Original Research Article

Role of social media in creating oral health awareness among IT professionals in Chennai, Tamilnadu, India: A cross sectional survey

Abstract:

Introduction: Social media is one of the significant online venues for the exchange of health-related information. If utilized in a productive manner, social media could serve as one of the cost-effective method of spreading oral health awareness. The purpose of this study is to assess the role of social media in spreading oral health awareness among IT professionals in Chennai City. **Materials and Methods:** This online survey was conducted among IT professionals who use social media and are willing to participate in the study. A pre-tested, structured, closed ended questionnaire was used. **Results:** A total of 353 participants including 186 males and 167 females responded to the survey. Around 29 participants (8.2%) searched for dental or oral health-related information online more than once a week. The most common information searched online was dental pain (23.2%) and bleeding gums (9.9%). The study participants received frequent oral health related messages from Youtube (28.8%) and Instagram (18.7%). **Conclusion:** Majority of the study population use social media to receive or share oral health related information. Although accessing oral health information in social media is advantageous, concerns about the quality and trustworthiness exist among the study population which could inhibit people from using social media to seek oral health related information.

Keywords: Digital, Internet, Information search, Oral health awareness, Social Media, Online

Introduction:

Oral health is one of the key indicators of overall health, well-being and quality of life. Promoting oral health is integral for maintaining the general health of the individuals and helping them to achieve their complete potential. The widespread lack of knowledge about the importance of maintaining oral health can lead to unhealthy oral habits and high prevalence of oral diseases. It becomes essential to teach the community about healthy lifestyle practices so that the people can change their existing unhealthy behavior and

understand the importance of maintaining healthy teeth and mouth.[1] Oral health promotional activities on a larger scale in the most populous country like India is challenging; the use of newer technologies like internet has become indispensable. As per Indian Ministry of Communications' press release, a total of 954.4 million people in India use internet as of March 2024 and one-third of them belong to rural areas. Internet accessibility is being provided to 95.15 % villages[2] and so mass oral health education through online sources can be a cost-effective initiative in creating oral health awareness.

Social media is a group of Internet-based applications build on Web 2.0 technology, that allow users to create and exchange of their contents. It includes the web or mobile based platform that enables interactive communication between an individual or agency.[3] Social media, referred as the great information equalizer, has become an integral part of modern life. Various technologies and gadgets are used to electronically promote engagement, sharing, social interaction, and collaboration within society. A whopping 50 crore Indians are actively using one or more social media platforms including WhatsApp, YouTube, Facebook, Instagram and Twitter. Majority of the public use social media for a wide range of meaningful activities such as education and marketing due to its various advantages like peer / social / emotional support, increased availability and accessibility, vast expanse of shared and tailored information and ability to communicate larger population at one time.[4] Since social media spreads user generated content, it is essential to monitor the credibility of the shared information. Dental public health delivery and outcomes can be improved if the access to credible and relevant oral health information coupled with access to information and communication technology is achieved.[5] Multiple factors like environmental factors, oral health information needed, creativity of the content, direct consultation influence the selection of the social media platform.[6]The extent of the social media in spreading oral health awareness can be assessed among the people who use social media platforms more often.Chennai, the capital of Tamilnadu is the tech powerhouse and its IT sector majorly contributes to India's software industry. Compared to other professions, social media platforms are familiar among most IT employees in Chennai due to their easy access to internet. Hence, the present study is aimed to assess the role of social media in spreading oral health awareness among IT professionals in Chennai city, Tamilnadu using an online survey.

Materials and methods:

Study setting and study area:

This cross sectional studywith descriptive epidemiological study designwas conducted through an online survey among IT Professionals from Chennai, Tamil Nadu for a period of six months from January 2024 to June 2024.

Inclusion criteria:

Participants who are aged 18 to 60 years and currently working in IT sector at Chennai, Tamilnadu were included.

Exclusion criteria:

Participants pursuing internship or those not willing to participate in the study were excluded.

Sample size estimation:

The sample size was estimated to be 355 using OpenEpi Version 3.01 softwareusing the formula n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)] as per the previous study by Widiyastutiet al[1]

Questionnaire:

A pre-tested, structured, closed-ended 15 item questionnaire was prepared in English language. The preliminary pilot testing of the questionnaire was conducted among 30 IT employees who were not part of the present study. The internal consistency was assessed through Cronbach's alpha (α = 0.89).The inter examiner reliability was assessed using Cohen's Kappa statistics and was found to be in almost perfect agreement (κ = 0.83). The questionnaire was prepared in Google forms and it included data regarding the demographic details, social media usage and oral health awareness, attitudes and practices.

