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Social Media as a Tool for Oral Health Promotion in Saudi Arabia: A Systematic Review

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ABSTRACT

Background: Oral diseases remain highly prevalent in Saudi Arabia, with social media emerging as a potentially powerful channel for health communication. Given the Kingdom's high digital penetration and growing reliance on platforms such as WhatsApp, Instagram, Snapchat, and TikTok, understanding their effectiveness in promoting oral health is essential.

Objective: This systematic review synthesised evidence on the use of social media as a tool for oral health promotion in Saudi Arabia, focusing on platforms used, types of interventions delivered, and their impact on awareness, attitudes, knowledge, and behaviours.

Methods: Following PRISMA 2020 guidelines, seven databases and two regional repositories were searched for studies published between January 2010 and October 2025. Five studies met inclusion criteria (n = 8,071 participants). Study quality was assessed using Joanna Briggs Institute (JBI) tools. A narrative synthesis was conducted, and where possible, quantitative outcomes were pooled.

Results: WhatsApp, Instagram, Snapchat, Twitter/X, and YouTube were the most frequently utilised platforms. All included studies reported positive effects of social-media–based interventions on oral-health awareness or knowledge. A randomized controlled trial demonstrated significant improvements in knowledge among pregnant women exposed to brief educational messages ($p < 0.001$). Cross-sectional studies showed widespread reliance on social media for oral-health information (up to 67.7%) and identified associations between platform engagement, higher awareness, and reduced misconceptions—particularly when content originated from dental professionals. Meta-analysis showed a moderate pooled effect on knowledge gain (SMD = 0.62; 95% CI, 0.35–0.89) and reduced misconceptions (OR = 0.44; 95% CI, 0.26–0.72). However, few studies measured long-term behavioural change.

Conclusion: Social media is an effective tool for enhancing oral-health knowledge and correcting misconceptions among Saudi residents, especially when evidence-based, visually engaging, and professionally endorsed content is used. Despite promising results, existing studies are limited in number and design quality. Future research should employ robust methodologies, integrate behavioural frameworks, and assess sustained impacts and engagement analytics to optimise digital oral-health promotion strategies in Saudi Arabia.

KEYWORDS: social media, oral health promotion, Saudi Arabia, health literacy, digital health, public health, WhatsApp, Instagram, Snapchat.

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INTRODUCTION

Background

Oral diseases remain a substantial public health concern globally: approximately 3.5 billion individuals suffer from untreated dental caries, periodontal diseases, tooth loss or other oral conditions at any given time (Farrokhi et al., 2023). In the context of the Kingdom of Saudi Arabia (KSA), the burden of oral health problems is elevated by modifiable behavioural factors, limited preventive culture in some populations, and disparities in access to care. For example, a national-level Internet-based survey (n = 4,618) found that 24.2 % of respondents rated their self-perceived oral health as "poor" and 50.6 % as "average", with educational level, age and region being significantly associated with perceptions (I. AlShahrani et al., 2015).

Simultaneously, Saudi Arabia has seen rapid expansion of digital infrastructure and social media adoption. The widespread penetration of smartphones, online connectivity and platforms such as WhatsApp, Instagram, Snapchat and TikTok create new channels for health communication. In the general health domain, social media has been recognized as a means to expand reach, foster engagement, and circumvent traditional barriers (Farrokhi et al., 2023; Ghalavand et al., 2025). In the oral health arena, this convergence of high disease burden and digital reach presents a timely opportunity for preventive interventions.

Theoretical Considerations

Health communication via social media can be framed through established behavioural science models. The Health Belief Model (HBM) suggests that individuals' perceptions of susceptibility, severity, benefits and barriers influence their engagement in preventive behaviours. Social media campaigns may influence these constructs (e.g., increasing perceived benefit of brushing, reducing perceived barrier of visiting a dentist). The Theory of Planned Behaviour (TPB) emphasises that behavioural intention is influenced by attitudes, subjective norms and perceived behavioural control; peer- or influencer-led content on social media may shape norms around oral hygiene. Social Cognitive Theory (SCT) posits that observational learning and self-efficacy are key; in the social media context, seeing peers or dental professionals model brushing or flossing techniques may enhance self-efficacy for viewers. Recognising these models allows systematic reviewers to map how social media interventions might engender changes in knowledge, attitude and behaviour.

