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ORIGINAL RESEARCH

The Use of the X Platform (Formerly Twitter) by Saudi Dental Societies: A Content and Engagement Analysis

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Aim: To analyze the patterns and use of "X" as a social media platform for Saudi dental societies and to assess their engagement strategies in light of national digital transformation goals.

Methods: This cross-sectional, observational study analyzed publicly available data from the official X (formerly Twitter) accounts of Saudi dental societies (n=8) from July 2023 to June 2024. Data were collected using the Twitter API v2 via the Tweepy library in Python. Thematic analysis was performed, classifying posts into main themes like. Continuing education, research, and community outreach. Posts were also categorized by their originality (original, repost, or quote), language, and content nature (text, media, or both). To ensure reliability, two trained investigators coded the posts, and weighted Kappa statistics confirmed strong inter-rater and intra-rater agreement. Data analysis was performed using IBM SPSS Statistics, including descriptive statistics, ANOVA, and multiple linear regression to identify factors associated with engagement.

Results: A total of 2649 posts were analyzed. The Saudi Dental Society (SDS) was the most active, producing 1257 posts (47.45%). Posts primarily focused on continuing education (70.4%), with news and announcements being the most frequent content types. The vast majority of posts were original (94.1%) and media-enriched (86.1%). The mean total engagement per post was 9.67. Research-related posts achieved the highest total engagement (22 ± 24.04), despite their very low frequency (0.1%).

Conclusion: Saudi dental societies primarily use the X platform for continuing education content, while posts focused on research, advocacy, and community outreach generate higher engagement. Analyzing these content and engagement patterns is important to guide strategic communication that enhances professional visibility, audience interaction, and public health outreach. These findings are also aligned with the Saudi Vision 2030 objectives promoting digital transformation and innovation in healthcare communication.

Keywords: Saudi dental societies, X platform, Twitter, digital engagement, professional advocacy, social media, content analysis

Introduction

The X platform (formerly known as Twitter) has been recognized as a valuable tool in the dental profession, offering opportunities for education, communication, and professional networking. A systematic review has explored the use of X platform in dental education, emphasizing its potential impact on training, education, and teaching in dentistry.[1] Social media platforms like X platform have been utilized to disseminate dental health information, connect professionals with patients, and share experiences and opinions on dental cosmetic interventions.[2] Additionally, X platform has been identified as a platform for sharing information among dental clinicians, discussing dental treatments, and engaging in professional discourse.[3]

The COVID-19 pandemic has underscored the importance of social media platforms like X platform in the dental profession. Studies have shown that X platform can be used to enhance the demand and supply of dental services during

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a pandemic.[4] Dental professionals have leveraged social media, including X platform, to disseminate information, connect with patients, and share experiences during the pandemic.[5] Furthermore, X platform has been recognized as a means to empower patients to share their experiences of dental care and explore patient experiences in orthodontic treatment.[6]

X platform has become a valued platform for dental societies to engage with their members, disseminate information, and enhance professional networking. Dental societies worldwide have acknowledged the potential of X platform in advancing their missions and connecting with a broader audience. Studies have demonstrated that X platform can be effectively utilized by dental societies to expand their reach beyond traditional communication channels, enabling them to share updates, educational resources, and engage in discussions with members and the public.[2,4,7] By utilizing X platform, dental societies can enhance their visibility, promote events such as annual congresses, and facilitate knowledge exchange among professionals.[8] Analyzing patterns of content and engagement on such platforms is vital for understanding how professional organizations build digital presence, foster audience interaction, and contribute to effective health communication. This analysis provides insight into what types of content enhance professional visibility and public trust while identifying opportunities to optimize digital outreach. In Saudi Arabia, this focus is particularly relevant given the Saudi Vision 2030, which prioritizes healthcare transformation, digital innovation, and community engagement. The Vision's Health Sector Transformation Program emphasizes the integration of digital technologies and social media to improve health promotion, preventive care, and patient education.[9] Therefore, examining how Saudi dental societies use the X platform provides meaningful evidence that aligns with national objectives of digital transformation and sustainable professional development.

There is currently no literature about Saudi Dental Societies' presence on X platform, what is their role, the type of messages being delivered, the quality of offered materials, and how could it be improved. The use of X platform to support the vision and mission of dental societies in achieving their goals whether with dentists, dental hygienists, or dental students' needs to be addressed. Thus, this study aimed to analyze the pattern and use of "X" as a social media platform for dental societies in Saudi Arabia. This study builds on prior investigations of social media use in dental education and outreach[2,4,7] by focusing specifically on Saudi dental societies' use of the X platform and analyzing engagement determinants over a more recent period.

