

Digital Discourse on Root Canal Treatment: A Social Semiotic Analysis of Conspiracy-Driven Misinformation on Social Media

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ABSTRACT

Background

Root Canal Treatment (RCT) is a commonly performed and evidence-based dental procedure. However, social media platforms increasingly circulate misinformation portraying RCT as unsafe and harmful, which may negatively influence patient perceptions and treatment decisions.

Aim

To analyse how misinformation related to Root Canal Treatment is communicated on social media using a social semiotic framework and to assess the quality, tone, and credibility of widely viewed content.

Method

A cross-sectional descriptive analysis of Instagram posts was conducted using predefined search terms related to root canal treatment and conspiracy-driven misinformation. Publicly available posts meeting the inclusion criteria were evaluated for content characteristics, tone, engagement, and misinformation patterns.

Result

Most analysed posts demonstrated fear-based messaging, emotionally charged language, and limited evidence-based references. Posts containing conspiracy-oriented narratives showed higher audience engagement compared to neutral educational posts.

Conclusion

Dental institutions and professional organizations should actively create simple and engaging educational content addressing common concerns about root canal treatment. This may help reduce misinformation online and support informed patient decision-making.

KEYWORDS

Root Canal Treatment, Instagram, Endodontics, Misinformation, Conspiracy, Quantitative Descriptive Analysis.

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I. INTRODUCTION

Root Canal Treatment (RCT) is a widely performed and scientifically established dental procedure used to preserve teeth affected by pulpal and periapical diseases. It is considered one of the most effective methods for maintaining natural dentition and preventing tooth extraction.[1,2] Advances in endodontic materials, diagnostic imaging, and clinical techniques have significantly improved the success rates and predictability of root canal therapy over the years.[2,3] Despite these developments, misconceptions and fear surrounding the procedure continue to persist among the general population.[4]

In recent years, social media platforms such as Instagram, YouTube, TikTok, and Facebook have become major sources of health-related information for the public.[5,6] While these platforms enable rapid dissemination of educational material, they have also facilitated the widespread circulation of misinformation and conspiracy-driven narratives related to healthcare and dentistry.[7,8] Root canal treatment is frequently portrayed online as dangerous, toxic, or associated with systemic diseases, despite the absence of strong scientific evidence supporting such claims.[8,9]

Previous research has demonstrated that misleading healthcare information on social media often receives substantial public engagement, particularly when presented using emotionally persuasive language, sensationalized claims, fear-inducing imagery, and anecdotal experiences.[10,11] Studies evaluating online

endodontic content have reported poor scientific quality and the frequent presence of misinformation in highly viewed social media posts and videos.[12,13]

The spread of misinformation related to RCT may negatively influence patient attitudes, increase dental anxiety, and discourage individuals from seeking appropriate dental treatment.[4,14] Untreated endodontic infections may subsequently result in pain, spread of infection, tooth loss, and reduced oral health-related quality of life.[1]

A social semiotic approach provides an opportunity to examine how visual elements, language, emotional framing, and symbolic communication strategies are used to shape public perception regarding healthcare interventions.[15] Understanding how misinformation surrounding RCT is constructed and disseminated on Instagram may help improve digital health communication strategies and support evidence-based patient education. Therefore, the present study aimed to analyse conspiracy-driven misinformation related to Root Canal Treatment on Instagram and evaluate the tone, credibility, communication patterns, and engagement characteristics of widely viewed content

II. METHODOLOGY

The data collection process was designed to replicate how an average patient searches for information on social media using goal-directed browsing strategies previously described in online health information research. [12,15] Searches were conducted on Instagram using predefined keywords related to Root Canal Treatment and conspiracy-associated narratives. Similar methodologies have been used in previous studies evaluating healthcare misinformation on YouTube and Instagram. [12,16]

All searches were completed on March 10, 2026, using a new public browser to minimize the influence of previous search history, cookies, and algorithm-based personalization.[12] The first 20 posts retrieved for each search term were selected for analysis, as previous studies have suggested that users rarely explore beyond the initial search results. [12,15]

Inclusion Criteria

- Publicly available Instagram posts
- Posts related to Root Canal Treatment
- English language posts
- Posts uploaded within the previous two years
- Video posts retrievable through the selected search terms

Exclusion Criteria

- Duplicate posts
- Non-English posts
- Promotional advertisements
- Irrelevant posts unrelated to Root Canal Treatment
- Private or inaccessible posts to improve reliability, all selected posts were independently reviewed by another member of the research team. [1]

- #Rootcanaltreatment
- #Rootcanaltherapy
- #Rootcanalrisks
- #Rootcanaldangers
- #ShouldIgetrootcanaldone

Figure 1: Search terms used for Instagram data collection.

