging to detect, classify, segment, or highlight features that may assist clinical interpretation. Systematic reviews and meta-analyses have reported promising diagnostic performance for AI-assisted caries detection and dentomaxillofacial image interpretation, although performance varies according to imaging modality, reference standard, dataset characteristics, and validation design (1–3). For patients, however, AI is not usually encountered as an abstract measure of sensitivity, specificity, or model calibration. It is experienced through highlighted radiographic regions, probability or confidence scores, and the explanation provided by a dentist when deciding whether finding warrants monitoring, preventive management, additional investigation, or treatment (4).

Patient-facing visualization can make AI-generated findings appear immediate and persuasive, but visibility does not necessarily provide clinically meaningful explanation. Heatmaps, bounding boxes, and similar visual outputs may indicate where a model has focused without explaining why the feature was identified,

how reliable the output is for the individual patient, whether image quality affected the result, or whether an identified abnormality is clinically active. More broadly, research on explainable AI has cautioned that visually intuitive explanations can create confidence that exceeds the evidential certainty or clinical relevance of the underlying model output (4–7). This distinction is particularly important in dentistry because AI-supported interpretations may contribute to decisions ranging from surveillance and preventive treatment to irreversible procedures such as extraction or extensive restoration (8).

Evidence from healthcare settings suggests that patient acceptance of AI is often conditional rather than unconditional. Patients generally appear more receptive when AI is presented as decision support, an additional check, or a tool operating under professional oversight than when it is perceived as replacing clinician judgment or controlling decisions independently (8–10). Consequently, diagnostic accuracy alone is unlikely to determine appropriate patient trust. Excessive trust can convert probabilistic information into perceived certainty, whereas excessive distrust may result in rejection of potentially useful decision support. A more clinically appropriate objective is therefore calibrated trust: confidence proportionate to the available evidence, the uncertainty surrounding the result, the degree of professional oversight, and the consequences of acting on the information (9).

Communication between the dentist and patient is central to this calibration process. Plain-language explanation, empathy, active listening, visual support, opportunities for questions, and shared decision-making can facilitate understanding and strengthen therapeutic relationships (11,12). In AI-assisted consultations, however, communication may also redistribute authority. Statements such as “the AI says” can inadvertently attribute diagnostic agency to software and obscure the clinician's independent reasoning, whereas explanations that distinguish algorithmic pattern recognition from clinical diagnosis may reinforce professional accountability. Qualitative investigation is therefore particularly important because trust in AI-assisted imaging involves meanings and experiences that cannot be adequately captured by diagnostic-performance measures or simple acceptance scores alone. Patients may respond differently according to perceived uncertainty, previous knowledge of AI, dental anxiety, privacy concerns, perceived commercial interests, and the reversibility or seriousness of the proposed treatment (13).

These interpersonal issues occur within a broader governance context. International guidance emphasizes transparency, accountability, appropriate data governance, identifiable human oversight, and protection of patient autonomy in the use of AI for health, while contemporary regulatory frameworks increasingly recognize medical AI systems as technologies requiring risk-sensitive oversight (13–15). Nevertheless, formal regulatory compliance may not be visible to patients during an individual dental consultation. Patients may instead judge accountability through whether the dentist can explain what the AI contributed, whether the output was independently reviewed, how patient images or related information may be processed, and who remains responsible when an AI-supported recommendation is uncertain or incorrect.

Despite rapidly expanding technical literature on dental AI, comparatively less attention has been given to how patients interpret AI-supported dental images and how communication shapes confidence, uncertainty, and willingness to act. The present qualitative study therefore examined how adults with experience of AI-assisted dental imaging understood and evaluated AI-generated visual information; how dentist communication influenced confidence, doubt, and treatment-related decision-making; and how accountability, privacy, fairness, anxiety, and treatment consequences shaped acceptable reliance on AI. The study specifically sought to identify the conditions under which AI-assisted imaging was perceived as trustworthy, the communication practices that strengthened or undermined that trust, and the circumstances in which participants considered additional human interpretation or verification necessary.

MATERIALS AND METHODS

This study used an interpretive qualitative design informed by a constructivist orientation to examine how patients made sense of AI-assisted dental imaging, dentist communication, uncertainty, and treatment-related decision-making. Meaning was treated as arising through participants' interpretations of the dental image, the consultation, and the anticipated consequences of a clinical decision rather than as a fixed attitude toward technology. Reflexive thematic analysis was selected because it supports systematic

interpretation of patterned meaning while recognizing the active role of researchers in developing themes rather than treating themes as objective entities that simply emerge from data (16–18). The investigation was conducted between January and May 2026 in an urban dental-care setting in Medan, Indonesia. The study addressed patient experiences and perceptions and did not assess the diagnostic accuracy of a specific commercial AI product.

