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ORIGINAL RESEARCH

Instagram and Aesthetic Dentistry: A Study of Content and Engagement Among Arabic Posts Related to Dental Smile

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Background: Instagram has gained ground over the past few years and is a significant health (mis)information source. Instagram posts significantly contribute to the increased demand for dental cosmetic procedures among patients in Arab countries. However, it is critical to assess the quality of these posts to ensure the dental information's reliability and accuracy.

Aim: This study aimed to assess the quality and engagement of Instagram posts related to aesthetic dentistry among Arabic-speaking users.

Materials and Methods: This cross-sectional observational study analyzed publicly available Instagram posts using 15 popular Arabic hashtags related to smile alteration and Hollywood smiles. The data collected included post type, poster role, content theme, and claim accuracy. After that, the collected data were analyzed using non-parametric statistical tests.

Results: The study analyzed 150 Instagram posts, predominantly shared by patients (49.3%) and dentists (32.7%). Marketing posts dominated, with 69.3% focusing on promotions. A concerning 84.0% of posts contained non-factual information. Patient-generated posts received the highest engagement but often lacked professional accuracy.

Conclusion: While Instagram is a powerful platform for marketing and patient engagement, the prevalence of misinformation is a significant concern. It is crucial for healthcare professionals to actively participate on social media to ensure the dissemination of accurate information and to counteract misinformation.

Keywords: Instagram, social media, aesthetic dentistry, patient education, dental marketing

Introduction

Nowadays, individuals' personalities and self-worthiness are dramatically affected by esthetics and physical appearance.[1] A beautiful smile with perfect teeth and well-proportioned lips may influence an individual's perceived age and attractiveness.[1] Cosmetic dentistry has constantly changed due to advancements in experience, technology, equipment, and available new products. Every dentist uses specific techniques to meet individuals' needs and enhance their smile beauty, enabling them to meet their demands without compromising oral health. In the last decade, aesthetic dentistry has gained increasing attraction due to the increased use of social media.[2] These demands led to dentists offering specific procedures, such as veneer placements and tooth whitening, to follow where the beauty industry is headed now.[3,4] A Hollywood smile is induced by a specific esthetic flaw of the dentition associated with actors, movie stars, and social media influencers.[3] Dental veneers supplement the processes of achieving desirable conservative and aesthetic results.

Instagram is among the numerous networking sites that many social media users prefer, among which dentists from every specialty.[5,6] Over the past few years, it has gained ground and is a significant health (mis)information source.[7]

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Many more dentists have used this avenue to showcase their clinical work, share their expertise, and upload educational content. Instagram became a fan favorite by single users attaching their commentaries to other users' images or contributing new content. A key factor for Instagram's popularity is that it permits users to interact with user-generated content through hashtags. It is also the most popular social media site, with a total number of active monthly Instagram users worldwide which reached one billion in 2020, and over two-thirds of them are below the age of 34.[8]

Studies have shown increased demand for dental cosmetic procedures among patients in Arab countries (49.3%).[9] Instagram posts are a significant contributor to this increase. However, it is critical to assess the quality of these posts to ensure the reliability and accuracy of the dental information and maintain a professional standard in the field. A previous study showed that a violation of the dental code was as high as 43.75% and 46.9%.[10] To our knowledge, no study has been conducted on the Arab population of Instagram users. The aim of this study was to assess the quality of Instagram posts related to aesthetic dentistry.

Methodology

This study is a cross-section observational study designed to analyze publicly available data on Instagram among Arabic speakers regarding dental smile alteration and Hollywood smile. Fifteen hashtags in Arabic were selected, and then search methods and data analysis processes were adapted from prior research.[11–13]

Data Collection

A new Instagram account was created, linked to a newly established Email address, on a device that had no prior association with Instagram. The account's birthdate was set to January 1, 2000. GPS permissions were disabled to minimize location-based content suggestions. The "Snooze Suggested Posts" feature was activated within the Instagram settings to limit algorithm-driven post recommendations in the feed. Additionally, the Sensitive Content Control setting was adjusted to "More" to ensure that no posts featuring surgical procedures or similar content would be restricted.

