



# Assessment of the Need for a Mobile Application to Monitor Orthodontic Treatment

Zineb Safi-Eddine<sup>1</sup>, Asmae Elhaya<sup>1</sup>, Zineb Serhier<sup>2</sup>, Farid El Quars<sup>1</sup>, Farid Bourzgui<sup>1</sup>

<sup>1</sup>Department of Orthodontics and Dentofacial Orthopedics, Faculty of Dentistry, Hassan II University of Casablanca, Casablanca, Morocco

<sup>2</sup>Laboratory of Medical Informatics, Faculty of Medicine & Pharmacy, Hassan II University of Casablanca, Casablanca, Morocco  
Email: safieddine.zineb@gmail.com

**How to cite this paper:** Safi-Eddine, Z., Elhaya, A., Serhier, Z., El Quars, F. and Bourzgui, F. (2025) Assessment of the Need for a Mobile Application to Monitor Orthodontic Treatment. *Open Access Library Journal*, **12**: e13584.  
<https://doi.org/10.4236/oalib.1113584>

**Received:** May 10, 2025

**Accepted:** June 22, 2025

**Published:** June 25, 2025

Copyright © 2025 by author(s) and Open Access Library Inc.

This work is licensed under the Creative Commons Attribution International

License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Objective:** This study aims to assess the awareness and perceived need for mobile applications to monitor orthodontic treatment among patients at the orthodontics department of the dental treatment and consultation centre (CCTD) at the Ibn Rochd university hospital in Casablanca. **Methods:** A descriptive cross-sectional study was conducted involving 157 participants. Data were gathered using a self-administered questionnaire in Moroccan Arabic, which included sections on participants' demographics, orthodontic experience, smartphone usage, and awareness of orthodontic content on mobile platforms. The survey also assessed the perceived need for a mobile application to monitor orthodontic treatment. **Results:** Of the 157 participants, 56.86% (89 participants) reported awareness of orthodontic content available on mobile applications or social media, with Google being the most frequently used platform for information retrieval. Regarding the perceived usefulness of the information encountered, 74.15% of participants considered it useful, while 17.97% found it very useful. Notably, only 4.46% of participants were aware of existing orthodontic mobile applications. Despite this limited awareness, 89.81% of respondents expressed strong interest in the development of a Moroccan orthodontic mobile application in Darija (Moroccan Arabic dialect). **Discussion and Conclusion:** This study underscores the potential benefits of orthodontic mobile applications (OMA) in enhancing patient engagement and adherence to treatment protocols. While awareness of such applications remains limited, there is a significant demand for a culturally tailored app in Moroccan Arabic. Future research should focus on evaluating the usability and clinical effectiveness of such applications to further enhance orthodontic care delivery and improve patient outcomes.

## Subject Areas

Dentistry (Orthodontics)

## Keywords

Orthodontics, Orthodontic Treatment, Mobile Application, Patient Awareness, Morocco

---

## 1. Introduction

Orthodontic treatment unfolds within a therapeutic framework that relies not only on the clinical expertise of the practitioner but—above all—on the patient’s sustained engagement. This active participation forms a cornerstone of treatment success, directly influencing both the effectiveness of interventions and the long-term stability of outcomes [1] [2].

Successful treatment depends on several interrelated factors [3] [4]: consistent attendance at follow-up appointments, strict compliance with the prescribed use of orthodontic devices (including intermaxillary elastics, clear aligners, and removable appliances), and the maintenance of rigorous daily oral hygiene. These requirements demand a high level of personal discipline, particularly in adolescent patients, who are often more susceptible to fluctuations in motivation over the course of treatment.

In daily clinical practice, maintaining such therapeutic adherence remains a persistent challenge [5], with practitioners frequently confronted by missed appointments, device misuse, or insufficient wear—any of which may prolong treatment duration or compromise its outcomes [3]-[5].