Data collection:

Questionnaire was sent through online social media platforms including Facebook, Instagram, LinkedIn, Twitter and WhatsApp. Initially, the authors posted the Google form link in their respective social media handles and invited the IT employees currently working in Chennai to participate in the study. The study participants were selected through convenience sampling technique and the participation was voluntary and anonymous. The

participants were also requested to share the link to their colleagues if they are interested. The link was designed to accept the responses till the sample size of 355 was achieved.

Statistical analysis:

The data were collected and entered in Microsoft Excel spreadsheet. Statistical analysis was done using the Statistical Package for Social Science (SPSS Version 20). Categorical data were reported as frequencies and percentages. Group comparison was performed using Chi-square test with a 95% confidence interval. The statistical significance was set at $p < 0.05$.

Results:

The present study included 188 males (53%) and 167 females (47%) who are aged 20 to 45 years. The mean age of the study participants was 23.7±4.8 years. Most of the study population were aged 20-25 years (71.3%). There were a total of 82 participants (23.1%) belonging to 26-30 years age group, 13 participants belonging to 31-35 years age group and 9 participants (2.5%) were aged above 36 years. A total of 279 participants have completed undergraduate degree (79%) and 59 participants have completed their postgraduate degree (17%). Only 12 participants (3.4%) have completed diploma and 3 participants (0.8%) completed PhD. More than half of the study population including 196 participants (55.3%) earned 1 to 3 lakhs per annum. An annual income of less than 1 lakh was earned by 55 participants (15.5%), 3-6 lakhs was earned by 39 participants (10.8%), 6-10 lakhs was earned by 30 participants (8.5%) and more than 10 lakhs was earned by 35 participants (9.9%). The table 1 shows the demographic details of the study participants.

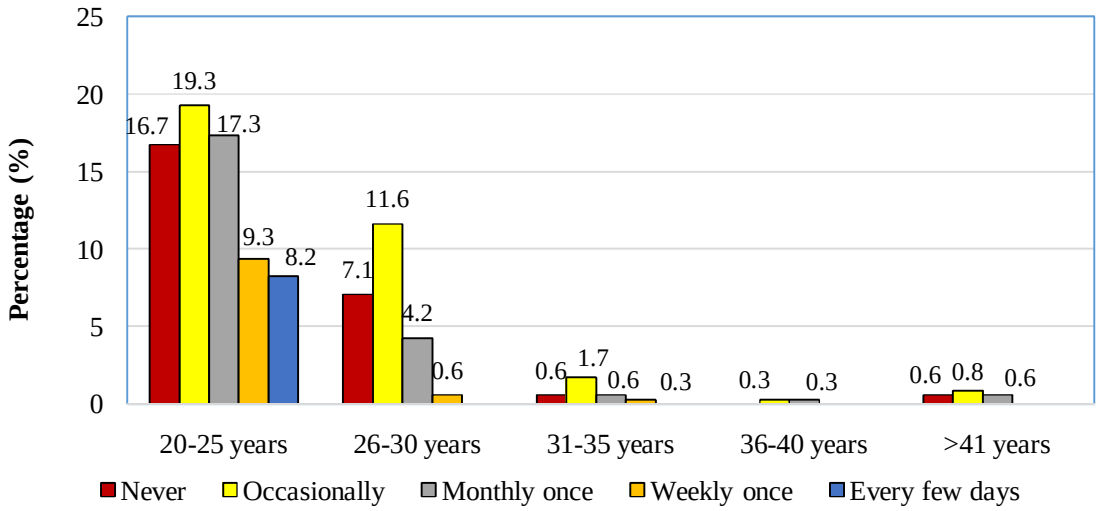
Table 1: Distribution of demographic details of the study participants

S.No	Parameter	Responses	Frequency	Percentage
1	Gender	Male	188	53
		Female	167	47
2	Age group	20-25 years	253	71.3
		26-30 years	82	23.1
		31-35 years	13	3.7
		>36 years	9	2.5

3	Education	Diploma	12	3.4
		Undergraduate	281	79.6
		Postgraduate	59	16.7
		PhD	3	0.8
4	Income per annum	<1 lakh	55	15.5
		1-3 lakhs	196	55.3
		3-6 lakhs	39	10.8
		6-10 lakhs	30	8.5
		> 10 lakh	35	9.9

