

Access this article online

Quick Response Code:



Website:

www.jorthodsci.org

DOI:

10.4103/jos.jos_115_21

Impact of online communication and type of media formats in enhancing orthodontic patients' knowledge

Talat H. Al-Gunaid^{1,2}, Ahmed A. Alkhaibari³, Basim S. Alrashidi³,
Mohammed A. Alrehaili³ and Salamah A. Alatawi³

Abstract

OBJECTIVES: This study aimed to evaluate the extent to which online communication can enhance patients' knowledge of orthodontic topics, as well as compare the effectiveness of images, video, and text messages as tools for delivering orthodontic information.

MATERIALS AND METHODS: Two WhatsApp groups were created comprising 30 males and 33 females. The Google form template was used to formulate a 25-item questionnaire containing information related to orthodontic topics. At the beginning of the first stage, a link to the questionnaire was sent to the groups and their answers were given scores, which were referred to as (T1). During the second stage, a piece of daily information relevant to the field of orthodontics was sent to the groups over a 14-day period. On Day 15, the link to the previous questionnaire was sent again and the participants were asked to complete it for a second time. These answers were corrected, given scores, and labeled as (T2). Scores from the first and second stages were compared.

RESULTS: There was a significant increase in the average total score from the first questionnaire (T1 = 15.3) to the second questionnaire (T2 = 17.9). All types of media formats were greatly effective in improving the patients' knowledge. Images proved to be the best tool for delivering information and were considerably more effective than video and text messages.

CONCLUSION: This study indicates that WhatsApp as an online communication tool could be used to effectively enhance the knowledge of orthodontic patients. Images are the best method for delivering information to orthodontic patients.

Keywords:

Online communication, orthodontics, patients' knowledge, WhatsApp

Introduction

Social media has become an important source of information for dental and medical patients, allowing them to share information about their previous treatments and experiences. The number of people using social media continues to rise, and multiple applications are innovated each year. These applications make it easier for people to communicate with each other using either text messages, images, videos, or voice messages. One of the most popular

social media applications is WhatsApp, with approximately 1.6 billion monthly active users^[1]—representing around 14 percent of the world's population. WhatsApp allows users to send free instant text messages, share images, videos, documents, voice messages, and even video calls. It also gives users the option to post social activities, share their location, and update their friends on important life events. Because of its extensive capabilities, it can reduce the costs of traditional phone calls and SMS, as well as saving time in sending documents to many people. The sender can also check

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Al-Gunaid TH, Alkhaibari AA, Alrashidi BS, Alrehaili MA, Alatawi SA. Impact of online communication and type of media formats in enhancing orthodontic patient' knowledge. J Orthodont Sci 2021;10:23.

¹Department of
Pediatric Dentistry and
Orthodontics, College
of Dentistry, Taibah
University, Madinah,
³Intern Student, College
of Dentistry, Taibah
University, Madinah,
Saudi Arabia, ²Department
of Orthodontics, Faculty of
Dentistry, Ibb University,
Ibb City, Yemen

Address for correspondence:

Dr. Talat H. Al-Gunaid,
Department of
Pediatric Dentistry and
Orthodontics, College
of Dentistry, Taibah
University, Kingdom
of Saudi Arabia.
E-mail: gunaid2000@
hotmail.com

Submitted: 07-Mar-2021

Revised: 18-Apr-2021

Accepted: 12-May-2021

Published: 15-Oct-2021

whether or not his messages have been delivered and read and above all, the app itself is free to download.^[2,3]

It is well-known that patient cooperation in orthodontics is crucial during treatment and the subsequent retention period, and that excellent results can only be obtained when patients demonstrate excellent compliance. In order to keep in touch with their patients, orthodontists need to use special software or applications to arrange appointments, inform patients about certain orthodontic procedures, and manage problems or offer guidance and advice. In this manner, orthodontists can increase the loyalty of existing patients and attract new ones to the practice.

