



## Usage Analysis of WhatsApp for Dentistry-related Purposes among General Dental Practitioners

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### ABSTRACT

**Introduction:** To assess the knowledge and extent of WhatsApp usage for dentistry related purposes among general dental practitioners (GDPs).

**Materials and methods:** A cross-sectional study was conducted among 105 randomly selected GDPs from Pune, Maharashtra, India. Data was collected in a personalized manner by means of validated questionnaire.

**Results and observations:** A total of 105 dentists participated in the survey: 96.19% of dentists had WhatsApp installed in their phones; 67.32% of dentists sought second opinion on WhatsApp; 60.29% of dentists received prompt replies, while 38.23% received late replies; 98.52% of dentists sent clinical photographs and radiographs for second opinion. 88.11% of dentists were a part of various 'dentistry related groups' and 72.27% of dentists told that patients ask their queries on WhatsApp. 36.76% of GDPs obtained verbal consent from the patients for sending clinical materials for second opinion. Majority of population of GDPs 63.23% (43) did not obtain any form of consent from the patients.

**Conclusion:** Majority of GDPs uses WhatsApp for 'dentistry related purposes' and it has become an integral part of their day-to-day practice. GDPs should obtain written consent before sending clinical materials for second opinion.

**Clinical significance:** Till date, the extent of WhatsApp usage by general dental practitioners was not reported in the literature. It appears that, WhatsApp application has become an integral part of general dental practice in India. By virtue of this, obtaining second opinion, taking appointments and solving queries of patients are no longer a time consuming events. In future, instant messaging services might play major role in providing efficient services in health care industry.

**Keywords:** Dentistry; General dental practice; Second Opinion; WhatsApp

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### INTRODUCTION

WhatsApp messenger is a new generation mobile application that allows easy exchange of text messages, images, audio and video files using internet connection.<sup>1</sup> It is a simple, economical and effective means of communication. A popular feature of 'group chat' further allows people to communicate and share images and videos over a common interface.<sup>2</sup> Today, 'WhatsApp' is the most widely used instant messaging service in the world with users across various age groups, professions and, socio-economic background. Because of the decreasing cost of smartphones and dropping internet data charges, the use of WhatsApp application has become much more affordable.

WhatsApp efficacy and utility has been demonstrated in pediatric burns and orthopedic trauma, palliative care,

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pulmonary medicine, neurosurgery, anesthesia, and par-esthesia evaluation, hematuria evaluation, dermatology practice, nursing practice, for second opinions in pathology, cytology (tele-cytology) and clinical medicine, and more recently in health education on tobacco and oral cancer.<sup>3,4</sup> In dentistry, efforts have been made to study the utility of WhatsApp messenger service across various disciplines.<sup>5-10</sup>

The general dental practitioner (GDP) is a dentist or dental surgeon with a recognized University qualification, registered to practice a broad range of treatments. Moreover, the GDP is of special interest because of he/she is the first dentist to attend to any dental problem and is positioned to cater to the dental needs of all age groups and is an essential oral health care provider throughout one's life. The GDP is well trained to provide services that include preventive procedures for adults and children, restorative procedures like crowns, dentures, and dental implants. Private dental practice is mushrooming in India to cater to the increasing rate of population. It is quite conceivable that many GDPs might be using WhatsApp in their day-to-day practice for both general and 'dentistry related purposes'.

However, as these mobile applications have become an essential part of everyday life, there has been no serious effort to document the data, and so far there is no evidence available in the literature about its use among general dentists. With this view in mind, an epidemiological survey was conducted to assess the knowledge and extent of WhatsApp usage for 'dentistry related purposes' among GDPs of Pune, Maharashtra.

## MATERIALS AND METHODS

The present study was approved by the institutional scientific and sub-ethics committee of Dr. D.Y. Patil Dental College and Hospital, Pune, India. A questionnaire was designed for practicing GDPs. The questionnaire was framed to assess: (a) Use of WhatsApp for taking second opinions; (b) Usefulness of dentistry related groups on WhatsApp and (c) Doctor-patient interaction on WhatsApp. Questions were both open-ended and closed-ended. The questionnaire had gone through an internal and external validation process. Simple random sampling methodology was carried out to select GDPs for the present study. GDPs with either 'BDS' (Bachelor in Dental Surgery) or 'MDS' (Master in Dental Surgery) degree with a valid Maharashtra Dental Council Registration were included in the present study. Data were collected in a personalized manner from 105 GDPs through the questionnaire.

