



## Assessing the Attitude of people living in Isfahan regarding Use of the Cyberspace and social media in Dentistry 2022

Kimia Yazdani<sup>1</sup>, Fatemeh Rashidi Meybodi<sup>2\*</sup>, Meysam Mahabadi<sup>3</sup>, Milad Safaripour<sup>4</sup>

Received: 2023-09-16 / Accepted: 2023-12-12 / First publication date: 2023-12-26

© The Author(s) 2023

### Abstract

**Background:** The use of cyberspace and social media has increased in recent years and has been applied to improve the health of people in society. A study was conducted to determine the attitude of people in Isfahan towards the use of these platforms in the field of dentistry.

**Materials and Methods:** This cross-sectional study involved 257 randomly selected participants from three groups based on age and education level in each of Isfahan's 15 districts. The questionnaire used in the study was divided into two parts: general information and attitude-related questions. To analyse the data, Student's t-test, Chi-square, Friedman, and Kruskal-Wallis tests were used ( $\alpha=0.05$ ).

**Results:** The study in Isfahan showed high use of cyberspace in dentistry, especially by women, young adults (16-35 years), and those with higher education. Users mainly seek dental information and select a dentist, with a significant relation to age ( $p<0.001$ ), gender ( $p=0.048$ ) and level of education ( $p=0.001$ ). Positive online comments and reviews were more important for young adults (16-35 years old) ( $p<0.001$ ) and have no significant relationship with gender and education ( $p>0.05$ ).

**Conclusion:** In conclusion the people of Isfahan had a positive attitude towards using cyberspace and social media in. Age, gender, and level of education can affect the use of cyberspace for health training, and selection of type and place of treatment.

**Keywords:** Dentistry; Attitude; Internet; social media

### Introduction

Virtual Social Networks (VSN) are one of the most important and widely used new media.

VSNs are a type of social platform that although relatively new, have already become an integral part of people's lives. They play a significant role in various aspects of people's personal and social lives, both nationally and internationally (1, 2).

Nowadays, people are more dependent on social media to search for services, including dental services, view displayed information, and read

customer feedback and opinions (3, 4). In dentistry, dental providers are increasingly using social networks to educate themselves, communicate with other dentists, and participate in dental care (5, 6). While there are various positive reviews of social media use by health care providers, there are also some potential concerns the most reported concerns were legal and security related issues (7, 8).

Examples of the most popular social network servers include Facebook, Twitter, Instagram, YouTube, and WhatsApp, which the number of users on these platforms continuously increases (9).

In recent years, social network sites have caught the attention of many doctors and researchers in the healthcare field (9). Due to increasing influence of social media on healthcare, researchers have begun to investigate its impact on professional credibility and the doctor-patient relationship (10).

**Corresponding author:** Dr. Fatemeh Rashidi Meybodi  
Department of oral diseases, Faculty of dentistry, Isfahan (khorasgan) Branch, Islamic Azad University, Isfahan, Iran  
**Email:** mahtab.rashidi.mr@gmail.com

<sup>1</sup> School of dentistry, Isfahan (khorasgan) Branch, Islamic Azad University, Isfahan, Iran.

<sup>2</sup> Department of oral diseases, Faculty of dentistry, Isfahan (khorasgan) Branch, Islamic Azad University, Isfahan, Iran.

<sup>3</sup> Department of prosthetic dentistry, Faculty of dentistry, Isfahan (khorasgan) Branch, Islamic Azad University, Isfahan, Iran.

<sup>4</sup> Department of prosthetic dentistry, Faculty of dentistry, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran.

These networks have become reliable tools for researchers to distribute health questionnaires and to increase public awareness of health issues

Dentists specializing in various areas, such as cosmetic dentistry, dental surgery, orthodontics, periodontology, and dental implants, use social media to highlight their services through images or videos. Many dental clinics also use social media for marketing purposes (2). The rise of social media has revolutionized the healthcare, and allowed specialists to interact with their patients and provide different types of health care services. Dentistry is no exception to this rule (11).

Research shows that social media is an effective tool for attracting patients (11), marketing (2), and improving the knowledge and skills of healthcare providers (5). However, some studies suggest that the use of social media in dental care can be ambiguous and unclear and recommend that guidelines be developed to ensure the safe and professional use of social networks (11, 12).