The final list of 15 hashtags (presented in Figure 1) was chosen after exploring the most popular terms about smile alteration and Hollywood smiles, like "#Hollywood smile" and "#veneers". This was followed by a pilot evaluation of

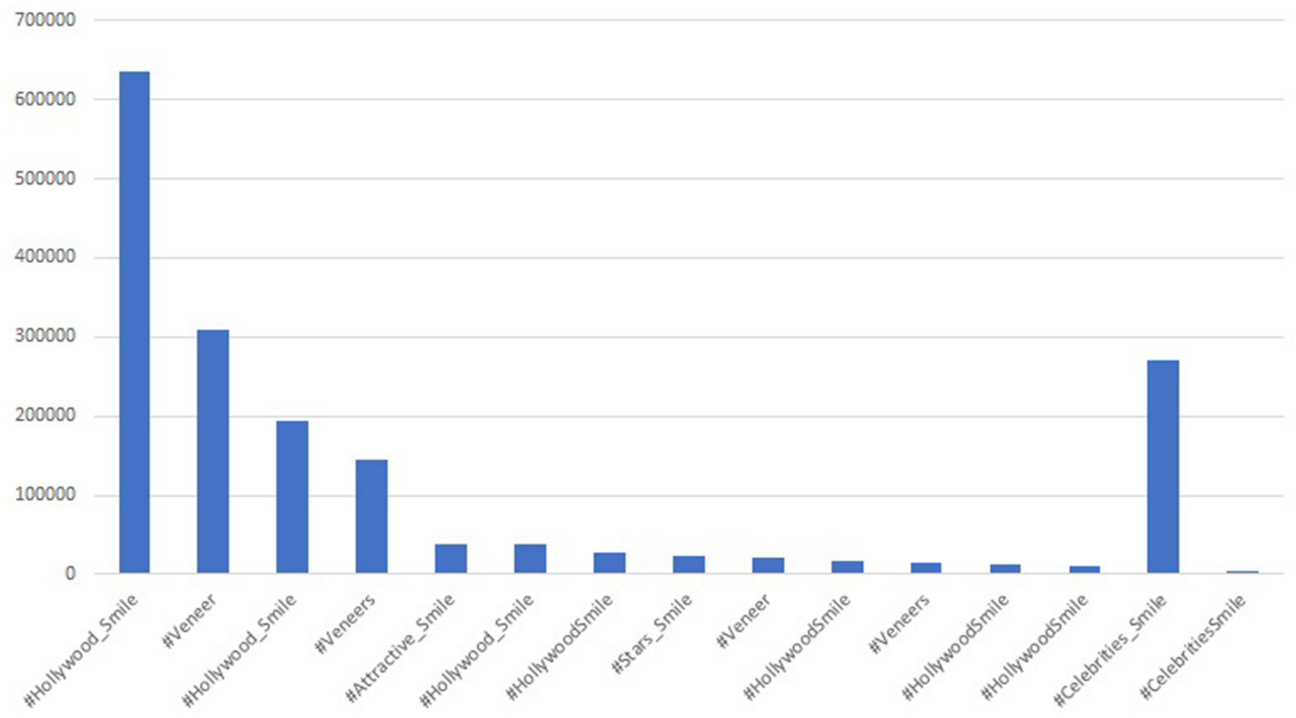

Figure 1 Number of posts per teeth aesthetic-related hashtags on Instagram.

a selected sample of posts to calibrate the researchers and establish shared evaluation criteria. Any disagreements during post-evaluation were resolved through discussion to reach a consensus. A comprehensive list of the top 10 posts for each selected hashtag was collected on the 4th of Feb 2024. Then, two calibrated researchers (MA & JA) independently reviewed the posts and collected the data. Non-related, duplicate posts and posts in languages other than Arabic were eliminated.

The "top 10 posts" of each selected hashtag were recovered on the same day based on the Instagram search algorithm. For each post, content-related data were collected, such as the account type (company, dental practice, dental professional, dental lab, or influencer), post type (practice advertisement, product advertisement, or clinical procedure), poster role (dental organization, or dental company, patient, dentist), the post theme (experience sharing, informational, or marketing), and the idea behind each post content (educational or promotional). Other data collected included the type of content (image, reel, or video) as well as the number of views and likes and the account followers. Posts advertising or promoting procedures, dental professionals, businesses, or products were labeled promotional. Furthermore, posts were classified as educational if the main purpose of the post was to raise awareness and educate about smile modification dental procedures. After data were collected and classified, one experienced researcher (RA) revised and confirmed the accuracy of claims (factual vs non-factual). In addition, posts were evaluated for the presence or absence of watermarks. To assess claim accuracy for each post, a simplified 2-point scale was adopted.[11] The language of the posts was recorded as Arabic or English.