## RESULTS AND OBSERVATION

A total of 105 dentists participated in this survey with years of practice ranged from 1 to 25 years with a mean of 8 years. Forty-one percent of GDPs were 'MDS' from various branches of dentistry while 59% of GDPs were BDS degree holders. Their average outpatient numbers ranged from 1 to 50 per day with a mean of 10 per day.

### Questionnaire Analysis

The details of the responses to the questionnaire and its analysis are depicted in Table 1.

*Installation of WhatsApp:* About 96.19% (101) of dentists had WhatsApp already installed in their phones and 3.8% (4) dentists did not have WhatsApp in their mobile phones. Surprisingly, these 3.8% of dentists had average years of practice of 15 to 25 years and their age was above 40 years. There was no significant pattern seen among BDS or MDS practitioners.

*Second opinion:* About 67.32% of (68) dentists seek the second opinion on WhatsApp and 32.67% of dentists do not seek any second opinion on WhatsApp. Among these 32.67%, most of the dentists had a practice exceeding 15 years.

About 60.29% of (41) dentists received a prompt reply for the opinions asked, and 38.23% (26) received late replies, while 1.47% of (1) received only occasional response from the receiver. 98.52% of (67) dentists sent clinical photographs for second opinion on WhatsApp. Among them, 44.11% of (30) dentists sent clinical photographs for second opinion monthly, 35.29% (24) sent photographs weekly, 19.11% (13) sent everyday, while 1.47% (1) did not send any clinical photographs for second opinion on WhatsApp.

About 98.52% (67) dentists sent radiographs for the second opinion on WhatsApp. Among them, 70.58% (48) dentists had sent radiographs for the second opinion weekly, 19.11% of (13) dentists sent radiographs monthly, 8.82% (6) sent everyday while 1.47% (1) did not send any radiographs for second opinion.

The most common discipline that required second opinion by dentists was 'endodontics', followed by 'oral surgery', 'oral pathology', 'oral radiology', 'periodontology', 'oral medicine', 'prosthodontics', 'pedodontics' and lastly orthodontics.

*Consent information:* Twenty-five percent (17) of GDPs always obtain verbal consent from the patients for sending clinical materials for the second opinion. While 11.76% (8) dentist occasionally obtained consent for sending clinical materials for the second opinion. In both the situations [36.76% (25)] only verbal consent was obtained from the patients. Majority of the population of GDPs

**Table 1** : Response of general dental practitioners on various WhatsApp related questions

Sr. no.	Question	Respondents	Options	% (n)
1.	Do you have WhatsApp installed in your phone?	105	Yes No	96.19% (101) 3.8% (4)
2.	Do you seek second opinion on WhatsApp?	101	Yes No	67.32% (68) 32.67% (33)
3.	What kind of response do you get from the receiver?	68	Prompt reply Late reply Occasional Reply No reply	60.29% (41) 38.23% (26) 1.47% (1) 0% (0)
4.	Do you send clinical photographs for second opinion on WhatsApp?	68	Yes No	98.52% (67) 1.47% (1)
5.	How often do you send clinical photographs for second opinion on WhatsApp?	68	Daily Weekly Monthly Never	19.11% (13) 35.29% (24) 44.11% (30) 1.47% (1)
6.	Do you send radiographs for second opinion on WhatsApp?	68	Yes No	98.52% (67) 1.47% (1)
7.	How often do you send radiographs for second opinion on WhatsApp?	68	Daily Weekly Monthly Never	8.82% (6) 70.58% (48) 19.11% (13) 1.47% (1)
8.	Do you obtain consent from patient for sending clinical material for second opinion?	68	Always Occasionally Never	25% (17) 11.76% (8) 63.23% (43)
9.	What type of consent is obtained?	68	Verbal Written No consent	36.76% (25) 0% (0) 63.23% (43)
8.	The most common discipline that needed second opinion.	68	Endodontics Oral Surgery Periodontics Oral pathology Oral radiology Prosthodontics Oral Medicine Pedodontics Orthodontics	20.58% (14) 19.11% (13) 10.29% (7) 10.29% (7) 10.29% (7) 8.82% (6) 8.82% (6) 7.35% (5) 4.41% (3)
9.	Are you a part of various dentistry related groups on WhatsApp?	101	Yes No	88.11% (89) 11.88% (12)
10.	What are your numbers of dentistry related groups on WhatsApp?	Range 1-100; Mean 9		
11.	What is most commonly shared on such groups?	89	Case reports CDE Events Radiographs Newer advances Articles Achievements	22.47% (20) 21.34% (19) 19.1% (17) 13.48% (12) 12.35% (11) 11.23% (10)
12.	Do Patients ask their queries on WhatsApp?	101	Yes No	72.27% (73) 27.72% (28)
13.	What sorts of queries do the patients ask?	73	Treatment related Appointment Postoperative instructions Medicines Diet	30.13% (22) 28.76% (21) 15.06% (11) 21.91% (16) 4.1% (3)
14.	Do you respond to their queries?	73	Yes No Occasionally	76.71% (56) 21.91% (16) 1.36% (1)

63.23% (43) did not obtain any form of consent from the patients.