However, a lack of understanding of dentists' and patients' attitude towards the use of social media in dentistry may deter dentists from engaging in social media activities that could be beneficial to them and their patients both. As for example social media provides a space for dentists and patients to communicate with each other without time and distance limitations (11).

Due to the increasing significance of social media and virtual networks in promoting public health around the world, it is imperative to evaluate the attitudes of people towards the use of these platforms for informing them about the types of dental treatments available, selecting the best treatment options and healthcare providers, and improving the doctor-patient relationship. This study aims to investigate the extent of people's usage of social media and virtual networks in the field of dentistry and examine the impact of various factors such as age, gender, and education level on their utilization of these tools.

## Materials and Methods

This cross-sectional study was conducted in 2022 to investigate the attitudes of 257 residents of Isfahan, comprising both genders, men, and women, aged between 16-35, 35-50, and 50-65 years, and three levels of education (below 12th grade, 12th grade, bachelor's degree, and master's and PhD degrees).

In this study, clinics and dental offices were randomly selected from each district. Questionnaires were given to several patients in each office or clinic, with approximately 8-9 women and 8-9 men being selected from each district. People who did not cooperate in completing the questionnaire were excluded from the study.

The sampling method used was stratified to ensure an equal number of people in each class and match the studied variables of age, gender, and level of education. People were divided into 24 groups based on these factors, with an attempt to equalize the number of people in each group ( $n=10-11$ ). As a result, after the initial sampling, some questionnaires were randomly removed from the groups that had a higher number than the given number, and the sampling continued until the number of people of all groups was almost equal and repeated and finally 257 questionnaires were sent for final evaluation.

The questionnaire was printed and, in some cases, provided to the participants online. The questionnaire included 2 parts: general information and questions related to attitude. The general information section included age, gender, level of education, the extent of use of cyberspace in general and related to dentistry (Appendix 1).

The attitude questionnaire consisted of 13 questions on a 5-point Likert scale, (very high, high, moderate, low, and not important) to evaluate people's opinions about the effectiveness of cyberspace and social media in the field of dentistry (Appendix 2).

The questionnaire was completed using questionnaires and articles in this field (10, 13) and localized considering the country's internet and cultural problems. The questionnaire was validated by 7 experts and its reliability was confirmed by the internal consistency and Cronbach's alpha coefficient. The alpha coefficient was calculated for the questionnaire for the internal consistency of the questions and a value of 0.724 was obtained, indicating acceptable reliability of the questionnaire.

The obtained data were analysed using *Student's t-test*, Chi-square, Friedman, and Kruskal-Wallis tests in SPSS 24 with a significance level of 0.05

## Results

The study found that a large percentage (97.3%) of the subjects used social media and the majority (86.8%) used cyberspace daily.

Based on the t-student test Women used cyberspace more than men in relation to dentistry, and the

difference was statistically significant. ( $p=0.033$ ). The most use of cyberspace related to dentistry was seen in the age groups of 16-35, 35-50, and 50-65 years, respectively ( $p=0.001$ ). People with higher education level bachelor's degree and master's, and PhD degree) used virtual space in relation to dentistry more than those with lower education level (12<sup>th</sup> and below 12<sup>th</sup> grade) ( $p=0.001$ ) (Table 1).

**Table 1.** The mean use of virtual space in relation to dentistry based on gender, age, and education

Variables		Mean $\pm$ SD	P value
Gender	Female	2.24 $\pm$ 1.10	0.023
	male	1.94 $\pm$ 1.16	
Age	16-35	2.40 $\pm$ 1.20	<0.001
	35-50	2.31 $\pm$ 1.17	
	50-65	1.56 $\pm$ 0.83	
Education	Cycle	1.86 $\pm$ 0.89	<0.001
	12th	1.97 $\pm$ 1.06	
	Bachelor's degree	2.14 $\pm$ 1.15	
	Master 's and PhD degree	2.53 $\pm$ 1.26	

Google was the most used tool for dentistry, and it was significantly more popular than other virtual tools (Instagram, doctor yab.ir, Telegram, WhatsApp, and Rubika) ( $p=0.005$ ).

