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The Influence of social media on Treatment Choices of Teeth bleaching among the Population in Makkah

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Abstract: Advances in restorative dentistry have made many tooth whitening techniques economical and cost effective both in developed and developing countries. Moreover, Social media is now an important part of many people's lives and is playing an important part in any platform that allows people to interact and exchange information about teeth bleaching. Aim of the study: Assess the influence and role of social media on treatment choices of teeth bleaching among the population in Makkah, Saudi Arabi. Design: cross sectional. Tool: An online questionnaire was constructed consisting of questions related to demographic data followed by questions including knowledge and perception towards teeth discoloration, bleaching/whitening, factors associated with the decision, etc. (624 participants). Results: Almost all of them heard about teeth whitening; from social media platforms as mainly from snapchat and Instagram. More than half of. The participants have previously performed teeth whitening; using tooth paste and patches. Minority of them have performed teeth whitening in the clinic under dentist supervision. Conclusion: They recommend performingteeth whitening under a dentist's supervision. Statistical significant differences were found regarding the type of social media platform with age, gender, income and perception that oral health impact general health.

Keywords: Social Media, Treatment Choices, Teeth bleaching

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Introduction:

Social media is now an important part of many people's lives and is playing an important part in any platform that allows people to interact and exchange information. The demand for aesthetic procedures is growing, and perhaps social media is the driving force behind this revolution. Social media, with its widespread use, has a great influence on today's society, as it affects our perception of beauty and aesthetics, hence the perception of our physical appearance changes. Consequently, the desire for physical improvement increases (Ferguson et al., 2014).

Social media as Twitter or Facebook has been also used in education, advertisement, as well as being used in self-promotion. Social media marketing is seen as beneficial in health care fields(Chandra et al., 2012). Social media platforms likely to have played a part in the recent expansion of cosmetic dentistry(Kelleher., 2014).

The concern about dental appearance has been noted in the last few decades (Carey., 2014). In 2013, Al-Zarea conducted a study in Saudi Arabia and found that majority of people were dissatisfied with their tooth color. Tooth stains arebeing classified as intrinsic, extrinsic or a combination of both.

A majority of extrinsic tooth stains are caused by smoking, certain foods, drinks (for example, tea and coffee), and aging. These stains may be eliminated by regular prophylactic procedures with dental hygienist. However, without regular dental visits or prophylactic procedures, extrinsic stains will become darker and more bothersome, though still treatable by bleaching.Modern bleaching agents are composed of both active and inactive ingredients. The major inactive ingredients may include binding agents, carriers, surfactants (detergents), coloring dispersants, flavoring, and preservatives while the active ingredients may include hydrogen peroxide or carbamide peroxide compounds in concentrations ranging from 3% to 40%, similar to a tooth whitening dentifrice (Al-Nomay et al., 2015).

Bleaching treatments that done without dentist supervision might enlarge gaps between enamel prisms, resulting in invasive pathways to surface, rough enamel surfaces promote plaque formation (Sato et al., 2013; Bersezio et al., 2018).

Despite the rapid growth of social media and its impact on the attitudes of users toward teeth bleaching (Alamassi et al., 2017). Until now, there is no evidence about the influence and role of

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social media on treatment choices of teeth bleaching among the population in Jeddah, Saudi Arabia. Therefore, the researcher found it necessary to investigates and estimate the role of social media platforms on the participants choices regarding teeth bleaching.

Aim of the study:

- Determine the main source of information on teeth whitening procedures among the population of Makkah.
- Assess the influence and role of social media on treatment choices of teeth bleaching among the population in Makkah, Saudi Arabia.

Research question:

- What are the influence and role of social media on treatment choices of teeth bleaching among the population in Makkah, Saudi Arabia?

Materials and method:

Materials:

Design:cross sectional study design was used.

Setting: online survey

Subjects: convenient-sampling technique will be employed and sample size was calculated using a web-based tool, “Survey Monkey” with the population of Makkah of 4,781,000 in 2022 and a confidence level of 95% with margin of error of 3% (624 participants).