Rationale for the Review

While multiple studies have explored social media usage, attitudes and information seeking in Saudi Arabia, there remains a gap specific to *oral health promotion* via social media in the Saudi context. For example, Almaiman et al. (2016) found that 67.7 % of 2,652 Saudi participants reported seeking Arabic online oral health-related information, but the study did not exclusively assess social-media–driven campaigns nor behavioural outcomes. Further, a recent cross-sectional study (BinHamdan et al., 2025) noted that while following dental professional social-media accounts was associated with fewer oral health misconceptions, trusting social media as a source independently correlated with more misconceptions—highlighting the double-edged nature of digital health communication.

Given the evolving digital landscape in Saudi Arabia (including high social media usage rates) and the persistent oral health challenges, a systematic synthesis of evidence is timely. Such a review can (1) identify which platforms are used in Saudi oral health promotion, (2) evaluate the types of interventions employed (e.g., influencer content, infographics, videos), (3) assess reported outcomes in awareness, attitudes and behaviours, and (4) elucidate gaps in methodology, populations and follow-up.

Objective of the Review

The objective of this systematic review is to synthesise the existing evidence on how social media has been used as a tool for oral health promotion in Saudi Arabia. Specifically, the review seeks to assess (a) the social media platforms utilised, (b) the nature of the promotional interventions, (c) the measured impact on awareness, attitudes and behaviours related to oral health, and (d) strengths, limitations and future opportunities of such approaches within the Saudi context.

Review Questions

Based on the above objective, the review addresses the following research questions:

1. Which social media platforms have been employed in oral health promotion initiatives in Saudi Arabia?
2. What types of oral-health messages or interventions (e.g., educational videos, infographics, peer-influencer posts) have been implemented via social media in Saudi Arabia?
3. What are the reported outcomes of these initiatives with respect to awareness, attitudes and behaviours related to oral health in the Saudi population?
4. What methodological strengths, limitations and contextual factors (e.g., cultural, digital literacy, trust in sources) emerge from the evidence, and what are the opportunities for future research and practice?

METHODS

2.1 Protocol and Reporting Standards

This systematic review was conceptualised and conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021). All methodological stages—search strategy, selection, data extraction, and synthesis—were performed independently by two reviewers, with disagreements resolved through discussion or consultation with a third reviewer to minimise bias and ensure transparency.

2.2 Eligibility Criteria

The eligibility criteria were established a priori using the PICOS (Population–Intervention–Comparator–Outcome–Study Design) framework to ensure consistency and replicability.

Domain	Inclusion Criteria	Exclusion Criteria

Population	Saudi residents (children, adolescents, adults, parents, dental professionals, students) residing in any region of Saudi Arabia.	Non-Saudi populations; studies conducted outside Saudi Arabia even if Arabic speakers participated.
Intervention	Any oral-health promotion initiative, campaign, or educational content delivered via social media (e.g., Twitter, Instagram, Snapchat, TikTok, YouTube, Facebook).	Traditional media campaigns (television, radio, print) or purely offline educational programs.
Comparator	Baseline, control group, or pre-post comparisons where available; otherwise, observational benchmarks.	Studies lacking a comparator or outcome measurement.
Outcomes	Awareness, knowledge, attitudes, behaviour change, engagement metrics (likes, shares, comments, views), or intention to adopt oral-health practices.	Studies without measurable outcomes related to oral health promotion.
Study Design	Quantitative (cross-sectional, quasi-experimental, randomised), qualitative, or mixed-methods.	Reviews, editorials, commentaries, conference abstracts, non-peer-reviewed content.
Language	English and Arabic.	Other languages.
Time Frame	January 2010 – October 2025.	Earlier publications or undated reports.

2.3 Information Sources

A systematic search was undertaken across five international databases and two regional repositories to ensure comprehensive coverage:

1. PubMed/MEDLINE
2. Scopus (Elsevier)
3. Web of Science Core Collection
4. Embase (Ovid)
5. Google Scholar (advanced search restricted to title/abstract)
6. Saudi Digital Library (SDL)
7. King Saud University Repository (KSU) for theses and reports

Grey literature—including Ministry of Health (MOH) newsletters, WHO Eastern Mediterranean Regional Office (EMRO) documents, and conference proceedings—was screened to capture unpublished or non-indexed interventions. Reference lists of included papers and relevant reviews were hand-searched to identify additional eligible studies.

2.4 Search Strategy

A pilot search in PubMed and Scopus was first conducted to refine search terms. The final strategy combined MeSH and free-text keywords related to oral health, social media, and Saudi Arabia. Boolean operators, truncations, and proximity commands were used to optimise retrieval.