Data Analysis

As all data exhibited non-normal distributions, non-parametric analyses were employed. Descriptive statistics, visual plots (histograms), and normality tests were used to assess data normality. Descriptive statistics included means, standard deviations (SDs), frequencies, and percentages. Claim accuracy was categorized as factual (objectively true, relevant, and minimal facts) or non-factual (including both non-facts and falsified information). Quantitative variables were compared using the Mann–Whitney *U*-test (for two groups based on post content) and the Kruskal–Wallis test (for three groups based on poster role), followed by multiple pairwise comparisons with Bonferroni adjustment for significance. Categorical variables were compared using the chi-square test (with the Monte Carlo correction applied when any cell count was less than 5). Data was analyzed using IBM SPSS Statistics for Windows, version 22.0 (IBM Corp). Statistical significance was set at $P < 0.05$.

Results

Table 1 presents an analysis of Instagram posts under teeth aesthetic-related hashtags. The average number of likes per post is 1666.36, with a very high standard deviation (8470.99), indicating significant variability. Similarly, the number of comments averages 181.49, also with a high degree of variability (SD ± 2011.61). The number of followers per account averages 135,408.82, but again, the large standard deviation (423,865.73) highlights the wide range of follower counts. Posts also use an average of 18.23 hashtags (SD ± 8.559).

A notable percentage of the first 10 comments (78.7%) are relevant to the post. Hashtags used are mostly relevant (56.0%). The majority of posts (66.7%) are in Arabic. Approximately two-thirds (65.3%) of posts include descriptions. In terms of content type, photos dominate, making up 51.3% of posts, followed by reels (30.0%), with videos (10.0%) and carousels (8.7%) being less common. Posts are most often created by patients (49.3%), followed by dentists (32.7%), and dental-related groups (18.0%).

The main themes of these posts lean heavily toward marketing, with 69.3% focusing on promoting products or services. The remaining posts either share personal experiences (15.3%) or provide informative or educational content (15.3%). In terms of post types, practice advertisements make up 43.3%, while clinical cases account for 40.7%, and 16.0% are related to discussions about concerns or procedures. Most of the accounts creating these posts are clinician-run (62.7%), followed by dental-interest groups (12.0%) and practices (25.3%).

The accuracy of the claims made in these posts raises some concerns. Only 16.0% of the posts contain factual information, while the remaining 84.0% consist of non-factual claims. Additionally, 74.0% of the posts contain ownership or brand protection watermarks.

Table 1 Characteristics of Posts Under Teeth Aesthetic-Related Hashtags (n = 150)

No. of likes	Mean ±SD	1666.36 ± 8470.986
No. of comments	Mean ±SD	181.49 ± 2011.614
No. of followers	Mean ±SD	135408.82 ± 423865.727
No. of #	Mean ±SD	18.23 ± 8.559
	n (%)	
*First 10 comments: (n=94)	Related Not related	74 (78.7) 20 (21.3)
# linked:	Related Not related	84 (56.0) 66 (44.0)
Language:	Arabic English Arabic and English other	100 (66.7) 13 (8.7) 28 (18.7) 9 (6.0)
Is there a description of the post?	Yes No	98 (65.3) 52 (34.7)
Content type:	Photo Video Carousel Reel	77 (51.3) 15 (10.0) 13 (8.7) 45 (30.0)
Poster role:	Patient Dental related group Dentist	74 (49.3) 27 (18.0) 49 (32.7)
Post theme:	Marketing Sharing experience Informative/ educational	104 (69.3) 23 (15.3) 23 (15.3)
Post type:	Clinical case Concern or procedure discussion Practice advertisement	61 (40.7) 24 (16.0) 65 (43.3)
Account type:	Clinician Dental interest group Practice	94 (62.7) 18 (12.0) 38 (25.3)
Accuracy of claims:	Facts Non-facts	24 (16.0) 126 (84.0)
Does the post have a watermark?	Yes No	111 (74.0) 39 (26.0)

Note: (n = 150), except * n = 94.
Abbreviation: SD, standard deviation.

Various post characteristics were compared across post themes in Table 2. Marketing posts have the highest mean number of likes (1918.50 ± 10,005.531), followed by Sharing Experiences and Informative/Educational posts. Similarly, Marketing posts have the highest mean number of followers (158021.20 ± 477,576.618), followed by Sharing Experience and Informative/Educational posts. Marketing posts again lead with the highest mean number of comments (249.26 ± 2415.949). On average, marketing posts use slightly more hashtags (19.04 ± 8.432), followed by Informative/Educational

