



A Cross Cultural study comparing patient acceptance of Orthodontic mini screws and patient views on Social Media use in Dentistry in two countries in the Middle East

Nijod Sharif¹, Rehab Bawayan¹, Haneen Shaheen¹, Ahmed Aldweik², Ali H. Hassan³ and Dalia EIBokle⁴

¹ Almsaeidiah Dental Centre, King Fahad General Hospital, Jeddah, **Saudi Arabia**

² Choueifat Dental Clinic, Jeddah, **Saudi Arabia**

³ King Abdulaziz University, Faculty of Dentistry Department of Orthodontics, Jeddah, **Saudi Arabia**

⁴ Zayed Orthodontics, Cairo, Egypt and Former professor of orthodontics at Cairo University, **Egypt**

*Correspondence: nijod_sharif@hotmail.com Received 01 October 2023, Revised: 01 November 2023, Accepted: 04 November 2023 e-Published: 06 November 2023

The primary aim of this study was 1) to evaluate patients' attitudes towards the use of social networking sites (SNS) for obtaining dental information, 2) to evaluate patients' acceptance, perceptions, and expectations of treatment using temporary anchorage devices (TADs) in private orthodontic clinics in both Saudi Arabia and Egypt. Online questionnaires via Google Forms were distributed to 60 participants in two private orthodontic clinics (Saudi Arabia and Egypt) asking about their opinions on using social media for obtaining dental information as well as their opinion on TADs as a treatment modality. Both groups were internally motivated to receive treatment, >70% sought to improve both esthetics and function, and 63% used social media to get information about orthodontic treatment. Moreover, both groups had the same opinion regarding TADs and accepted them as a treatment modality where necessary. There was a statistically significant difference in the responses of Saudi Arabia and Egypt ($p=0.045$) regarding whether or not the number of extracted teeth mattered in the orthodontic treatment plan. The Saudi sample was more likely to trust their dentist if they had a social media profile (statistically significant difference $p=0.019$). Patients appreciate doctors who have social media accounts and use social networking sites to learn about therapies. Patients from both nations feel comfortable contemplating TADs as a treatment modality. To meet patients' expectations and encourage their acceptance of TADs, clinicians should think about expanding their social media presence.

Keywords: Patient acceptance, Orthodontic mini-screws, TADs, Social media

INTRODUCTION

The field of orthodontics has witnessed many developments in treatment over the years. Anchorage, which is the resistance to undesired tooth movement has been controlled mostly by other teeth, head, and neck via headgear, occasionally the palate, (Sampson et al. 2021), and more recently via mini-screws or temporary anchorage devices (TADs). The clinical applications of TADs encompass direct and indirect anchorage for intrusion, mesializing, and distalizing teeth during the correction of various malocclusions (Mizrahi 2016). TADs have the advantage that they are easy to place and remove, relatively small in size, can be loaded immediately, and are well accepted by patients (Zawawi 2014).

Treatment perception studies are of value because they provide clinicians with reliable information from

actual patient's reported pain experiences that can be used to educate patients prior to obtaining informed consent (Casarett et al. 2001). Moreover, they can add insight into patient acceptance of any treatment modality (Zawawi 2014).

When compared to tooth extractions as a reference procedure to evaluate patient pain and discomfort, installation of TADs was found to cause significantly less pain (Ganzer et al. 2016) and in some studies no pain (Kaaouara et al. 2018) and was recommended even in adolescents (Ganzer et al. 2016). It has been found that patients tend to overestimate pain before the insertion of TADs, yet later after the procedure, they would endorse it to others (Sandhu et al. 2013). Also when visual analog scores (VAS) for pain 1 day after various orthodontic procedures were compared for TAD placement vs. first premolar extraction vs. fixed

appliance insertion, TAD placement scores were significantly lower than the other procedures (Chen et al. 2011).

According to a recent study conducted in Saudi Arabia around 90% of orthodontists in government hospitals and 80% of those in private clinics used orthodontic mini screws in clinical practice. Practitioners who did not use orthodontic mini-screws mentioned it was due to a lack of information about how to apply them, or that they were not available at their center, or that it was the job of the oral surgeon (Fatani et al. 2019).