Exclusion criteria:

- Be less than 18 years of age.
- From outside Makkah

Tools:

One tool was utilized by the researcher for data collection, in order to fulfill the study aim. The survey was adapted from a previous study by Nora Nomay titled “Public attitude and awareness towards their teeth color and dental bleaching in Saudi Arabia: A cross-sectional survey”. The

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self-administered questionnaire composes of two main sections. Firstly, socio-demographic data which included age, gender, occupation, marital status, educational level, city of residence.

- Secondly, attitude towards oral hygiene and teeth bleaching was assessed by questions addressing the following: willingness to undergo bleaching in the future, approving the use of whitening material on the teeth surfaces to get a lighter shade of teeth color and lastly source of information on teeth bleaching and the influence of social media on the treatment modalities.

Methodology:

Ethical Approval was obained. Tool was adopted from Nora Nomay (2016), English and Arabic drafts of the questionnaire were prepared by the authors and checked for content validity and dependability.

Pilot study:

Before conducting the actual study, a pilot study was carried out on 10% of the study patients (60 participants) online; to ascertain the clarity and applicability of the study tools and to identify obstacles that may be faced during data collection. However; these participants were not included within the actual study subjects. The Data collection was done using online survey from the period of February 2021-April 2021.

Ethical considerations:

Participants consent will be taken upon entering the questionnaire. Participant privacy was assured and the purposes of the study were explained to all the studied participants stressing confidentiality and anonymity of the collected data for each one was ascertained

Statistical analysis:

Data collected will be entered in MS Excel by a calibrated investigator and statistical analysis will be done using SPSS version 23 (IBM Corp. USA) by an independent biostatistician.

-Categorical variables will be summarized as proportions and frequencies and any possible relationship of the variables will be analyzed using Pearson’s Chi-square test.

-Continuous variables obtained will be expressed as mean and standard deviation.

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-The significance value (p-value) ≤ 0.05 is considered as statistically significant.

Results:

Table I: frequency distribution of the participants' sociodemographic characteristics:

This table showed that the majority of participants (73.2%) aged from 18-40 years. More than half (57.1%) were females, single (53.8%), from Makkah (71.3%), with average income level (59.1%).

	N(624)	**%**
Age		
<18	28	4.5
18-25	142	22.8
26-30	172	27.6
31-40	142	22.8
41-50	100	16.0
>50	40	6.4
Gender		
Female	356	57.1
Male	268	42.9
Marital status		
Single	336	53.8
Married	288	46.2
City		
Makkah	445	71.3
Other	179	28.7
Income level		
I don't have	5	.8
Low	193	30.9
Average	369	59.1
High	57	9.1

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Table II: assessment of participants' knowledge about dental health:

This table revealed that (63.0%) of participants agreed that oral health impacts general health, (70.7%) brush their teeth once or twice a day, (69%) visit the dentist rarely or if they feel pain and the last visit for the dentist was over a year or two years ago for a filling (24%) or pain purposes (34.8%).

	N	**%**
Oral health impacts general health		
I do not agree	29	4.6
I agree	393	63.0
Strongly agree	202	32.4
How often do you brush your teeth?		
Twice with the use of the thread	80	12.8
Twice a day	221	35.4
Once a day	220	35.3
2-3 times a week	84	13.5
rarely	19	3.0
How many times a year do you visit the dentist?		
Once every six months	107	17.1
once a year	83	13.3
If you feel pain	224	35.9
rarely(	210	33.7
When was your last visit to the dentist?		
3 months ago	123	19.7
6 months ago	129	20.7
over a year ago	184	29.5
over two years ago	188	30.1
What was the reason for the visit?		
Regular inspection visit	42	6.7
Lime cleaning and removal	131	21.0

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Fillings	150	24.0
Pain	217	34.8
Cosmetic procedure	84	13.5

Table III: assessment of participants' satisfaction of their smile and teeth color:

This table showed that one third of participants (34.62%) are satisfied with their overall smile and teeth color (30.59%).

