

Association of social media misinformation with patient perception of root canal treatment: A cross-sectional study

Rakhi Margret¹, Azhar Malik², Ajay Kumar³, Rachana Dhani⁴, Ankit kumar¹, Dr. Frijo Xavier^{5*}

¹ Department of Conservative Dentistry and Endodontics, Indira Gandhi Government Dental College and hospital, Jammu, Jammu and Kashmir, India

² Professor and Head, Department of Conservative Dentistry and Endodontics, Indira Gandhi Government Dental College and hospital, Jammu, Jammu and Kashmir, India

³ Associate Professor, Department of Conservative Dentistry and Endodontics, Indira Gandhi Government Dental College and hospital, Jammu, Jammu and Kashmir, India

⁴ Registrar, Department of Conservative Dentistry and Endodontics, Indira Gandhi Government Dental College and hospital, Jammu, Jammu and Kashmir, India

⁵ Senior Resident, Oral and Maxillofacial Surgery, Department of Dentistry, All India Institute of Medical Sciences (AIIMS), Bibinagar, Telangana, India

Corresponding Author: Dr. Frijo Xavier

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Abstract

Background: Social media is an increasingly common source of dental information but may also disseminate misinformation about root canal treatment (RCT). This study evaluated the association between social media misinformation and patient perception of RCT and treatment-related decision-making.

Methods: An analytical cross-sectional study was conducted among 251 adults in Jammu, India. A validated 21-item questionnaire assessed RCT perception, misinformation exposure, previous RCT experience, and treatment-related decision-making. Associations were analysed using the Chi-square test, Cramer's V, and binary logistic regression.

Results: Positive perception of RCT was reported by 218 (86.9%) participants. Misinformation exposure was reported by 96 (38.2%), of whom 28 (11.2%) believed the information. Negative perception was significantly higher among participants exposed to misinformation than those not exposed (24.0% vs. 6.5%; $\chi^2 = 14.2$, $p = 0.001$; Cramer's $V = 0.32$). Misinformation exposure was independently associated with negative perception (AOR = 3.8; 95% CI: 1.9–7.5; $p < 0.001$). Social media influence on treatment-related decision-making was also associated with negative perception (AOR = 2.1; 95% CI: 1.1–4.0; $p = 0.020$).

Conclusion: Social media misinformation was significantly associated with negative perception of RCT. Improving digital health literacy and evidence-based clinician-patient communication may help address misinformation-related misconceptions.

Keywords: Endodontics, health misinformation, patient perception, root canal treatment, social media

Introduction

Root canal treatment (RCT) is a well-established procedure for preserving teeth affected by pulpal and periapical disease, with high long-term success rates and favourable functional outcomes.^[1] Despite these advantages, patient perception of RCT is frequently influenced by fear, anxiety, and misconceptions regarding pain and treatment outcomes.^[2]

The widespread use of social media has substantially changed how patients access and interpret healthcare information. An increasing number of individuals seek dental information online before consulting healthcare professionals.^[3,4] Although digital platforms improve accessibility to health information, they also facilitate the dissemination of misinformation that may contradict established scientific evidence.^[5] Previous studies have shown that inaccurate health-related content on social media often achieves greater visibility and engagement than evidence-based information.^[6]

In dentistry, misinformation associated with “biological” or “holistic” dentistry has gained increasing visibility on social media platforms.^[7] Such content frequently promotes

unsupported claims linking RCT with systemic diseases, chronic inflammation, immune dysfunction, and malignancies.^[8] In addition, extraction is sometimes portrayed as a safer alternative to RCT despite evidence supporting tooth preservation whenever feasible.^[9]

Most previous investigations have primarily focused on analysing misinformation-related content on platforms such as YouTube, Instagram, and Facebook.^[10,11] However, limited evidence is available on the direct association between exposure to misinformation and patients' perceptions or treatment-related decision-making in endodontics.^[12] This represents an important clinical concern because conflicting information may contribute to confusion, hesitation, and reduced acceptance of evidence-based treatment.^[13]

Therefore, the present study aimed to evaluate the association between exposure to social media-driven misinformation and patients' perceptions of RCTs, and to assess its influence on treatment-related decision-making. The null hypothesis was that exposure to misinformation has no significant association with patients' perceptions of RCTs.

Subjects and Methods

This analytical cross-sectional questionnaire-based study was conducted at a dental college in Jammu, between January and March 2025. Participants aged ≥18 years from the general population were recruited using convenience sampling through online dissemination of Google Forms and in-person distribution in community settings. Participation was voluntary. Individuals with formal dental education or professional dental background were excluded to minimise professional knowledge bias. The final analytical sample consisted of 251 participants. This study was conducted and reported in accordance with the STROBE guidelines for cross-sectional studies.

Sample Size Determination

The sample size was calculated using the single population proportion formula $n = Z^2P(1-P)/d^2$, assuming 40% prevalence of exposure to health-related misinformation on social media, 95% confidence level, and 6% margin of error, yielding a minimum sample size of 251 participants.^[5]

A structured 21-item questionnaire was developed based on previously published literature and modified according to the objectives of the present study.^[14] The questionnaire comprised five domains: demographic characteristics, awareness and perception of RCT, previous experience with RCT, exposure to misinformation, and treatment-related decision-making. The questionnaire was self-administered and distributed in English.