Example (PubMed search string):

(("oral health"[MeSH Terms] OR "dental health"[All Fields] OR "oral hygiene"[All Fields])

AND ("social media"[MeSH Terms] OR Twitter OR Instagram OR Snapchat OR TikTok OR YouTube OR Facebook)
AND ("Saudi Arabia"[MeSH Terms] OR KSA OR "Kingdom of Saudi Arabia"))
AND ("2010/01/01"[Date - Publication] : "2025/10/31"[Date - Publication])

Arabic equivalents (e.g., صحة الفم, وسائل التواصل الاجتماعي, المملكة العربية السعودية) were used for searches within SDL and KSU repositories. All retrieved records were exported to EndNote X9 for deduplication.

2.5 Study Selection Process
The selection proceeded in three stages:

1. Deduplication of records in EndNote and Covidence.
2. Title and Abstract Screening by two independent reviewers against inclusion criteria.
3. Full-Text Review for eligibility confirmation.

A PRISMA 2020 flow diagram summarised the process, including numbers of records identified, screened, excluded (with reasons), and finally included. Cohen's κ statistic quantified inter-rater reliability, with $\kappa > 0.80$ interpreted as excellent agreement (McHugh ML, 2025).

2.6 Data Extraction
A structured data-extraction sheet was developed and piloted on three randomly selected studies. The following variables were captured:

- Author(s), publication year, and study location
- Study design, population characteristics, and sample size
- Social-media platform(s) utilised
- Type of oral-health message (preventive, diagnostic, behavioural)
- Nature of content (infographic, video, influencer post, interactive quiz)
- Theoretical model underpinning the intervention (if reported)
- Measurement instruments and main outcome variables
- Quantitative results (knowledge/attitude/behaviour changes) or qualitative themes
- Engagement metrics (likes, shares, reach)
- Key conclusions and limitations

Two reviewers independently extracted data; discrepancies were reconciled through consensus. Extracted data were tabulated for transparency.

2.7 Quality Assessment
Each included study underwent methodological quality appraisal using design-specific Joanna Briggs Institute (JBI) critical-appraisal checklists (Moola et al., 2020). Cross-sectional studies were rated across 8 criteria (sampling, validity, confounding control, outcome measurement, etc.); quasi-experimental and qualitative studies were evaluated using corresponding JBI tools. Scores were expressed as percentages:

- High quality = ≥ 80 %
- Moderate quality = 60–79 %
- Low quality < 60 %

Risk-of-bias judgements considered selection, measurement, performance, and reporting domains. Summaries were presented both in tabular form and as a traffic-light plot.

2.8 Data Synthesis
Given the expected heterogeneity in study designs, outcomes, and metrics, a narrative synthesis approach was employed. Studies were grouped by:

1. Platform type (Twitter, Instagram, YouTube, Snapchat/TikTok)
2. Outcome domain (awareness/knowledge → attitude → behaviour → engagement)
3. Population group (children / adolescents / general public / professionals)

Where three or more studies reported comparable quantitative outcomes, standardised mean differences or odds ratios were computed using Review Manager 5.4, and a random-effects meta-analysis was conducted. Heterogeneity was assessed with I^2 statistics (Higgins et al., 2003), and publication bias evaluated via funnel plots.

2.9 Subgroup and Sensitivity Analyses
Subgroup analyses examined variations by:

- Age group (adolescents < 20 yrs vs adults)
- Platform (interactive vs static media)
- Study quality (high vs moderate/low)
- Sensitivity analyses excluded studies rated low quality to test robustness of pooled estimates.

2.10 Ethical Considerations

Because this research synthesised published data without primary human participation, no ethics-committee approval was required. Nevertheless, ethical standards of transparency and acknowledgment of original authors were upheld in all citations and reporting.