Table 2 Comparison of Post Characteristics According to Post Theme

		Marketing	Sharing Experience	Informative/ Educational	P
Number of likes	Mean ±SD	1918.50 ± 10005.531	1510.65 ± 3377.967	681.96 ± 2131.940	0.816
Number of followers	Mean ±SD	158021.20 ± 477576.618	113024.50± 321519.388	55545.87 ± 189717.338	0.558
Number of comments	Mean ±SD	249.26 ± 2415.949	36.96± 79.049	19.57 ± 48.738	0.826
Number of #	Mean ±SD	19.04 ± 8.432	15.30 ± 8.364	17.48 ± 8.979	0.150
**First 10 comments: n (%) (n=94)	Related Not related	51(68.9) 17(85.0)	12(16.2) 2(10.0)	11(14.9) 1(5.0)	0.489
# linked: n (%)	Related Not related	59(70.2) 47(68.8)	15(17.9) 7(10.9)	10(11.9) 13(22.3)	0.305
Language: n (%)	Arabic English Arabic & English other	65(65.0) 9(69.2) 25(89.3) 5(55.6)	16(16.0) 2(15.4) 2(7.1) 3(33.3)	19(19.0) 2(15.4) 1(3.6) 1(1.1)	0.186
Post description: n (%)	Yes No	69(70.4) 35(67.3)	14(14.3) 9(17.3)	15(15.3) 8(15.4)	0.883
Content type: n (%)	Photo Video Carousel Reel	65(84.4) 12(80.0) 7(53.9) 20(44.4)	6(7.8) 1(6.7) 5(38.5) 11(24.4)	6(7.8) 2(13.3) 1(7.7) 14(31.1)	*<0.001
Poster role: n (%)	Patient Dental related group Dentist	54(73.0) 25(92.6) 25(51.0)	19(25.7) 0(0.0) 4(8.2)	1(1.4) 2(7.4) 20(40.8)	*<0.001
Post type: n (%)	Clinical case Concern or procedure discussion Practice advertisement	50(82.0) 2(8.3) 52(80.0)	7(11.5) 5(20.8) 11(16.9)	4(6.6) 17(70.8) 2(3.1)	*<0.001
Account type: n (%)	Clinician Dental interest group Practice	70(74.5) 8(44.4) 26(68.4)	8(8.5) 9(50.0) 6(15.8)	16(17.0) 1(5.6) 6(15.8)	*<0.001
Accuracy of claims: n (%)	Facts Non-facts	7(29.2) 97(77.0)	1(4.2) 22(17.5)	16(66.7) 7(5.6)	*<0.001
Watermark: n (%)	Yes No	85(76.6) 19(48.7)	8(7.2) 15(38.5)	18(16.2) 5(12.8)	*<0.001

Notes: *Significant at $p < 0.05$. (n = 150), except ** n = 94.
Abbreviation: SD, standard deviation.

and Sharing Experience posts. The p-value for the number of likes, followers, hashtags, and comments was insignificant despite noticeable differences between post themes.

When looking at the first ten comments across the post themes, it was noticed that most of the comments were related to the veneer content, with a majority of marketing posts compared to Sharing Experience and Informative/Educational posts ($p = 0.489$). Also, when looking at the linked hashtags, we notice most related posts across post themes, with marketing posts at the top ($p = 0.305$). Arabic was the most common language across all themes, with a mix of other languages being used to varying degrees with no significant difference in language usage ($p = 0.186$). In addition, most posts were described throughout the post themes with no statistically significant difference between post themes ($p = 0.883$).

There was a significant difference in the type of content across themes ($p < 0.001$). Marketing posts predominantly use photos (84.4%), while Informative/Educational posts are more evenly distributed across photos, videos, carousels,

and reels. As for the poster role, there was a significant variation across themes ($p < 0.001$). Marketing posts were mainly shared by patients (73.0%), whereas Sharing Experience posts were predominantly by dental-related groups (92.6%), and Informative/Educational posts were shared mainly by dentists (51.0%). The type of post varies significantly across themes ($p < 0.001$). Marketing posts were mostly practice advertisements (80.0%), while Informative/Educational posts focused on concerns or procedure discussion (70.8%). The type of account also shows significant differences ($p < 0.001$), with Marketing posts mostly coming from clinicians (74.5%) and Informative/Educational posts primarily from clinicians. The accuracy of claims significantly varies across post themes ($p < 0.001$). Many Marketing posts are based on non-facts (77.0%), whereas Informative/Educational posts predominantly present factual information (66.7%). Watermark presence also differs significantly across themes ($p < 0.001$). Marketing posts are more likely to include a watermark (76.6%) than Sharing Experiences and Informative/Educational posts.