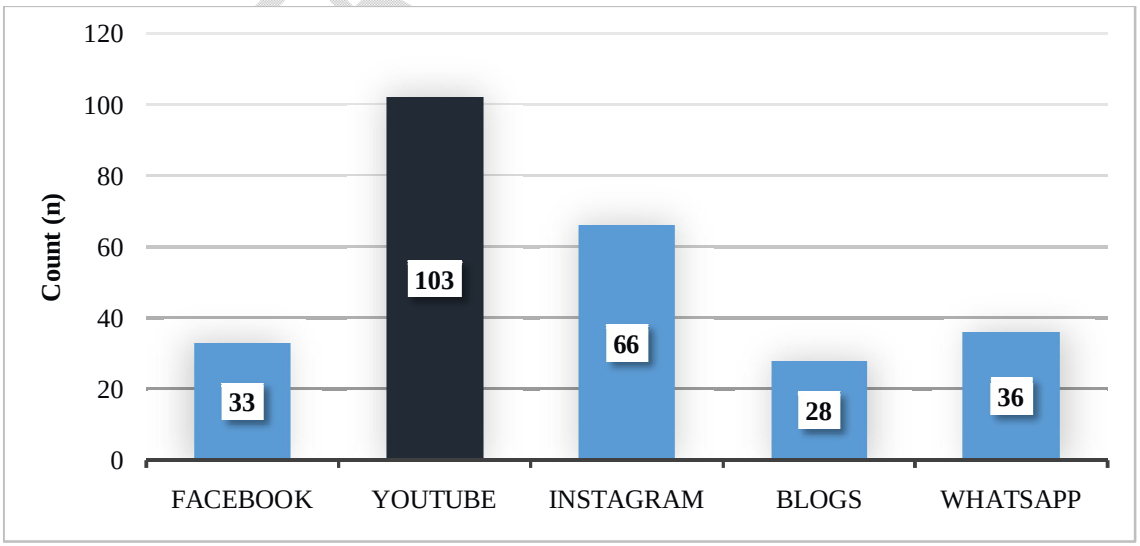
The study participants aged 20-25 years (70.8%) were found to use social media for searching oral health information more commonlythan the participants from other age groups including 26-30 years (23.5%), 31-35 years (3.2%), 36-40 years (0.6%) and >41 years (2%). Most of the participants were found to have occasionally searched online oral health information (33.7%). Around 25% of the participants have never searched for online information related to oral health. Only few participants have searched online oral health information once in every few days (8.5%), monthly once (22.7%) and weekly once (10.2%). The graph 1 depicts the age-wise average time spent for searching oral health related information online.

Graph 1: Age based distribution of average time spent for searching online oral health related information



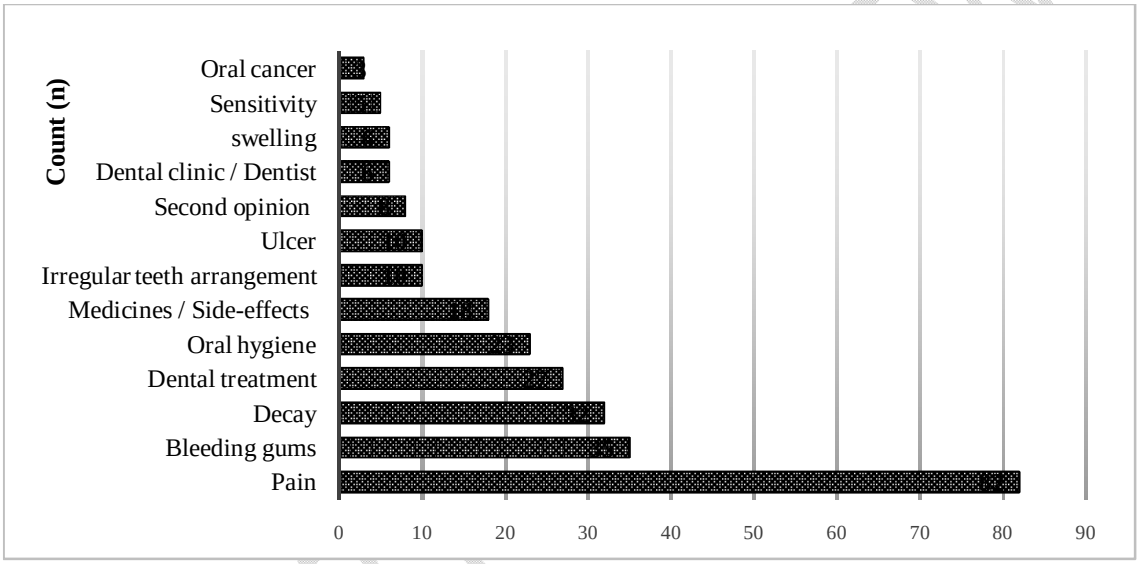
YouTube (38.2%) is the most commonly used platform to receive oral health related messages, followed by Instagram (24.8%), WhatsApp (13.5%), Facebook (10.5%) and Blogger (7.6%). The graph 2 shows the number of participants receiving frequent oral health related messages through different social media platforms.