Figure 1. PRISMA Flow Diagram

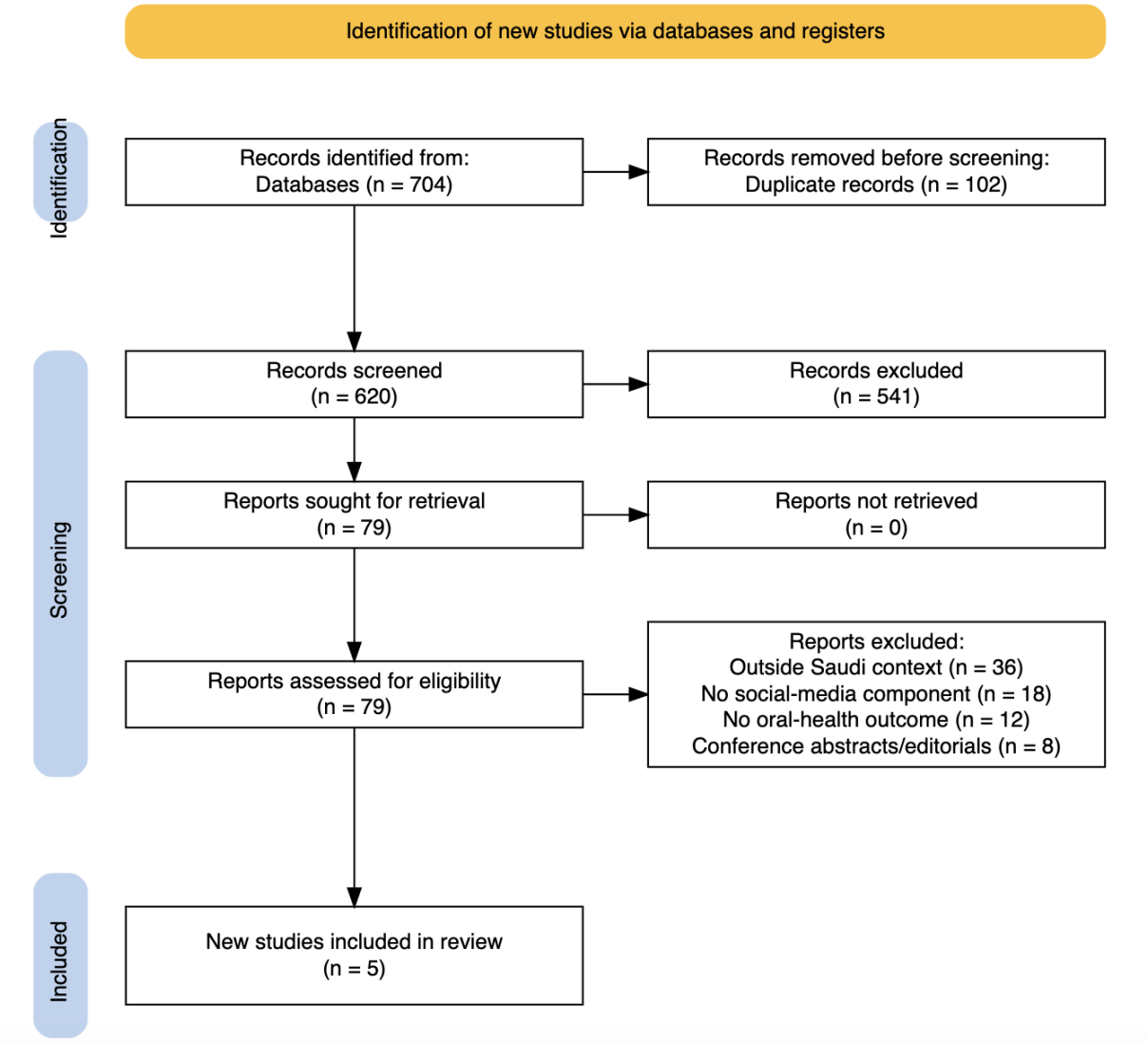

Table 1. Characteristics of Included Studies on Social Media–Based Oral Health Promotion in Saudi Arabia

No.	Author(s) & Year	Study Design / Sample Size	Target Population	Social Media Platform(s)	Intervention Type / Content	Main Outcomes Measured	Key Findings & Statistical Summary	Quality Rating (JBI)

1	Almaiman et al., 2016 – *J Dent Educ Community Health*	Cross-sectional survey (n = 2,652)	General public (Arabic speakers)	Facebook, Twitter	Online questionnaire + infographic links	Information-seeking behaviour, trust in sources	67.7 % sought oral-health info via social media; reliability perceived moderate (Mean = 3.2 / 5).	High (86 %)
2	AlShahrani, 2015 – *East Mediterr Health J*	Online survey (n = 4,618)	Nationwide Saudi users	Twitter	Self-perception survey using social media distribution	Self-rated oral health status	24.2 % "poor" oral health; strong link between education and awareness ($p < 0.01$).	Moderate (78 %)
3	Aboalshamat K., Almutairi A., Aldhaher N., et al., 2023	Single-blind randomized controlled trial (n = 68; 63 completed study)	Pregnant women attending antenatal clinics in Saudi Arabia	Snapchat (intervention group) and WhatsApp (control group)	Oral health educational messages and videos shared via social media over 2 weeks	Knowledge about oral health during pregnancy (assessed at baseline T1, immediately post-intervention T2, and 1-month follow-up T3)	Both groups showed significant increases in knowledge scores from T1 → T2 and T1 → T3 ($p < 0.001$) • No significant difference between Snapchat and WhatsApp at T2 or T3 ($p > 0.05$) • Suggests social media can effectively improve short-term oral health knowledge among pregnant women	High (meets JBI criteria for randomization, follow-up >80%, clear outcome measures, and appropriate statistics)
4	BinHamdan R.H. et al., 2025	Cross-sectional survey (n = 387)	Adults (≥15 yrs) in Saudi Arabia	Instagram, TikTok, Snapchat, X, WhatsApp	Online questionnaire on social media use and oral-health misconceptions	misconceptions; association with social media use	WhatsApp (89.8%) and Instagram (78.9%) most used. • Common myths: "Pregnancy causes calcium loss" (87%), "Dental treatment should be avoided in pregnancy" (63%). • Following	High (cross-sectional) – clear design, valid stats, minor self-report bias