Table 3 compares the characteristics of Instagram posts according to the poster's role. Patients' posts have the highest mean number of likes (2768.46 ± 11,879.426), followed by posts from dental-related groups and Dentists ($p = 0.286$). Interestingly, dental-related groups have a significantly higher mean number of followers (291638.67 ± 698,657.749) than patients and dentists ($p = 0.021$). Patients' posts again have the highest mean number of comments (357.05 ± 2862.986) with no significant difference compared to dental-related groups or dentists ($p = 0.576$). As for the number of hashtags, dental-related groups use the most hashtags on average (20.59 ± 7.551) with no significant difference compared to patients and dentists ($p = 0.188$).

Table 3 Comparison of Post Characteristics According to Poster Role

		Patient	Dental Related Group	Dentist	P
Number of likes	Mean ±SD	2768.46 ± 11879.426	869.00± 2262.263	441.33 ± 1261.788	0.286
Number of followers	Mean ±SD	156083.40 ± 156083.40	291638.67 ± 698657.749	18100.16 ± 30163.322	*0.021
Number of comments	Mean ±SD	357.05 ± 2862.986	6.74 ± 16.906	12.63 ± 39.225	0.576
Number of #	Mean ±SD	17.14 ± 8.440	20.59 ± 7.551	18.57 ± 9.113	0.188
**First 10 comments: n (%) (n=94)	Related Not related	42(56.8) 9(45.0)	8(10.8) 5(25.0)	24(32.4) 6(30.0)	0.203
# linked: n (%)	Related Not related	46(54.8) 28(42.4)	10(11.9) 17(25.8)	28(33.3) 21(31.8)	0.150
Language: n (%)	Arabic English Arabic & English other	45(45.0) 6(46.2) 18(64.3) 5(55.6)	19(19.0) 5(38.5) 3(10.7) 0(0.0)	36(36.0) 2(15.4) 7(25.0) 4(44.4)	0.138
Post description: n (%)	Yes No	47(48.0) 27(51.9)	18(18.4) 9(17.3)	33(33.7) 16(30.8)	0.897
Content type: n (%)	Photo Video Carousel Reel	39(50.6) 9(60.0) 8(61.5(18)40.0(	20(26.0) 0(0.0) 1(7.7) 6(13.3)	18(23.4) 6(40.0) 4(30.8) 21(46.7)	*0.039
Poste theme: n (%)	Marketing Sharing experience Informative/ educational	54(51.9) 19(82.6) 1(4.3)	25(24.0) 0(0.0) 2(8.7)	25(24.0) 4(17.4) 20(87.0)	*<0.001
Post type: n (%)	Clinical case Concern or procedure discussion Practice advertisement	46(75.4) 3(12.5) 25(38.5)	5(8.2) 1(4.2) 21(32.3)	10(16.4) 20(83.3) 19(29.2)	*<0.001

(*Continued*)

Table 3 (Continued).

		Patient	Dental Related Group	Dentist	P
Account type: n (%)	Clinician Dental interest group Practice	50(53.2) 10(55.6) 14(36.8)	7(7.4) 8(44.4) 12(31.6)	37(39.4) 0(0.0) 12(31.6)	*<0.001
Accuracy of claims: n (%)	Facts Non-facts	3(12.5) 71(56.3)	2(8.3) 25(19.8)	19(79.2) 30(23.8)	*<0.001
Watermark: n (%)	Yes No	50(45.0) 24(61.5)	23(20.7) 4(10.3)	38(34.2) 11(28.2)	0.160

Notes: *Significant at $p < 0.05$. (n = 150), except ** n = 94.
Abbreviation: SD, standard deviation.

When looking at the first ten comments across the poster's role, it was noticed that most comments were related to the veneer content, with most posts coming from patients followed by dentists and dental-related groups ($p = 0.203$). As for linked hashtags, it was noticed that most related posts across the poster's role exist with leading patients' posts ($p = 0.150$). Arabic was the most common language across all poster roles, with a mix of other languages being used to varying degrees with no significant difference in language usage ($p = 0.138$). In addition, most of the posts were described throughout the poster's role with no statistically significant difference ($p = 0.897$).

Patients and dental-related groups commonly use photos, while reels are top-rated among dentists, with a significant difference in the type of content shared by each group ($p = 0.039$). Marketing was the predominant theme for posts, with a highly significant difference in post themes between the groups ($p < 0.001$). Patients are more likely to share clinical cases. In contrast, dentists are more inclined to discuss concerns or procedures, and dental-related groups share practice advertisements with a highly significant difference in the types of posts made by each group ($p < 0.001$). Clinician accounts are more common among patients and dentists, while practice accounts are more common among dental-related groups ($p < 0.001$). Dentists are more likely to post factual content (79.2%). In contrast, non-factual content is more prevalent in posts by patients (56.3%) and dental-related groups (19.8%) with a p-value <0.001, which highlights a significant difference in the accuracy of claims across the groups. Patients' posts are more likely to have a watermark (45.0%) compared to dental-related groups (20.7%) and dentists (28.2%), with no statistically significant difference among the groups ($p = 0.160$).