Materials and Methods

This cross-sectional, observational study analyzed the official X platform accounts of Saudi dental societies over a one-year period from July 2023 to June 2024. This specific duration was intentionally selected to establish a stable baseline of activity, enabling the capture of a full cycle of organizational and seasonal posting patterns (eg, conferences, holidays, and awareness campaigns), thereby providing a robust foundation for comparative analysis and mitigating the influence of short-term temporal confounders. Publicly available data were used; therefore, institutional review board approval from Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia, was not required. The reporting of this study's design, data sources, variables, and quantitative analysis methods follows the STROBE (Strengthening the Reporting of Observational studies in Epidemiology) Statement to ensure rigorous and transparent communication of the research.

Search Strategy

A list of officially recognized Saudi dental societies was compiled. Only verified or clearly official X platform accounts of these societies were included. Posts from non-official or supporting accounts (eg, personal accounts, university accounts, or affiliated clubs) were excluded. Data were collected from the official X platform accounts of Saudi dental societies using the Twitter API v2 via the Tweepy library in Python, with cleaning and processing in pandas and openpyxl, supported by AI-powered parallel processing, quantum-inspired optimization, and secure multi-layer database protocols. All posts published within the study period were entered into Microsoft Excel. For each post, the following data were recorded:

- Society name and X handle
- Post content (full text)
- Number of views, reposts, likes, replies, bookmarks, and hashtags
- Presence and type of mentions

Coding of Posts

The thematic analysis of posts was performed in a manner consistent with previous studies.[2,4,7,10] Posts were first classified into main themes, including continuing education, research, community outreach, professional advocacy, or unclassified, and further sub-classified into news, announcements, dental professional communication, oral-health education, promoting participation, or unclassified categories. In addition to thematic coding, posts were categorized according to originality (original, repost, or quote), language (Arabic, English, both, or unclassified), content nature (text, media, or both), hashtag use (own society hashtag, common dental-related, common subject-related, trending unrelated, combination, or unclassified), and mentions (organizational, personal, or both).

Two trained and calibrated investigators (DA and HA) performed the coding. A pilot coding of 100 random posts was conducted to standardize the process. Weighted Kappa statistics confirmed reliability: inter-rater agreement = 0.812 and intra-rater agreement = 0.854 (DA) and 0.878 (HA). Discrepancies were resolved by discussion with a gold standard examiner (KK).

Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 22 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as frequencies, percentages, and means with standard deviations. In addition, the temporal distribution of posts over the one-year study period was analyzed. The number of posts was grouped by month to visualize posting trends, as shown in Figure 1.

Total engagements were calculated as the sum of reposts, likes, replies, bookmarks, hashtags, and mentions, while the engagement score (%) was derived by dividing total engagements by the number of views and multiplying by 100. Hashtags were included in the engagement score as they act as active engagement facilitators by transforming content into searchable and interactive threads, thereby driving discoverability and user participation within professional communities. Categorical data were compared using chi-square tests, continuous variables such as engagement measures were analyzed using ANOVA, and multiple linear regression was performed to identify factors associated with the engagement score. Prior to conducting the regression analysis, model assumptions were evaluated. The normality and homoscedasticity of residuals were examined through visual inspection of residual plots, confirming that assumptions were satisfactorily met. Independence of observations was ensured by design, as each post represented a distinct data point. Potential multicollinearity among predictors (likes, replies, reposts, hashtags, bookmarks, and views) was assessed using variance inflation factor (VIF) values, all of which were below 3, indicating no significant multicollinearity. A significance level of $p \leq 0.05$ was applied to control Type I error, consistent with similar social media engagement analyses.

