DENTAL MISCONCEPTIONS IN SOCIAL MEDIA ACCOUNTS: YOUTUBE AND INSTAGRAM APPLICATIONS AMONG FLUORIDE TOXICITY, BLEACHING AND, WATERJET

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ABSTRACT

To investigate the percentage of dental misconceptions in SM taking into considerations the most-trendy subjects. And evaluating the data validation and prove it by Evidence-Based Dentistry. We used two SM applications "YouTube and Instagram" as they have several advantages over other applications. We explored various posts by entering different hashtags related to dentistry. Posts with incorrect information and present frequently were selected, ending up with three topics "fluoride toxicity, bleaching, and water-jet". Then we searched about each topic with different hashtags. Posts with wrong information were picked and sorted according to the highest no. of views and likes. Ending the process with six posts for each subject. Presenter profession, type of post, and content validity were checked for each post.
Analysis results showed 100% misconception among fluoride, 50% in bleaching and 33.33% related to water jet. Presenters may play a role in this as the findings showed participation by the laymen were doubled than dental professional, and the chance of them delivering right information was 27.3%. When it comes to the validity of information posted, 61.1% off the data in the three subjects were wrong. And according to the likes with 0our cut-off point 100, 61.1% of data posted lead to misconception among population. High percentage of misconceptions was found regardless the small sample size. And this is a real issue as nowadays SM shapes people lifestyle, and patients find it easy to seek information related to their health condition through SM.

Key words: Social media SM, Misconceptions, Fluoride F, Waterjet Wj, Community water fluoridation CWF, Bleaching.

Introduction

The popularity of social media and the participation of the general public in it has increased dramatically in the past few years. Social media can be defined as internet-based tools that foster user-generated content [1], social interaction, collaboration with other users in real-time. It allows individuals and communities to figure out and share information, ideas, videos, photo, and personal messages.

Social media offer a diversity of sites that confer many services such as social interactions, professional networking, delivering information, and entertainment purposes [2].

Nowadays shaping of people's lifestyles is affected by social media. It holds considerable potential values which influence the professional environment [2].

However, the evidence of using social media in the health care context is also growing, which can't be repudiated. (There are recent estimates that social media use of doctors has risen significantly from 41% in 2010 to 90% in 2011, while rates of use have been found to be above 90% for medical students [2].

Furthermore, a large number of patients with a certain disease find it easy to seek information related to their health condition through social media and contact with others affected by a similar condition [2].

In addition to the features of social media that we have mentioned above, it allows the health care professional to use it for professional education, organizational promotions, patient care, patient education, and public health programs [3].

Despite the benefits of social media, regrettably, it poses a risk in dentistry and health professionals, which has largely overwhelmed its positive impact due to distribution of poor quality information, damage to professional image [2], and dental misconceptions by some of the ineligible general practitioners, unqualified doctors and by incompetent general public users.

Objective
To investigate the percentage of dental misconceptions in Social Media 'SM' accounts (YouTube and Instagram), taking into consideration the most-trendy subject. The intent of this review is also to consider the data validation and prove it by Evidence-Based Dentistry.

Materials and Methods

Although literature reviews in dentistry have traditionally followed positivistic epistemologies. The intent is to measure,

quantify, or generalize the results, as is the case with Cochrane reviews.

More specifically, we intend to target the trendy misconception posted on social media by general practitioner dentists and famous users, defend the information's validity, and illustrate them in this review. Ultimately the knowledge synthesized here will allow readers to decide for themselves.

We used in this research two search engines, "YouTube and Instagram, "because they have several advantages over other applications, as their ability to store and retrieve the data, and through these applications, we can measure the number of followers, views, and likes. It also gives us the capability to overlook the video owner's profile in general, and besides that, they show more information about the video as posting date.

Even though other social media applications such as "Snapchat, Twitter, and Facebook "have higher popularity, they were excluded owing to the fact that Snapchat lacks the searching engine and the data are not available after a certain period, and there is no retrieving choice.