The study primarily employed a quantitative descriptive content analysis approach while also considering visual and linguistic communication patterns used within Instagram posts, including emotional language, fear-based framing, and conspiracy-oriented messaging.[16]

The variables included in the study were defined and categorized systematically to ensure consistency during data analysis. The post type was classified based on the format of the Instagram content and included video/reel, carousel, infographic, text-based post, and caption-based post. The source category referred to the professional or social background of the content creator and was categorized as dentist, influencer, alternative health professional (AHP), or other.

The tone of the post was evaluated as positive, negative, or neutral. Posts discouraging root canal treatment or portraying it as harmful, unsafe, or unnecessary were categorized as having a negative tone. Posts containing

scientifically inaccurate, misleading, unsupported, or exaggerated claims related to root canal treatment were classified under misinformation.

The variable scientific misunderstanding referred to posts demonstrating incorrect interpretation of scientific concepts, misuse of evidence, or inaccurate representation of research findings. Emotional language was identified in posts that used emotionally charged wording intended to provoke fear, anxiety, anger, or distrust among viewers. Posts that exaggerated potential harm or danger associated with root canal treatment without valid scientific evidence were categorized as fear mongering. Additionally, posts implying suppression of truth, corruption within dentistry, hidden agendas, or institutional conspiracies were classified under conspiracy language.

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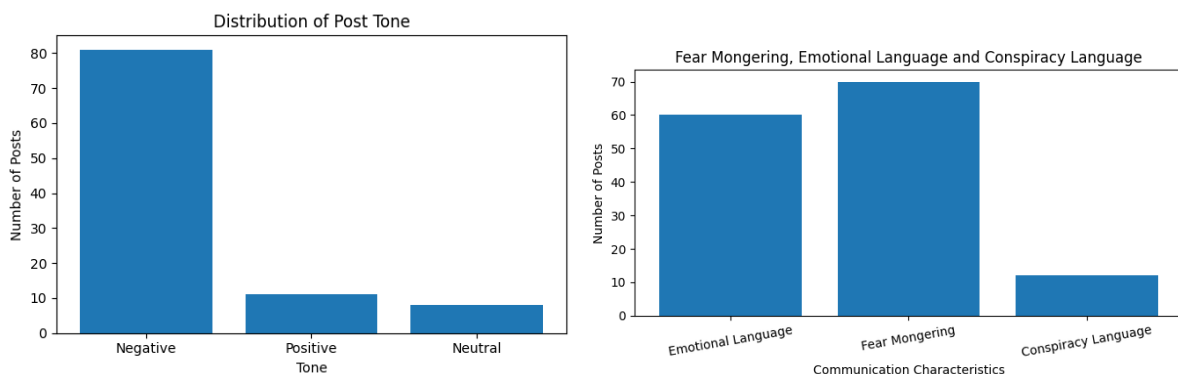
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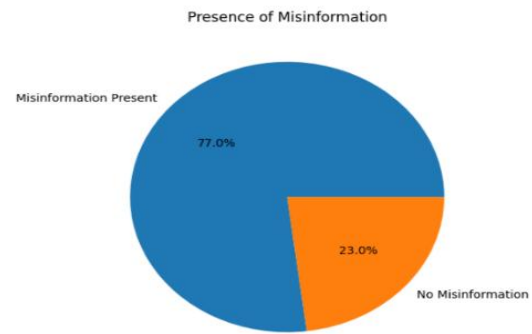
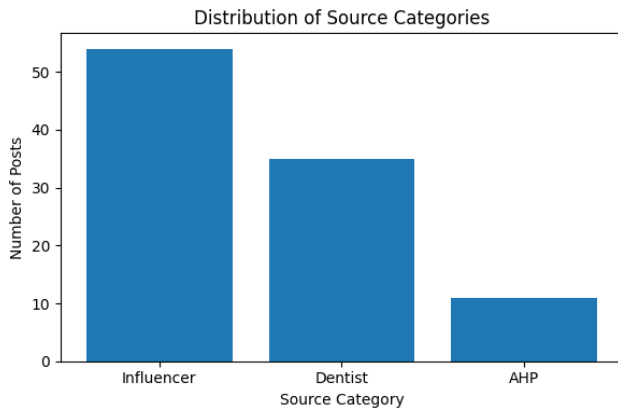
Engagement metrics were also recorded for each post. Total engagement was calculated as the sum of likes, comments, and shares associated with individual Instagram posts to evaluate audience interaction and content reach.