Purposive variation sampling was used to include 12 adults aged 24–58 years who had previous experience of dental radiographic imaging accompanied by an AI-assisted visual or verbal explanation. Sampling sought variation in gender, educational attainment, previous awareness of AI, imaging experience, and dental anxiety. Individuals unable to provide informed consent, dental professionals, and AI developers were excluded. Sample adequacy was considered in relation to information richness, diversity of participant accounts, and the inclusion of contrasting or contradictory perspectives rather than through a predetermined numerical saturation threshold. This approach was consistent with the interpretive and reflexive orientation of the analysis and avoided treating saturation as a purely mechanistic sample-size criterion.

Data were generated through semi-structured individual interviews exploring participants' understanding of AI-assisted imaging; reactions to visual highlights and confidence scores; perceptions of accuracy and uncertainty; experiences of dentists' explanations; disagreement between human and AI interpretations; perceived responsibility; privacy and secondary data use; fairness; treatment costs; and treatment choice. Questions were framed to elicit participants' reasoning rather than simply asking whether they considered AI to be beneficial or harmful. Participants were encouraged to describe how they believed the system worked, which aspects of the visual output increased or reduced credibility, how the dentist's explanation influenced interpretation, and what additional information they required before accepting or questioning an AI-supported recommendation. Follow-up probes were used to request examples and explore apparent contradictions within participants' accounts. Interview records were anonymized using participant identifiers.

Analysis followed six recursive phases of reflexive thematic analysis: familiarization with the data, initial coding, construction of candidate themes, review of candidate themes against relevant extracts and the dataset as a whole, definition and naming of themes, and development of the written analytic account (16–18). Coding attended to both semantic and latent meaning. Explicit statements describing AI as an additional check, for example, were considered alongside underlying assumptions concerning visual authority, certainty, professional responsibility, and the transfer of decision-making authority to technology. Reflexive memos were used to document analytic expectations and observations that challenged those expectations. An audit trail documented movement between codes and themes, divergent accounts were retained rather than removed to produce artificial agreement, and a cross-participant comparison table was used to reduce dependence on particularly vivid individual quotations.

The study's reporting was structured with reference to established qualitative reporting guidance, including the Consolidated Criteria for Reporting Qualitative Research and Standards for Reporting Qualitative Research (19,20). Consistent with reflexive thematic analysis, analytic quality was not defined by a requirement for statistical intercoder reliability or a mechanistic saturation threshold; instead, emphasis was placed on transparent analytic development, reflexive interpretation, attention to divergent cases, and a clear relationship between participant accounts and thematic claims. Universitas Prima Indonesia granted ethical approval for the study. Participant anonymity and restricted access to study data were maintained.

RESULTS

The study included 12 adults aged 24–58 years, comprising seven women and five men. Participants represented different educational backgrounds and had experienced bitewing, periapical, panoramic, or cone-beam computed tomography imaging. Their reported prior awareness of AI and dental anxiety also varied. Participants with greater prior awareness of AI were not uniformly more trusting; some questioned model validation and data use more critically, whereas participants with less prior awareness could be

reassured by an apparently clear visual output. Dental anxiety similarly operated in different directions. For some participants, an AI-supported visual finding appeared to corroborate the existence of a dental problem, whereas for others, prominent highlights increased fear and a sense that immediate treatment might be necessary. These contrasting responses reinforced the interpretive finding that visual clarity did not automatically translate into appropriate confidence.

Table 1. Participant characteristics

ID	Age, years	Gender	Education	Imaging experience	AI awareness / dental anxiety
P01	24	Female	Bachelor	Bitewing	High / Moderate
P02	31	Male	Diploma	Panoramic	Moderate / Low
P03	45	Female	Secondary	Periapical	Low / High
P04	38	Male	Bachelor	CBCT	High / Moderate
P05	27	Female	Bachelor	Bitewing	Moderate / High
P06	52	Male	Secondary	Panoramic	Low / Moderate
P07	34	Female	Postgraduate	CBCT	High / Low
P08	41	Male	Diploma	Periapical	Moderate / High
P09	29	Female	Bachelor	Bitewing	High / Moderate
P10	58	Female	Secondary	Panoramic	Low / High
P11	36	Male	Postgraduate	CBCT	High / Low
P12	47	Female	Diploma	Periapical	Moderate / Moderate

Note: AI awareness and dental anxiety are presented as reported in the source dataset. CBCT, cone-beam computed tomography.