Table 4 compares Instagram post characteristics across three different post types. Clinical case posts received the highest average number of likes (2640.28 ± 12,929.808), while practice advertisements were associated with the highest mean number of followers (180637.82 ± 550,833.672). Clinical cases generated the most comments on average (426.05 ± 3153.377). Interestingly, hashtag usage was similar across all post types. The p-value for the number of likes, followers, hashtags, and comments was insignificant despite noticeable differences between post types.

When looking at the first ten comments across the post types, it was noticed that most comments were related to the veneer content with most clinical cases ($p = 0.057$). Also, when looking at the linked hashtags, we notice most related posts across post types with practice advertisement leading the posts ($p = 0.150$). Arabic was the predominant language across post types, while English was more common in clinical cases and practice advertisements ($p = 0.010$). Practice advertisements were more likely to include post descriptions (49.0%) compared to clinical cases and concern or procedure discussions ($p = 0.897$).

Clinical cases and practice advertisements predominantly feature photos, while reels are even more common for concern or procedure discussion, with a highly significant difference across post types ($p = 0.004$). In addition, marketing themes were predominant in clinical cases and practice advertisements, while informative/educational themes were more common for concern or procedure discussion with a highly significant difference across post types ($p < 0.001$). Patients were the primary posters of clinical cases and practice advertisements, while dentists were the main contributors to concern or procedure discussions.

Table 4 Comparison of Post Characteristics According to Post Type

		Clinical Case	Concern or Procedure Discussion	Practice Advertisement	P
Number of likes	Mean ±SD	2640.28 ± 12929.808	673.13 ± 2077.938	1119.11 ± 2683.209	0.498
Number of followers	Mean ±SD	115888.92 ± 323226.688	62526.71 ± 186349.661	180637.82 ± 550833.672	0.457
Number of comments	Mean ±SD	426.05 ± 3153.377	17.29 ± 37.710	12.60 ± 45.514	0.471
Number of #	Mean ±SD	18.62 ± 7.908	16.75 ± 8.892	18.40 ± 9.083	0.650
**First 10 comments: n (%) (n=94)	Related Not related	37(50.0) 7(35.0)	13(17.6) 1(5.0)	24(32.4) 12(60.0)	0.057
# linked: n (%)	Related Not related	35(41.7) 26(39.4)	9(10.7) 15(22.7)	40(47.6) 25(37.9)	0.150
Language: n (%)	Arabic English Arabic & English Other	32(32.0) 9(69.2) 16(57.1) 4(44.4)	20(20.0) 3(23.1) 0(0.0) 1(11.1)	48(48.0) 1(7.7) 12(42.9) 4(44.4)	*0.010
Post description: n (%)	Yes No	33(33.7) 28(53.8)	17(17.3) 7(13.5)	48(49.0) 17(32.7)	0.897
Content type: n (%)	Photo Video Carousel Reel	34(44.2) 8(53.3) 6(46.2) 13(28.9)	6(7.8) 1(6.7) 1(7.7) 16(35.6)	37(48.1) 6(40.0) 6(46.2) 16(35.6)	*0.004
Poste theme: n (%)	Marketing Sharing experience Informative/ educational	50(48.1) 7(30.4) 4(17.4)	2(1.9) 5(21.7) 17(73.9)	52(50.0) 11(47.8) 2(8.7)	*<0.001
Poster role: n (%)	Patient Dental interest group Dentist	46(62.2) 5(18.5) 10(20.4)	3(4.1) 1(3.7) 20(40.8)	25(33.8) 21(77.8) 19(38.8)	*<0.001
Account type: n (%)	Clinician Dental interest group Practice	45(47.9) 9(50.0) 7(18.4)	17(18.1) 2(11.1) 5(13.2)	32(34.0) 7(38.9) 26(68.4)	*0.006
Accuracy of claims: n (%)	Facts Non-facts	5(20.8) 56(44.4)	15(62.5) 9(7.1)	4(16.7) 61(48.4)	*<0.001
Watermark: n (%)	Yes No	48(43.2) 13(33.3)	14(12.6) 10(25.6)	49(44.1) 16(41.0)	0.148

Notes: *Significant at $p < 0.05$. (n = 150), except ** n = 94.
Abbreviation: SD, standard deviation.