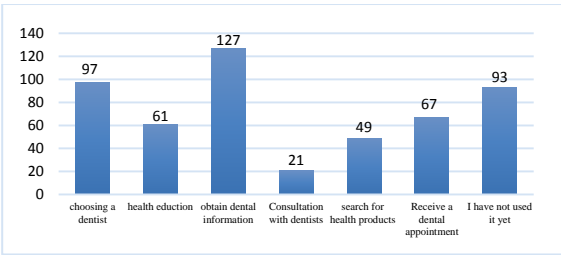
Based on the Fisher exact test results, no significant difference was discovered between gender and the utilization of virtual tools in dentistry ( $p=0.221$ ).

A significant relationship was found between age and using and virtual tools in dentistry ( $p<0.000$ ). The age group of 16-35 years had the highest usage of Instagram, while the age group of 35-50 years utilized Google the most. The age group of 50-65 years, on the other hand, reported not using any virtual tools yet.

Furthermore, the level of education was significantly linked to the virtual tools employed in dentistry ( $p=0.014$ ).

The use of virtual tools was the lowest (never used) among individuals with education below 12th grade, while Google was the most used tool among those with a 12th grade or bachelor's degree. Instagram was the most popular virtual tool used among individuals with higher than a bachelor's degree.

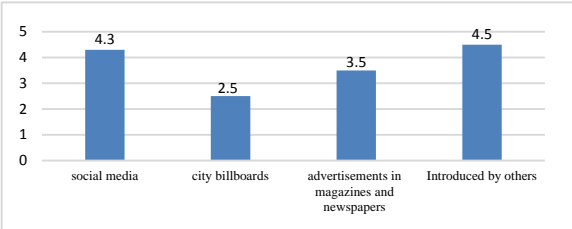
For the question on the objectives of using cyberspace in relation to dentistry in the studied samples, the most important objective was to obtain dental information and then, choose a dentist, receive a dental appointment, health education, search for health products and consultation with dentists (Figure 1).



**Figure 1.** Purpose of using virtual space

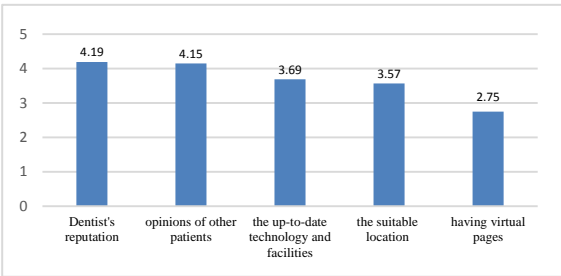
The percentage of women who aimed for each of the objectives was significantly higher than that of men ( $p=0.048$ ). Additionally, using cyberspace in dentistry had a significant relationship with the age ( $p=0.001$ ) and level of education ( $p=0.001$ ) of the people in the study.

The method of introducing a dental clinic or office in the studied samples was mainly introduction by others, followed by others and social media. City billboards and advertisements in magazines and newspapers had a smaller percentage (Figure 2). Based on the Fisher exact test there was no significant relationship between gender ( $p=0.254$ ), age ( $p=0.059$ ) and level of education ( $p=0.034$ ) of the people.



**Figure 2.** How to introduce a dental clinic or office?

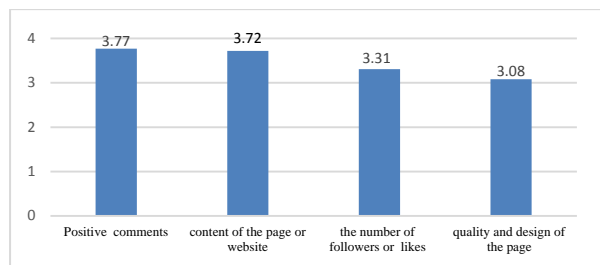
The factors that were most important for selecting a dental office or clinic, in descending order, were the dentist's reputation, the views or opinions of other patients, the up-to-date technology and facilities of the office or clinic, the suitable location of the clinic or office, and having virtual pages or social media (Figure 3).