They are good search engines regarding twitter and Facebook, and they provide several advantages. We used two SM applications, "YouTube and Instagram" due to several advantages such as, they considered a good searching engine, they have the ability to store and retrieve the data, they can be used readily, and they are exclusive for videos and photos which help to express people's thoughts, and ideas that usually entrenched in minds more than regular statements shared in the timeline in other applications, furthermore a number of likes and views are visible, and access to the Presenter's profile is possible which are conditions we need to seek of statistics of the study. Even though they have several disadvantages, their benefits overwhelmed the cons of other excluded applications such as "Facebook, Twitter, and Snapchat. " We started by exploring different dental videos and photos by entering different hashtags related to dental such as "Dental health, teeth, oral health, fluoride, teeth bleaching, teeth whitening, veneers, braces, scaling, teeth cleaning, and cosmetic dentistry." Validity of the information was checked, and the posts with incorrect information were selected, then sorted according to the most frequent and trendy topics, which were "fluoride toxicity, bleaching, and water-jet." Then we start searching about these topics by entering different hashtags related to each subject. Posts with wrong information were picked, then sorted again according to the highest no. of views for videos and highest no. of likes for photos, ending the process of sorting with six posts for each subject. We coded subjects 1,2 and 3 for fluoride toxicity, bleaching, and water-jet respectively, and we created a table, each post in each subject was checked for several things, first, type of post whether it's a video with a code 1 or photo which will be taken code 2. Second, if she/he is a dental professional, the presenter will be given codes 1 and 2 for the non-dental presenter. Third, the post's content validity was coded 1 and 2 for right and

wrong, respectively. Finally, the number of likes and views was entered. We used the double-entry method. Depending on all of these data, we give each postcode 1 if it caused misconception and code 0 if it didn't.

Results and Discussion

Descriptive analysis was used. Social media posts (fluoride toxicity, bleaching modality, and water-jet) have been represented in the data equally by 33.33% with P value=0,048 which is considered significant see "**Table 1**". However, the photos versus the videos are less in terms of presentation in social media, representing 27.8% see "**Table 2**". Analysis results showed 100% misconception about fluoride. In comparison, the bleaching is 50%, and 33.33% related to water-jet see "**Table 3**". Presenters may play a role in this as the findings showed participation by non-professionals were doubled than a dental professional who represents only 38.9%. Where non-dental professional participants in posting dental information represent 61.1% of total presenters, see "**Table 4**". These results might clarify that people are more interested in esthetic part more than cleaning part which the data have been showing little misconception in water-jet. Also, we can say the contribution by the dental profession is very negligible.

Regarding the relationship between the presenter who participates in posting the information via social media and misconception, it was found that if the non-professionals did the post, the chances of delivering the right information is 27.3%. It will cause 30% more errors and more misconception through people who receive the information see "**Table 5**". Unfortunately, due to the small sample size, the findings were insignificant with a P-value = 0.22.

Moving to the relationship between the social media posts and the likes were (M = 7139.8, SD = 10865.3) for fluoride, (M = 5183.5 SD = 5655.9) for bleaching. Water-jet showed (M = 126, SD = 78.5), with such high variability, the results were insignificant with a P-value of 0.240, and this is due to limited sample size as we illustrated before. However, this comes in favor because it means that people have no discrimination among a certain group. See "**Table 6**".

When it comes to the validity of information posted, 38.9% of data in all 3 subjects were right, whereas 61.1% were wrong. And according to the likes with our cut-off point 100, 61.1% of the data posted leads to misconception among the population who are seeing the post and like it. To end up the results, we wanted to know the odds of having a post that contains correct information but leads to misconception. Statistics showed that if a post was made right with accurate information, there's still a 28.6% chance of people understanding it wrong, which will lead to misconception. Regardless that 71.4% of the time, no misconception will result from a post made right. See "**Table 7**".

Table 1. Representation of sample size

Social media post	Frequency	Percent	Valid Percent	Cumulative Percent
1	6	33.3	33.3	33.3
2	6	33.3	33.3	66.7
3	6	33.3	33.3	100.0
Total	18	100.0	100.0	

Social media posts which are 1: fluoride, 2: Bleaching, 3: Water jet, represented equally by 33.33% in the data.

Table 2. Frequency of videos versus photos.

Type of post		Frequency	Percent	Valid Percent	Cumulative Percent
	1	13	72.2	72.2	72.2
Valid	2	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

This table shows the percentage of videos that had been coded 1 and the percentage of photos with code 2. The images are less in terms of presentation in social media by 27.8% than videos representing 72.2%.

Table 3. The percentage of misconception among each topic.

SM post		Misconception		Total	Percentage
		0	1		
	1	0	6	6	100%
P	2	3	3	6	50%
	3	4	2	6	33.33%

	Total	7	11	18

This table shows the percentage of misconception in fluoride, which coded 1 is 100%, bleaching, which coded 2 is 50%, and water-jet, which coded 3 is 33.33%. Code 0: Post did not cause misconception, and code 1: Post cause misconception.