Graph 2: Distribution of the study population based on commonly searched social media platforms



The most searched dental topic was pain (23.2%), followed by bleeding gums (9.9%) and decayed teeth (9.1%). The other topics which were searched included details about dental treatment (10.1%), oral hygiene(8.6%), medicines / side-effects (6.7%), irregular teeth arrangement (3.75%), ulcer (3.75%), second opinion (3%), dental clinic / dentist (2.25%), swelling (2.25%), sensitivity (1.87%), oral cancer (1.12%). The graph 3 depicts the commonly searched dental topics by the study participants.

Graph 3: Distribution of the commonly searched dental topics by the study participants



The frequency of searching oral health information through online sources is reported to be very rare by 119 participants (33.5%). This was followed by 89 participants who have never used social media to search oral health related information (25.1%). Yet, most participants often searched before (45.5%) and after (40.8%) visiting a dentist. Only a few participants always searched oral health related information before (3.10%) and after (2%) vising a dentist. A total of 93 participants (26.2%) sometimes searched online health information before visiting a dentist.Online oral health information search was never done before and after visiting a dentist by 25.10% and 38.1% participants, respectively. Around 75% of the study participants used social media to search / share oral health information.A significant association was found between gender and frequency of searching online oral health-related information (p=0.002*) as well as search after dental visit (p=0.007*). The table 2 depicts the frequency of searching oral health related information through online sources.

Table 2: Distribution of study population based on frequency of searching online oral health related information

		Gender		Total	p-value
		Male	Female		
Frequency of searching dental or oral health-related information in online	Most frequent	14 (3.9)	15 (4.2)	29(8.2)	0.002*
	Frequent	11 (3.1)	25 (7)	36(10.1)	
	Rare	29 (8.2)	53 (14.9)	82(23.1)	
	Very rare	57 (16.1)	62 (17.5)	119(33.5)	
	Never	56 (15.8)	33 (9.3)	89(25.1)	
Frequency of searching online oral health information before visiting your dentist	Always	4 (1.10)	7 (2)	11 (3.10)	0.076
	Often	79 (22.2)	83 (23.3)	162 (45.5)	
	Sometimes	37 (10.4)	56 (15.8)	93 (26.2)	
	Never	47 (13.30)	42 (11.8)	89 (25.10)	
Frequency of searching online oral health information after visiting your dentist	Always	2 (0.6)	5 (1.4)	7 (2)	0.007*
	Often	73 (20.6)	72 (20.2)	145 (40.8)	
	Sometimes	35 (9.8)	33 (9.3)	68 (19.1)	
	Never	57 (16.1)	78 (22)	135 (38.1)	
Use social media to search / share oral health information	Yes	138 (38.9)	128 (36)	266 (74.9)	0.562
	No	50 (14.1)	39 (11)	89 (25.1)	

*Statistically significant at p <0.05, Chi-square test

The social media platforms have influenced oral health care in 142 participants (40%)while 121 participants (34.1%) were neither influenced by social media.A total of 198 participants (55.8%) gave a neutral response about the reliability of information shared in the social media.The information shared in the social media was found to be very reliable by 34 participants (9.6%), reliable by 61 participants (17.2%), sometimes reliable by 43 participants (55.8%) and never reliable by 19 participants (5.4%).Ease of understanding and accuracy of information were reported to be important factors for selecting a social media platform by 136 (38.30%) and 113 (31.80%) participants, respectively. Interactivity was found to be the least important factor (4.75%) while selecting social media.Comprehensiveness/ completeness was considered important by 19 participants (5.4%) and use of multimedia was