	N	**%**
How satisfied are you with your overall smile?		
% of satisfaction	34.62%	
Range	1-10.	
Mean±SD	3.461±1.274	
How satisfied are you with your teeth color?		
% of satisfaction	30.59%	
Range	1-10.	
Mean±SD	3.059±1.295	

Table IV: assessment of participants' knowledge about teeth whitening:

This table revealed that majority of participants (96.2) were heard about teeth whitening from social Media platforms (76.3%). Regarding the type of social Media platforms, (42.6%) headed from snapchat and (30.6 %) from Instagram. (37.2%) of participants not fully credible for the results of the products advertised on social media, while (22.3%) were convinced. majority of participants (71.9%) think that they need teeth whitening because they see results for a celebrity on social media platforms (42.3%)and not convinced of the presence of pigmentation on the surfaces of their teeth / yellowish color of their teeth (41.8%).

	N	**%**
Have you heard about teeth whitening?		
No	24	3.8
Yes	600	96.2
If yes, where did you hear about teeth whitening?		

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Dentist	62	10.3
Friends/relatives	80	13.3
Social Media platforms	458	76.3
If it was through social media platforms, could you specify which one of them?		
Twitter	32	7.0
Instagram	140	30.6
Snapchat	195	42.6
Tiktok	34	7.4
Facebook	51	11.1
Other	6	1.3
How credible are the results of the products advertised on social media from your point of view?		
Not completely convinced	93	14.9
Unconvinced	98	15.7
To some extent	232	37.2
Convinced	139	22.3
Totally convinced	62	9.9
Do you think you need teeth whitening?		
Yes	447	71.6
No	174	27.9
Maybe	3	.5
If you answered yes, why do you think you need to whiten your teeth?		
The opinion of the dentist in one of the visits.	28	6.3
The opinion of a relative or friend.	39	8.7
See results for a celebrity on social media platforms.	189	42.3
Not convinced of the presence of pigmentation on the surfaces of my teeth / yellowish color of my teeth.	187	41.8
other	4	.9

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Table V: assessment of participants' practice about teeth whitening:

This table clarified that more than half of participants (52.7%) undergone teeth whitening using whitening toothpaste (43.2%), instant teeth whitening patches from pharmacy or beauty supply stores (32.2%) and (28.9%) perform teeth whitening in the clinic under the supervision of a dentist. Less than half of participants (44.4%) were not completely convinced with the results of teeth whitening procedure because the expected change in tooth color did not occur(58.0%) and presence of severe sensitivity in the teeth after whitening (20.9%). Majority of them (81.7%) think that they need to whiten their teeth under medical supervision (76.5%).

	N	**%**
Have you undergone teeth whitening?		
No	295	47.3
Yes	329	52.7
Whitening toothpaste.	142	43.2
Instant teeth whitening patches from pharmacy or beauty supply stores	106	32.2
Light-assisted home teeth whitening devices	63	19.1
Teeth whitening in the clinic under the supervision of a dentist	95	28.9
Home molds specially designed for personal use according to the size of the teeth and jaw	31	9.4
How satisfied are you with the results of teeth whitening procedure?		
Not completely convinced	277	44.4
Unconvinced	114	18.3
To some extent	132	21.2
Convinced	49	7.9
Totally convinced	52	8.3
If you are not satisfied with the result, why are you not satisfied with the end result?		
The expected change in tooth color did not occur.	149	58.0

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Severe sensitivity in the teeth after whitening.	53	20.6
Crowding and misalignment of the teeth.	7	2.7
The shape of the teeth (protrusion / retraction / voids).	16	6.2
Whitening toothpaste.	32	12.5
Do you think you need to whiten your teeth?		
No	114	18.3
Yes	510	81.7
If your current experience is without medical supervision, do you think it is best to re-whiten your teeth under medical supervision?		
Yes	421	67.5
No	30	4.8
Maybe	173	27.7

Table VI: significance of difference between participants' sociodemographic characteristics and social media platforms:

This table showed a significant difference between social media platforms and age, gender, income level and level of agreement about effect of oral health on general health. Within age, most of participant aged from 31-40 years knew from twitter and Facebook, while Tiktok were frequently used by participants from 18-25 years of age. Participants with low income and males were knew from Facebook, while females were mostly knowing from snapchat, Tiktok and Instagram.