In light of these challenges, the rapid advancement of digital technologies—most notably the widespread accessibility of smartphones and mobile health applications—offers promising new avenues for enhancing patient follow-up and motivation [6]. These tools, now deeply embedded in the routines of younger populations, represent a strategic and innovative lever to reinforce patient involvement. Mobile applications can provide real-time reminders, encourage behavioral consistency, and foster communication between patient and clinician. Moreover, the incorporation of gamification strategies and dynamic progress-monitoring features is increasingly explored as a way to stimulate motivation and promote sustained engagement throughout the treatment process [6] [7].

Within this context, the present study aims to assess the level of awareness and needs of patients consulting at the orthodontics department of the dental treatment and consultation centre (CCTD) at the Ibn Rochd university hospital in Casablanca.

## 2. Methods

A cross-sectional study was conducted over a period of three months on 157 pa-

tients recruited according to the following criteria:

- Patients attending the service, whether for a new consultation seeking orthopedic or orthodontic treatment, currently undergoing treatment, or having completed treatment.
- Patients who are literate.
- Minors accompanied by their legal guardian.

The exclusion criteria were:

- Patients with cognitive impairments or other conditions that prevent them from understanding or completing the study's questionnaires.
- Patients who refuse to participate in the study or do not provide informed consent.

Data were collected using a self-administered questionnaire in Moroccan Arabic (dialect), ensuring anonymity and confidentiality of participants' responses. The data collection was carried out by two independent operators. The questionnaire comprised 14 closed-ended questions, organized into five distinct sections:

- **Demographic Data:** Information on the patient's age and gender.
- **Orthodontic Experience:** Data regarding the patient's treatment status, type of orthodontic treatment received, and treatment duration.
- **Smartphone Usage:** Questions related to access to smartphones, types of smartphones used, and commonly accessed platforms.
- **Sensitivity to Orthodontic Information on Mobile Applications and Social Media:** This section assessed patients' awareness and sensitivity to orthodontic-related content available on mobile applications and social media.
- **Assessment of the Need for a Mobile Application:** This section evaluated the need of a mobile application for monitoring orthodontic treatment. Further, it explored the specific desire for a Moroccan orthodontic application in Moroccan Arabic, designed to facilitate access to treatment information and improve patient engagement. The questionnaire was either administered directly to the patients or distributed via WhatsApp for remote completion.

Informed consent was obtained from all selected participants for their involvement in the study.

Data analysis was performed using Jamovi version 2.2.2. The Chi-square test ( $\chi^2$ ) was applied to assess associations between categorical variables. The significance level was set at  $p < 0.05$  for all statistical tests. A correlation test was performed on data collected from five patients over a 15-day interval to assess the consistency and reliability of the responses.

### 3. Results

The average age of the participants was 22.24 years  $\pm$  8.608. The sample consisted of 104 females and 53 males (**Table 1**).

Among the 157 patients, 134 were currently undergoing orthodontic treatment, while 23 were seeking to start treatment. None of the patients attending during this period had completed their treatment. All patients were treated using a multi-

bracket system. The average duration of orthodontic treatment was 2.03 years  $\pm$  3.3.

Out of the 157 participants, 155 were using smartphones. Among them, 124 owned their smartphones, while the remaining participants used smartphones belonging to other family members. The most commonly used operating system was Android, with 73.54% of participants using it (**Table 2**).

**Table 1.** Demographic characteristics of the study population.

	Average age (years) M (SD)	Gender distribution	%
Population n = 157	<b>22.24 (<math>\pm</math>8.608)</b>	Female 104 Male 53	66.24 33.76

M: Mean; SD: Standard deviation.