considered important by 48 participants (13.5%). The common reasons cited for receiving / sharing oral health information through social media are accessibility (25.6%), free availability (18.6%), providing enough information (15.2%), interaction with dental professionals (10.5%) and connectivity / share information at a larger scale (6.5%). Around 75% of the study participants has never stopped any medications/treatment as advised/advertised on social media without asking physician/dentist. Around 60 participants (16.9%) have sometimes stopped medications/treatment while only 32 participants (9%) most frequently stopped medications/treatment because of social media.The majority of the population (39.7%) asked the dentist / health professionals for verifying the oral health information on social media. The other sources used for verification of the oral health information on social media are articles in related journals (3.4%), friends / relatives (21.9%), related websites (5.1%), Wikipedia (3.1%).The table 3shows the impact of social media in influencing the oral health of IT professionals.

Table 3: Distribution of study population based on impact of social media on oral health

		Gender		Total	p-value
		Male	Female		
Oral health care influenced by social media platforms	Yes	40 (11.3)	52 (14.6)	142 (40)	0.493
	No	62 (17.5)	59 (16.6)	121 (34.1)	
	Maybe	65 (18.3)	77 (21.7)	92 (25.9)	
Reliability of the information in social media	Never reliable	10 (2.8)	9 (2.5)	19 (5.4)	0.705
	Sometimes reliable	22 (6.2)	21 (5.9)	43 (12.1)	
	Neutral	88 (24.8)	110 (31)	198 (55.8)	
	Reliable	28 (7.9)	33 (9.3)	61 (17.2)	
	Very reliable	19 (5.4)	15 (4.2)	34 (9.6)	
Factors considered important in selecting online health information and support	Accuracy of information	55 (15.50)	58 (16.30)	113 (31.80)	0.742
	Comprehensiveness / Completeness	9 (2.50)	10 (2.80)	19 (5.40)	

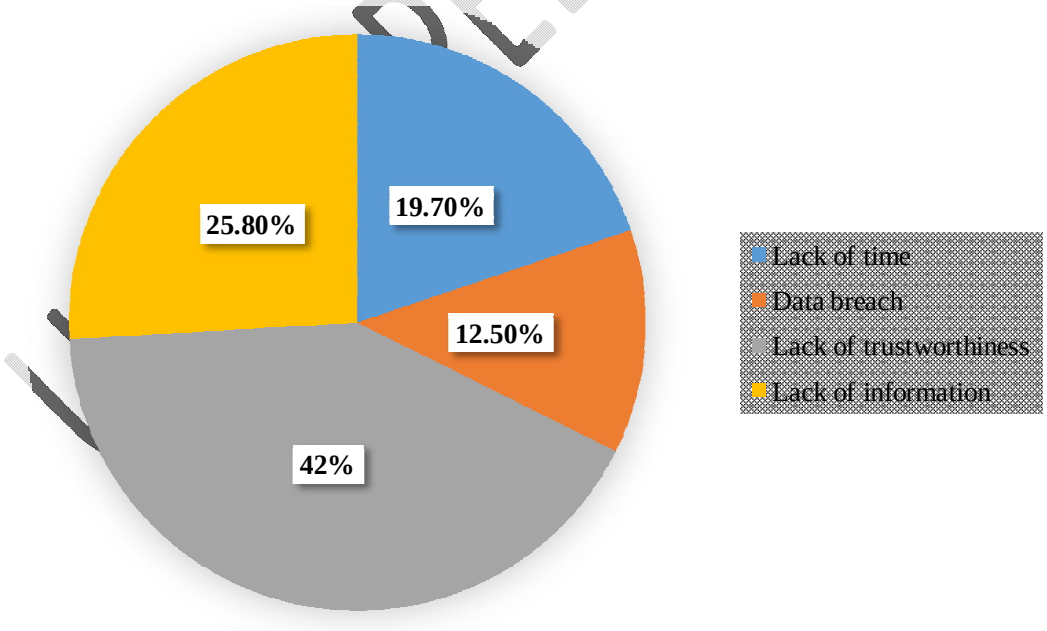
	Ease of understanding	58 (16.30)	78 (22)	136 (38.30)	
	Interactivity	9 (2.50)	8 (2.25)	17 (4.75)	
	Use of Multimedia (Text/ Image/ Audio/ Video/ Animation)	25 (7.0)	23 (6.5)	48 (13.5)	
	Website appearance	10 (2.80)	11 (3.10)	21 (5.90)	
Reasons for preferring social media to receive/share oral health-related messages	Accessibility / Easiness	39 (10.7)	53 (15)	92 (25.6)	0.067
	Connectivity / Share information at a larger scale	9 (2.5)	14 (3.9)	23 (6.5)	
	Enough information is provided	18 (5.1)	36 (10.1)	54 (15.2)	
	Free	38 (10.7)	28 (7.9)	66 (18.6)	
	Interaction with dental professionals	18 (5.1)	19 (5.4)	37 (10.5)	
	No, I do not use social media to receive/share oral health related messages	46 (13)	38 (10.1)	84 (22.8)	
Frequency of stopping any medications/treatment as advised/advertised on social media without asking physician/dentist	Most frequently	15 (4.2)	17 (4.8)	32 (9)	0.880
	Sometimes	30 (8.5)	30 (8.5)	60 (16.9)	
	Never	122 (34.4)	141 (39.7)	263 (74.1)	
Sources used for verification of the oral health information on	Articles in related Journals	6 (1.70)	6 (1.70)	12 (3.4)	0.651