			If it was through social media platforms, could you specify which one of them?						**Chi-square**	
			Twitter	**Instagram**	**Snapchat**	**Tiktok**	**Facebook**	**Other**	**X^2**	**P-value**
Age	**<18**	**N**	0	5	7	6	1	0	66.420	0.000
		%	0.0%	3.6%	3.6%	17.6%	2.0%	0.0%		
	18-25	**N**	5	32	49	11	5	0		
		%	15.6%	22.9%	25.1%	32.4%	9.8%	0.0%		
	26-30	**N**	9	38	54	4	8	1		

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		%	28.1%	27.1%	27.7%	11.8%	15.7%	16.7%		
	31-40	N	11	28	55	5	19	1		
		%	34.4%	20.0%	28.2%	14.7%	37.3%	16.7%		
	41-50	N	4	30	21	8	14	0		
		%	12.5%	21.4%	10.8%	23.5%	27.5%	0.0%		
	>50	N	3	7	9	0	4	4		
		%	9.4%	5.0%	4.6%	0.0%	7.8%	66.7%		
Gender	Female	N	16	78	126	21	14	2	25.212	0.000
		%	50.0%	55.7%	64.6%	61.8%	27.5%	33.3%		
	Male	N	16	62	69	13	37	4		
		%	50.0%	44.3%	35.4%	38.2%	72.5%	66.7%		
Marital status	Single	N	17	78	100	23	25	2	4.875	0.431
		%	53.1%	55.7%	51.3%	67.6%	49.0%	33.3%		
	Married	N	15	62	95	11	26	4		
		%	46.9%	44.3%	48.7%	32.4%	51.0%	66.7%		
City	Makkah	N	19	98	138	20	35	4	3.219	0.666
		%	59.4%	70.0%	70.8%	58.8%	68.6%	66.7%		
	Other	N	13	42	57	14	16	2		
		%	40.6%	30.0%	29.2%	41.2%	31.4%	33.3%		
Income level	I don't have	N	0	1	1	1	0	0	52.440	0.000
		%	0.0%	.7%	.5%	2.9%	0.0%	0.0%		
	Low	N	7	45	58	7	35	0		
		%	21.9%	32.1%	29.7%	20.6%	68.6%	0.0%		
	Average	N	21	74	125	25	13	4		
		%	65.6%	52.9%	64.1%	73.5%	25.5%	66.7%		
	High	N	4	20	11	1	3	2		
		%	12.5%	14.3%	5.6%	2.9%	5.9%	33.3%		
Oral health impacts	I do not agree	N	0	7	7	2	3	0	28.463	0.002
		%	0.0%	5.0%	3.6%	5.9%	5.9%	0.0%		
	I agree	N	22	95	120	23	44	1		

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general health		**%**	68.8%	67.9%	61.5%	67.6%	86.3%	16.7%		
	Strongly agree	**N**	10	38	68	9	4	5		
		%	31.3%	27.1%	34.9%	26.5%	7.8%	83.3%		

Table VII: significance of difference between social media platforms and type of teeth whitening method:

This table revealed that there was no statistically significant difference between social media platformsand type of teeth whitening method

		If it was through social media platforms, could you specify which one of them?					**Chi-square**	
		Twitter	**Instagram**	**Snapchat**	**Tiktok**	**Facebook**	**X^2**	**P-value**
Whitening toothpaste.	**N**	8	32	55	3	4	1.735	0.885
	%	40.0%	40.5%	43.0%	25.0%	36.4%		
Instant teeth whitening patches from pharmacy or beauty supply stores	**N**	7	31	38	3	1	7.346	0.196
	%	35.0%	39.2%	29.7%	25.0%	9.1%		
Light-assisted home teeth whitening devices	**N**	2	16	30	5	3	5.768	0.329
	%	10.0%	20.3%	23.4%	41.7%	27.3%		
Teeth whitening in the clinic under the supervision of a dentist	**N**	6	24	30	3	5	3.578	0.612
	%	30.0%	30.4%	23.4%	25.0%	45.5%		
Home molds	**N**	1	9	11	1	2	2.198	0.821