There is a lack of research when it comes to examining the impact of WhatsApp on community education in general, let alone orthodontics as a specific field. As a result, it is not clear how this application affects patients' compliance, and acceptance toward orthodontic treatment. Zotti *et al.*^[4] studied the effect of WhatsApp on monitoring the oral hygiene of patients with fixed orthodontic appliances. Their results showed a reduction in white spots, plaque index, gingival index, and caries.^[4]

This study aimed to evaluate the extent to which online communication can enhance patients' knowledge of orthodontic topics, as well as compare the effectiveness of images, video, and text messages as tools for delivering orthodontic information.

Materials and Methods

Ethical approval to conduct this study was obtained from the ethical committee at the College of Dentistry, Taibah University (TUCDREC/20200311). A cross-sectional analytical design was used to carry out the research.

Seventy subjects who were selected from the public (35 males and 35 females) were invited and agreed to participate in this study. The inclusion criteria were as follows: WhatsApp users and willing to enroll and be active in a WhatsApp group for a two-week period. The exclusion criteria were illiterate people, dental students, and dentists. Two WhatsApp groups were created: one for females and one for males. Each group was composed of 35 participants. The Google form template was used to formulate a questionnaire containing information relating to orthodontic topics, such as types of malocclusion, etiology of malocclusion, habits, types of orthodontic appliances, duration of orthodontic treatment, time of treatments, and types of orthodontic retainers. A 25-item questionnaire was designed using Google Forms, containing different formats such as text questions (eight questions), videos (eight questions), and photos or images (nine questions). A link to the questionnaire was then sent to both WhatsApp groups.

The members of these groups were asked to answer each question in the questionnaire. At the end of the session, their answers were blindly corrected by one of the authors and every question was given a score, which were kept aside until the end of the second stage. These were called (T1). After that, the second stage commenced, with a piece of orthodontic-related information being sent to the two groups every day for about 14 days. At the end of this stage, the participants were sent a link to the previous questionnaire and they were asked to complete it once again. Their answers were corrected and given scores, which were labeled (T2). At the end of this process, the answers from the first and second stages were statistically compared.

Statistical methods

The Shapiro–Wilk normality test was applied to the data, revealing that the data were not normally distributed. A comparison was made between T1 and T2 using the Wilcoxon signed-rank test. The results of both the male and female participants were also compared using the Mann-Whitney test. The Kruskal-Wallis test was used to compare images, videos, and text messages, and this was followed by a Mann-Whitney test. All statistical analyses were performed using Statistical Package for the Social Sciences version 20 (IBM Corporation, Chicago, Illinois, USA). The significance level was set to $P < 0.05$.

Results

Table 1 reveals the demographic data of the participants. Out of the 70 participants who entered the study, there was a drop-out rate of 10%, leaving a total of 63 remaining until its completion. Thirty-three of these were female and 30 were male. More than 50% of the participants were 21–30 years of age. The demographic data obtained revealed that there was an equal sex distribution and that more than 50% of the participants had received a university-level education.

Table 2 shows the means and standard deviations of the participants' answers to the questionnaires, both at the beginning of the first stage (T1) and at the end of the second stage (T2). It also presents the difference between T1 and T2. The average total score achieved for the first questionnaire (T1) was 15.3, while it was 17.9 for T2. The mean difference was 2.7. Significant differences were found across all of the tested variables, whereby all types of media formats were significantly effective in improving the patients' knowledge ($P < 0.01$, $P < 0.001$).

A gender comparison is displayed in Table 3. Videos were more effective when it came to improving the knowledge of males, as reflected by the significant increase from T1 to T2 ($P < 0.01$). In addition, males showed a significant difference in the total scores ($P < 0.01$). Among the

female participants, there were dramatic changes from T1 to T2 across all of the media formats, with the greatest changes observed in images (mean difference 1.27 ± 2.5 , $P < 0.009$) and the lowest in text messages (mean difference 0.79 ± 2.3 , $P < 0.04$). A comparison between males and females revealed no significant differences, even though the overall changes were more obvious among females (3.2) than males (2.07).