**Table 2.** Smartphone usage among participants.

	Smartphone usage		Operating system					
	n	%	Android	%	iOS	%	Other	%
Smartphone ownership	<b>134</b>	85.35						
Smartphone belonging to another family member	<b>21</b>	13.37	114	73.54	38	24.51	2	1.29
Participants not using smartphones	<b>2</b>	1.27						
<b>Total of participants</b>	<b>157</b>	100	<b>Total of participants using smartphones</b>			<b>155</b>	100	

Among the participants, 89 (56.86%) reported being aware of orthodontic content on mobile applications or social media, while 68 (43.31%) were not.

Regarding the platforms most commonly used to access orthodontic information, search engines such as Google, Yahoo, and Wikipedia were reported by 42 participants (47.19%), followed by Facebook, Instagram, and TikTok (31 participants; 34.83%). 16 participants (17.98%) reported using other platforms and/or applications.

Concerning the usefulness of the orthodontic information encountered, 66 participants (74.15%) considered the information to be useful, 16 participants (17.97%) found them very useful, while 7 participants (7.78%) judged them not useful (**Table 3**).

A total of 4.46% of participants (n = 7) reported being aware of existing orthodontic mobile applications, while 89.81% of respondents (n = 141) considered that the development of a Moroccan orthodontic mobile application in Darija (Moroccan Arabic dialect) would be useful.

All chi-square tests conducted to evaluate the associations between gender, age, and responses across the various sections of the questionnaire, including **orthodontic experience, smartphone usage, sensitivity to orthodontic information on mobile platforms and social media, and awareness and perceived need for**

a Moroccan orthodontic mobile application, did not yield statistically significant results.

Correlation test conducted on a subset of 5 patients over a 15-day interval showed a high degree of consistency in responses, with a correlation of 97%.

**Table 3.** Awareness, sources, and perceived usefulness of orthodontic information on mobile platforms.

Awareness of orthodontic content			Platforms used for searching orthodontic content			Perceived usefulness of information		
Yes	89	56.86%	Google, Yahoo, Wikipedia	42	47.19%	Very Useful	16	17.97%
No	68	43.31%	Facebook, Instagram, TikTok	31	34.83%	Useful	66	74.15%
<b>Total of participants</b>	157	100%	Other	16	17.98%	Not useful	7	7.89%
			Total	89			100%	

#### 4. Discussion

This study aimed to assess the level of awareness and the needs of patients regarding the use of mobile applications for monitoring their orthodontic treatment. The results revealed that 56.86% actively seek orthodontic information, with the majority relying on search engines such as Google, Yahoo, and Wikipedia (47.19%) as their primary sources. This aligns with the general trend of patients using accessible online platforms to gather health-related information. In addition to search engines, 34.83% of participants reported using social media platforms like Facebook, Instagram, and TikTok for orthodontic-related content. The growing popularity of these platforms, particularly among younger demographics, underscores their potential in the dissemination of health information.

When comparing these findings with existing literature, a scoping review conducted by Meade *et al.* [8] indicates that, among the studies included, 24 found Google to be the most commonly used search engine by patients seeking orthodontic information. Similarly, the study conducted by Crispino *et al.* [9] revealed that 64.6% of participants sought orthodontic information online before their appointment, with Google being the most commonly used platform, irrespective of the patients' age.

Those findings are consistent with the broader trend of patients turning to readily available online platforms to seek health-related information. They also highlight the need for orthodontic professionals to actively monitor and engage with the information being shared, ensuring that accurate and trustworthy orthodontic content is promoted.

This trend appears to have evolved significantly over time. A notable illustration of this shift is provided by a 2013 study conducted by Stephens *et al.* [10], which found that the main sources of orthodontic information were speaking with a dentist or orthodontist (84%), talking to peers (66%), and reading information

leaflets (64%), while only 8% of respondents reported using the Internet.

Concerning the usefulness of orthodontic information encountered online, our study found that 74.15% of participants considered the information useful, while 17.97% considered it very useful, and 7.78% deemed it not useful.