Table 4. Number of dental profession presenters versus a number of non-dental profession presenters.

Type of presentation	Frequency	Percent	Valid Percent	Cumulative Percent
1	7	38.9	38.9	38.9
2	11	61.1	61.1	100.0
Total	18	100.0	100.0	

The table shows the percentage of dental profession presenters, which coded 1 is 38.9%, whereas the percentage is double in non-dental presenters, which coded 2 is 61.1%.

Table 5. Misconception release by dental profession presenters versus non-dental presenters.

presentation	Misconception		Total
	0	1	
1	4	3	7
2	3	8	11
Total	7	11	18

The table shows codes 1 and 2 for dental and non-dental profession presenters, respectively. In contrast, codes 0 and 1 didn't cause misconception and caused misconception, respectively. It explains if the non-professionals did the post, the percentage of delivering the right information is 27.3%, and it will cause 30% misconception.

Table 6. Mean value (± std. Deviation) of the number of likes in each post.

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	6	7139.83	10865.255	4435.722	-4262.55	18542.22	121	24631
2	6	5183.50	5655.902	2309.012	-752.01	11119.01	44	12267
3	6	126.00	78.483	32.041	43.64	208.36	30	233
Total	18	4149.78	7306.100	1722.064	516.54	7783.02	30	24631

Table 7. The relation between formation validity and misconception.

Beneficial		Misconception				Total	
		0		1			
		No. of posts	Percentage	No. of posts	Percentage	No. of posts	Percentage
Incorrect information	1	2	18.2%	9	81.8%	11	61.1%
Coreect information	2	5	71.4%	2	28.6%	7	39.9%
Total		7	39.9%	11	61.1%	18	100%

The table explains the percentage of correct and incorrect information, in addition to the percent of misconceptions caused by correct information. Codes 1 and 2 under beneficial means incorrect and correct information, respectively.

This is a pilot study that no one has done it before, the first one conducted in Saudi Arabia. And due to this fact, we had a small sample size, with high variability in the results, and some P-values were insignificant. In the meanwhile, the results showed 100% misconception among fluoride. The bleaching is 50% and 33.33% related to water-jet. This means that we have the main issue in the information posted in SM, which is considered a major source for some users and patients to obtain health-related information. The media followers could be considered a vast number of people. Presenters prioritize addressing that problem to them; they are the leaders of the posts. Most of the presenters deliver a

combination of correct and incorrect information; in the meantime, followers can't differentiate whether this information is valid or not. We aim in the future to further our research with a large sample size, and a variety of subjects might be included.

The most common trendy oral health-related misconceptions in S.M accounts
were divided into three main categories: fluoride toxicity, water-pick uses, and modality of bleaching.

Fluoride

Is inorganic ion that comes from fluorine. It exits naturally in air, water and soil. Considered the thirteen most abundant element in earth's crust. And it can be industrialized to serve many benefits as adding it to water, toothpaste and many other products [4]. It has been proven that approximately 437.2 million people all around are exposed to natural and artificial fluoridated water [5]. As reported by WHO, dental caries is a major public health disease in most industrialized countries, it strikes 60-90% of school children and majority of adults [6]. Fluoride is now considered as the principal factor for the dramatic reduction in caries prevalence which has been approved all around [7]. Dental caries become more challenge in lower socioeconomic groups for which community water fluoridation (CWF) is a safe and effective strategy. CWF reaches all socioeconomic groups without active participation of individuals [8].

There are so many people posting in social media false facts about toxicity of fluoride, as it could induce so many diseases and sometimes it might be lethal, even with minimal dose intake. Some conceive that it has carcinogenic effect and others believe that it could enhance the destructive action of many drugs. And the strange of these believes that make lots of people imagine that the fluoride influences the brain which could induce memory loss, also effect the thyroid gland as it predispose hypothyroidism. Last but not least the power of fluoride to weaken the bone and the teeth. Unfortunately wide range of public users supporting these posts by not using fluoridated toothpaste and mouth rinse and advising the people around them. And what makes it worse that all of these misconceptions are out of source.

We can't deny that a large section of population suffer from fluorosis, is a hypomineralization of enamel but it happens when the intake of fluoride exceeds the normal required dose by young children with developing teeth. And this could be easily prevented and controlled by following up with specialized dentist for prescribing the suitable required amount and type of fluoride [9].