According to recent social media statistics for Saudi Arabia, Instagram is used by 76.80% of the population, and is closely followed by Snapchat, Twitter, and TikTok at around 68% each (GMI, 2023). On the other hand, in Egypt, Facebook is the leading social media platform used by 95.9% of the respondents and is followed by Instagram at 54.6%, then TikTok at 45.7% (Zawya by LSEG, 2023).

Various cross-sectional surveys have been done around the world to explore whether social media can be of use in dental practice and for educating patients (Almozainy 2017; Ajwa et al. 2018; Al Awdah et al. 2018; AlAlawi et al. 2019; Taneja et al. 2022; Sivaramakrishnan et al. 2023).

The primary aim of this study was to evaluate patients' attitudes towards the use of social networking sites (SNS) for obtaining dental information and patient acceptance, perceptions, and expectations of treatment using temporary anchorage devices (TADs) in private orthodontic clinics in Saudi Arabia and Egypt.

MATERIALS AND METHODS

Study Design:

This is a cross-sectional study based on research by Sampson et al. 2021. After written permission from the author to translate and adjust their questionnaire and methodology, patients in the waiting room were approached by office staff and invited to participate voluntarily in this survey anonymously by scanning a QR code that led to an online Google Forms questionnaire written in both English and Arabic. The patients were requested to fill out the form to investigate patients' demographics, incentives for seeking orthodontic treatment, patients' opinions on various orthodontic treatment options including TADs, as well as their views on the use of social media to obtain dental information. This study was conducted in two private clinics in the Middle East, one was based in Jeddah, Saudi Arabia and the other was based in Cairo, Egypt.

Sample selection:

A sample size of 30 in each country was specified with the following inclusion criteria: 1) Patients over 18 years old of both genders 2) Within one year of retention or

still under orthodontic treatment 3) Did not need and did not have TADs as part of their treatment.

Ethical approval :

Ethical approval was obtained from the Saudi Ministry of Health with national registration number NCBE-KACST, KSA: (H-02-J-002), and also in Egypt ethical approval was obtained from Al-Azhar University, Assuit branch with the registration number AUAREC202100008-4.

Data Analysis:

Data were analyzed using IBM SPSS Statistical software for Windows version 26.0 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics (frequencies and percentages) were used to describe the categorical study and outcome variables. The Non-parametric Pearson Chi-square test was used to compare the categorical nominal scale responses of each of the 8 perception items' responses towards Orthodontic treatment between subjects in two locations (Saudi Arabia and Egypt). The non-parametric Mann-Whitney U-test was used to compare the 5-point ordinal scale responses of each of the 9 attitude items towards using social media for dental treatment between subjects in both locations (Saudi Arabia and Egypt). A p-value of <0.05 was used to report the statistical significance of the results.

RESULTS

Out of 60 study subjects, 30 were from Saudi Arabia, 30 were from Egypt and 62% of the participants were women. The distribution of age groups for these 60 subjects was from 18 to >35 years, and the largest age group was between 18-25y at 35%. About 43% of patients were internally motivated to have orthodontic treatment and the rest were persuaded to seek treatment by friends/relatives 26.7% or the Dentist/Orthodontist 30%. More than 70% sought orthodontic treatment for both aesthetics and function. About 91.7% of the patients use social media in general, whereas 63.3% of them use social media to get information about orthodontic treatment. (Table1)

The Comparison of perception items responses towards orthodontic treatment between subjects of two locations (Saudi Arabia and Egypt) showed no statistically significant difference in the distribution of categorical responses for 7 out of 8 items. Only one item (Would the number of teeth extracted matter?), had a statistically significant difference in the responses of Saudi Arabia and Egypt subjects where 83.3% of subjects from Saudi Arabia had responded as "Yes" when compared with 60% of subjects from Egypt (p=0.045) (Table2).

The Comparison of responses regarding the attitude towards using social media for dental treatment between subjects of two places (Saudi Arabia and Egypt) showed no statistically significant difference in

the distribution of 5-point ordinal responses for 8 out of 9 attitude items. However, for the question "I would trust my dentist more if they had a social media profile" there was a highly statistically significant difference in the responses of the Saudi Arabia and Egypt subjects ($p=0.019$). (Table 3), where 36.7% of subjects from

Saudi Arabia responded with "Agree" and "Strongly agree" when compared with 20% of subjects from Egypt. Also, 40% of subjects from Saudi Arabia responded with 'Uncertain' versus 23.3% of subjects from Egypt with the same response of 'Uncertain'.