These results are consistent with those reported in the literature, where a majority of patients perceive online information as useful or very useful. For instance, the study by Meade *et al.* [8] showed that 68.8% of digital natives and 64.1% of digital immigrants considered online information to be “useful” or “very useful”. However, the perception of reliability of online sources varied across generations, with digital immigrants tending to find online information more reliable than digital natives.

Crispino *et al.* [9] reported that 68.8% of digital natives and 64.1% of digital immigrants considered online orthodontic information to be useful or very useful.

It is worth noting that digital natives refer to individuals who have grown up with digital technologies and are typically more familiar with using the internet and social media. In contrast, digital immigrants are those who were introduced to digital tools later in life and may not use them as intuitively.

In terms of awareness of orthodontic mobile applications, only 4.46% (n = 7) of participants in our study reported being familiar with their existence. Despite this low level of awareness, a substantial majority—89.81% (n = 141)—believed that the development of a Moroccan orthodontic mobile application in Darija (Moroccan Arabic dialect) would be useful.

This limited awareness is consistent with previous studies. Sharif *et al.* [11] reported that only 7% of orthodontic patients were aware of orthodontic apps, despite 87% expressing willingness to use them to support their treatment.

Similarly, the study conducted by Ahmed *et al.* [12] also reflects a similar gap in awareness and desire of orthodontic mobile applications. While 87% of participants expressed interest in using orthodontic applications to aid their treatment, only 3% of patients were aware of their existence.

While the effectiveness of orthodontic mobile applications remains a subject of debate in the literature, with some studies supporting their use [7] and others questioning their impact [13] [14], it is clear that there is potential for further exploration.

A future perspective for our work would be to develop a mobile application tailored specifically to the Moroccan context, ideally in the Moroccan Arabic dialect (Darija). Such an app could be tested initially to assess its usage patterns, allowing for the identification of necessary modifications based on user feedback. Subsequently, its clinical performance could be evaluated to determine its efficacy in improving patient engagement, treatment adherence, and overall outcomes. This would provide valuable insights into the potential of culturally adapted digital health tools in the orthodontic field and could serve as a foundation for future developments in digital healthcare applications.

## 5. Conclusion

In summary, the growing interest in digital health tools, particularly mobile ap-

plications, presents a unique opportunity to enhance patient education and engagement in orthodontics. While current awareness and usage of orthodontic mobile applications remain limited, the potential benefits of such tools, especially when tailored to local languages and cultural contexts, may be significant. The development of an orthodontic mobile application in Moroccan Arabic Darija could potentially improve patient access to relevant information and treatment support. Future research should focus on assessing the usability and clinical performance of such applications, with an emphasis on continuous improvement based on user feedback. Ultimately, the integration of culturally adapted digital tools into orthodontic practice may offer valuable contributions to improving patient outcomes and enhancing the overall quality of care.

### Conflicts of Interest

The authors declare no conflict of interest.