Table 4 compares the three types of media formats (images, videos, and text messages) on the enhancement of the patients' knowledge. During the initial stage of the study, participants were more successful in the questions related to images than they were in the ones related to videos ($P < 0.001$) and text messages ($P < 0.01$). Furthermore, highly significant changes were observed

in the scores of images compared to those of videos and text messages ($P < 0.001$) at T2.

Discussion

WhatsApp allows individuals to communicate efficiently with a large number of people, as well as facilitate the arrangement of meetings and visits. It can also be used on any type of smartphone. In a fast-paced environment such as the orthodontic office, orthodontists are often busy and sometimes, the time allocated to each patient is simply not sufficient to discuss and cover all of the in-depth details relating to treatment procedures, instructions, and follow-up. It is also difficult for dental assistants to find the time needed to take responsibility for these details. WhatsApp could be an effective solution to this problem, as it empowers both parties to engage with each other at any time, without limitations.

In this study, men and women were separated into two groups for the sake of privacy and cultural reasons. There was a low drop-out rate of 10% (7 out of 70), which was perhaps due to a lack of motivation or the length of the study itself (14 days of daily information).

According to the findings of this study, the delivery of all types of media formats (images, videos, and text messages) through WhatsApp proved very effective in the teaching of patients. This was demonstrated by the drastic improvement in patient knowledge from T1 to T2, with a significance level of more than $P < 0.01$ [Table 2]. Zotti *et al.*^[5] investigated the use of WhatsApp to follow the oral hygiene of orthodontic patients. They explored whether or not the application was effective in enhancing patient compliance through shared selfies and information. The researchers concluded that utilizing social media in orthodontic practice is successful in improving both oral health and patient cooperation.^[5] This is in line with the

Table 1: Demographic data of the participants

Variable	Participants (63)
Gender	
Male	30 (47.6%)
Female	33 (52.3%)
Age	
16-20	21 (33.3%)
21-30	32 (50.7%)
31-40	10 (15.8%)
Educational level	
School Level	30 (47.6%)
University Level	33 (52.3%)

Table 2: Average scores obtained at T1 and T2 and difference between T1 and T2 (n=63)

Variable	T1		T2		T2 - T1		T2 - T1 P
	Mean	SD	Mean	SD	Mean	SD	
Images	5.8	1.7	6.8	2.3	1.0	2.4	0.002
Video	4.5	1.2	5.5	1.6	0.95	1.6	0.0001
Text	4.9	1.2	5.6	2.02	0.7	2.2	0.008
Total Score	15.3	2.2	17.9	4.9	2.7	4.4	0.0001

n=subjects, T1=first questionnaire, T2=second questionnaire, T2-T1=T2 minus T1

Table 3: Comparison of males and females

Variable	Males (n=30)						P	Females (n=33)						P	Female vs Males T2 - T1 P
	T1		T2		T2 - T1			T1		T2		T2 - T1			
	Mean	SD	Mean	SD	Mean	SD		Mean	SD	Mean	SD	Mean	SD		
Images	5.57	1.59	6.21	2.42	0.77	2.39	0.10	6.06	1.90	7.33	2.19	1.27	2.52	0.009	0.39
Videos	4.53	1.17	5.12	1.63	0.70	1.47	0.01	4.61	1.27	5.79	1.71	1.18	1.76	0.001	0.25
Text	4.83	1.32	5.32	1.95	0.60	2.03	0.12	4.97	1.21	5.76	2.15	0.79	2.33	0.04	0.54
Total Score	14.93	1.93	16.63	5.27	2.07	4.43	0.01	15.64	2.53	18.88	4.83	3.24	4.37	0.0001	0.33

n=subjects, T1=first questionnaire, T2=second questionnaire, T2-T1=T2 minus T1

Table 4: Comparison of average scores obtained at T1, T2 and T2-T1 for images, videos, and text messages