Analysis generated three interconnected themes: (1) seeing strengthens belief but does not prove correctness; (2) the dentist remains the trusted interpreter; and (3) trust is conditional on accountability, privacy, and consequence. Together, these themes indicated that participants did not treat trust in AI-assisted dental imaging as a stable attitude toward technology. Instead, confidence was negotiated through the relationship between what participants could see on the image, how the dentist interpreted that information, whether uncertainty and alternatives remained open for discussion, and the potential consequences of acting on the recommendation.

Table 2. Thematic structure and representative quotations

Theme	Interpretive meaning	Verbatim quotation
Seeing strengthens belief but does not prove correctness	AI-supported visualization could orient participants toward a finding and provide initial confidence, but visual highlights and confidence scores were not regarded as sufficient clinical explanations.	"A box around something is not an explanation." (P11)
The dentist remains the trusted interpreter	Trust was strengthened when the dentist clarified the respective roles of AI and clinician judgment, interpreted findings in clinical context, invited questions, and personally owned the recommendation.	"I want the dentist to say, 'I recommend this,' and then tell me how the AI helped." (P12)
Trust is conditional on accountability, privacy, and consequence	Reliance on AI depended on identifiable responsibility, understanding of data use, fairness concerns, perceived motives, and the potential harm or reversibility of the proposed intervention.	"For removing a tooth, I would want another human opinion." (P02)

Theme 1: Seeing Strengthens Belief but Does Not Prove Correctness

AI-assisted visualization gave participants an accessible point of entry into radiographic images that they could not independently interpret. Participants described the visual correspondence between the location highlighted by software and the area subsequently discussed by the dentist as reassuring because it made an otherwise unfamiliar image easier to follow. P06, for example, described the colour display as helping identify where attention should be directed, while P02 and P09 characterized the technology as functioning like an additional check or another set of eyes. In these accounts, visualization appeared to reduce informational asymmetry by providing a shared visual reference for discussion between the dentist and patient.

This confidence remained conditional because participants distinguished between identifying an area of interest and explaining its clinical meaning. P11 emphasized this distinction directly: “A box around something is not an explanation.” Participants wanted to know not only where an abnormality had been highlighted but also what the finding represented, how certain the interpretation was, and what implications followed from it. Numerical confidence information could therefore create additional ambiguity rather than resolve it. P03 described being told that an AI output was “eighty-seven per cent” but remaining uncertain about whether that level of confidence justified drilling the tooth. The relevant question for participants was not simply whether a number appeared high, but how uncertainty should be translated into options such as further examination, additional imaging, preventive management, monitoring, or intervention.

Visual salience could also increase anxiety. Prominent coloured marks were sometimes interpreted as indicators of severity or urgency even when their clinical importance had not yet been explained. This was particularly relevant among participants with greater dental anxiety, for whom seeing several highlighted areas could increase fear before the dentist had contextualized the findings. Conversely, participants also described greater confidence when the dentist acknowledged that the software could be incorrect and explained that the AI output was being independently assessed. The theme therefore reflected a distinction between visibility and evidence: visualization could support orientation and discussion, but appropriate confidence depended on clinical interpretation of what the visualization did and did not establish.

Theme 2: The Dentist Remains the Trusted Interpreter

Participants evaluated AI-assisted imaging largely through the behaviour of the dentist who interpreted it. Confidence was greater when participants perceived that the dentist had independently examined the patient, considered symptoms and history, and then related the AI-supported image to those clinical findings. P03 described relying more on the recommendation when the dentist first examined the mouth and subsequently explained how the visual information corresponded with the clinical assessment. In this context, professional verification was made visible through the sequence and content of the consultation rather than merely through the presence of a clinician.

Clear differentiation between the role of AI and the role of the dentist was especially important. Participants responded positively when AI was explained as a tool that could direct attention toward areas requiring closer review rather than as a machine independently establishing the diagnosis. Technical information appeared most useful when connected to the practical question of what the software contributed and how the dentist reached the final recommendation. Participants were less comfortable with communication that appeared to transfer authority to the system without an accompanying clinical explanation.

