



Research article

Awareness of patients with impacted teeth about impacted teeth in Turkey: A questionnaire study

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ABSTRACT

Objective: The aim of this study is to evaluate the knowledge and awareness levels of patients who have at least one impacted tooth and who had previously applied to the dentist.

Study design: This study was conducted in patients aged 15 years and older who applied to Ordu University Faculty of Dentistry for routine examination and agreed to fill out the questionnaire form. A total of 325 people participated in the survey conducted to determine the awareness of patients applying to the faculty of dentistry about their existing impacted teeth. A Pearson's chi-square test was used for hypothesis testing when expected frequencies exceeded 5.

Results: It was determined that 56.9 % (185) of the participants were aware of their existing teeth, while 43.1 % (140) were not aware. When the patients were evaluated according to the institutions they had visited, it was seen that the group who were most aware of the presence of impacted tooth were those who apply to the faculty of dentistry (74.4 %). The rate of being informed by dentists in the institutions that they had previously visited was higher in patients with university or post-university graduates ($p < 0.05$). The most common information given by the dentists to the patients about their impacted dental problems was that the tooth should be followed up (40.4 %), while the removal of the tooth constituted 28.4 % of the information given.

Conclusion: This study showed that although patients are aware of their existing impacted teeth, their level of knowledge about the risks it may pose is low. For a healthy oral care and health, patients should be adequately informed about impacted teeth.

1. Introduction

Tooth eruption is the process of a tooth from its developmental site in the bone to its functional position in the oral cavity [1]. Owing to local, systemic, or genetic factors, the tooth cannot complete its movement toward the oral cavity. Teeth in this position are referred to as 'impacted teeth.' Impacted teeth are a common phenomenon that can be observed in different parts of the jaws [2]. Third molars, maxillary canines, maxillary and mandibular premolars, and maxillary central incisors are the teeth most commonly impacted [3]. Studies have shown that third molars remain embedded in the jaws throughout evolution. Approximately 65% of the human population has at least one impacted third molar tooth at 20 years of age [4]. According to the literature, the prevalence of impacted teeth in different countries ranges from 8 % to 38 % [2,5–8].

Etiological factors for impacted teeth include genetic factors, ankylosis of the primary teeth, early loss of the primary teeth,

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abnormal eruption paths, endocrine disorders, presence of supernumerary teeth, tooth crowding, loss of space, dental trauma, pathological lesions, and root dilation [9].

Impacted teeth are often asymptomatic and may go unnoticed unless detected during routine examinations. To prevent problems that may arise from impacted teeth, patients should undergo routine examinations and should be followed up by their dentist. To achieve this, it may be necessary to raise the awareness of the patient on this issue and increase the knowledge level.

Impacted teeth can cause carious lesions, infections, resorption of adjacent teeth, periodontal diseases, and even cysts or tumors. Therefore, dentists should inform patients about the risks that could occur [5].

The high incidence of impacted teeth has led researchers to study this subject and its treatments. Researchers have focused on the prevalence, incidence, and treatment of impacted teeth. Twyana et al. [10] conducted a study to measure dental students' knowledge of impacted teeth. Although all participants were dental students, half of them lacked knowledge about impacted teeth. Balakrishnan et al. [11] evaluated the knowledge of dentistry students in India about impacted third molars. Balakrishnan et al. stated that students only mastered the terminology and needed to gain knowledge of issues such as tooth extraction indications. In the literature, there are no studies showing the awareness of individuals about impacted teeth, except for similar studies among dentists or dental students.

The aim of this study is to evaluate the knowledge and awareness levels of patients who have at least one impacted tooth and who have applied to the dentist before. The hypotheses of this study were patients are aware that they have impacted teeth, patients were informed by their dentists in the institution they visited to before, gender and education status of patients have no effect on their awareness of impacted teeth.

2. Materials and methods

2.1. Study design

This survey study was conducted over a period of 5 months (September 2021–January 2022) in accordance with the principles of the Declaration of Helsinki. Permission for the study was obtained from Ordu University Clinical Research Ethics Committee with the decision number 2022/79. The sample size of the study was calculated using G*Power software (version 3.1.9.2; Axel Buchner, Universität Düsseldorf, Düsseldorf, Germany) and the total sample size required to detect a moderate effect (effect size: 0.30) with 95 % power. A total of 220 participants were required for this study.