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specially designed for personal use according to the size of the teeth and jaw	**%**	5.0%	11.4%	8.6%	8.3%	18.2%		

Discussion:

Teeth bleaching or whitening has become a common practice, and products applied in the clinic by the dentist, as well as over-the-counter products, are getting more and more popular (Bersezio et al., 2020). Social media platforms consider a cornerstone in determining and manipulating the knowledge and teeth bleaching methods and alternatives (Mellgren et al., 2018).

The study results revealed that the majority of the participants aged from 18-40 years, more than half were females, single, from Makkah, with an average income and agreed that oral health impacts the general health. Majority of them brush their teeth daily and unsatisfied about their smile and teeth color. Almost all of them heard about teeth whitening; from social media platforms as snapchat and Instagram. More than half previously performed teeth whitening; using toothpastes and patches. Minority of them perform teeth whitening in the clinic under dentist supervision. However, they were unsatisfied by the products because the results are not as expected and due to the presence of postoperative sensitivity. They recommend doingteeth bleaching under dentists' supervision. Statistical significant differences were found regarding the type of social media platform with age, gender, income and perception that oral health impact general health.

Supporting the study results which confirmed that majority of participants using various teeth whitening products; Perdigão et al., 2016 go in the same line and concluded that demand for tooth whitening has been reflected in the various products and methods available. Social media widely publicizes supposedly innovative techniques to improve the appearance of teeth.

Most of studied population was unsatisfied with their smile and tooth color. These results were harmonious withChisini et al., 2019 who reported that dental appearance is an important

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component of facial attractiveness. Moreover, Alamassi et al., 2017 concluded that most of the patients are not satisfied with the color of their teeth, and their most desired aesthetic treatment is bleaching. Social media could be a suitable channel for special educational programs designed by dental professionals to increase the general population's awareness of tooth discoloration and bleaching.

Age play an important role and positive attitude toward teeth bleaching. Nomay, 2016 reported that gender differences were observed with regards to the attitude towards bleaching. Moreover, participants who had the knowledge of teeth color showed more positive attitude towards teeth bleaching.

Most of patients using commercial products without medical supervision that place the patient under a risk of various side effects. This result is supported by Sato et al., 2013 and Dahl et al., 2003, who found that hydrogen peroxide used in clinical bleaching protocols dramatically alters the structural and biochemical properties of dental hard and soft pulp tissue. In addition, Fiorillo et al., 2019 confirmed that tooth whitening treatment is not suitable for everyone and must be carefully evaluated by a specialist.

Regarding the population knowledge about tooth bleaching, the results of the present study were opposite with Eyyd et al., 2021who found that students' level of knowledge regarding discoloration is unsatisfactory but satisfactory regarding bleaching.

Most of the participants heard about teeth bleaching via advertisements. In addition, most of them have used home bleaching more than the professional bleaching methods. Respondents with frequent dental visits had higher levels of knowledge on teeth bleaching compared to respondents with a lack of dental visits (AlOtaibi et al., 2020). Massive online communication of patient experiences made possible through social media will continue to influence the practice of medicine, both aesthetic and otherwise (Schlichte et al., 2015). Simsek et al., 2020 didn't go in the same line and recommended that YouTube™ should not be used as a thoroughly reliable and accurate source for patient information about teeth whitening. More informative and reliable content YouTube™ videos about teeth whitening should be uploaded by professionals.

Conclusion and recommendations:

Social media platforms play an in important role regarding the knowledge about tooth bleaching and its different methods of application. Further efforts should be paid to increase the public

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awareness about the benefits of teeth bleaching under dentists' supervision.

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