Interpersonal communication also influenced how AI-generated information was processed. Participants described empathy, appropriate pacing, and invitations to ask questions as important, particularly when visual highlights increased anxiety. Accounts in which the dentist noticed concern, slowed the explanation, and addressed the patient's interpretation of the visual output were perceived as more collaborative. By contrast, excessive attention to the screen or rapid explanation could make the interaction appear more technology-centred and potentially coercive. Opportunities to confirm understanding were therefore valued because they positioned comprehension as part of the clinical interaction rather than as the patient's responsibility alone.

The importance of professional ownership became especially apparent when participants considered possible disagreement between clinician and software. Participants did not necessarily expect the dentist to follow the AI output, but they expected disagreement to be acknowledged and explained. Concealing an AI result or accepting it without critical interpretation were both regarded as problematic. P12 summarized the preferred relationship between the two sources of information: “I want the dentist to say, ‘I recommend this,’ and then tell me how the AI helped.” Participants therefore appeared to place greater trust in AI-supported care when the dentist retained explicit responsibility for the recommendation rather than presenting the software as the decision-maker.

Trust was also strengthened when the consultation preserved meaningful alternatives. Participants described reassurance when monitoring, prevention, further assessment, and restorative treatment could be discussed as options rather than when the image appeared to compel a single course of action. Consequently, the perceived quality of AI communication was not equivalent to whether the patient accepted treatment. Participants valued explanations that allowed them to understand how an AI-supported finding related to different management options and to participate in the decision.

Theme 3: Trust Is Conditional on Accountability, Privacy, and Consequence

Participants' evaluations of AI extended beyond the immediate image to questions about who remained responsible for decisions, how patient data were handled, and what would happen if an AI-supported recommendation proved incorrect. Responsibility could not, in participants' accounts, be delegated entirely to software. P04 expressed this concern directly: “The computer does not apologise, justify or remedy the damage.” P07 similarly indicated that AI was acceptable when the dentist and clinic remained responsible for its use. These accounts suggested that accountability was understood as requiring identifiable human and institutional responsibility rather than simply access to a technically sophisticated system.

Privacy concerns became more prominent when participants considered the possibility that dental images might leave the clinic, be accessed by external vendors, be linked with other health information, or be reused for future model development. Some participants initially appeared to assume that their images remained within the clinic and expressed greater concern once optional secondary uses were considered. Participants with greater prior awareness of digital technologies tended to raise more detailed questions concerning external access and commercial reuse, although these concerns were not confined to that group. The accounts suggested that apparent absence of privacy concern should not automatically be interpreted as informed acceptance when participants may have incomplete information about how data are processed.

Fairness was discussed in practical rather than abstract terms. Participants questioned whether an AI system had been developed or evaluated using patients, dental anatomy, restorations, implants, image artefacts, and imaging conditions sufficiently similar to their own circumstances. Their concern was therefore not limited to whether an AI system was formally available for clinical use; they also wanted assurance that its output was relevant to the individual patient and image being assessed. These accounts connected perceived fairness with the dentist's ability to understand and communicate the limits of an AI-supported interpretation.

The anticipated consequence and reversibility of treatment produced the clearest variation in acceptable reliance. Participants were generally more comfortable tolerating uncertainty when AI was being used to support screening, monitoring, or consideration of additional imaging than when the same uncertainty could contribute to an irreversible procedure. P02 stated, “For removing a tooth, I would want another human opinion.” Concerns about cost and commercial incentives also influenced interpretation: some participants worried that AI could identify additional abnormalities that generated billable treatment, whereas others believed earlier identification might reduce future treatment burden. Trust was therefore not uniform across decisions. The same participant could consider AI useful for low-consequence decision support while seeking stronger human verification before invasive or irreversible care.

Across the three themes, patient trust was best characterized as conditional and consequence-sensitive. AI-supported visualization could make dental findings more understandable, but visual clarity alone did not establish correctness. Participants continued to rely on dentists to translate technical output into clinically meaningful information, acknowledge uncertainty, explain alternatives, and retain responsibility for recommendations. Trust was further shaped by expectations concerning privacy, fairness, institutional accountability, treatment costs, and reversibility. The findings therefore indicate that appropriate reliance on AI-assisted dental imaging was negotiated through the interaction between technological output, professional interpretation, and the consequences of the decision rather than through confidence in the technology alone.