2.2. Data collection

A questionnaire form was prepared to evaluate the awareness levels of patients regarding their existing impacted teeth. The form was given to the patients to complete before their examination. This study was conducted in patients aged 15 years and older who applied to Ordu University Faculty of Dentistry for routine examination and agreed to fill out the questionnaire form. Informed consent was obtained by informing patients or parents about the aims and objectives of the study. The inclusion criteria were patients who had at least one impacted tooth, who had previously consulted a dentist and who volunteered to participate in the study.

2.3. Statistical analysis

Age, gender, and educational status of the patients were also recorded. The collected data were entered into a computer and analyzed using Excel and Statistical Package for Social Sciences (SPSS®) software (version 20, SPSS®, Inc., Chicago, IL, USA). Descriptive statistics were generated to summarize the responses. Pearson's chi-square test was used for hypothesis testing when all expected frequencies exceeded 5.

3. Results

A total of 325 individuals participated in the survey conducted to determine the awareness of patients applying to the Ordu University Faculty of Dentistry regarding their existing impacted teeth. It was determined that 56.9 % (185) of the participants were aware of their existing impacted teeth, and 43.1 % (140) were unaware of their impacted teeth. When the patients were evaluated

Table 1

Awareness and knowledge of the patients according to the institutions they visited before.

	Are You Aware of Your Existing Impacted Teeth?		P*	Did the Dentist Inform You?		P*
	Yes	No		Yes	No	
Type of Institution	n (%)	n (%)		n (%)	n (%)	
Private	32 (47.1 %)	36 (52.9 %)	.001	23 (33.8 %)	45 (66.2 %)	.000
Public	95 (53.1 %)	84 (46.9 %)		69 (38.5 %)	110 (61.5 %)	
Faculty of Dentistry	58 (74.4 %)	20 (25.6 %)		49 (62.8 %)	29 (37.2 %)	
Total	185 (56.9 %)	140 (43.1 %)		141 (43.4 %)	184 (56.6 %)	

* According to the Chi-square Test, a value of $P < 0.05$ will be considered significant.

according to the institutions they went to, it was seen that the group who was most aware of the presence of impacted teeth was those who applied to the faculty of dentistry. (74.4 %) In addition, there was a significant correlation between the institutions visited by the patients and awareness of their impacted teeth ($p < 0.001$). 43.4 % (141) of the participants answered “yes” to the question “Did the dentist inform you about impacted teeth in the institution you visited before?”. In this regard, the rate of respondents indicating no to this question was 56.6 %. Patients applying to the Faculty of Dentistry were the most informed group about their impacted teeth by dentists (62.8 %), while those applying to private institutions were the least informed group (33.8 %). A significant correlation was found between the institutions visited prior to and the information given by the dentists about impacted teeth. ($p < 0.001$). [Table 1](#) presents the patients’ awareness of existing impacted teeth according to the institutions visited, as well as the information provided by dentists regarding their impacted teeth.

In this study, the relationship between the awareness of the patients about their existing impacted teeth and the information provided by the dentists and educational status was found to be statistically significant ($p < 0.05$, $p < 0.05$, respectively). It was determined that 48.1 % of the participants with a pre-university education (primary school, secondary school, etc.) and 51.9 % of the participants with university and postgraduate degrees were aware of their impacted teeth. It was observed that the rate of being informed about impacted teeth by dentists in the institutions they had previously visited was higher in patients who were university or post-university graduates ([Table 2](#)).

In this study, 61.3 % of the participants were female, and 38.7 % were male. No significant difference was found between gender being informed by the dentist and awareness ($p > 0.05$). Patients’ awareness of impacted teeth and the rates of being informed by dentists were similar in both genders ([Table 3](#)).

The most common information given by dentists to patients about their impacted teeth were follow-up of the impacted tooth (40.4%) and extraction of the impacted tooth (28.4%), respectively. The information provided by dentists to patients regarding impacted teeth is shown in detail in [Table 4](#). Among the patients who stated that they were not informed about their impacted teeth, 83.7 % stated that they did not have any information, 8.7 % stated that they had information about impacted teeth from the internet, and 7.6 % stated that they had information from the social environment ([Table 4](#)). When evaluated according to age groups, the age group with the highest awareness of existing impacted teeth was the 21–25 age group. The awareness rate in this age group was 64.7 % ([Fig. 1](#)). The least aware age group was 51–77 years old (33.3 %). Similarly, the 21–25 age range is the age range in which dentists provide the most information about impacted teeth. The rate was 54.1 % ([Fig. 1](#)). The age range of 51–77 years was the age group in which dentists provided the least amount of information regarding impacted teeth (29.2 %) ([Fig. 1](#)). Of the 325 patients 273 (84 %) had impacted third molars, followed by maxillary canines in 38 patients (11.7 %) ([Fig. 2](#)).