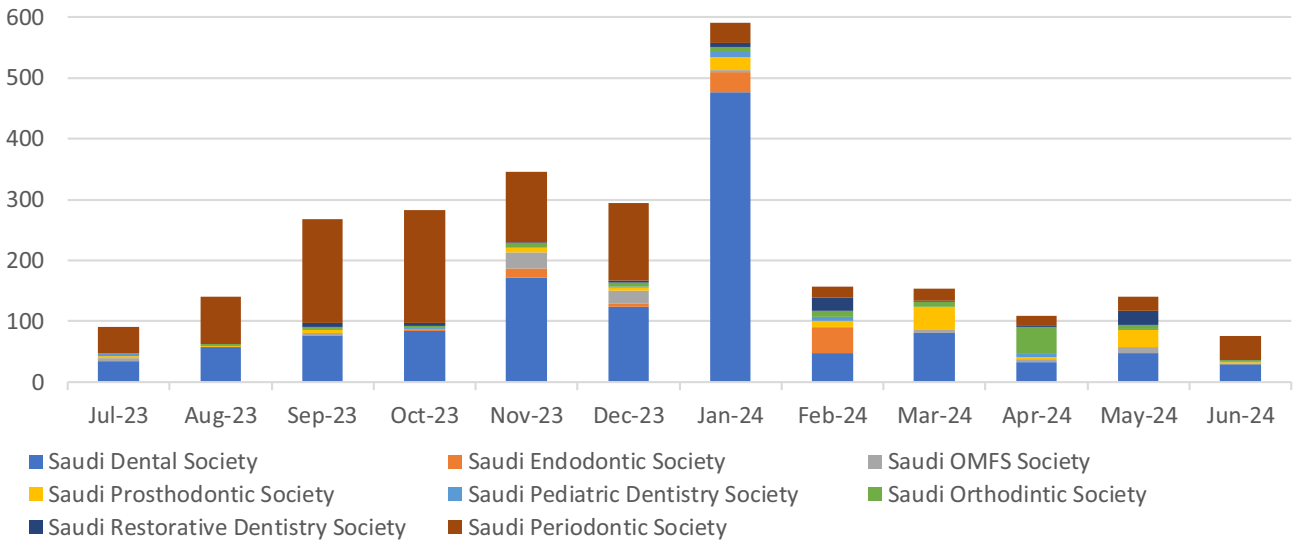

Figure 1 Distribution of posts per month (July 2023–June 2024).

Results

A total of 2649 posts from the official X platform accounts of Saudi dental societies were analyzed between July 2023 and June 2024 (Table 1). The Saudi Dental Society (SDS) produced 1257 posts (47.45%), the Saudi Society of Periodontology and Implant Dentistry (SSPID) produced 872 posts (32.92%), and the remaining societies collectively accounted for 520 posts (19.63%). The SDS also had the highest number of followers (44,300), followed by the Saudi Restorative Dentistry Society (14,600) and SSPID (13,400), indicating a varied reach across organizations.

Distribution of Posts by Content Characteristics

Posts were primarily focused on continuing education (70.4%), followed by professional advocacy (12.8%), community outreach (11.4%), and research-related posts (0.1%) (Table 2). Under sub-classification, news (38.1%) and

Table 1 Dental Societies Accounts Information and Number of Posts (July 2023–June 2024)

Society Name	X (@username)	X Join Date	Number of Followers	Number of Posts N = 2649 n (%)	Annual Conference
Saudi Dental Society	DentalSaudi	September 2012	44300	1257 (47.45)	January
Saudi Endodontic Society	SaudiEndoS	October 2016	10200	98 (3.70)	April
Saudi Society of OMFS	ssoms_lec	February 2013	9617	85 (3.21)	December
Saudi Prosthodontic Society	saudiprostho	October 2019	8174	127 (4.79)	September
Saudi Society of Pediatric Dentistry	sspd_sa	May 2016	7721	37 (1.40)	June
Saudi Orthodontic Society	SaudiOrthodent	September 2013	11300	101 (3.81)	December
Saudi Society of Restorative Dentistry	SSRD_KSA	April 2016	14600	72 (2.72)	September
Saudi Society of Periodontology &Implant Dentistry	saudiperio	October 2018	13400	872 (32.92)	September

Table 2 Distribution of Posts According to the Study Variables for the Saudi Dental Societies

Variable		Dental Society				P-value
		All	SDS	SSPID	Other	
		n (%)				
Main classification	Continuing education	1866 (70.4)	829 (66)	735 (84.3)	302 (58.1)	<0.001*
	Research	2 (0.1)	2 (0.2)	0 (0)	0 (0)	
	Community outreach	302 (11.4)	171 (13.6)	79 (9.1)	52 (10)	
	Professional advocacy	338 (12.8)	220 (17.5)	7 (0.8)	111 (21.3)	
	Unclassified	141 (5.3)	35 (2.8)	51 (5.8)	55 (10.6)	
Sub classification	News	1009 (38.1)	246 (19.6)	594 (68.1)	169 (32.5)	<0.001*
	Announcement	991 (37.4)	592 (47.1)	186 (21.3)	213 (41)	
	Communication	1(0)	0 (0)	1 (0.1)	0 (0)	
	Oral health Education	216 (8.2)	170 (13.5)	40 (4.6)	6 (1.2)	
	Promoting Participation	292 (11)	215 (17.1)	0(0)	77 (14.8)	
	Unclassified	140 (5.3)	34 (2.7)	51 (5.8)	55 (10.6)	

(*Continued*)

Table 2 (Continued).