Variable	Images		Videos		Text		P ^a	Mann-Whitney
	Mean	SD	Mean	SD	Mean	SD		
T1	5.8	1.7	4.5	1.2	4.9	1.2	0.000	Images > Videos ***, Images > Text**
T2	6.8	2.3	5.5	1.6	5.6	2.02	0.000	Images > Videos ***, Images > Text***
T2 - T1	1.03	2.4	0.95	1.6	0.7	2.1	0.69	

T1=first questionnaire, T2=second questionnaire, T2-T1=T2 minus T1, ^aKruskaal Wallis test, ** $P < 0.01$, *** $P < 0.001$

present findings. In another study, Zotti *et al.*^[4] reported that WhatsApp is an inexpensive tool that enables orthodontic patients to take an active role in their health care and monitor their own progress. The results of this study support Zotti *et al.*^[4] in that the engagement of orthodontic patients with WhatsApp activity seems to increase patient compliance, resulting in better long-term outcomes. Giordano *et al.*^[6] conducted a systematic review about WhatsApp usage as a tool for healthcare. They concluded that the application, when used properly, is a promising tool of communication between health practitioners and the general public. This study supports both the findings of Giordano *et al.*,^[6] as well as other reports that prove WhatsApp to be an effective tool for professional health education.^[7-11]

The present study revealed that males tend to be more attentive to videos than other media formats; videos showed significant effects on the improvement of the male participants' knowledge. In contrast, all formats were significantly effective among the female participants and led to considerable improvements in their knowledge. Despite this, no significant variations were observed between males and females. It is common knowledge that patient adherence to the follow-up process is a crucial point during treatment. Based on the results of this study, it is advised that videos should be used to reach males to achieve better knowledge, while images and videos can be used to improve the results among female patients. Johnston *et al.*^[12] studied the effectiveness of WhatsApp as a communication tool for an emergency surgery group. They concluded that the application offers an effective and quick form of communication regarding emergency medicine. Barhoumi^[13] investigated the efficacy of WhatsApp learning on knowledge management for students. They found that the tool made learning easier and allowed for clear communication of knowledge in less time.^[13] Alsharif *et al.*^[14] investigated the effectiveness of hybrid learning using WhatsApp as a tool for delivering knowledge to undergraduate dental students. They found significant improvement in the students' performance and knowledge. They concluded that WhatsApp could be used as an effective teaching tool. Underwood *et al.*^[15] investigated the use of health mobile app to enhance the oral health behavior. They came to the conclusion that mobile apps are a promising method for encouraging an evidence-based oral hygiene routine.

Again, these results are in accordance with the current study. Our findings also support those of Zotti *et al.*,^[4] demonstrating that WhatsApp is a very economical solution for teaching and may be motivating patients to become more involved in their health treatment plan. WhatsApp can be implemented in orthodontic practices with ease, serving any number of patients and helping

to achieve goals and monitor progress. Creating a close orthodontic community (for example, by forming an orthodontic WhatsApp group) can strengthen the relationship between the orthodontist and the patient. In contrast to this, Clavier *et al.*^[16] reported that despite greater global recognition, the use of WhatsApp for teaching has been correlated with poor clinical performance. They also argued that its use on smartphones may lead to distraction and reduced levels of attention.^[16]

According to this study, images are the best tool for delivering information to participants and are much more effective than videos and text messages. This can be explained by the fact that brief, simple, and immediate delivery is preferred by all of us when it comes to our daily communication habits, and so there is no better way to accomplish this goal than through images or photos. However, sharing photos on WhatsApp may raise some potential ethical issues relating to patient privacy. It is therefore never advised to reveal a patient's identity or full-face photos without their consent.^[17]

Finally, the online interaction between orthodontists and their patients may open doors to active and fruitful cooperation, ultimately facilitating successful orthodontic treatments and postoperative stability.

The limitations of this study include the small sample size and the limited number of age groups, which are insufficient in providing a comprehensive result on which we can completely rely. However, some of the obvious trends that were detected could be of great value to our practice.