A pilot assessment involving 30 participants was undertaken to determine the clarity, comprehensibility, and reliability of the questionnaire. Data obtained during this preliminary phase were excluded from the main analysis. Internal consistency of the instrument was evaluated using Cronbach’s alpha, which demonstrated good reliability ($\alpha = 0.82$). Content validity was established by evaluation from three subject experts in endodontics and public health, who assessed the questionnaire for relevance, clarity, and content adequacy. Informed consent was obtained from all participants before questionnaire completion. Only fully completed responses were included in the final analysis.

The primary outcome variable was perception of RCT, categorised as positive or negative. Secondary variables included exposure to misinformation, belief in misinformation, influence of social media on treatment-related decision-making, psychological impact following exposure to RCT-related information, and treatment

preference.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows (version 26.0; IBM Corp., Armonk, NY, USA). Categorical variables were summarised as frequencies and percentages. The association between exposure to misinformation and perception of root canal treatment was assessed using the Chi-square test, with effect size estimated using Cramer’s V. Binary logistic regression analysis was used to determine factors independently associated with negative perception of root canal treatment. Variables demonstrating a p-value <0.20 in univariate analysis, along with those considered clinically relevant, were entered into the multivariable regression model. Adjusted odds ratios with 95% confidence intervals were reported. A p value <0.05 was considered statistically significant.

Ethical approval for the study was obtained from the Institutional Ethics Committee (Approval No. IEC/GDC/125/2025). Participation was entirely voluntary, and electronic informed consent was secured from all participants prior to enrolment. No personal identifying information was recorded to ensure participant confidentiality. The study was carried out in accordance with the ethical principles outlined in the Declaration of Helsinki.

Results

A total of 251 participants were included in the analysis (Table 1). The majority of participants were aged 18-25 years (39.0%), and 59.4% were female. Overall, 86.9% of participants demonstrated a positive perception of RCT, while 13.1% reported a negative perception. Previous experience with RCT was reported by 78.9% of participants. Exposure to misinformation and its behavioural impact are summarised in Table 2. Exposure to misinformation about RCTs was reported by 38.2% of participants, of whom 11.2% believed it. Social media influenced treatment-related decision-making in 58.2% of participants. Psychological impact following exposure to RCT-related information included confusion in 13.7% and hesitation in 3.6% of participants, whereas 82.7% reported no significant psychological impact. Regarding treatment preference, 47.0% preferred RCT, 8.8% preferred extraction with implant placement, and 44.2% indicated that treatment preference would depend on the clinical situation.

Table 1: Demographic characteristics and root canal treatment perception among study participants (n = 251)

Variable	Category	n (%)
a. Age (years)	18-25	98 (39.0)
	26-35	92 (36.7)
	>35	61 (24.3)
b. Gender	Male	102 (40.6)
	Female	149 (59.4)
c. Perception of Root Canal Treatment	Positive	218 (86.9)
	Negative	33 (13.1)
d. Previous Root Canal Treatment experience	Yes	198 (78.9)
	No	53 (21.1)

Table 2: Exposure to root canal treatment-related misinformation and associated behavioural outcomes

Variable	Category	n (%)
a. Exposure to misinformation regarding Root Canal Treatment	Not exposed	155 (61.8%)
	Exposed	96 (38.2)
	Exposed but not believed	68 (27.1)
	Exposed and believed	28 (11.2)
b. Social media influence on treatment-related decision-making	Yes	146 (58.2)
	No	105 (41.8)
c. Psychological impact following exposure to Root Canal Treatment - related information.	Confusion	34 (13.7)
	Hesitation	11 (3.6)
	No impact	206 (82.7)
d. Treatment preference following exposure to Root Canal Treatment -related information.	RCT	118 (47.0)
	Extraction with implant placement	22 (8.8)
	Individualised treatment preference	111 (44.2)

The association between exposure to misinformation and perception of RCT is presented in Table 3. A significantly higher proportion of participants not exposed to misinformation demonstrated a positive perception of RCT compared with those exposed to misinformation (93.5% vs 76.0%). Negative perception was more common among participants exposed to misinformation than among those not exposed (24.0% vs 6.5%). This association was statistically significant ($\chi^2 = 14.2$, $p = 0.001$) with a moderate effect size (Cramer's $V = 0.32$).

Table 3: Association between exposure to misinformation and perception of Root Canal Treatment

Exposure	Positive n (%)	Negative n (%)	Total (n)
No	145 (93.5)	10 (6.5)	155
Yes	73 (76.0)	23 (24.0)	96

$\chi^2 = 14.2$, $p = 0.001$; Cramer's $V = 0.32$ (moderate effect size)

Multivariable analysis is presented in Table 4. Binary logistic regression analysis identified exposure to misinformation as the strongest independent predictor of negative perception of RCT (adjusted odds ratio [AOR] = 3.8; 95% confidence interval [CI]: 1.9-7.5; $p < 0.001$). Social media influence on treatment-related decision-making was also significantly associated with negative perception (AOR = 2.1; 95% CI: 1.1-4.0; $p = 0.020$). In contrast, age (>35 years), gender, and previous RCT experience were not significantly associated with perception of RCT. These findings indicate rejection of the null hypothesis, as exposure to misinformation was significantly associated with patient perception of RCT.