Variable		Dental Society				P-value
		All	SDS	SSPID	Other	
		n (%)				
Originality	Original	2492 (94.1)	1171 (93.2)	856 (98.2)	465 (89.4)	<0.001*
	Repost	129 (4.9)	83 (6.6)	15 (1.7)	31 (6)	
	Quote	28 (1.1)	3 (0.2)	1 (0.1)	24 (4.6)	
Language	Arabic	748 (28.2)	383 (30.5)	125 (14.3)	240 (46.2)	<0.001*
	English	1488 (56.2)	609 (48.4)	710 (81.4)	169 (32.5)	
	Both	335 (12.6)	234 (18.6)	2 (0.2)	99 (19)	
	Unclassified	78 (2.9)	31 (2.5)	35 (4)	12 (2.3)	
Content nature	Text	162 (6.1)	42 (3.3)	52 (6)	68 (13.1)	<0.001*
	Media	206 (7.8)	71 (5.6)	89 (10.2)	46 (8.8)	
	Both	2281 (86.1)	1144 (91)	731 (83.8)	406 (78.1)	
Hashtag	Yes	1558 (58.8)	596 (47.4)	715 (82)	247 (47.5)	<0.001*
	No	1091 (41.2)	661 (52.6)	157 (18)	273 (52.5)	
Hashtag Type	Own Hashtag	819 (52.5)	61 (10.2)	631 (88.1)	127 (51.4)	<0.001*
	Common dental related	383 (24.6)	352 (59)	19 (2.7)	12 (4.9)	
	Common subject related	76 (4.9)	32 (5.4)	1 (0.1)	43 (17.4)	
	Trending unrelated	33 (2.1)	0 (0)	26 (3.6)	7 (2.8)	
	Combination	155 (9.9)	63 (10.6)	39 (5.4)	53 (21.5)	
	Unclassified	94 (6)	89 (14.9)	0 (0)	5 (2)	
Mention	Yes	214 (8.1)	91 (7.2)	24 (2.8)	99 (19)	<0.001*
	No	2434 (91.9)	1165 (928)	848 (97.2)	421 (81)	
Mention Type	Organizational	115 (54)	64 (71.9)	23 (95.8)	28 (28)	<0.001*
	Personal	81 (38)	21 (23.6)	1 (4.2)	59 (59)	
	Both	17 (8)	4 (4.5)	0 (0)	13 (13)	

Note: *Statistically significant at <0.05.
Abbreviations: SDS, Saudi Dental Society; SSPID, Saudi Society of Periodontology and Implant Dentistry.

announcements (37.4%) were the most frequent content types, while oral health education (8.2%), promoting participation (11.0%), and dental professional communication (0.01%) were less represented.

The vast majority of posts were original content (94.1%), with only 4.9% reposts and 1.1% quotes. Media-enriched content was dominant (86.1%) compared to text-only posts (6.1%).

Language distribution showed that 56.2% of posts were in English, 28.2% in Arabic, and 12.6% bilingual. Hashtags appeared in 58.8% of posts, with 52.5% featuring society-specific tags. Mentions of other accounts were present in 8.1% of posts, with organizational mentions (54%) more frequent than personal mentions (38%). All content characteristics differed significantly among societies ($p < 0.001$), confirming heterogeneous approaches to posting practices.

Engagement Measures Across Societies

The mean total engagement per post was 9.67 ± 17.86 (Table 3). SDS posts achieved 11.98 ± 22.66 engagements per post, while SSPID posts had lower engagement (4.47 ± 6.95) compared with other societies (12.82 ± 15.32) ($p < 0.001$).

Analysis of individual engagement components showed significant variation across societies ($p < 0.001$) for views, reposts, likes, replies, bookmarks, hashtags, and mentions, confirming that posting strategies influenced how audiences interacted with content.

Engagement by Post Classification

By main classification (Table 4), research-related posts achieved the highest total engagement (22 ± 24.04) despite their very low frequency. Professional advocacy (14.46 ± 20.95) and community outreach (14.18 ± 28.28) posts also

Table 3 Measures of Posts Engagement for the Saudi Dental Societies

Variable	Dental Society				P-value
	All	SDS	SSPID	Other	
	Mean ± SD				
Number of Views	3053.01±8287.89	3169.5±2084.45	1558.71±4201.82	5277.23±17365.9	<0.001*
Number of Reposts	2.18±4.86	2.67±6.00	0.99±2.65	2.98±4.23	<0.001*
Number of Likes	5.05±11.28	6.6±14.85	1.95±4.04	6.49±8.04	<0.001*
Number of Replies	0.44±2.52	0.51±3.44	0.21±1.04	0.69±1.37	0.002*
Number of Bookmarks	1.11±3.15	1.45±3.73	0.29±0.91	1.67±3.73	<0.001*
Number of Hashtags	1.31±0.70	1.35±0.65	1.21±0.54	1.51±0.90	<0.001*
Number of Mentions	1.48±0.96	1.64±1.25	1.04±0.20	1.43±0.71	0.019*
Engagement score	1.10±13.42	1.79±19.25	0.35±0.44	0.85±7.53	0.049*
Total Engagement	9.67 ± 17.86	11.98 ± 22.66	4.47 ± 6.95	12.82 ± 15.32	<0.001*

Note: *Statistically significant at <0.05.
Abbreviations: SDS, Saudi Dental Society; SSPID, Saudi Society of Periodontology and Implant Dentistry.