*Dentistry related groups:* 88.11% (89) dentists are part of various 'dentistry related groups' on WhatsApp, while 11.88% (12) dentists are not part of any such groups. The number of

groups per dentist varied from 1 to 100, with a mean of nine groups. Most frequently information related to regular scheduled events like Case reports 22.47% (20), CDE Events 21.34% (19), Radiographs 19.1% (17), Newer advances 13.48% (12), Articles 12.35% (11), Achievements 11.23% (10).

*Patient-doctor interaction:* 72.27% (73) dentists say that their patients ask some queries on WhatsApp, while 27.72% (28) dentists say that their patients do not ask queries which also suggests that some have not shared their contact numbers with their patients. The most common queries are treatment-related [30.13% (22)], followed by consecutive appointments [28.76% (21)], medicines [21.91% (16)], postoperative instructions [15.06% (11)] and lastly diet [4.1% (3)].

76.71% (56) dentists responded to patients' queries, 21.91% (16) responded occasionally, while 1.36% (1) dentists did not answer at all. The 1.36% (1) dentists who did not answer had a tight schedule and their average years of practice had exceeded 15 years.

## DISCUSSION

In recent times, smartphone use has become a part and parcel of life. It is not only used for general day-to-day communication but also extensively in medical practice for the purpose of patient care, monitoring, rehabilitation, diagnosis, teaching, and for research purposes. In dentistry, smartphones have emerged as an effective tool in providing quality oral health to patients. Petruzzi and De Benedittis<sup>5</sup> studied the use of WhatsApp as a telemedicine platform for facilitating remote oral medicine consultation and improving clinical examination. Clinical images and related questions were submitted by general dentists, physicians, dental hygienists, and patients to the authors via WhatsApp. Zotti et al.<sup>6</sup> studied the usefulness of WhatsApp in improving oral hygiene compliance in adolescent orthodontic patients. The systematic review by Dhuvad et al.<sup>7</sup> provided evidence that utilization of smartphones in oral and maxillofacial surgery facilitate in the differential diagnosis, treatment, follow up, prevention of the disease further and thereby improve the quality of patient care without requiring the presence of the maxillofacial surgeon in remote areas. Recently, Sarode et al.<sup>8</sup> studied the efficacy of WhatsApp application for obtaining the second opinion on histopathological diagnosis in oral pathology practice. It was found that transfer of photomicrograph via WhatsApp is an effective and convenient approach in procuring second opinion on 'histopathological diagnosis of oral pathologies' which may be tricky on several occasions. The involvement of multiple observers decreases individual error rate and increase chance of correct diagnosis. In a recent study, Nayak et al. reported that WhatsApp can be a more effective tool for providing dental education on tobacco and oral cancer as compared to conventional audio-visual aids.<sup>4</sup> However, the literature search did not reveal any studies on WhatsApp usage pattern among GDPs for 'dentistry related activities.'

In the present study, 96.19% (101) GDPs had WhatsApp application installed on their phone. This describes the popularity of this mobile application among dentists. Intriguingly, 3.8% (4) of GDPs did not use smartphones and their average age was above 40 years. Old age and lack of knowledge about the WhatsApp use could be one of the reasons for not having smartphones.

A large population of GDPs 67.32% (68) reported to using WhatsApp for obtaining the second opinion. However, 32.67% (33) of GDPs did not report using WhatsApp for the second opinion. Surprisingly, all these GDPs had practice experience exceeding 15 years. The vast clinical and operator experience could be the reason for not seeking the second opinion. Other reasons could be the regular visits of expert consultants for challenging cases.

The most common discipline that required the second opinion by dentists was the area of 'endodontics' 20.58% (14). In agreement with this most frequently [98.52% (67)] photographs of radiographs were sent by GDPs for the second opinion. 'Oral Surgery' and 'Oral Pathology' were the second and third most common disciplines sought through the second opinion. This could be for seeking a clinical diagnosis for challenging cases requiring expertise. The last branch was 'Orthodontics' because of orthodontic treatment is not routinely practiced by GDPs.

In the present study, we observed that 60.29% (41) dentists received a prompt reply for the opinions asked, followed by 38.23% (26) who received a late reply, and 1.47% (1) received an occasional response from the receiver. This finding suggests that WhatsApp is an effective and easy tool for obtaining the prompt second opinion. However, measurement of accuracy and authenticity of the second opinion obtained from such practice was not within the scope of the present paper.