To improve reliability and reduce selection bias, all selected posts were independently reviewed by another member of the research team. Similar approaches for reviewer agreement and content validation have been utilized in previous social media misinformation studies. [12, 16]An inter-rater agreement of 90% was achieved between the reviewers, indicating high consistency in data interpretation and classification.

Analysis

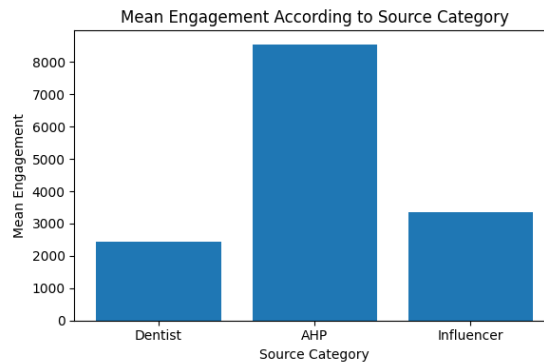
A quantitative descriptive analysis was performed for all included posts. Frequencies and percentages were calculated for content categories, misinformation themes, emotional tone, and engagement characteristics. The study also incorporated selected social semiotic elements such as tone, emotional language, fear mongering, and conspiracy-related framing to understand how misinformation was communicated and emotionally constructed within the analysed posts. The findings were interpreted to understand how misinformation narratives related to Root Canal Treatment are framed and disseminated on social media platforms.





Misinformation Presence Pie Chart

Misinformation Presence Pie Chart



III. RESULTS

A total of 100 Instagram posts related to Root Canal Treatment (RCT) misinformation were included for analysis. Posts were categorized according to source type, emotional tone, fear-mongering characteristics, conspiracy-related messaging, and engagement metrics.

Table 1 presents the characteristics and engagement metrics of Instagram posts according to source category. Influencers constituted the largest proportion of posts (54%), followed by dentists (35%) and Alternative Health Professionals (AHPs) (11%). Overall, the mean follower count across all accounts was 237,131.69, ranging from 539 to 3,300,000 followers. AHP accounts demonstrated the highest mean follower count (448,969.00) and generated the greatest overall engagement, with a mean total engagement of 8,545.45. Influencer accounts also demonstrated high audience reach and engagement, with a mean total engagement of 3,363.32. Dentist-generated posts showed comparatively lower engagement metrics despite contributing a substantial proportion of the dataset. Across all categories, total engagement ranged from 0 to 84,348 interactions. These findings indicate that misinformation-related RCT content circulated predominantly through highly followed influencer and alternative health accounts, which also received greater audience interaction.

Table 2 demonstrates the association between post tone and the presence of misinformation. Of the 100 analyzed posts, 77 contained misinformation, while 23 did not. Negative emotional tone was the most common characteristic overall (81%), and was strongly associated with misinformation-related content. Among posts containing misinformation, 75 of 77 posts demonstrated a negative tone, whereas none displayed a positive tone. In contrast, posts without misinformation were more evenly distributed across negative, neutral, and positive tones. Positive tone was observed exclusively among posts without misinformation (11 posts). These findings suggest that misinformation surrounding RCT on Instagram was predominantly communicated using negatively framed and emotionally persuasive language.

Table 3 evaluates the relationship between fear-mongering and conspiracy-oriented language in Instagram posts. Fear-mongering characteristics were identified in 70% of posts, whereas conspiracy-related language was observed in 12% of the dataset. Among conspiracy-oriented posts, 11 of 12 also demonstrated fear-mongering elements, indicating a strong overlap between these communication styles. In comparison, posts without conspiracy messaging were more variably distributed between fear-mongering and non-fear-mongering

content. These findings demonstrate that conspiracy narratives surrounding RCT were frequently reinforced through fear-based messaging strategies.

The characteristics of the top 10 most engaged Instagram posts are summarized in Table 4. The highest-engaged post, produced by an influencer, received a total engagement of 84,348 interactions and promoted the narrative of “poisonous root canals” linked to systemic health threats. Several other highly engaged posts associated RCT with severe systemic diseases including cancer, heart attacks, strokes, autoimmune diseases, and chronic infections. Influencer and Alternate Health Professional accounts accounted for the majority of the top-performing posts. Common themes included the portrayal of RCT as “toxic,” “silent killers,” or hidden causes of systemic disease. Emotionally charged titles and conspiracy-oriented claims were frequently used to attract audience attention and maximize engagement. Although a small number of dentist-generated posts also achieved high engagement, the majority of highly interacted posts promoted misinformation-driven or fear-based narratives. Overall, the most engaged Instagram posts demonstrated how emotionally persuasive and sensationalized content may contribute substantially to the spread of RCT-related misinformation on social media.