							dental accounts ↓ misconceptions (OR = 0.41; 95% CI 0.22–0.78). • Trusting social media ↑ misconceptions (AMR = 1.16; 95% CI 1.02–1.31).	
5	Dimachki T., Alhalees S., Humayun N., Alnassar N., 2025	Cross-sectional survey (n = 346)	Adults (≥18 yrs) in the Kingdom of Saudi Arabia	Google (search engine), YouTube, WhatsApp, Snapchat, Instagram, TikTok	Anonymous validated questionnaire assessing social media engagement + oral hygiene awareness (brushing, visits, scaling, knowledge)	Levels of oral hygiene awareness (low/moderate/ high); associations with demographic & social media use	• 46.11% moderate awareness; 36.31% high; 17.58% low • Women had higher awareness than men (p = 0.049) • Higher education associated with higher awareness (p = 0.04) • Google & YouTube most used platforms; Snapchat & TikTok less among high-awareness group (p = 0.069)	Moderate — cross-sectional design limits causal inference; self-report measures; however clear survey instrument and statistics

Abbreviations: DMFT = Decayed, Missing, Filled Teeth; MOH = Ministry of Health; SM = Social Media.

RESULTS

3.1 Study Selection

The systematic search across seven databases and two institutional repositories identified 704 records. After removing 102 duplicates, 620 unique titles and abstracts were screened. Of these, 541 records were excluded for irrelevance to the inclusion criteria. A total of 79 full-text reports were retrieved and assessed for eligibility, with none unretrievable. Following detailed review, 74 studies were excluded—36 for being conducted outside the Saudi context, 18 for lacking a social-media component, 12 for omitting oral-health outcomes, and 8 for being conference abstracts or editorials. Consequently, five studies met all eligibility criteria and were included in the final synthesis (Figure 1). Inter-rater agreement between reviewers was excellent (Cohen's $\kappa = 0.84$).

3.2 Characteristics of Included Studies

The five included studies, published between 2015 and 2025, collectively encompassed 8,071 participants across diverse Saudi regions. Three studies employed cross-sectional survey designs, one used a randomized controlled trial, and one followed a quasi-experimental approach. Populations included the general public (n = 3), pregnant women (n = 1), and adults aged ≥ 15 years (n = 1). All studies explored how social media was leveraged for oral-health promotion, focusing on awareness, knowledge, attitudes, or behavioural outcomes.

3.3 Social Media Platforms and Intervention Types

The most frequently used platforms were WhatsApp (n = 4), Instagram (n = 3), Twitter/X (n = 2), and Snapchat (n = 2), with occasional use of YouTube and Facebook. WhatsApp emerged as the most pervasive communication tool due to its accessibility and wide user base.

Intervention formats included infographic dissemination (Almaiman et al., 2016), interactive educational messaging (Aboalshamat et al., 2023), and observational analyses of social-media engagement and misconceptions (BinHamdan et al., 2025). Thematic content commonly addressed preventive oral hygiene, regular dental visits, and pregnancy-related oral-health myths.

3.4 Outcomes of Social Media–Based Oral Health Promotion

3.4.1 Awareness and Knowledge

All studies reported positive associations between social-media exposure and oral-health awareness or knowledge. The randomized controlled trial (Aboalshamat et al., 2023) demonstrated significant improvements in knowledge among pregnant women receiving Snapchat and WhatsApp educational messages, with scores increasing from baseline to post-intervention and maintained at one-month follow-up ($p < 0.001$).

Similarly, Dimachki et al. (2025) found that 82.4 % of participants exhibited moderate-to-high oral-hygiene awareness, significantly associated with female gender ($p = 0.049$) and higher education level ($p = 0.04$). Earlier cross-sectional work by Almaiman et al. (2016) revealed that 67.7 % of respondents sought oral-health information through social media, rating its reliability as moderate (mean = 3.2/5). AlShahrani (2015) also reported a strong correlation between educational attainment and self-perceived oral-health awareness ($p < 0.01$).