social media	Ask friends / relatives	37 (10.4)	41 (11.5)	78 (21.9)	
	Dentists / Health professionals	66 (18.6)	75 (21.1)	141 (39.7)	
	Related websites	6 (1.7)	12 (3.4)	18 (5.1)	
	Wikipedia	5 (1.4)	6 (1.7)	11 (3.1)	
	I do not verify the credibility of oral health information on social media	42 (11.9)	53 (14.92)	95 (26.82)	

*Statistically significant at p <0.05, Chi-square test

Among those who never used social media to share oral health information, it is seen that 37 participants (41.5%) found lack of trustworthiness as a major barrier. Other barriers like lack of time (19.7%) and data breach (12.5%) were reported by 18 participants and 11 participants, respectively. The graph 4 shows the barriers reported by the study participants.

Graph 4: Distribution of the barriers in social media usage by study participants



Discussion:

The present study included a majority of male participants (53%) in contrast to the study by Mir H et al (63.5%)[7] and Awdah et al (87.3%)[8] where women participants were higher. In India, 67% men and 33% women use internet among which 78% Indian social media users are men.[9]Pew Research Center's Internet and American Life Project's tracking surveys found the western social media usage is becoming increasingly gender-equal and women significantly use social media sites than men.[10]Nearly 71% in the present study were aged 20-25 years, which is similar when compared to the other Indian study conducted by Taneja et al[11] (69.9%), but higher than the study by Mir H et al[7] (28.7%).

The present study population included most participants belonging to Generation Z who are the "digital natives". As technology has always been accessible to this generation, they have become accustomed to communicating in a connected world. Young adults spend increasing time using Social Networking Sites.[12] The present study population occasionally searched information similar to the studies by Althunayan et al[13] (37.5%) and Almozainy et al[14] (38.10%). The study by Almozainy et al among Saudi Arabian population reported that 75% of the study participants belonging to 18-25 years were interested in searching oral health information online due to their involvement in new technologies and usually they are more active in social media.[14]

Dental pain was the most searched topic by the present study participants. The study by Almozainy et al stated that most of the study participants (58%) searched dental issue, 31.9% searched the dentist's qualifications, treatment pictures and positive comments or recommendations from the followers.[14] The study by Althunayan A et al reported that oral Hygiene (54.5%), Bleaching (50%) are the most commonly searched topics.[13] The Indian study by Maharani et al[15] stated that 49.3% searched related to dental treatment. The mainreasons for using the internet as reported in the previous studies were insufficient appointment time with physicians and obstacles to obtaining qualified health services. The social media has many advantages like convenience and coverage which could have resulted in increased online oral health seeking behaviour.[16]

Around 75% of the present study population used social media to search online oral health information which is similar to the previous studies by Althunayan (64%)[13], EL Tantawi et al (57.5%)[17] and Almaiman et al (67.7%)[18]. On the other hand, in developed countries like America, around 80% used online sources even before 13 years.[10] A huge increase in internet access and the use of social media is seen in recent years. the Indian

studies by Sharma et al[19] and Maharani et al[15] reported that nearly 50% and 36.1% participants searched for online health information, respectively. A total of 40% participants in the present study got influenced by social media while more than half of the study population trusted social media in previous studies by Mir et al (56.6%)[7], Taneja et al (62.9%)[11] and Awdah et al (55%)[8]. In the study by Althunayan et al, around 67.1% reported that their health behavior changed because of social media. This is in contrast to the study by Almozainy M et al[14] where only 32% were influenced by social media. This could be due to limited internet accessibility and more trust on healthcare providers, and so only a minority searched for online health information.