**Figure 3.** Factors for choosing a dental office or clinic

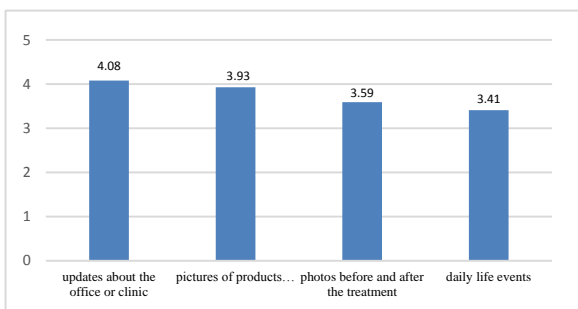
Based on the Friedman test women, age group of 16-35 years, and those with a bachelor's degree and above gave more importance to these factors, and the differences were statistically significant ( $p=0.012$ ,  $p<0.001$  and  $p<0.001$ , respectively).

In the studied samples, the most important influencing factors when following the virtual page of dentists were online criticisms and positive comments, followed by the content of the page or website, the number of page followers or post likes, and the quality and design of the page or website (Figure 4). Based on the Friedman test women ( $p=0.017$ ), age group of 16-35 years ( $p=0.000$ ), and in those with a bachelor's degree, master's and PhD ( $p=0.001$ ) gave more importance to these factors.



**Figure 4.** Importance of different parts of dentist's virtual page

For the importance of different parts of the virtual page in the studied samples as shown in figure 5 in descending order, were updates about the office or clinic, pictures of products, facilities and treatment methods updated in the office or clinic, photos before and after the treatment of patients and office or clinic staff and their daily life events and familiarity with their personality.



**Figure 5.** The importance of content on the virtual page of dentists

Based on the Friedman master's women ( $p=0.001$ ), age group of 16-35 years ( $p=0.023$ ), and those with a bachelor's degree, masters and PhD ( $p=0.021$ ) gave more importance to these factors.

## Discussion

According to the results of the present study, more than 97% of the subjects used social networks daily. Which is a significantly high percentage. Also, women between the ages of 16 and 35 years and with a bachelor's degree and master's degree or PhD used cyberspace far more than other people in relation to dentistry. In a study by Ajwa et al. (2), women were also found to be the most frequent users of social networks, with Instagram being the most commonly used social network among the subjects. In the present study, most people got their information through Google search, and the second social platform used was Instagram. A study by Krasnova et al. (14), revealed women used social networks far more than men, as women use these media to maintain close relationships and obtain social information, while men are more interested in obtaining general information in person.

According to the results of the present study, age is an important factor that affects the use of social networks. As people age, the tendency to use mobile phones and the Internet decreases, which is consistent with the results of other studies (13, 15).

The elderly are less likely to use social media due to age-related physical and psychological barriers.

Additionally, due to the rapid emergence of cyberspaces, there is a difficulty for the elderly to interact with this technology, which is why the older the people, the less the use of this technology.

A study by Lenhart et al. (15) showed a significant difference in the use of the Internet by teenagers and people aged 18-29 and 30 years and older. The present study is consistent with the less use of the internet by the elderly, but the difference is not consistent with the results of the Lenhart study (15).

The difference between the results of the two studies could be because of the topics of interest searched in different age groups. The present study focused more on the use of cyberspace in relation to dentistry and indicated that people were more interested in this topic. However, it is important to note that the difference in the years of conducting the study is also an important factor.

Lenhart et al. (2010) (15) investigated the reasons why dentists use social media platforms through an electronic questionnaire. This difference can be justified as this study was conducted 13 years ago when the number of social networks was limited to Facebook, Twitter, and Google plus, compared to 2011 and later. When there are numerous social

networks such as Telegram, WhatsApp and Instagram that can be accessed through smartphones, making cyberspace more accessible.

According to the results of the present study, the first tool for obtaining information in cyberspace was Google followed by Instagram.

Perhaps one of the reasons for using Google more than Instagram is people's mistrust of Instagram advertising practices. Furthermore, creating an account on Instagram is time-consuming and requires more effort, cost, and credibility than Google.