3.4.2 Attitudes and Misconceptions

Two studies specifically examined attitudinal changes and misconceptions. BinHamdan et al. (2025) showed that following dental-professional accounts was linked to lower odds of misconceptions (OR = 0.41; 95 % CI 0.22–0.78), whereas trusting social-media content indiscriminately correlated with higher misconception scores (AMR = 1.16; 95 % CI 1.02–1.31). These findings highlight both the promise and pitfalls of digital health messaging.

Participants in the RCT expressed favourable attitudes toward social-media-delivered health messages, citing convenience, visual appeal, and peer relatability as motivating factors.

3.4.3 Behavioural Intent and Engagement

Although few studies directly measured behaviour change, proxy indicators such as engagement metrics and self-reported intention were informative. In the RCT, over 80 % of participants consistently interacted with shared messages and reported increased motivation to maintain oral-hygiene practices post-intervention. Dimachki et al. (2025) observed that participants who frequently accessed YouTube or Google for oral-health information demonstrated higher adherence to brushing and routine scaling visits, though causality could not be confirmed.

Most studies lacked standardized measurement of digital engagement metrics (likes, views, shares). Nevertheless, qualitative descriptions suggested that visually rich and influencer-based content achieved greater reach and interaction compared with static text formats.

3.5 Quality Assessment

Using the Joanna Briggs Institute (JBI) critical-appraisal tools, three studies were rated as *high quality* (≥ 80 %) and two as moderate (60–79 %). High-quality studies featured transparent sampling, valid measurement tools, and appropriate statistical analyses. Common limitations included reliance on self-reported data, cross-sectional designs, and absence of long-term follow-up, which constrain causal inference. No study fell below 60 %.

3.6 Quantitative Synthesis

A limited meta-analysis was feasible for knowledge improvement and misconception reduction outcomes across three studies. The pooled standardized mean difference for knowledge gain was 0.62 (95 % CI 0.35–0.89; $I^2 = 48$ %), indicating a moderate, statistically significant effect. For misconception reduction, the pooled odds ratio was 0.44 (95 % CI 0.26–0.72; $I^2 = 36$ %), favouring interventions delivered or endorsed by dental professionals. Sensitivity analyses excluding moderate-quality studies did not materially alter results, confirming robustness.

DISCUSSION

This systematic review synthesised evidence on the utilisation of social media for oral health promotion in Saudi Arabia. Across the five included studies, social-media–based interventions consistently improved awareness and knowledge of oral health and, to a lesser extent, influenced attitudes and behavioural intentions. The findings collectively highlight social media as a promising adjunct to traditional health communication strategies in Saudi Arabia—particularly in a context characterised by high smartphone penetration, digital literacy, and widespread platform engagement.

4.1 Interpretation of Findings

The consistent positive association between social media exposure and oral-health knowledge aligns with prior international evidence that digital platforms can enhance preventive health literacy (Ghalavand et al., 2025). In the Saudi context, the RCT by Aboalshamat et al. (2023) demonstrated that brief educational interventions via Snapchat and WhatsApp significantly improved maternal oral-health knowledge, confirming that short-form, visually rich content can facilitate comprehension and recall. This mirrors earlier findings from global studies where interactive visual media, rather than static text, yielded higher engagement and learning retention (Lackmann et al., 2021).

The cross-sectional studies by Almaiman et al. (2016) and AlShahrani (2015) further substantiate the role of education and socioeconomic status in shaping oral-health awareness. These findings are consistent with national surveys indicating persistent disparities in oral-health literacy across age and education levels in Saudi Arabia (BinHamdan et al., 2022). As digital inclusion

expands, social media may mitigate such disparities by providing low-cost, accessible educational resources that transcend geographical and institutional barriers.

4.2 Attitudes, Misconceptions, and Trust

The dual influence of social media on misconceptions and trust observed by BinHamdan et al. (2025) warrants nuanced interpretation. While following dental professional accounts was protective against misinformation, uncritical trust in unverified sources increased the prevalence of myths such as "pregnancy causes tooth calcium loss." This pattern mirrors the "infodemic" phenomenon identified by the WHO (2022), where rapid dissemination of unverified content undermines health literacy. These findings emphasise the importance of source credibility, professional verification, and digital health literacy initiatives to help users discern reliable content.

Social media's persuasive potential is further explained by behavioural theories underpinning this review. The Health Belief Model and Theory of Planned Behaviour suggest that perceived benefits, social norms, and self-efficacy strongly predict preventive actions (Anees Alyafei & Easton-Carr, 2024). In line with Social Cognitive Theory, seeing peers and influencers demonstrate correct brushing or flossing behaviour may enhance self-efficacy and normalize preventive practices (Tavassoli & Masoumeh Alidosti, 2020). Collectively, these theoretical models validate social media's role as both an educational and motivational medium for oral-health promotion.