Table 4 Measures of Posts Engagement by Main Classification

Variable	Main Classification						P-value
	Continuing Education	Research	Community Outreach	Professional Advocacy	Unclassified	Total	
	Mean ±SD						
Number of Views	2773.49 ± 8713.99	1070±1513.21	3519.53±6735.65	4397.96±8567.50	2557.03 ± 2689.19	3053.01 ± 8287.89	0.013*
Number of Reposts	1.74 ± 3.90	8 ± 8.49	4.14 ± 8.466	2.86 ± 5.34	2.04 ± 2.87	2.18 ± 4.86	<0.001*
Number of Likes	3.99 ± 7.76	8.5 ± 9.19	7.28 ± 20.602	8.92 ± 15.47	5.03 ± 7.41	5.05 ± 11.28	<0.001*
Number of Replies	0.33 ± 1.02	0.5 ± 0.70	0.59 ±1.296	0.57 ± 1.88	1.37 ± 9.65	0.44 ± 2.52	<0.001*
Number of Bookmarks	1.26 ± 3.56	5 ± 5.66	0.63 ± 1.287	0.93 ± 2.25	0.48 ± 1.41	1.11 ± 3.15	<0.001*
Number of Hashtags	1.19 ± 0.49	0 ± 0	1.7 ± 1.058	1.27 ± 0.66	2.02 ± 1.192	1.31 ± 0.70	<0.001*
Number of Mentions	1.28 ± 0.72	0± 0	2.13 ± 1.539	1.38 ± 0.69	1.33 ± 0.65	1.48 ± 0.96	<0.001*
Engagement Score	0.86±11.82	0.2336± 0	2.181417.73865	1.75±18.94	0.38±0.99	1.10 ± 13.41	0.454
Total Engagement	8.04 ± 14.67	22 ± 24.04	14.18 ± 28.28	14.46 ± 20.95	9.96 ± 15.71	9.67 ± 17.86	<0.001*

Note: *Statistically significant at <0.05.

demonstrated higher engagement than continuing education posts (8.04 ± 14.67), which were the most common but less interactive ($p < 0.001$).

Sub-classification analysis (Table 5) showed that news (38.1%) and announcements (37.4%) were the most frequent content types, whereas oral health education (8.2%) and promoting participation (11.0%) were less common. Significant differences ($p < 0.001$) were observed for reposts, likes, bookmarks, hashtags, and mentions across sub-classifications, although the engagement score itself was not significantly different ($p = 0.266$), suggesting that post type affected the quantity but not the nature of interactions.

Regression Analysis of Engagement Factors

Multiple linear regression identified several independent predictors of engagement score (Table 6). Such as likes ($\beta = 0.033$, $p < 0.001$), replies ($\beta = 0.074$, $p = 0.001$), hashtags ($\beta = 0.057$, $p = 0.014$), and reposts ($\beta = 0.008$, $p = 0.036$) which were considered positive predictors. While bookmarks ($\beta = –0.081$, $p < 0.001$) and views ($\beta = –4.63 \times 10^{-5}$, $p < 0.001$) were considered negative predictors.

The model explained 75.7% of the variance ($R^2 = 0.757$) in engagement score, with strong overall significance ($F(6104) = 54.043$, $p < 0.001$). These findings indicate that interactive actions such as likes and replies contributed positively to engagement, while passive exposure (views, bookmarks) correlated negatively.

Temporal Distribution of Posts

Monthly posting patterns (Figure 1) revealed fluctuations aligned with major society events and annual conferences. Periods of increased activity corresponded to professional meetings, indicating event-driven content generation across societies.

Discussion

The analysis showed that Saudi dental societies largely used the X platform to share continuing education content, but engagement remained modest overall and was more pronounced when posts highlighted research, professional advocacy, or community outreach, indicating variations in audience interaction across content types. These findings align with the growing recognition that social media platforms play an important role in professional communication, education, and outreach within dentistry, yet also reveal gaps in how effectively this potential is being utilized by professional organizations.