Table 1. Characteristics and Engagement Metrics of Instagram Posts According to Source Category (n = 100)

Characteristics	Overall	Dentist	Alternate Health Professional	Influencer
Number of posts, n (%)	100 (100)	35 (35)	11 (11)	54 (54)
Followers – Mean	2,37,131.69	1,75,095.43	4,48,969.00	2,34,132.98
Followers – Range	539–3,300,000	981–1,100,000	2,878–1,900,000	539–3,300,000
Likes – Mean	2,273.94	1,356.09	4,809.45	2,353.64
Likes – Range	0–82,300	0–16,500	3–16,500	1–82,300
Comments – Mean	348.65	556.4	529.45	177.17
Comments – Range	0–7,203	0–7,203	1–3,798	0–3,673
Shares – Mean	973.11	516.74	3,206.55	813.94
Shares – Range	0–16,000	0–7,924	0–15,200	0–16,000
Total Engagement – Mean	3,608.98	2,429.23	8,545.45	3,363.32
Total Engagement – Range	0–84,348	0–23,799	4–26,664	1–84,348

Table 1 compares audience reach and engagement metrics among different source categories posting RCT-related content on Instagram.

Table 2. Association between Post Tone and Presence of Misinformation (n = 100)

Tone	Negative	Neutral	Positive	Total
Yes (misinformation)	75	2	0	77
No (no misinformation)	6	6	11	23
Total	81	8	11	100

Table 2 demonstrates the relationship between emotional tone and misinformation prevalence in Instagram posts related to Root Canal Treatment.

Table 3. Association Between Fear Mongering and Conspiracy Language (n = 100)

	Fear Mongering = Yes	Fear Mongering = No	Total
Conspiracy = Yes	11	1	12
Conspiracy = No	59	29	88
Total	70	30	100

Table 3 evaluates the overlap between fear-based communication and conspiracy-oriented messaging within misinformation-related posts.

Table 4. Characteristics of the Top 10 Most Engaged Instagram Posts (n = 10)

Rank	Source Type	Title	Likes	Comments	Shares	Total Engagement
1	Influencer	“Remove Poisonous Root Canals: The Hidden Threat to Your Health.” Root Cause Documentary Parasites on Extracted Root Canal Teeth	82,300	290	1,758	84,348
2	Alternate Health Professional	“The Dangers Behind A Root Canal” RCT Termed As “Silent Killer” And Linked To Autoimmune Diseases	11,000	464	15,200	26,664
3	Influencer	“No 1 Cause Of Heart Attack Is A Root Canal Treated Tooth.” Root Canal Treated Tooth Termed As “Toxic”	9,496	414	16,000	25,910
4	Dentist	“If You Ever Ad A Root Canal, Make Sure You’re Doing These 4 Things...”	8,837	7,038	7,924	23,799

5	Alternate Health Professional	“One Root Cause For Strokes Found In Mouth” Correlated Strokes With Mouth Infections	16,500	418	3,604	20,522
6	Influencer	“I Have Never Seen A Cancer Patient That Didn’t Have Oral Infection”	7,741	3,673	8,411	19,825
7	Influencer	“The Hidden Dangers Of Root Canals: What You Need To Know” Correlated Cancer With Root Canal Treated Teeth	7,874	178	11,000	19,052
8	Dentist	“If I Woke Up Tomorrow And My Dentist Told Me I Needed A Root Canal, Here’s Exactly What I’d Ask Before I Said Yes”	5,058	7,203	880	13,141
9	Influencer	Root Canals And Breast Cancer – What’s The Connection?	4,050	1,773	2,957	8,780
10	Alternate Health Professional	“Uncover The Shocking Dental Dangers That Could Be Impacting Your Health!”	4,655	3,798	98	8,551

Table 4 illustrates the nature of content present in the most highly engaged Instagram posts and highlights how emotionally persuasive and misinformation-oriented narratives are communicated to audiences.

IV. DISCUSSION

The present study demonstrated that misinformation related to Root Canal Treatment (RCT) on Instagram is frequently communicated using emotionally persuasive, fear-inducing, and conspiracy-oriented narratives. A substantial proportion of posts contained misinformation (77%), with most misinformation-related posts demonstrated a negative emotional tone. Similarly, fear-mongering language was identified in 70% of posts, and conspiracy-oriented messaging was strongly associated with fear-based communication strategies. These findings suggest that misinformation surrounding RCT is not merely informational in nature, but is strategically framed to provoke emotional responses such as fear, distrust, and anxiety toward dental treatment.