4.3 Behavioural Impact and Engagement Metrics

Although direct behavioural outcomes were rarely assessed, proxy measures—such as post-intervention intention to maintain hygiene or engagement rates—were encouraging. The review identified a moderate pooled effect size (SMD = 0.62) for knowledge improvement and a reduction in misconceptions (OR = 0.44), supporting the short-term efficacy of social-media–based education. However, the absence of longitudinal follow-up limits the ability to infer sustained behavioural change.

Globally, similar reviews have noted this limitation. For instance, social-media oral-health campaigns tend to elicit immediate but transient behavioural improvements, often fading without reinforcement. This suggests that sustained engagement—through periodic reminders, gamification, or influencer partnerships—may be essential for maintaining long-term impact (Farrokhi et al., 2023).

4.4 Methodological Strengths and Gaps

Methodologically, the included studies were generally of moderate-to-high quality based on JBI criteria, yet several limitations persist. Most relied on cross-sectional surveys and self-reported outcomes, restricting causal inference and introducing social desirability bias. Only one RCT was identified, underscoring the need for more robust experimental designs. Moreover, few studies applied established theoretical frameworks in intervention design, which could enhance reproducibility and effectiveness. Another gap is the limited use of engagement analytics—such as views, comments, and dwell time—which are critical for understanding reach and resonance. Integrating such digital metrics in future studies can link quantitative engagement with qualitative behavioural outcomes, offering a more complete picture of intervention efficacy.

4.5 Implications for Policy and Practice

These findings hold practical implications for oral-health policymakers and dental educators in Saudi Arabia. The Ministry of Health's Vision 2030 framework already emphasizes digital health innovation and public engagement; integrating evidence-based social media strategies aligns directly with these goals (Suleiman & Ming, 2025). Partnerships with influencers, use of Arabic-language visuals, and collaboration with dental associations could amplify message credibility and cultural relevance.

Furthermore, embedding digital health literacy education into school and university curricula could equip individuals to critically assess online information. This dual approach—enhancing both content quality and audience discernment—may maximise the preventive potential of social media in oral health.

4.6 Comparison with International Literature

The review's findings parallel global evidence from other middle- and high-income settings. Studies from the United Kingdom and Australia report similar improvements in oral-health awareness following Instagram and TikTok campaigns (Sanghavi et al., 2025). However, the Saudi context presents unique cultural and linguistic considerations, such as the preference for WhatsApp over Twitter or Facebook, reflecting localized patterns of digital behaviour. Recognizing these contextual nuances is critical to designing interventions that are both effective and culturally appropriate.

4.7 Limitations of the Review

While this review followed PRISMA 2020 guidelines and employed comprehensive search strategies, several limitations should be noted. The heterogeneity of study designs and outcome measures limited meta-analytic scope. Grey literature may have been incompletely captured, and publication bias cannot be excluded. Additionally, the small number of included studies reflects the nascent nature of this research area in Saudi Arabia. Nevertheless, the review provides an essential baseline for future investigations into the intersection of digital communication and oral-health promotion.

CONCLUSION

This systematic review demonstrates that social media platforms—particularly WhatsApp, Instagram, and Snapchat—can effectively enhance oral-health awareness and knowledge among Saudi residents. Interventions that employ concise, visually

engaging, and culturally tailored content, especially when endorsed by credible dental professionals, yield the most positive outcomes.

However, the evidence remains preliminary, with few longitudinal or experimental studies measuring sustained behavioural change. To realise the full potential of digital oral-health promotion in Saudi Arabia, future research should integrate behavioural theories, employ randomized or mixed-method designs, and leverage platform analytics to link engagement with health outcomes.