Fluoride considered to be a revolution in the world of dentistry which it shows so many benefits as reducing and treating the dental caries due to its anti-cariogenic and anti-microbial properties [4]. Scientifically proven that the most effective way to prevent caries is by using fluoridated dental products [10]. It lowers the PH of oral cavity which makes

bacteria use more energy to maintain PH, so they won't have more energy to establish any biological processes as growing, reproduction, and generating acids. Therefore, it reduces risk of caries. Also it could re-mineralize the tooth substance which make the tooth acid-resistant and caries resistant. In consideration fluoride should be used consciously with the right amount, in the right place, at the right time, and by eligible dentist [4].

Teeth bleaching

Is the process which lightens the color of a tooth Currently, the population has become more and more concerned about their aesthetic and facial appearance. Studies found that 20-35% of the population in United States and United Kingdom recognize the staining of their teeth and are dissatisfied with the color they have, which dramatically increases the frequent search for treatments for teeth bleaching especially in younger population. The advantages of teeth bleaching are the dental structure preserved ,and the procedure is relatively safe and quick [11]. The appearance of the mouth and smile is essential in the evaluation of the facial appeal. The results propose teeth whitening increases dental confidence [12]. It could be achieved by several methods which extrinsic or intrinsic. The most common misconceptions that have been posted in the social media are about teeth whitening by OTC whitening products and home remedies. For example, the use of charcoal, lemon and baking soda, strawberry, and whitening strips. These methods can induce damages to the tooth structure. It can affect either the enamel layer or make the oral cavity more susceptible to caries activity and oral sores. This process should be accomplished by dental team after a comprehensive oral examination which include medical and dental history, thorough intra-oral examination. Accurate diagnosis should be done to exclude any discoloration that result from disease or condition that require endodontic, restorative, or surgical treatment. Therefore, the patient should be excluded from this procedure until all dental treatments achieved. Then the clinician will decide if the patient is good candidate for teeth bleaching or not. "Lastly the patient should be reminded that unknowingly purchase products that may have little or no beneficial effect on the color of their teeth and may also have the potential to cause harm" *et al*. ada.org, tooth whitening/ bleaching: Treatment Considerations for Dentist and Their Patients [13].

Water-jet

Also known as oral pulsating irrigator, is a device which pump the water at your teeth for plaque removal. Effective daily plaque removal and maintain the oral hygiene is a cornerstone in preventing and controlling oral infections and diseases [14]. Mechanical cleaning of the teeth is essential to reduce the risk of caries and periodontal disease. Interdental cleaning aid should be used in addition to the daily use of a manual or electrical toothbrush. There are several as manual (e.g. dental floss, interdental brushes, wooden toothpicks) and a few power-driven devices (e.g. oral irrigators) currently available [15]. Waterjet functions through pulsation and

pressure action. These two actions disrupting the plaque and removing the loosely lodged debris. The water flosser can also deliver antimicrobial solutions into the sulcus and interproximal regions. One of the most important indications of water flosser is for people with diminished manual dexterity [16]. A water pick has many advantages which can benefit in some cases more than traditional string floss. In cases with braces, permanent retainer as lingual bar, crowns, bridges, implants, and whom with periodontal diseases.

Water pick showed superior results over string floss in reducing gingival bleeding and plaque removal in adjunct with teeth brushing [17]. In patients which are undergoing orthodontics treatment, they found that dental water jet was significantly effective in reduction the whole mouth and interproximal plaque and mouth bleeding than the regular one [18]. it is considered effective, reliable, and an easy way of flossing. Studies have proven that addition of the water flosser to manual tooth brushing is obviously more efficient for improving gingival and oral health than manual tooth brushing alone. In social media, it has been found lots of controversial information about regular floss or water jet. fortunately, most of these posts were right but they are limited in numbers.

Conclusion

Statistics prove that dental misconceptions were significant, the P value= .048. It was found in high percentages through SM in the three main subjects: fluoride, bleaching, and water-jet by 100%, 50%, and 33.3%, respectively. Even though we have a small sample size, this is considered the main issue because SM shapes people's lifestyles nowadays. In the meantime, a large number of patients find it easy to seek information related to their health condition through SM.

Recommendation
So, we have to solve this issue through many steps: starting with an awareness program as it's considered the first defensive line; in the meantime, dental societies should take action concerning authorities to legalize the appearance of presenters in social media.

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