The findings of the present study are consistent with previous research evaluating online information related to Root Canal Treatment. McLean et al. reported that misleading, sensationalized, and low-quality YouTube content frequently received higher public engagement than evidence-based educational material.[12] Similar to the present Instagram-based findings, their study demonstrated that videos produced by non-clinicians and alternative health advocates often relied on emotionally charged messaging, sensationalist titles, and conspiracy-driven narratives linking root canal treatment with systemic diseases such as cancer and autoimmune disorders.[12] In the current study, many highly engaged Instagram posts similarly promoted unsupported claims associating RCT with strokes, heart disease, chronic infections, and cancer.

An important observation in the present study was that influencer and Alternative Health Professional (AHP) accounts generated the highest audience engagement despite frequently disseminating misinformation. This trend parallels the YouTube findings reported by McLean et al., where videos produced by regulatory organizations and clinicians generally demonstrated higher informational quality but substantially lower audience interaction and visibility.[12] Social media algorithms are largely engagement-driven, meaning that emotionally provocative and sensationalized content may receive greater amplification through likes, comments, shares, and recommendations.[10,17,22] Consequently, evidence-based educational posts from dental professionals may become comparatively less visible to users searching for information related to RCT.

The communication patterns observed in the current study also align with the concept of “clickbait” and emotionally persuasive framing described in previous misinformation research.[23,24] Many highly engaged Instagram posts used dramatic phrases such as “poisonous root canals,” “silent killers,” and “hidden dangers,” which appear designed to attract user attention and encourage interaction. Such fear-based framing may contribute to increased dental anxiety, reduced trust in dental professionals, and avoidance of clinically necessary treatment.[4,14] Similar concerns were highlighted by Holden, who reported that conspiracy-driven narratives related to dentistry frequently rely on symbolic fear, emotional storytelling, and anti-establishment rhetoric to construct persuasive digital misinformation narratives.[8,16]

The present findings further reinforce broader concerns regarding health misinformation on social media platforms. Previous research has demonstrated that false or emotionally provocative information often spreads more rapidly online than scientifically accurate information due to higher engagement and sharing behaviour.[10,11] Within dentistry, misinformation regarding RCT may have serious public health consequences, as untreated endodontic infections can lead to pain, spread of infection, tooth loss, and deterioration in oral health-related quality of life.[1,14]

Another important finding was the relatively lower visibility and engagement of evidence-based educational content generated by dentists. Although some dentist-generated posts achieved high engagement, the majority of highly interacted posts promoted misinformation-oriented narratives. This imbalance suggests that

accurate educational information alone may not be sufficient to compete with emotionally framed misinformation unless presented using more accessible and engaging communication strategies. McLean et al. similarly emphasized the need for professional organizations and regulatory bodies to strategically create visually engaging and audience-oriented educational content capable of counteracting misinformation online. [12]

The present study highlights the growing importance of digital health communication within dentistry. Dental professionals, institutions, and professional organizations must actively participate in social media communication by producing concise, evidence-based, visually appealing, and emotionally balanced educational content. In addition, fact-checking initiatives, improved public digital health literacy, and platform-level moderation strategies may help reduce the spread of misinformation related to RCT and other dental procedures. [11, 17, 19, 25]

V. CONCLUSION

The present study demonstrated that misinformation related to Root Canal Treatment on Instagram is commonly communicated through fear-inducing language, emotionally persuasive framing, and conspiracy-oriented narratives. Posts containing misinformation frequently received high audience engagement, particularly when shared by influencers and Alternative Health Professionals. Conspiracy-driven posts were strongly associated with fear-mongering communication styles, suggesting that emotional manipulation plays a significant role in the dissemination of misleading dental information online.

The findings are consistent with previous research evaluating social media misinformation related to root canal treatment, which similarly reported that sensationalized and low-quality content often achieves greater visibility and interaction than evidence-based educational material.[12] The widespread circulation of unsupported claims associating RCT with systemic diseases may negatively influence patient perceptions, increase dental anxiety, and discourage individuals from seeking appropriate endodontic care.

There is an urgent need for greater involvement of dental professionals, academic institutions, and professional organizations in digital health communication. Strategic development of engaging, accessible, and evidence-based social media content may help counter misinformation trends, improve public awareness, and support informed patient decision-making regarding Root Canal Treatment.[11,12,17,25]

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