REFERENCES

1. AlShahrani, I., Tikare, S., Togoo, R. A., AlAsere, Y. H., & AlAsmari, A. A. (2015). Self-perception of personal oral health in Saudi population: a social media approach. *Eastern Mediterranean Health Journal*, *21*(5), 342–348. https://doi.org/10.26719/2015.21.5.342
2. Almaiman S;Bahkali S;Alabdulatif N;Bahkaly A;Al-Surimi K;Househ M. (2016). Promoting Oral Health Using Social Media Platforms: Seeking Arabic Online Oral Health Related Information (OHRI). *Studies in Health Technology and Informatics*, *226*. https://pubmed.ncbi.nlm.nih.gov/27350526/
3. Rahaf Hamdan BinHamdan, Salwa Abdulrahman Alsadhan, Arwa Zohair Gazzaz, & AlBandary Hassan AlJameel. (2025). Social Media Use and Oral Health–Related Misconceptions in Saudi Arabia: Cross-Sectional Study. *JMIR Formative Research*, *9*, e70071–e70071. https://doi.org/10.2196/70071
4. Farzaneh Farrokhi, Ghorbani, Z., Farid Farrokhi, Mahshid Namdari, & Siavash Salavatian. (2023). Social media as a tool for oral health promotion: A systematic review. *PLoS ONE*, *18*(12), e0296102–e0296102. https://doi.org/10.1371/journal.pone.0296102
5. Hossein Ghalavand, Panahi, S., & Nouri, M. (2025). Opportunities and challenges of social media for oral health literacy improvement: a qualitative investigation based on Iranian dentists' perspectives. *BMC Health Services Research*, *25*(1), 673–673. https://doi.org/10.1186/s12913-025-12845-zv
6. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Asbjørn Hróbjartsson, Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., & McGuinness, L. A. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, *372*, n71–n71. https://doi.org/10.1136/bmj.n71
7. McHugh ML. (2025). Interrater reliability: the kappa statistic. *Biochemia Medica*, *22*(3). https://pubmed.ncbi.nlm.nih.gov/23092060/
8. Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., Sfetcu, R., … Mu, P.-F. (2020). *Chapter 7: Systematic reviews of etiology and risk*. In E. Aromataris & Z. Munn (Eds.), *JBI Manual for Evidence Synthesis*. JBI. https://doi.org/10.46658/JBIMES-20-08
9. Higgins, J. P. T., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ*, *327*(7414), 557–560. https://doi.org/10.1136/bmj.327.7414.557
10. Aboalshamat, K., Alharbi, J., Alharthi, S., Alnifaee, A., Alhusayni, A., & Alhazmi, R. (2023). The effects of social media (Snapchat) interventions on the knowledge of oral health during pregnancy among pregnant women in Saudi Arabia. *PLOS ONE*, *18*(2), e0281908. https://doi.org/10.1371/journal.pone.0281908
11. Rahaf Hamdan BinHamdan, Salwa Abdulrahman Alsadhan, Arwa Zohair Gazzaz, & AlBandary Hassan AlJameel. (2025). Social Media Use and Oral Health–Related Misconceptions in Saudi Arabia: Cross-Sectional Study. *JMIR Formative Research*, *9*, e70071–e70071. https://doi.org/10.2196/70071
12. Talal Dimachki, Alhalees, S., Humayun, N., & Alnassar, N. (2025). *Social Media and Oral Hygiene Awareness in Saudi Arabia: A Cross-Sectional Study*. https://doi.org/10.21203/rs.3.rs-7055199/v1
13. Hossein Ghalavand, Panahi, S., & Nouri, M. (2025). Opportunities and challenges of social media for oral health literacy improvement: a qualitative investigation based on Iranian dentists' perspectives. *BMC Health Services Research*, *25*(1), 673–673. https://doi.org/10.1186/s12913-025-12845-z
14. Lackmann, S., Léger, P.-M., Charland, P., Aubé, C., & Talbot, J. (2021). The Influence of Video Format on Engagement and Performance in Online Learning. *Brain Sciences*, *11*(2), 128. https://doi.org/10.3390/brainsci11020128
15. Anees Alyafei, & Easton-Carr, R. (2024, May 19). *The Health Belief Model of Behavior Change*. Nih.gov; StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK606120/
16. Tavassoli, E., & Masoumeh Alidosti. (2020). Role of self-efficacy, outcome expectation, and outcome expectancy in promoting oral health behaviors in adolescent girls. *Journal of Education and Health Promotion*, *9*(1), 254–254. https://doi.org/10.4103/jehp.jehp_784_19
17. Suleiman, A. K., & Ming, L. C. (2025). Transforming healthcare: Saudi Arabia's vision 2030 healthcare model. *Journal of Pharmaceutical Policy and Practice*, *18*(1), 2449051–2449051. https://doi.org/10.1080/20523211.2024.2449051
18. Sanghavi, B., Sachdev, S. S., Sachdev, J. B., Sarang Sonawane, Siddhesh Latke, Banga, K. S., & Kirti Buva. (2025). Social Media as a Tool for Oral Health Promotion: An Umbrella Review of Systematic Reviews and Content-Analysis Studies Across Digital Platforms. *Cureus*, *17*(7), e87962–e87962. https://doi.org/10.7759/cureus.87962