In the present study, we observed the good frequency of sharing clinical photographs and radiographs for obtaining the second opinion. Clinical and radiological images were sent everyday by 19.11% (13) and 8.82% (6) of GDPs respectively. Whereas, 44.11% (30) and 19.11% (13) GDPs sought the second opinion for clinical images and radiographs once a month. This disparity could be due to the number of patients visiting to the dental clinics of GDPs.

'Group formation' is very common and popular among users of WhatsApp application. It is observed that 88.11% (89) of the GDPs were the part of various 'dentistry related groups' on WhatsApp. The most common piece of information shared on groups was related to upcoming CDE events. We believe that WhatsApp has played a significant role in keeping GDPs aware about educational activities and keep them updated about the recent advances in the field of dentistry. In recent study,

dental students found WhatsApp an efficient tool for communication with the staff member would like to make such practice as permanent to improve their learning environment.<sup>11</sup> Mobile applications such as WhatsApp will indirectly have a significant impact on the delivery of good oral health care to the general population. Many people shared their achievements on WhatsApp, which is quite motivational for them and others.

In the present study, it has been observed that 72.27% (73) of GDPs received queries from patients on WhatsApp. 76.71% (56) responded to the queries, while 21.91% (16) responded occasionally. In the real sense, this saves a lot of time for patients as well as the doctors. The most common queries are treatment-related followed by appointment, medicines, post-operative instructions and lastly diet. Recently, it has been observed that oral submucous fibrosis patients have significant impairment of functional and psychosocial parameters.<sup>12-14</sup> These results also suggest that WhatsApp can be used obtained answers related to the quality of life on certain morbid oral pathologies. This will help in assessing the progression of the disease and response to the treatment rendered. Surprisingly, 28 (27.72%) dentists did not receive any queries from patients on WhatsApp. It was observed that all 28 GDPs did not share their personal numbers with their patients.

Transfer of patients' data on online messaging platform always carries a risk of data leakage and its misapplication. Although messages in WhatsApp application are secured with end-to-end encryption (means WhatsApp and the third party cannot read listen to them), one should not underestimate the technological advancements in the hacking industry. Another major issue is related to patients consent for sharing clinical data with other practitioners. In the present study, 63.23% (43) GDP never obtained verbal or written consent from the patient. This situation could land up in serious medico-legal problems. Remaining 36.76% (25) GDPs gets verbal consent for sending clinical data for the second opinion and no one obtains written consent. Verbal agreements are generally valid and legally binding as long as they are reasonable, equitable, conscionable and made in good faith. However, verbal agreements tend to present difficulties when it comes to enforcement. Contracts that are clearly written and executed are easier to present as evidence in court than the testimony of the contractual parties. It is recommended that written patient consent must be reached whenever possible, and all pictures should be carefully blinded to protect patient identity and can be restricted to intra-oral observations if possible.<sup>15</sup>

In mobile interactions through applications like WhatsApp, there is a definitive risk of patient privacy matters. To avoid this, patient consent must be reached

whenever possible, and all pictures should be carefully blinded to protect patient identity and can be restricted to intra-oral observations if possible.<sup>15</sup>

WhatsApp can be a potentially useful tool for victim identification in mass disasters. The anti-mortem evidence available at GDPs in the form of dental records can be transferred via WhatsApp application for faster identification of the victims. However, in a recent study, it has been observed that dental record maintenance by GDPs is inadequate which can potentially impact the victim identification in mass disasters due to unavailability of dental records.<sup>16</sup> To better understand the role of WhatsApp in victim identification, we recommend future studies in this direction.

The present study was conducted on a relatively small cross-section of dentists from a single metropolitan city, hence the results obtained here cannot be generalized as mobile use, socializing culture and health awareness are complex phenomena. Thus, we recommend nation-wide studies in the future that will give a more general pattern of WhatsApp use in private dental practice. Moreover, an in-depth analysis of WhatsApp use by each individual disciplines will bring out a better picture current scenario.

## CONCLUSION

Majority of GDPs significantly use WhatsApp for dentistry related purposes and it has become an integral part of their day-to-day practice. The second opinion was most often requested on WhatsApp platform for endodontics and oral surgery related queries. Most frequently the clinical photographs and radiographs were shared for obtaining the second opinion. Moreover, GDPs were also involved in solving queries raised by their patients, which were most often related to treatment and appointment. All these findings suggest a positive impact of WhatsApp on good dental healthcare practice. However, such practice is not a replacement for conventional consultation practice.

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