Conclusion

This study indicates that WhatsApp as an online communication tool could be used to effectively enhance the knowledge of orthodontic patients. Images are the best method for delivering information to orthodontic patients.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. WhatsApp - Statistics and Facts | Statista. Available from: <https://www.statista.com/topics/2018/whatsapp/>. [Last accessed on 2020 Jul 26].
2. Cheston CC, Flickinger TE, Chisolm MS. Social media use in medical education: A systematic review. *Acad Med* 2013;88:893-901.
3. Poblete P, Nieto E. Does time matter? WhatsApp vs electronic mail for dental education. *A pilot study. Eur J Dent Educ* 2020;24:121-5.

4. Zotti F, Zotti R, Albanese M, Nocini PF, Paganelli C. Implementing post-orthodontic compliance among adolescents wearing removable retainers through Whatsapp: A pilot study. *Patient Prefer Adherence* 2019;13:609-15.
5. Zotti F, Dalessandri D, Salgarello S, Piancino M, Bonetti S, Visconti L, *et al.* Usefulness of an app in improving oral hygiene compliance in adolescent orthodontic patients. *Angle Orthod* 2016;86:101-7.
6. Giordano V, Koch H, Godoy-Santos A, Dias Belangero W, Esteves Santos Pires R, Labronici P. WhatsApp Messenger as an adjunctive tool for telemedicine: An overview. *Interact J Med Res* 2017;6:e11. doi: 10.2196/ijmr. 6214.
7. Oyewole BK, Animasahun VJ, Chapman HJ. A survey on the effectiveness of WhatsApp for teaching doctors preparing for a licensing exam. *PLoS One* 2020;15:e0231148. doi: 10.1371/journal.pone. 0231148.
8. Jhaveri KD, Pascarelli B, Hasan A, Kozikowski A, Fishbane S, Pekmezaris R. WhatsApp@ening in nephrology training. *Clin Kidney J* 2019;13:8-13.
9. Khanna V, Sambandam SN, Gul A, Mounasamy V. "WhatsApp"ening in orthopedic care: A concise report from a 300-bedded tertiary care teaching center. *Eur J Orthop Surg Traumatol* 2015;25:821-6.
10. Petruzzi M, De Benedittis M. WhatsApp: A telemedicine platform for facilitating remote oral medicine consultation and improving clinical examinations. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2016;121:248-54.
11. Mars M, Escott R. WhatsApp in clinical practice: A literature review. *Stud Health Technol Inform* 2016;231:82-90.
12. Johnston MJ, King D, Arora S, Behar N, Athanasiou T, Sevdalis N, *et al.* Smartphones let surgeons know WhatsApp: An analysis of communication in emergency surgical teams. *Am J Surg* 2015;209:45-51.
13. Barhoumi C. The effectiveness of whatsapp mobile learning activities guided by activity theory on students' knowledge management. *Contemp Educ Technol* 2015;6:221-38.
14. Alsharif AT, Alsharif B, Alsharif L, Althagafi N, Natto ZS, Kassim S. Effectiveness of WhatsApp as a part of a hybrid learning environment: An opportunity for post-COVID-19 pandemic pedagogy. *J Contemp Dent Pract* 2020;21:1331-6.
15. Underwood B, Birdsall J, Kay E. The use of a mobile app to motivate evidence-based oral hygiene behaviour. *Br Dent J* 2015;219:E2. doi: 10.1038/sj.bdj. 2015.660.
16. Clavier T, Ramen J, Dureuil B, Veber B, Hanouz JL, Dupont H, *et al.* Use of the smartphone app WhatsApp as an E-learning method for medical residents: Multicenter controlled randomized trial. *JMIR Mhealth Uhealth* 2019;7:e12825. doi: 10.2196/12825.
17. Bennani A, Sekal M. Usefulness of WhatsApp for discussing difficult cases in pathology practice: A Moroccan experience. *Turk Patoloji Derg* 2019;35:134-8.