Table 1: Distribution of socio-demographic characteristics of study subjects and other study variables

Characteristics and other variables	Saudi Arabia Subjects(n=30) No. (%)	Egypt Subjects (n=30) No. (%)	All Subjects (n=60) No. (%)
<u>Age groups</u>			
18-23	8(26.7)	13(43.3)	21(35)
24-29	10(33.3)	6(20.0)	16(26.7)
30-35	8(26.7)	7(23.3)	15(25.0)
>35	4(13.3)	4(13.3)	8(13.3)
<u>Gender</u>			
Male	11(36.7)	8(26.7)	19(31.7)
Female	19(63.3)	22(73.3)	41(68.3)
<u>Who prompted you to seek orthodontic treatment?</u>			
Friend/Relative	7(23.3)	9(30.0)	16(26.7)
Dentist/Orthodontist	9(30.0)	9(30.0)	18(30.0)
Self	14(46.7)	12(40.0)	26(43.3)
<u>Reason for orthodontic treatment</u>			
Esthetics	8(26.7)	8(26.7)	16(26.7)
Function	1(3.3)	0	1(1.7)
Both	21(70.0)	22(73.3)	43(71.6)
<u>Do you use social media?</u>			
Yes	26(86.7)	29(96.7)	55(91.7)
No	4(13.3)	1(3.3)	5(8.3)
<u>Do you use social media to get information about treatment?</u>			
Yes	19(63.3)	19(63.3)	38(63.3)
No	11(36.7)	11(36.7)	22(36.7)

Table2: Comparison of perception responses towards Orthodontic treatment between subjects of two places (Saudi Arabia and Egypt)

Perceptions items	Place of study subjects		Total	X ² -value	p-value
	Saudi Arabia	Egypt			
<u>Would you agree to the extraction of teeth as part of your orthodontic treatment if it was necessary?</u>					
Yes	25(83.3)	28(93.3)	53(88.3)	1.46	0.228
No	5(16.7)	2(6.7)	7(11.7)		
<u>Would the number of teeth has extracted matter?</u>					
Yes	25(83.3)	18(60.0)	43(71.7)	4.02	0.045
No	5(16.7)	12(40.0)	17(28.3)		
<u>Is the length of orthodontic treatment time a concern to you?</u>					
Yes	19(63.3)	21(70.0)	40(66.7)	0.30	0.584
No	11(36.7)	9(30.0)	20(33.3)		
<u>Would you agree to have jaw surgery as part of your</u>					

<u>orthodontic treatment if it was necessary?</u>					
Yes	25(83.3)	21(70.0)	46(76.7)	1.49	0.222
No	5(16.7)	9(30.0)	14(23.3)		
<u>Would you agree to a mini-screw/temporary anchorage device/TAD/mini-implant as part of your orthodontic treatment if it was necessary?</u>					
Yes	17(56.7)	14(46.7)	31(51.7)	0.76	0.682
No	5(16.7)	5(16.7)	10(16.7)		
I don't know	8(26.7)	11(36.7)	19(31.7)		
<u>Would you prefer to have a mini-screw/temporary anchorage device/TAD/mini-implant if it meant avoiding tooth extractions?</u>					
Yes	17(56.7)	14(46.7)	31(51.7)	2.34	0.311
No	2(6.7)	6(20.0)	8(13.3)		
I don't know	11(36.7)	10(33.3)	21(35.0)		
<u>Would you prefer to have a mini-screw/temporary anchorage device/TAD/mini-implant if it meant you did not need jaw surgery?</u>					
Yes	16(53.3)	21(70.0)	37(61.7)	1.82	0.403
No	4(13.3)	3(10.0)	7(11.7)		
I don't know	10(33.3)	6(20.0)	16(26.7)		
<u>Would you prefer to have a mini-screw/temporary anchorage device/TAD/mini-implant if it meant shorter treatment time?</u>					
Yes	13(43.3)	19(63.3)	32(53.3)	2.55	0.279
No	8(26.7)	6(20.0)	14(23.3)		
I don't know	9(30.0)	5(16.7)	14(23.3)		

Table 3: Comparison of Attitude responses towards using Social media for dental treatment between subjects of two places (Saudi Arabia and Egypt)