The overwhelming focus on continuing education suggests that dental professionals are prioritizing knowledge dissemination and scholarly interaction over other potential social media uses. This aligns with findings from Al-Khalifa et al which emphasized the usage of X platform for educational purposes among dental schools in Saudi Arabia and noted a significant emphasis on sharing resources and promoting academic achievement.[7] Further analysis revealed that community outreach and professional advocacy were notably less prominent, indicating a potential gap in advocacy and community engagement efforts. This discrepancy raises pertinent questions regarding the effectiveness of outreach strategies employed by dental societies and their overall engagement with the community. The limited emphasis on advocacy and outreach activities may reflect broader trends in dental social media strategies and community engagement efforts.

The content of the tweets predominantly consisted of original material and was media enriched, indicating a commitment to engaging presentations of information. This aligns with literature showing that media-enriched content tends to garner more engagement and interaction among users.[7,11] Notably, language use among Saudi dental societies was predominantly English, resulting in a bilingual landscape that reflects the sociolinguistic dynamics of the region. This is consistent with broader trends observed in social media usage within healthcare communication, wherein professionals often utilize dominant languages to maximize outreach.[12] Additionally, hashtags were prevalent, with society-specific tags posts, indicating a trend toward creating community identifiers that enhance group coherence and professional identity.[7]

The exploration of engagement measures across Saudi Dental Societies' posts reveals significant variations in interaction levels among different societies. The Saudi Dental Society (SDS) achieved a relatively higher engagement

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Table 5 Measures of Posts Engagement by Sub-Classification

Variable	Sub-Classification							P-value
	News	Announcement	Dental Professional Communication	Oral Health Education	Promoting Participation	Unclassified	Total	
	Mean ± SD							
Number of Views	2792.15±11868.39	3222.53±5579.77	3259.0±0.0	2972.28±1801.27	3682.53±4947.72	2543.10±2693.74	3053.01±8287.89	0.601
Number of Reposts	1.51±3.51	2.24±4.69	2.0±0.0	4.73±9.63	2.45±4.33	2.05±2.87	2.18±4.86	<0.001*
Number of Likes	3.76±7.95	4.58±7.99	7.0±0.0	8.46±23.80	8.59±15.80	5.06±7.43	5.05±11.28	<0.001*
Number of Replies	0.31±.95	0.44±1.42	0±0.00	0.56±1.15	0.40±1.29	1.35±9.68	0.44±2.52	0.001*
Number of Bookmarks	0.83±2.37	1.64±4.28	0±0.00	0.60±1.10	0.97±2.32	0.48±1.42	1.11±3.15	<0.001*
Number of Hashtags	1.16±0.45	1.38±0.65	3.0±0.0	1.68±1.12	1.24±0.64	2.02±1.19	1.31±0.70	<0.001*
Number of Mentions	1.23±0.54	1.29±0.77	1.0±0.0	2.31±1.65	1.42±0.71	1.38±0.65	1.48±0.96	<0.001*
Engagement Score	0.71±9.87	0.95±12.84	0.40±0.0	2.91±20.94	2.0±20.51	0.38±1.0	1.10±13.42	0.266
Total Engagement	7.34±13.42	9.47±16.18	13.0±0.0	15.95±32.31	13.63±20.82	9.99±15.76	9.67±17.86	<0.001*

Note: *Statistically significant at <0.05.

Table 6 Results of Multiple Linear Regression on Factors Associated with Engagement Score

Effect	Estimate	SE	t	95% CI		P
				Lower Limit	Upper Limit	
Constant	0.310	0.056	5.527	0.199	0.422	<0.001*
# of Likes	0.033	0.002	15.006	0.029	0.038	<0.001*
# of Bookmarks	−0.081	0.008	−9.482	−0.097	−0.064	<0.001*
# of Views	-4.632×10^{-5}	0.000	−8.408	0.000	0.000	<0.001*
# of Replies	0.074	0.022	3.320	0.030	0.118	0.001*
# of Hashtags	0.057	0.023	2.512	0.012	0.102	0.014*
# of Reposts	0.008	0.004	2.120	0.001	0.015	0.036*

Notes: *Statistically significant at p<0.05. R = 0.870. R^2 = 0.757. Adjusted R^2 = 0.743. Std. Error = 0.294. F(6, 104) = 54.043, Sig. = <0.001.
Abbreviations: SE, Standard error; CI, confidence interval.

compared to the Society of other societies. These findings underscore the influence of strategic posting on audience engagement. Comparative research, such as the analysis by Cinelli et al, suggests that engagement levels can be positively influenced by high-quality communication strategies on social media.[13] Their findings support these results, indicating that posts characterized by quality communication techniques are likely to resonate with audiences, promoting increased interaction. This alignment illustrates the necessity of engaging content to enhance user interaction across different healthcare disciplines.