DISCUSSION

This qualitative study indicates that patient trust in AI-assisted dental imaging is conditional, relational, and sensitive to the consequences of the clinical decision. Across the three themes, participants did not treat an AI-generated highlight or confidence score as sufficient evidence in itself. Instead, trust was negotiated through the interaction between what could be seen on the image, how the dentist interpreted the output, whether uncertainty and alternatives were openly discussed, and whether responsibility for the recommendation remained clearly human. This interpretation is consistent with broader healthcare-AI literature showing that patients tend to accept AI more readily when it supplements rather than replaces professional judgment and when human oversight remains visible (8–10,21).

The first theme, seeing strengthens belief but does not prove correctness, highlights the difference between visual accessibility and clinically meaningful explanation. Participants valued overlays and highlighted regions because these made otherwise unfamiliar radiographs easier to discuss, but they did not necessarily regard those displays as proof of diagnostic correctness. This distinction is consistent with concerns raised in the explainable-AI literature, where saliency maps and other intuitive visual outputs may appear persuasive without necessarily explaining model reasoning, uncertainty, or clinical relevance (4–7). In the present study, confidence scores created a similar tension: numerical precision could appear authoritative while leaving participants uncertain about what the value meant for treatment. These accounts suggest that patient-facing AI explanation should therefore move beyond showing where a model has identified an abnormality and should clarify the clinical significance, uncertainty, and management implications of that finding.

The findings also caution against presenting AI as an independent "second opinion" without qualification. Participants often welcomed AI as an additional check, yet their confidence remained dependent on clinical corroboration by the dentist. Agreement between a clinician and an AI system should not automatically be interpreted by patients as two completely independent sources of evidence, particularly because AI models may reflect clinician-generated labels, training-data characteristics, and systematic limitations identified in the wider medical-imaging literature (4–7). Communication should therefore present AI as an additional source of pattern recognition or decision support whose output requires integration with history, examination, image quality, and clinical context rather than as an autonomous diagnostic authority.

The second theme, the dentist remains the trusted interpreter, reinforces the central role of professional communication in determining how patients understand AI-supported findings. Participants described greater confidence when dentists independently examined the patient, explained how AI contributed to interpretation, acknowledged uncertainty, invited questions, and personally owned the recommendation. These findings are compatible with established principles of effective dentist–patient communication, including plain-language explanation, empathy, active listening, visual support, and shared decision-making (11,12). In the context of AI-assisted care, these behaviours appear to have an additional function: they make human oversight observable. A clinician may formally retain decision-making authority, but patients may not experience meaningful oversight if the clinician simply repeats the software output without explaining how it was assessed.

Communication therefore has implications not only for patient satisfaction but also for safe use of AI-assisted decision support. Participants responded positively when uncertainty was translated into practical options, such as monitoring, additional assessment, prevention, or obtaining another opinion. Generic statements that "AI can make mistakes" are unlikely to be sufficient if patients are not helped to understand what uncertainty means for the particular decision being considered. International guidance on health AI similarly emphasizes transparency, accountability, human oversight, and preservation of patient autonomy rather than treating technical performance as the sole determinant of responsible implementation (13–15). In practice, this suggests that the dentist's explanation should clarify both what the AI contributed and what clinical reasoning remains necessary before action is taken.

The third theme, trust is conditional on accountability, privacy, and consequence, broadens the concept of trust beyond the immediate interaction with the algorithm. Participants wanted responsibility for clinical decisions to remain identifiable at the clinician and institutional level, and some became more concerned about privacy once potential data flows beyond the clinic were considered. This is consistent with wider literature on digital consent and trustworthy healthcare AI, which emphasizes that meaningful consent depends on understandable information about data purpose, access, retention, secondary use, and patient choice rather than on nominal disclosure alone (22,23). The findings also suggest that an apparent absence of concern should not necessarily be interpreted as informed acceptance when patients may not know that images can be processed by external systems or reused for purposes beyond immediate care.

The consequence of a decision emerged as an important condition shaping acceptable reliance. Participants were generally more comfortable with uncertainty when AI supported screening, monitoring, or additional imaging than when a recommendation could contribute to extraction or another irreversible intervention. This consequence-sensitive pattern is consistent with broader ethical arguments that the level of explanation, verification, and shared decision-making required for AI-supported care should reflect both uncertainty and the potential harm associated with acting on an incorrect recommendation (21,24,25). The present findings therefore support a risk-sensitive communication approach in which greater clinical consequence is accompanied by stronger explanation, clearer professional ownership, and, where appropriate, additional human verification.