Attitude items	Place of study subjects		Total	p-value*
	Saudi Arabia	Egypt		
<u>I would find social media useful in providing me with information on dental treatments</u>				
Strongly disagree	1(3.3)	4(13.3)	5(8.3)	0.330
Disagree	0	4(13.3)	4(6.7)	
Uncertain	10(33.3)	7(23.3)	17(28.3)	
Agree	17(56.7)	10(33.3)	27(45)	
Strongly agree	2(6.7)	5(16.7)	7(11.7)	
<u>I would trust social media for information on dental treatments</u>				
Strongly disagree	1(3.3)	2(6.7)	3(5.0)	0.719
Disagree	6(20.0)	8(26.7)	14(23.3)	
Uncertain	17(56.7)	9(30.0)	26(43.3)	
Agree	5(16.7)	8(26.7)	13(21.7)	
Strongly agree	1(3.3)	3(10.0)	4(6.7)	
<u>I would find social media an easy way to get information about dental treatment</u>				
Strongly disagree				
Disagree	1(3.3)	1(3.3)	2(3.3)	0.955
Uncertain	6(20.0)	7(23.3)	13(21.7)	
Agree	4(13.3)	4(13.3)	8(13.3)	
Strongly agree	17(56.7)	14(46.7)	31(51.7)	
<u>I would find it useful to get opinions on other's experiences of dental treatment</u>	2(6.7)	4(13.3)	6(10.0)	
Strongly disagree				
Disagree				
Uncertain	1(3.3)	2(6.7)	3(5.0)	0.247
Agree	2(6.7)	2(6.7)	4(6.7)	
Strongly agree	4(13.3)	5(16.7)	9(15.0)	
<u>I can easily rate whether the information or opinions I see on social media are</u>	16(53.3)	18(60.0)	34(56.7)	

<u>useful or of good quality</u>	7(23.3)	3(10.0)	10(16.7)	
Strongly disagree				
Disagree				
Uncertain	1(3.3)	1(3.3)	2(3.3)	0.601
Agree	3(10.0)	4(13.3)	7(11.7)	
Strongly agree	9(30.0)	9(30.0)	18(30.0)	
<u>I might make a decision on buying something based on what I have seen on social media</u>	12(40.0)	13(43.3)	25(41.7)	
Strongly disagree	5(16.7)	3(10.0)	8(13.3)	
Disagree				
Uncertain	4(13.3)	2(6.7)	6(10.0)	0.866
Agree	3(10.0)	7(23.3)	10(16.7)	
Strongly agree	10(33.3)	7(23.3)	17(28.3)	
<u>I would prefer if my dentist had a social media profile</u>	11(36.7)	11(36.7)	22(36.7)	
Strongly disagree	2(6.7)	3(10.0)	5(8.3)	
Disagree				
Uncertain	2(6.7)	3(10.0)	5(8.3)	0.154
Agree	4(13.3)	4(13.3)	8(13.3)	
Strongly agree	9(30.0)	14(46.7)	23(38.3)	
<u>I would trust my dentist more if they had a social media profile</u>	11(36.7)	8(26.7)	19(31.7)	
Strongly disagree	4(13.3)	1(3.3)	5(8.3)	
Disagree				
Uncertain	3(10.0)	5(16.7)	8(13.3)	0.019
Agree	4(13.3)	12(40.0)	16(26.7)	
Strongly agree	12(40.0)	7(23.3)	19(31.7)	
<u>I want to be able to see my dentist's work on social media</u>	8(26.7)	6(20.0)	14(23.3)	
Strongly disagree	3(10.0)	0	3(5.0)	
Disagree				
Uncertain	1(3.3)	5(16.7)	6(10.0)	0.218
Agree	2(6.7)	2(6.7)	4(6.7)	
Strongly agree	5(16.7)	7(23.3)	12(20.0)	
	18(60.0)	11(36.7)	29(48.3)	
	4(13.3)	5(16.7)	9(15.0)	

*By using Mann-Whitney U-test

DISCUSSION

This study showed that both the Saudi Arabian and Egyptian populations have generally similar opinions regarding TADs and social media use. This could be due to them having similar social cultures that are comparable in many aspects of life.

Motivation for treatment in both groups was internal, and mainly to improve esthetics which is in agreement with another Saudi study where the primary motivation for 58.6% of adult patients was esthetics, and only 12.1% were concerned with functional problems (Felemban et al. 2022). Another online survey with responses of orthodontic patients from 30 countries, also found that over 72% of female patients and around 54% of male patients sought orthodontic treatment to improve their esthetics (Saccomanno et al. 2022).