In the present study, understandability & accuracy of information were the common reasons for selecting social media for online oral health information while interactivity was reported to be the least reason. The other common reasons reported in the previous studies were accessibility and easiness of getting information (79.7%), dentist social media (68.8%) and easiness in sharing information (61%). Majority of the present study population gave a neutral response about the reliability of social media platforms. Lack of trust is cited as a main reason for unreliability. In the previous study by Mir et al,[7] 65.8% of the participants reported that they were affected by criticism of dentist on social media. The study by Freire et al also reported that online review of dental clinic (44.1%) is very important.[20] Dentist or healthcare professionals were approached by the present study participants for verifying the online oral health information shared through social media platforms similar to the previous study by Fox et al (70%).[10]

In the present study, YouTube was the most common platform used for searching oral health related information. This is similar to the other studies by Bahabri et al[4] (75%) and Maharani et al[15] (40.7%). The other studies reported the commonly used social media platforms like Twitter (53.8%), Instagram (40.9%)[13], Facebook (88.5%), Snapchat (81.06%)[14],Whatsapp (49.5%)[11]. The interventional study by Ghahramani et al[21] reported that Facebook and YouTube were effectively used for intervention and education purposes to change health behaviour while Twitter and Instagram were used more to observe the trend of changes in health behaviour. This shows the raise of popularity of social media platforms among the people searching online health information.

The rise of social media platforms has become inevitable, yet, around 75% of the present study population have not stopped their treatment based on social media advice. Lack

of trust is considered as a main barrier for obtaining online oral health related information from these social media platforms. Other barriers reported include communication difficulty, oral health information's credibility, distribution of poor-quality information, damage to professional image, breaches of patient privacy, violation of personal–professional boundaries, and licensing or legal issues. The existence of difference in information from one site to another might create doubts about the truth and accuracy of the information. Creators with dental and oral health competencies could be encouraged to overcome these weaknesses and obstacles by making correct content with good quality and attractive creativity based on evidence and expert opinion.

Recommendations and limitations:

The social networking applications are rapidly evolving and so online dental education can be enhanced through these platforms due to their accessibility and interactivity. Although social media offers efficiency and convenience for interventions aimed at oral health prevention and promotion, its utilization is not yet widespread. Online social media campaigns can be strategically planned by the oral health promoters so that their messages further promote actual healthy behaviour. A specialized dental website with evidence based information and guidelines could be the most effective method to gain dental information and avoid the spread of poor quality information. These online platforms can be best utilized for professional networking, health communication and opinion modification for making dental treatment choices. ethical considerations, demanding vigilance in adhering to privacy regulations and combatting misinformation.[21-25]

Internet-based interventions have been used as oral health promotion tools and they have demonstrated their usefulness in improving oral hygiene, increasing dental knowledge in maternal caries transmission, improving adherence to orthodontic treatment, managing dental anxiety and so on. The rise of user-generated content and participatory engagement strategies will enable a more inclusive and collaborative approach to oral health promotion. Collaborations between oral health professionals, organizations, and influencers on social media will amplify credibility and reach. However, these advancements come with ethical considerations, demanding vigilance in adhering to privacy regulations and combatting misinformation.[26-30] Since this is a cross-sectional online survey which included people from one region only, the present study findings may not be generalized to other populations or

study settings. As the responses were self-reported, there could be social desirability bias. More longitudinal studies considering these research gaps are required in the future to gain a deeper insight of the intersection between social media and oral health promotion.

Conclusion:

The present study reported that a majority of the study participants were young adults who searched online oral health information through social media platforms. Nearly half of them were influenced by the social mediawhich ascertains their easy availability and accessibility to retrieve oral health information. Although accessing oral health information in social media is advantageous, concerns about the quality and trustworthiness exist among the study population which could inhibit people from using social media. More research is needed on the potential use and outcomes of social media in improving oral health. Social media can be used to promote oral health by valuable contribution from each individual, dental professionals and regulatory authorities.

Consent

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

Ethical Approval: The study was conducted after obtaining ethical clearance from the Institutional Review Board of APDCH.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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