In a study by Alanzi et al. (5), people searched for information on the Internet and through Google search engine. In contrast Ajwa et al. (2), found that Instagram was the most commonly platform. Nelson et al. (13) and Henry et al. (16) identified Facebook as the most commonly used social network among the subjects. This difference can be attributed to filtering of Facebook and Twitter in Iran. According to the results of the present study, people with a bachelor's degree and master's and PhD used social networks for the health training and selecting the type of treatment, and most of the people with diploma education used social networks more to choose their treatment place.

In the present study, most of the people in the age range of 16-35 years used social networks more to select the type of treatment (obtaining dental information and consultation with dentists) and the age groups of 35-50 and 50-65 years used social networks more to select the place of treatment (selecting a dental office or clinic and make appointments). Because people with higher levels of education or younger ages have more information in the fields of health and treatment, and as a result, they have a greater desire to participate in selecting the type of treatment or health practices, rather than relying solely on the doctor's opinion, and try to achieve acceptable results themselves using cyberspace. Women have far more use of cyberspace in dentistry, and they were superior to men in terms of health training and selecting the type and place of treatment. This can be due to women giving more importance to health and health issues or living conditions and having more time during the day to use cyberspace and social media.

Even with the widespread use of social networks and cyberspace, most people still rely on recommendations from others when choosing a dental clinic or office. This is supported by the findings of Alalawi et al. (9). It is possible to post

people's feedback, both positive and negative, about their experiences with different healthcare providers on websites such as doctor-yab.ir. The availability of such feedback will enable other users to make informed decisions regarding their treatment options.

Considering the rapid introduction of social networks and cyberspace into the life of people, worldwide, information plays a crucial role in various fields of this method. According to Al-Khalifa et al. (17), social media has an active role in patients' decision-making when selecting healthcare providers.

Alanzi et al. (5) stated that social media improves the knowledge and abilities of doctors. Ajwa et al. (2) called social networks the most important advertising tool for attracting patients. In a study by Alalawi et al. (9), up-to-date facilities and technology of the office, the competence of the dentist and the positive opinion of other patients were among the most important factors of selecting a dentist by the patient. In a study by Alalawi et al. (9) on the importance of different parts of a dentist's virtual page, online positive comment was the most important, and the number of likes or the quality of the page and website was less important, which was consistent with the results of the present study.

In terms of the dentist's virtual page content, Ajwa et al. (2) found that the most important updated content is about the office or clinic, new techniques, and up-to-date methods. This is consistent with the findings of the present study.

## Conclusion

In conclusion, the study in Isfahan showed that people have a positive attitude towards using cyberspace and social media in field of dentistry. Age, gender, and level of education can affect the use of cyberspace for health training, and selecting the type and place of treatment