Both cultures accepted the idea of extractions for orthodontic purposes, but the Saudi sample was more concerned about the number of teeth extracted, this could be because 73.3% of the Saudi responses were from those over 23 years of age hence, they are more cautious about the need for extractions compared to a 56.6% of over 23-year-olds in the Egyptian sample.

One of the most grueling aspects of orthodontics is prolonged treatment time, which was of concern in both

groups. According to another Saudi study 83% of patients thought orthodontic treatment took too long and 55.5% wished it took less than 6 months (Linjawi et al. 2019). Uribe et al. (2014) found that the majority of patients were prepared to pay 50% more in fees for a 50% reduction in treatment time. When asked about TADs both groups were accepting of this treatment modality if deemed necessary and even more, if it meant shorter treatment time, avoiding extractions, or orthognathic surgery which is intimidating for most people. Mani et al. (2021) found that 93% of orthodontic patients felt anxious when they were told about orthognathic surgery. However, in our study if orthognathic surgery was absolutely necessary both groups were willing to go ahead irrespective of time duration.

The internet has made it possible for many people with medical questions to virtually find answers from anywhere at any time. The majority of participants in both locations found social media an easy and useful way to obtain information on dental treatment, this was in line with findings from a Bahraini cross-sectional survey, where 83.5% of patients said they always used it to examine content related to dentistry and 69.8% of dentists believed that patients who use social media had a greater oral health knowledge (Sivaramakrishnan et

al.2023). However, there were relatively high levels of uncertainty in both groups regarding the trustworthiness of information from social media, yet a large proportion of participants from both sides mentioned that they could easily rate whether the information on social media was of good quality or not. Our results also showed that a higher percentage (56.7%) from the Saudi group have replied as "uncertain" if they would trust their dentists if they had a social media profile, On the other hand, 30% of the Egyptian group replied as "uncertain" to this question which was measured on a 5-point scale. Sumayyia et al. (2019) stated that among other difficulties, addressing information accuracy may decrease the chance of patients receiving false information regarding their health on social media. This contribution could be made feasible by urging patients and the general public to visit reputable websites that adhere to scientific truth and by educating their patients on how to distinguish between websites with high and low scientific rigor. Healthcare providers have a responsibility to increase public access to evidence-based health information (Farsi et al. 2022).

Prospective patients are impacted by the social media content that is available. Our study showed that over 50% of the participants in both countries wanted to see their dentists' work on social media. The Egyptian group had a higher percentage of uncertain patients who preferred their dentist to have a social media profile unlike the Saudi group which exhibited a higher preference for their dentist having a social media profile, However, the difference between the groups was not statistically significant.

Patients are interested in learning about dentists' credentials before they visit the office, and they may utilize LinkedIn to do so because so many dentists utilize this platform to advertise their skills, according to a prior study (Parmar et al.2019). Additionally, patients said that the most significant Facebook page information they looked for was academic credentials. Others said they also looked for good feedback and accolades in addition to the original content. According to patients in another survey, the reviews and the dentist's credentials were the most crucial considerations when choosing a dentist on social media, with the awards won and the number of likes coming in last (Alalawi et al. 2019).

According to Ajwa et al. (2018) 89.4% of dental professionals in Saudi Arabia said that social media marketing (SM) was the best method for luring new clients to their offices. They also stated that 82.3% of the participants in their sample believed that putting an advertisement on social media boosted the number of patients visiting dental clinics. Dentists need to recognize that their use of social media in their dental practices should be guided by the platforms that their patients regularly utilize. Another study by Al-Khalifa et al.(2021) found that most dentists believed that patients selected their dentists through social media, and 74% of

them think dentists should play a leading role in correcting false online health information.

SM's significance in dental practice is growing as more patients and practitioners rely on this type of technology. The application of SM in dental service delivery, advertising, counseling, and oral health education about new treatment methods such as TADs can improve dental practices. Additionally, SM platforms could be used for professional development, allowing dental organizations and educators to share news and updates via various SM platforms (Al-Khalifa et al.2021).

This study had a few limitations such as being a questionnaire-based study with a relatively small sample size, and convenience samples in private clinics. In the future this study could be considered as an exploratory study and further studies should be carried out with a larger sample size in governmental clinics, and could include more questions about preferred SNS and patients' exposure to TADS in social media.