($p < 0.001$). Clinician accounts were most frequent in posting throughout different post types with a p-value of 0.006, suggesting significant differences in account types across post types. Concern or procedure discussions have the highest percentage of factual claims (62.5%), while practice advertisements and clinical cases are less factual ($p < 0.001$). Watermark usage was relatively similar across post types, with practice advertisements (44.1%) and clinical cases (43.2%) being slightly more likely to include a watermark than concern or procedure discussions (12.6%) with no statistically significant difference noticed ($p = 0.148$).

Discussion

The data analyzed post characteristics related to Arabic hashtags on veneers and esthetics revealed essential findings regarding user interactions and content marketing. It was noted that marketing posts dominated other themes in regard to the number of likes, followers, and comments. This finding supports the literature that has established Instagram as an effective marketing platform, especially when relying on visual appeal.[14,15] The high engagement levels characteristic of marketing posts indicate that users are not only reading content but are also attracted to the marketing story that brands and influencers tell. Unexpectedly, the level of engagement with posts on different hashtags selected was significantly different. This implies that although marketing posts seem to perform better in engagement, the general user engagement with various forms of content may not be as distinct from one another as the numbers indicate.[16,17] The absence of such differences may suggest that users are equally ready to interact with any content for different purposes.

The content type also differed by themes, while marketing accounts use photos most frequently (62.5%), sharing experiences and informative/educational accounts posts using reels more often (47.8% and 60.9%, respectively). This difference in content can be attributed to the beliefs of the content providers that the perceived efficacy of the various content is more effective in attracting the targeted audience. The use of photos in marketing posts may be due to the nature of the platform, which is more suited to the use of images to market products and services.[18,19] On the other hand, utilizing reels to share experiences and educational content implies transitioning to more dynamic and entertaining formats to deliver the information. Furthermore, the poster's role analysis showed that most marketing and sharing experience posts were created by patients (51. 9% and 82. 6%, respectively), while informative/educational posts were made by dentists (87%). This difference shows that the content creators have different motives and may have varying levels of experience, which can affect the perceived reliability and interaction with the posts. A professional's informative and shared content may appeal to users looking for accurate information.

In contrast, the content shared by a patient may be more appealing to users looking for something they can relate to or feedback. The posts' factual information level also differed by themes, where a significant portion of marketing (93.3%) and sharing experience (95.7%) posts contained non-factual information. In comparison, informative/educational posts contain primarily factual information (69.6%). Many such discrepancies raise the question of how social media marketing is rife with misinformation and the resulting repercussions on public health and consumer patterns. Such techniques can adversely impact the credibility and believability of the marketing campaign in an industry in which sensitivity concerning the provision of information is paramount. Such misleading information does impact the public perception of what is healthy or esthetic and request for a certain treatment over another and can be seen in the comment section regarding the public acceptance of what dentally would be considered as a health compromise.

In this regard, it was observed that the use of watermarks was more pronounced in marketing posts, constituting 81.7% of all other themes. This illustrates that the authors are attempting to protect their works and thoughts from plagiarism by competitors in the highly competitive social media markets. It is efficient that this activity is characteristic of branding in social media as users' visual identification plays a vital role in user engagement.[20]

A deeper examination of the posts' features based on the poster's role highlights the patterns of users' interactions and content fluctuations in the dental sphere. Most importantly, patient-generated posts have the highest mean number of likes ($2768.46 \pm 11{,}879.426$), more than dental-related groups and dentists. This implies that the patient's content is well received by the audience, possibly because of the relativity of the content, as mentioned earlier. Patients also post their stories and results, creating a sense of belonging among the followers, thus increasing engagement.[21,22] Although patients' posts are popular, the overall level of engagement for different poster roles may not be as far apart as the averages suggest. Surprisingly, the dental-related groups have a higher mean number of followers than the patients and

dentists. This could be attributed to the fact that dental-related groups have more comprehensive coverage and are more organized than the other groups; hence, they may employ more strategic marketing and content sharing. These groups may post more general content and include educational and promotional posts, attracting more people.[23,24] The fact that there are more followers in dental-related groups shows that collective branding is viable and that these groups can act as opinion leaders in dentistry. As for comments, patient posts are more frequent; this means that the patients read the content and participate in the discussion. This aligns with the idea that personal narratives and other engagement stories generate more interaction since followers may have to reply to the post.[25] The same can be said about hashtags, which also shows some peculiarities: the average number of hashtags per post is the highest in the dental-related groups. The proper application of hashtags can increase audience reach and engagement, meaning the posts will not be limited to the followers list only.[26] The evaluation of the first ten comments according to the role of the poster indicates that most comments were associated with veneer content, primarily from patients. This may mean a targeted interest in specific dental procedures, which might be popular or topical during the survey. The fact that Arabic was the most common first language in all the poster roles shows that the audience is localized and interacts mainly in their first language, reinforcing the cultural aspect of the information shared. The content type significantly differs depending on the poster roles; patients and dental-related groups mostly share photos, while dentists prefer reels. This distinction underscores the changing nature of content consumption on Instagram, especially when dynamic formats such as reels may be more helpful in presenting information or capturing the audience's attention.[27] The marketing theme is the most dominant in all the groups, with a highly significant variation in the post type. Patients are more likely to share clinical cases, dentists are more likely to share concerns or procedures, and dental-related groups are more likely to share practice advertisements.