**Conflict of Interests:** The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or non-financial in this article.

## References

1. Bryant R. What kind of space is cyberspace. *Minerva-An Internet journal of philosophy*. 2001;5(2001):138-1.
2. Ajwa N, Al Mohsen S, Kuwail A, Al Osaif E. 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(4):1-10.
3. von Muhlen M, Ohno-Machado L. Reviewing social media use by clinicians. *J Am Med Inform Assoc*. 2012;19(5):777-81.
4. Leonardi PM. Social media, knowledge sharing, and innovation: toward a theory of communication visibility. *Information Systems Researc*. 2014;25(4):796–816
5. Alanzi T, Al-Yami S. Physicians' Attitude towards The Use of Social Media for Professional Purposes in Saudi Arabia. *Int J Telemed Appl*. 2019;2019:6323962
6. Keller B, Labrique A, Jain KM, Pekosz A, Levine O. Mind the gap: social media engagement by public health researchers. *J Med Internet Res*. 2014;16(1):e8
7. Al-Khalifa KS, AlSheikh R. Teledentistry awareness among dental professionals in Saudi Arabia. *PLoS One*. 2020;15(10):e0240825.
8. Aboalshamat K, Alkiyadi S, Alsaleh S, Reda R, Alkhalidi S, Badeeb A, et al. Attitudes toward social media among practicing dentists and dental students in clinical years in Saudi Arabia. *Open Dentistry Journal* 2019;13(1): 143-149
9. 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;13:1685-1692.
10. Meira TM, Prestes J, Gasparello GG, Antelo OM, Pithon MM, Tanaka OM. The effects of images posted to social media by orthodontists on public perception of professional credibility and willingness to become a client. *Prog Orthod*. 2021;22(1):7
11. 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;20(6):e10109.
12. Ranschaert ER, Van Ooijen PM, McGinty GB, Parizel PM. Radiologists' usage of social media: results of the RANSOM survey. *J Digit Imaging*. 2016;29(4):443–9.
13. Nelson KL, Shroff B, Best AM, Lindauer SJ. Orthodontic marketing through social media networks: the patient and practitioner's perspective. *Angle Orthod*. 2015;85(6):1035-41.
14. Krasnova H, Veltri NF, Eling N, Buxmann P. Why men and women continue to use social networking sites: The role of gender differences. *The Journal of Strategic Information Systems*. 2017; 26( 4):261-284.
15. Lenhart A, Purcell K, Smith A, Zickuhr K. social media & mobile internet use among teens and young adults. millennials. *Pew Internet& American Life Project*. 2010; <http://pewinternet.org/reports/2010/Social-Media-and-Young-Adults.aspx>.
16. Henry RK, Molnar A, Henry JC. A survey of US dental practices' use of social media. *The Journal of Contemporary Dental Practice*. 2012;13(2):137-41.
17. Al-Khalifa KS, Al-Swuailem AS, AlSheikh R, Muazen YY, Al-Khunein YA, Halawany H, et al. The use of social media for professional purposes among dentists in Saudi Arabia. *BMC Oral Health*. 2021;21(1):1-8.

**Appendix****Appendix 1: The general part of the questionnaire**

Demographic information:

Age: 16-35 ☐ 35-50 ☐ 50-65 ☐Gender: male ☐ female ☐Education: under 12th ☐ 12th ☐ bachelor ☐ master PhD ☐

1. Do you use cyberspace and social media (Instagram, Telegram, WhatsApp, Rubika, etc.)?

Yes ☐ No ☐

2. How often do you use cyberspace and the Internet in general?

Daily ☐ Weekly ☐ Rarely ☐ Never ☐

3. Have you ever used cyberspace and social media (Instagram, Telegram, WhatsApp, Rubika, etc.) in relation to dentistry?

Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never ☐

4. Which of the following tools do you use the most in relation to dentistry?

Google ☐ Instagram ☐ Telegram ☐ WhatsApp ☐ Soroush ☐ Rubika ☐ iGap ☐Doctor-yab applications (Good Doctor, Acceptance 24, Homeland Doctor, etc.) ☐ I have not used it yet ☐

5. For what purpose have you used cyberspace (Google and platforms such as Good Doctor, paziresh24, nobat.ir, etc.) and social media (Instagram, Telegram, WhatsApp, Rubika, etc.) in relation to dentistry?

(You can select more than one option)

☐ Selection of a dentist☐ Health training☐ Obtain dental information☐ Consultation with dentists☐ Search for health products☐ Make a dental appointment☐ I have not used it yet

6. How would you like a dental clinic or office to be introduced to you?

☐ Cyberspace and social media☐ City billboards☐ Advertisements in magazines and newspapers☐ Introduction by others☐ I have not used it yet**Appendix 2: Attitude**

7. How important are the following factors to you for selecting a dental office or clinic?

Questions	very high	high	moderate	low	not important
Having virtual pages or social media (such as Instagram, etc.)					
Conventional location of the clinic or office					
Opinions of other patients					
Up-to-date technology and office or clinic facilities					
Dentist's reputation (dentist's competence)					

8. How important are the following factors to you when visiting the virtual page of dentists?

Questions	very high	high	moderate	low	not important
Quality and design of the page or website					
Content of the page or website					
Number of page followers or likes of posts					
Criticisms and positive opinions online (comments)					

9. How important is each of the following contents to you on the virtual page of dentists?

Questions	very high	high	moderate	low	not important
Photos of office or clinic staff and their daily life events and an introduction to their personality					
Photos of the products, facilities and treatment methods of the office or clinic					
Updates about the office or clinic (such as working hours, location, name of the dentist, services, etc.)					
Photos before and after treatment of patients					