CONCLUSIONS

Patients generally appreciate doctors who have social media accounts and use social networking sites to learn about therapies. Patients from both nations feel comfortable contemplating TADs as a treatment modality. To meet patients' expectations and encourage their acceptance of TADs, clinicians should think about expanding their social media presence.

Supplementary materials

The supplementary material / supporting for this article can be found online and downloaded at: <https://www.isisn.org/article/10.3390/antiox12081524/s1>,

Author contributions

Conceptualization, N.S.; methodology, N.S., R.B., H.S. and D.E.; software, N.S., R.B. and H.S.; validation, N.S., D.E. and A.H.; formal analysis, N.S., R.B. and H.S.; investigation, N.S., R.B., A.A., and D.E.; resources, N.S., D.E. and A.H.; data curation, N.S., R.B., A.A. and D.E.; writing-original draft preparation, N.S.; writing-review and editing, N.S. and D.E.; visualization, N.S.; supervision, D.E. and A.H.; project administration, N.S.; funding acquisition, No funding. All authors have read and agreed to the published version of the manuscript.

Funding statement

This study was supported by the

Institutional Review Board Statement

The study was approved by the Bioethical Committee of the

Informed Consent Statement

Not applicable.

Data Availability Statement

All of the data is included in the article/Supplementary Material.

Acknowledgments

To Dr. Arianne Sampson for allowing modification and translation of the questionnaire and methodology.

Conflict of interest

The authors declare no conflict of interest.

Copyrights: © 2023@ author (s).

This is an **open access** article distributed under the terms of the **Creative Commons Attribution License (CC BY 4.0)**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author(s) and source are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Publisher's note/ Disclaimer

All claims stated in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher. ISISnet remains neutral with regard to jurisdictional claims in published maps and institutional affiliations. ISISnet and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

Peer Review: ISISnet follows double blind peer review policy and thanks the anonymous reviewer(s) for their contribution to the peer review of this article.

REFERENCES

- Ajwa N, Mohsen SA, Kuwail A, Osaif EA. The impact of using social media networks on dental treatment marketing in Saudi Arabia: the practitioners and patient's perspectives. *J Oral Health Dent Sci.* 2018;2(3):1–10.
- Al Awdah AS, Ali BB, Al Twaim S, Al Habdan AA (2018) The Power of Social Media on Esthetic Dental Treatment Choices in Arabian Gulf Region. *Int J Dent Oral Health* 5(1)
- Al-Khalifa KS, Al-Swuailem AS, AlSheikh R, Muazen YY, Al-Khunein YA, Halawany H, Al-Abidi KS. The use of social media for professional purposes among dentists in Saudi Arabia. *BMC Oral Health.* 2021 Jan 12;21(1):26.
- Alalawi A, Aljuaid H, Natto ZS. The Effect Of Social Media On The Choice Of Dental Patients: A Cross-Sectional Study In The City Of Jeddah, Saudi Arabia. *Patient Prefer Adherence.* 2019 Oct 3;13:1685-1692.