Participants also raised concerns about fairness, commercial motives, and whether an AI system was applicable to patients or images similar to their own. These concerns indicate that patient trust encompasses more than technical accuracy. Responsible communication may require clinicians and institutions to understand the intended use, relevant validation population, important limitations, and data practices of the AI tools they employ so that they can communicate those boundaries accurately. This expectation is consistent with contemporary governance frameworks emphasizing accountability and transparency in high-risk health applications of AI (13–15,23). It also reinforces the importance of critical AI health literacy: patients should be supported not merely to accept or reject AI but to understand when confidence, uncertainty, questioning, or additional evidence is appropriate (26).

Taken together, the findings suggest a practical communication sequence for AI-assisted dental imaging. The clinician should explain why AI is being used, distinguish its role from clinical diagnosis, demonstrate the relevant visual output without implying certainty, relate the finding to examination and other clinical evidence, acknowledge material uncertainty, discuss reasonable management alternatives, clarify professional responsibility and relevant data-use considerations, and check patient understanding. This sequence should not be treated as a rigid script. Communication should remain responsive to the patient's prior knowledge, dental anxiety, preferences for participation, and the clinical consequences of the proposed intervention. Such an approach is consistent with patient-centred dental communication principles while addressing additional challenges created by AI-supported interpretation (11,12,26).

Several limitations should be considered when interpreting these findings. First, the purposively selected sample consisted of 12 adults from a single urban dental-care context in Medan, and the findings are therefore intended to provide interpretive depth rather than population-level prevalence estimates. Transferability to rural settings, patients requiring language support, individuals with limited access to digital technologies, or substantially different healthcare systems requires further investigation. Second, the study relied on participant accounts of previous experiences and hypothetical scenarios involving disagreement, privacy, and treatment consequences rather than direct observation of standardized AI-assisted consultations. The findings therefore describe perceptions and reasoning rather than objective effects of communication on treatment uptake, diagnostic accuracy, or clinical outcomes. Third, social desirability may have influenced accounts, particularly where participants discussed trust in dentists or professional responsibility. The extent of this risk also depends on the recruitment pathway and any prior relationship between participants and the research team, details that should be reported explicitly in the final manuscript.

Additional methodological limitations relate to qualitative data generation and interpretation. The study used reflexive thematic analysis, in which themes represent an interpretive engagement with the dataset rather than statistically reproducible categories (16–18). Consequently, the three themes should not be interpreted as prevalence estimates or as evidence that all patients experience AI-assisted imaging in the same way. The manuscript should also transparently report interviewer characteristics, language of data collection, transcription and translation procedures, and researcher reflexivity because these factors may shape both participant accounts and their interpretation. If quotations were translated into English, some nuance may have been lost during translation, and this should be acknowledged where applicable. Similarly, if participants were recruited through clinicians or the treating institution, selection and social-desirability effects should be considered explicitly.

Despite these limitations, the study provides a useful patient-centred account of how trust may be calibrated during AI-assisted dental imaging. Its contribution lies not in demonstrating that AI increases or decreases trust, but in identifying mechanisms through which patients judged whether reliance was warranted: visual comprehensibility, clinician interpretation, acknowledgment of uncertainty, preservation of choice, identifiable accountability, transparency regarding data use, and greater verification when consequences were irreversible. Future research should examine these mechanisms prospectively in observed clinical consultations, across diverse patient populations and dental settings, and evaluate whether alternative communication strategies improve understanding, decisional confidence, and appropriate—not merely increased—reliance on AI-supported recommendations.

CONCLUSION

Patients in this qualitative study did not express unconditional trust in AI-assisted dental imaging; rather, acceptance depended on how visual outputs were interpreted, communicated, and connected to professional responsibility and treatment consequences. AI-supported visualization could make radiographic findings easier to understand, but participants continued to rely on dentists to place those findings in clinical context, acknowledge uncertainty, explain alternatives, and retain ownership of recommendations. Trust was further conditioned by concerns about privacy, fairness, institutional accountability, cost, and the reversibility of treatment, with stronger human verification expected when decisions carried greater potential harm. These findings support an implementation approach in which AI is presented as decision support rather than autonomous authority, communication is adapted to patient understanding and anxiety, and higher-consequence decisions receive proportionately greater explanation and clinical corroboration. The study does not establish population-level effects of AI on trust or treatment uptake; instead, it identifies conditions that may support appropriate, patient-centred reliance on AI-assisted dental imaging.

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