The engagement measures also present an opportunity to reflect on proper use of social media during public health initiatives such as COVID-19 pandemic.[2] The marked disparity in engagement among the Saudi dental societies suggests that strategically crafted, engaging content relevant to community needs is crucial for enhancing overall interactions within the digital space.

The analysis of engagement by post classification among Saudi Dental Societies reveals important insights into the effectiveness of social media strategies in professional contexts. The high engagement associated with research-related posts reflects findings in other studies. For instance, Batra et al indicated that posts engaging with specific scholarly content typically generate higher audience engagement, underscoring the potential of research to stimulate interaction in professional settings.[14] This suggests that when dental societies prioritize research content, they engage an audience that values evidence-based information, likely resulting in higher interaction levels.

The analysis of post sub-classifications in the context of social media engagement reveals that news and announcements dominated the content shared by Saudi Dental Societies, while oral health education and promoting participation were less frequent. Notably, significant differences in engagement measures such as reposts, likes, bookmarks, hashtags, and mentions were observed across these sub-classifications, although the overall engagement score was not significantly different across all post types. This suggests that while the types of posts influenced the quantity of interactions, they did not alter the core nature of the engagements. When comparing these findings to other studies, it is evident that the type of content does play a crucial role in determining user engagement on social media platforms. Furthermore, deeper engagement (such as shares and comments) comes from posts that create immersive experiences.[15] This could imply that the lower engagement observed in oral health education and participation posts might stem from insufficiently compelling content that encourages immersive interaction.

A considerable body of research highlights the importance of interactive elements in social media engagement. For instance, Al-Khalifa et al assessed the role of content type in generating engagement on social media platforms for dental professionals, underscoring that communication formats that promote interaction, such as comments and likes,

significantly enhance audience involvement.[16] Their findings resonate with the positive predictors identified in this study, reinforcing that likes and replies are crucial for fostering meaningful interactions.

The analysis of monthly posting patterns among Saudi Dental Societies revealed significant fluctuations in activity, correlating closely with major events such as professional meetings and annual conferences. This event-driven content generation is a common trend in the social media behaviors observed in dental education and outreach.[7] In one study, social media use and professional behaviors among dental students, exhibited higher engagement around educational content.[17] However, the findings need to be interpreted cautiously as they primarily focus on student populations and may not fully represent the activities of professional societies.

Limitations

This study is subject to several limitations that should be acknowledged. First, the analysis was restricted to posts from Saudi dental societies on a single social media platform (X platform), which may not fully capture their overall digital communication strategies across other platforms such as Instagram, LinkedIn, or Facebook. Second, the study design was cross-sectional, reflecting posting and engagement patterns during a defined one-year period; these patterns may evolve over time and may not represent long-term trends. Third, the analysis relied on publicly available metrics, which provide a quantitative view of engagement but do not assess the quality or depth of interactions, such as the professional relevance of replies or the sentiment of audience responses. Additionally, while the classification of posts was systematically applied, it remains subject to inherent limitations of content categorization, and subtle nuances of messages may not have been fully captured. It is worth to mention that data were collected through the Twitter API v2, potential technical constraints inherent to API-based data retrieval were beyond the analytical focus of this study, which was intended for a dental and public health audience rather than a computer science framework. Finally, the study did not assess how audience demographics (eg, dentists, students, patients) influenced engagement levels, limiting conclusions about which stakeholder groups were most responsive to different types of content.

Future Recommendations

Future studies should explore multi-platform social media analyses to provide a more comprehensive understanding of how dental societies engage with their audiences. Longitudinal research designs would help to identify evolving patterns and measure the sustainability of engagement strategies over time. Incorporating qualitative methods, such as sentiment analysis or content evaluation of replies and mentions, could yield deeper insights into the quality of engagement rather than relying solely on quantitative metrics. Comparative studies across different countries or regions could also reveal cultural or organizational factors influencing social media use. Furthermore, evaluating the effectiveness of specific content strategies—such as incorporating interactive elements, bilingual messaging, or targeted advocacy campaigns—could guide dental societies in optimizing their outreach. Finally, integrating audience segmentation analysis would help societies understand which groups (eg, students, practicing clinicians, patients) are most engaged, enabling tailored communication to maximize impact.