- Almozainy M. Assessing the use of social media as a source of information related to dentistry in Saudi Arabia. *J Dent Health Oral Disord Ther.* 2017;8(7):663-668
- Casarett D, Karlawish J, Sankar P, Hirschman KB, Asch DA. Obtaining informed consent for clinical pain research: patients' concerns and information needs. *Pain.* 2001 May;92(1-2):71-9.
- Chen CM, Chang CS, Tseng YC, Hsu KR, Lee KT, Lee HE. The perception of pain following interdental microimplant treatment for skeletal anchorage: a retrospective study. *Odontology.* 2011 Jan;99(1):88-91.
- Farsi D, Martinez-Menchaca HR, Ahmed M, Farsi N. Social Media and Health Care (Part II): Narrative Review of Social Media Use by Patients. *J Med Internet Res.* 2022 Jan
- Fatani E, Eskandarani R, Alfadil L. Use of orthodontic mini-screws among orthodontists in Saudi Arabia. *Int J Res Med Sci.* 2019 Apr;7(4):1150-1155
- Felemban OM, Alharabi NT, A Alamoudi RA, Alturki GA, Helal NM. Factors influencing the desire for orthodontic treatment among patients and parents in Saudi Arabia: A cross-sectional study. *J Orthod Sci.* 2022 May 4;11:25.
- Ganzer N, Feldmann I, Bondemark L. Pain and discomfort following insertion of miniscrews and premolar extractions: A randomized controlled trial. *Angle Orthod.* 2016 Nov;86(6):891-899.
- GMI, 2023 . Saudi Arabia Social Media Statistics 2023. . Perception of mini-screw anchorage devices by patients. *Int Orthod.* 2018 Dec;16(4):676-683.
- Linjawi AI, Abushal AM, Al-Zahrani AM, Bakhamis BA. Patients' Perceptions To Reduced Orthodontic Treatment Time In Saudi Arabia. *Patient Prefer Adherence.* 2019 Nov 19;13:1973-1981.
- Mani B, Mani M, Ramar S, Srinidhi S, Bharathi SR, Sengodan T. Knowledge, Attitude, and Awareness of Orthognathic Surgery among Orthodontic Patient- <https://www.globalmediainsight.com/blog/saudi-arabia-social-media-statistics/> Accessed 9/5/2023
- Kaaouara Y, Sara EA, Rerhrhaye W Prospective Study. *J Pharm Bioallied Sci.* 2021 Nov;13(Suppl 2):S1029-S1032.
- Mizrahi E. The Use of Miniscrews in Orthodontics: a Review of Selected Clinical Applications. *Prim Dent J.* 2016 Nov 1;5(4):20-27
- Nancy Ajwa, Sukainah Al Mohsen, Amjad Kuwail, Esraa Al Osaif (2018) The Impact of Using Social Media Networks on Dental Treatment Marketing in Saudi Arabia: The Practitioners and Patient's Perspectives. *J Oral Health Dent* 2: 305
- Parmar N, Dong L, Eisingerich AB. Connecting with your dentist on Facebook: patients' and dentists' attitudes towards social media usage in dentistry. *J Med Internet Res.* 2018 Jun 29;20(6)

- Saccomanno S, Saran S, Laganà D, Mastrapasqua RF, Grippaudo C. Motivation, Perception, and Behavior of the Adult Orthodontic Patient: A Survey Analysis. *Biomed Res Int.* 2022 Mar 4;2022:2754051.
- Sampson A, Figueiredo DSF, Jeremiah HG, Oliveira DD, Freitas LRP, Chahoud M, Soares RV, Cobourne MT. The effect of social media on patient acceptance of temporary anchorage devices. *Angle Orthod.* 2021 May 1;91(3):363-370.
- Sandhu JS, Sandhu SV, Bector K, Sandhu SS. Patients Perception and postoperative discomfort with mini implants. *J Ind Orthod Soc* 2013;47(4):199-201
- Sivaramakrishnan G, AbdulAmeer F, Faisal F, Mansoor Z, Hasan S, Ebrahim S, AlSalihi L, Alsobaiei M. Use of Social Media to View and Post Dentistry-related Information in Bahrain: A Cross-Sectional Study. *Healthc Inform Res.* 2023 Jan;29(1):31-39.
- Sumayyia MD, Al-Madaney MM, Almousawi FH. Health information on social media. Perceptions, attitudes, and practices of patients and their companions. *Saudi Med J.* 2019 Dec;40(12):1294-1298.
- Taneja, Pratibha; Mahapatra, Soumya; Marya, Charu Mohan; Nagpal, Ruchi; Kataria, Sakshi. Impact of Social Media on Dental Treatment Choices: A Web-Based Survey. *Journal of Indian Association of Public Health Dentistry* 20(4):p 415-419, Oct–Dec 2022.
- Uribe F, Padala S, Allareddy V, Nanda R. Patients', parents', and orthodontists' perceptions of the need for and costs of additional procedures to reduce treatment time. *Am J Orthod Dentofacial Orthop.* 2014 Apr;145(4 Suppl):S65-73.
- Zawawi KH. Acceptance of orthodontic miniscrews as temporary anchorage devices. *Patient Prefer Adherence.* 2014 Jun 30;8:933-7.
- Zawya by LSEG, 2023. Facebook leads social media platforms in Egypt, followed by Instagram and TikTok.
<https://www.zawya.com/en/business/technology-and-telecom/facebook-leads-social-media-platforms-in-egypt-followed-by-instagram-and-tiktok-p7oc4mgo> Accessed 9/5/2023