The difference in content strategy is due to the goals and knowledge of the poster roles, where patients post their stories, and dentists post their professional opinions.[28] Furthermore, the truthfulness of the claims differs between the groups, where patients and dental-related groups are more inclined to post non-factual information (96%) than dentists (61.2%). This disparity makes one wonder about the credibility of information posted on social media, especially health-related issues since wrong information can lead to adverse effects.[29,30] Watermarks were identified in 85. 2% of posts by dental-related groups, 67.6% of posts by patients, and 77.6% of posts by dentists; the difference was not statistically significant ($p = 0.160$). Watermarks may be useful in protecting intellectual property and promoting brand identity, especially for organizations that heavily utilize visual media in their marketing strategies. Therefore, the evaluation of Instagram posts, depending on the role of the poster, provides valuable information about the users' activity, content fluctuations, and the necessity of correct information sharing in the dental field. Patients' posts receive much attention, which underlines the importance of sharing personal stories, whereas dental-related groups can use their structure to gain more followers. Therefore, the study calls for healthcare professionals to actively participate on social media platforms to ensure that the information being passed is relevant and correct.

The analysis reveals two preferable areas for modification in social networks, particularly Instagram posts regarding dental procedures and others. Firstly, the experience-sharing and marketing posts offer non-factual information and misinformation. That is why concern is raised about how accurate social media posts are and how consumer behavior is influenced by wealth and sin information. Secondly, there is excessive dependence on user-created content, the accuracy of which may only sometimes be professional.[31] Although the public has dramatically appreciated patient-driven posts, they do not necessarily include professional prospects, leaving the audience with the wrong impression of dental procedures. The discussion also mentions other limitations. First, it is pointed out that qualitative user engagement cannot be evaluated using only such metrics as likes and comments.[25,32]

Furthermore, it is shocking to find that out of 150 Instagram posts, only 17% contain factual information, which shows a worrying trend in how faux news affects the public health of consumers. Another drawback of the analysis of content and its results regarding different types and their effectiveness in attracting users is the absence of audience data that could be used to adjust the content.[33] The following recommendations are made to overcome the limitations mentioned above: The use of social networks in healthcare should be based on reportage and clarity of information published by healthcare institutions in collaboration with social media content management. It is recommended that healthcare practitioners engage in social media platforms to counter the nonsense that floods the platform. Possible

solutions: the need for educational campaigns to raise the audience's critical thinking level using social networks and joint work of healthcare workers with social network administrators.[34]

Conclusion

This study highlights key findings on the role of Arabic hashtags in Instagram posts related to veneers and esthetics. Marketing posts dominate user engagement, underscoring Instagram's power as a visual marketing platform. However, the study reveals significant misinformation, particularly in patient-generated and marketing posts, raising concerns about public health impacts. Although patient-driven content garners more engagement, it often lacks professional accuracy. This can be utilized by generating patient-generated posts in collaboration with health professionals to engage the target population better.

The results emphasize the need for healthcare professionals to be more active on social media to ensure the dissemination of factual information and to counteract misinformation. Educational campaigns and collaboration between healthcare workers and social media platforms are recommended to enhance content reliability.

Ethics Statement

The research described in this manuscript involved data collected from Instagram. No ethical approval was needed as the research dealt with publicly available data. The following ethical guidelines were followed:

1. Instagram Permission Requirements: The use of Instagram data was conducted in compliance with Instagram's Terms of Service and Data Policy, particularly with respect to the use of public content for research purposes.
2. Adherence to Requirements: All data collected from Instagram adhered to these requirements, ensuring that no personal or private information was accessed without explicit permission. Only publicly available data was used in the analysis, in accordance with Instagram's guidelines.
3. Additional Permissions: As no restricted or private data was accessed, no additional permissions were required from Instagram.

Disclosure

The authors report no conflicts of interest in this work.

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