Table 4: Binary logistic regression analysis of factors associated with negative perception of Root Canal Treatment

Variable	Adjusted Odds Ratio	95% CI	p-value
Exposure to misinformation (Yes vs No)	3.8	1.9-7.5	<0.001
Age (>35 vs ≤35 years)	1.6	0.8-3.2	0.120
Female vs Male	1.2	0.7-2.1	0.300
Previous RCT (Yes vs No)	0.7	0.3-1.4	0.280
Social media influence (Yes vs No)	2.1	1.1-4.0	0.020

Discussion

The present study demonstrated a significant association between exposure to social media misinformation and unfavourable perception of RCT. Participants exposed to misinformation were more likely to report negative perceptions, and social media influence on treatment-related decision-making was also independently associated with these perceptions. These findings suggest that digital misinformation may contribute to altered patient attitudes towards evidence-based endodontic care. Social media has emerged as an important source of health information, but the quality and reliability of such content remain inconsistent. Systematic reviews have shown that health-related misinformation is widely disseminated across digital platforms, often gaining greater public engagement than evidence-based information.^[15]

Previous studies evaluating online health information have reported substantial variability in content quality, completeness, and scientific accuracy, raising concerns regarding their potential influence on patient expectations and treatment decisions.^[16,17] Digital misinformation may alter public attitudes and health-related decision-making, particularly when complex clinical information is presented

through simplified or persuasive narratives.^[18] Unlike prior investigations that primarily characterised misinformation content, the present study examined its association with patient perception and treatment-related decision-making in endodontics. This distinction is clinically relevant because the presence of misinformation alone does not necessarily indicate behavioural influence; however, the present findings suggest that exposure to such content may be associated with uncertainty regarding the safety, effectiveness, and necessity of root canal treatment.

A possible explanation for this association is the persuasive nature of social media communication. Health-related content presented through anecdotal testimonials, emotionally charged narratives, or simplified claims may be more readily accepted by lay audiences than evidence-based professional information.^[19] In endodontics, where fear of pain, treatment complexity, and procedural anxiety already influence patient attitudes, misinformation may reinforce pre-existing apprehensions and contribute to treatment avoidance.^[20] Previous evidence has shown that patient anxiety remains an important determinant of endodontic treatment acceptance, and exposure to conflicting online information may further amplify these concerns.^[21]

An additional finding of this study was the independent association between social media influence on treatment decisions and negative perception of RCT. This suggests that social media may increasingly function not only as an information source but also as a behavioural determinant in healthcare decision-making.^[22] As patients increasingly seek dental information before professional consultation, preconceived beliefs shaped by online content may influence clinician-patient interactions, treatment discussions, and acceptance of recommended care.²¹ This has practical implications for endodontic practice, where informed consent and patient confidence play important roles in treatment uptake. The findings also highlight the importance of digital health literacy in dental care.^[23]

Patients may lack the skills to critically appraise the credibility of online health information, particularly when misinformation is presented in authoritative language or accompanied by persuasive visual content. Improving patient awareness regarding reliable information sources and proactively addressing misconceptions during consultation may help reduce misinformation-driven hesitation.^[24, 25] Clinicians should anticipate misinformation-related concerns and incorporate clear, evidence-based communication into routine patient counselling.^[26]

Several limitations of the present study should be acknowledged. First, the cross-sectional design precludes the establishment of causal relationships between social media misinformation and patient perceptions of root canal treatment. Second, the use of convenience sampling may have introduced selection bias, thereby limiting the representativeness of the study population and potentially affecting the external validity of the findings. Additionally, the reliance on self-reported data is subject to recall bias and social desirability bias, which may have influenced participants' responses. The relatively small number of adverse perception outcomes included in the regression analysis may also have reduced the precision and stability of the estimated associations. Furthermore, as participants were recruited from a single geographic region, caution should be exercised when extrapolating these findings to other populations and healthcare settings. Nevertheless, despite these limitations, the study provides clinically relevant preliminary evidence regarding the potential influence of digital misinformation on patient attitudes and perceptions toward endodontic treatment.

Conclusion

Within the limitations of this study, social media-driven misinformation was significantly associated with negative or uncertain perceptions of root canal treatment and emerged as the strongest predictor of treatment hesitancy. Although awareness of root canal treatment was generally high, misinformation appeared to influence patient decision-making and treatment acceptance. These findings highlight the importance of improving digital health literacy and promoting evidence-based patient education through both clinical and digital platforms.

Declarations

Ethics Approval and Consent: Ethical approval was obtained from the Institutional Ethics Committee (Approval No. IEC/GDC/125/2025). Informed consent was obtained from all participants.

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