Conclusion

Saudi dental societies predominantly use the X platform to share continuing education content, with relatively modest overall engagement. Posts related to research, advocacy, and community outreach generated higher interaction, suggesting that diversifying content could enhance audience engagement. To strengthen public connection, societies should adopt interactive and participatory strategies—such as Q&A sessions, polls, bilingual content, and collaborations with community figures—to increase inclusivity and relevance. Greater engagement can improve oral health awareness, foster trust in the dental profession, and support the digital transformation goals of Saudi Vision 2030. Strengthening the use of interactive, evidence-based, and community-oriented messaging may allow these organizations to more effectively leverage social media for professional communication, education, and outreach.

Disclosure

The authors report no conflicts of interest in this work.

References

1. van Schaijik B, Alshawa A, Hamadah O, et al. The role of Twitter in dental education: a systematic review. *J Dent Educ*. 2021;85(9):1471–1481. doi:10.1002/jdd.12621
2. Al-Khalifa KS, AlSheikh R, Alsahafi YA, et al. Dental care in the Arab countries during the COVID-19 pandemic: an infodemiological study. *Risk Manag Healthc Policy*. 2021;14:2153–2162. doi:10.2147/RMHP.S310023
3. Joda T, Yeung AWK, Hung K, et al. Disruptive innovation in dentistry: what it is and what could be next. *J Dent Res*. 2021;100(5):448–453. doi:10.1177/0022034520978774
4. Al-Khalifa KS, Bakhurji E, Halawany HS, et al. Pattern of dental needs and advice on Twitter during the COVID-19 pandemic in Saudi Arabia. *BMC Oral Health*. 2021;21(1):456. doi:10.1186/s12903-021-01825-4
5. Sivaramakrishnan G, AbdulAmeer F, Faisal F, et al. Use of social media to view and post dentistry-related information in Bahrain: a cross-sectional study. *Healthc Inform Res*. 2023;29(1):31–39. doi:10.4258/hir.2023.29.1.31
6. Barber SK, Lam Y, Hodge TM, et al. Is social media the way to empower patients to share their experiences of dental care? *J Am Dental Assoc*. 2018;149(6):451–459.e9. doi:10.1016/j.adaj.2018.01.007
7. Al-Khalifa KS, AlMuhammadi FN, AlOraifi NY, et al. The pattern and use of Twitter among dental schools in Saudi Arabia. *PLoS One*. 2022;17(9):e0272628. doi:10.1371/journal.pone.0272628
8. Gholami-Kordkheili F, Wild V, Strech D. The impact of social media on medical professionalism: a systematic qualitative review of challenges and opportunities. *J Med Internet Res*. 2013;15(8):e184. doi:10.2196/jmir.2708
9. Arabia), M.o.H.S. *National eHealth strategy – eHealth initiative in digital transformation (Vision 2030)* Available from: https://www.moh.gov.sa/en/Ministry/nehs/Pages/vision2030.aspx. Accessed November 20, 2025.
10. Al-Khalifa KS, Alsuroor TA, Alafaleq SA, et al. Social media for professional outreach: a study of Saudi dental societies' instagram usage. *Inf Med Unlocked*. 2025;58:101680. doi:10.1016/j.imu.2025.101680
11. Gonzalez SM, Gadbury-Amyot CC. Using Twitter for teaching and learning in an oral and maxillofacial radiology course. *J Dent Educ*. 2016;80(2):149–155. doi:10.1002/j.0022-0337.2016.80.2.tb06070.x
12. Hamasha AAH, Alghofaili N, Obaid A, et al. Social media utilization among dental practitioner in Riyadh. *Saudi Arab Open Dent J*. 2019;13(1):101–106. doi:10.2174/1874210601913010101
13. Cinelli M, Peruzzi A, Schmidt AL, et al. Promoting engagement with quality communication in social media. *PLoS One*. 2022;17(10):e0275534. doi:10.1371/journal.pone.0275534
14. Batra S, Orban J, Zhang H, et al. Analysis of social mission commitment at dental, medical, and nursing schools in the US. *JAMA Network Open*. 2022;5(5):e2210900. doi:10.1001/jamanetworkopen.2022.10900
15. Oh J, Bellur S, Sundar SS. Clicking, assessing, immersing, and sharing: an empirical model of user engagement with interactive media. *Commun Res*. 2015;45(5):737–763. doi:10.1177/0093650215600493
16. Al-Khalifa KS, AlSheikh R, Alakloby BO, et al. Instagram's impact on dental consumers: analyzing toothpaste hashtags. *Front Oral Health*. 2025;5. doi:10.3389/froh.2024.1420500
17. Kamarudin Y, Mohd Nor NA, Libamin AC, et al. Social media use, professional behaviors online, and perceptions toward E-professionalism among dental students. *J Dent Educ*. 2022;86(8):958–967. doi:10.1002/jdd.12912