### References

- [1] van der Bie, R.M., Bos, A., Bruers, J.J.M. and Jonkman, R.E.G. (2024) Patient Adherence in Orthodontics: A Scoping Review. *BDJ Open*, **10**, Article No. 58. <https://doi.org/10.1038/s41405-024-00235-2>
- [2] Santana, L.G., Gatti-Reis, L., Paiva, S.M., Ramos-Jorge, M.L. and Marques, L.S. (2025) Patient-Centered Factors Associated with Orthodontic Treatment Success: A Scoping Review. *Brazilian Oral Research*, **39**, e020. <https://doi.org/10.1590/1807-3107bor-2025.vol39.020>
- [3] Hussein, S. and Ismail, H. (2023) Influence of Reminder on Enhancing Compliance in Patients with Fixed Orthodontic Appliance Treatment (a Randomized Controlled Clinical Trial). *Patient Preference and Adherence*, **17**, 1759-1769. <https://doi.org/10.2147/ppa.s418109>
- [4] Timm, L.H., Farrag, G., Baxmann, M. and Schwendicke, F. (2021) Factors Influencing Patient Compliance during Clear Aligner Therapy: A Retrospective Cohort Study. *Journal of Clinical Medicine*, **10**, Article 3103. <https://doi.org/10.3390/jcm10143103>
- [5] Pattanaik, S., Veeraraghavan, V.P., Dasari, A.K., Patil, S.R., Alzahrani, S.G. and Fareed, M. (2024) Orthodontic Treatment in Adults: Challenges, Outcomes, and Factors Affecting Compliance and Satisfaction. *Journal of Orthodontic Science*, **13**, 14. [https://doi.org/10.4103/jos.jos\\_186\\_23](https://doi.org/10.4103/jos.jos_186_23)
- [6] Choi, E., Park, B. and Noh, H. (2020) Efficacy of Mobile Health Care in Patients Undergoing Fixed Orthodontic Treatment: A Systematic Review. *International Journal of Dental Hygiene*, **19**, 29-38. <https://doi.org/10.1111/ijdh.12459>
- [7] Patil, S., Hedad, I.A., Jafer, A.A., Abutaleb, G.K., Arishi, T.M., Arishi, S.A., *et al.* (2021) Effectiveness of Mobile Phone Applications in Improving Oral Hygiene Care and Outcomes in Orthodontic Patients. *Journal of Oral Biology and Craniofacial Research*, **11**, 26-32. <https://doi.org/10.1016/j.jobcr.2020.11.004>
- [8] Meade, M.J., Poirier, B. and Jensen, E.D. (2024) The Quality of Web-Based Orthodontic Information: A Scoping Review. *American Journal of Orthodontics and Dentofacial Orthopedics*, **166**, 313-329. <https://doi.org/10.1016/j.ajodo.2024.05.018>
- [9] Crispino, R., Mannocci, A., Dilena, I.A., Sides, J., Forchini, F., Asif Alherawi, W.M., *et al.* (2023) Orthodontic Patients and the Information Found on the Web: A Cross-

Sectional Study. *BMC Oral Health*, **23**, Article No. 860.

<https://doi.org/10.1186/s12903-023-03609-4>

- [10] Stephens, R., Ryan, F.S. and Cunningham, S.J. (2013) Information-Seeking Behavior of Adolescent Orthodontic Patients. *American Journal of Orthodontics and Dentofacial Orthopedics*, **143**, 303-309. <https://doi.org/10.1016/j.ajodo.2012.10.018>
- [11] Sharif, M.O., Siddiqui, N.R. and Hodges, S.J. (2019) Patient Awareness of Orthodontic Mobile Phone Apps. *Journal of Orthodontics*, **46**, 51-55. <https://doi.org/10.1177/1465312518821361>
- [12] Ahmed, H.M.A., Obaid, D.H., Kadhum, H.I., Nahidh, M., Russo, D., Herford, A.S., et al. (2024) Awareness of Orthodontic Patients towards Smartphone Orthodontic Apps. *Minerva Dental and Oral Science*, **73**, 134-141. <https://doi.org/10.23736/s2724-6329.23.04853-2>
- [13] Al-Moghrabi, D., Alkadhimi, A., Tsihlaki, A., Pandis, N. and Fleming, P.S. (2022) The Influence of Mobile Applications and Social Media-Based Interventions in Producing Behavior Change among Orthodontic Patients: A Systematic Review and Meta-Analysis. *American Journal of Orthodontics and Dentofacial Orthopedics*, **161**, 338-354. <https://doi.org/10.1016/j.ajodo.2021.09.009>
- [14] El-Naghy, R., Al-Qawasmi, R. and Hasanin, M. (2023) Does Using Mobile Applications and Social Media-Based Interventions Induce Beneficial Behavioral Changes among Orthodontic Patients? *Evidence-Based Dentistry*, **24**, 26-27. <https://doi.org/10.1038/s41432-023-00859-7>