4. Discussion

In this study, the awareness of the patients about their existing impacted teeth and the information given by the dentists about their impacted teeth in the institution previously visited were evaluated. It was observed that more than half of the patients participating in the study were aware of their existing impacted teeth. Less than half of the participants stated that they were informed by the dentists they had visited before.

If patients are aware of their impacted teeth and the risks of it, they might visit the dentist regularly. Impacted teeth can cause carious lesions, infection, resorption of adjacent teeth, periodontal disease, and cysts or tumors. A partially erupted third molar has been reported to cause a carious lesion on a mandibular second molar [[3,12–14](#)]. Resorption is the destruction of dental tissue by osteoclasts. Impacted teeth can cause resorption of the crowns and roots of the adjacent teeth. It was reported that the presence of advanced root resorption in the lateral teeth or distal to the adjacent second molar was reported [[15–18](#)]. A wide variety of cysts and neoplasms are encountered in the jaw, usually due to the tissues involved in tooth formation. Studies have shown that cysts and tumors, such as dentigerous cysts and adenomatoid odontogenic tumors, are associated with impacted teeth [[19](#)]. In order to prevent and early diagnose these problems, it is essential for patients with impacted teeth to have regular dental examinations. Therefore, patients with impacted teeth should not neglect routine control measures. In addition, it is important for dentists to inform patients about the risks of impacted teeth.

In this study, 56 % of the patients knew that they had impacted teeth. In a study by Balakrishnan et al. [[11](#)] (2020), among dental students, the level of knowledge about impacted teeth was found 50 %. Although they conducted their study on dental students, we obtained similar results. In this study, 44 % of the patients were informed by dentists about the risks of impacted teeth. In the Faculty of Dentistry, 62 % of dentists informed patients about impacted teeth, while this rate was 38.5 % in public institutions and 32 % in the

Table 2
Awareness and knowledge of the patients according to educational status.

Educational Status	Are You Aware of Your Existing Impacted Teeth?		P*	Did the Dentist Inform You?		P*
	Yes n (%)	No n (%)		Yes n (%)	No n (%)	
Pre-University	89 (48.1 %)	89 (63.6 %)	.006	67 (47.5 %)	111 (60.3 %)	.021
University	96 (51.9 %)	51 (36.4 %)		74 (52.5 %)	73 (39.7 %)	
Total	185 (56.9 %)	140 (43.1 %)		141 (56.6 %)	184 (43.4 %)	

* According to the Chi-square Test, a value of $P < 0.05$ will be considered significant.

Table 3
Awareness and knowledge of the patients according to the gender.

Gender	Are You Aware of Your Existing Impacted Teeth?		P*	Did the Dentist Inform You?		P*
	Yes (%)	No (%)		Yes (%)	No (%)	
Female	117 (63.2 %)	88 (62.9 %)	.943	86 (61 %)	119 (64.7 %)	.436
Male	68 (36.8 %)	52 (37.1 %)		55 (39 %)	65 (35.3 %)	
Total	185 (56.9 %)	140 (43.1 %)		141 (43.4 %)	184 (56.6 %)	

* According to the Chi-square Test, a value of P < 0.05 will be considered significant.

Table 4
Distribution of information given to patients by institutions.

Type Of Institution	What information did the doctor give?							Non-doctor information source		
	Follow-up (n)	Remove (n)	Resorption (n)	Cysts (n)	Abcess (n)	Pain (n)	Eruption (n)	Social Circle (n)	Internet (n)	Don't Know (n)
Private	15.8 % (9)	12.5 % (5)	8.3 % (1)	30 % (3)	20 % (1)	33.3 % (3)	12.5 % (1)	7.1 % (1)	31.2 % (5)	25.3 % (39)
Public	40.4 % (23)	65 % (26)	58.3 % (7)	30 % (3)	40 % (2)	33.3 % (3)	62.5 % (5)	57.1 % (8)	62.5 % (10)	59.7 % (92)
Faculty of Dentistry	43.9 % (25)	22.5 % (9)	33.3 % (4)	40 % (4)	40 % (2)	33.3 % (3)	25 % (2)	35.7 % (5)	6.2 % (1)	14.9 % (23)
Total	40.4 % (57)	28.4 % (40)	8.5 % (12)	7.1 % (10)	3.5 % (5)	6.4 % (9)	5.7 % (8)	7.6 % (14)	8.7 % (16)	83.7 % (154)

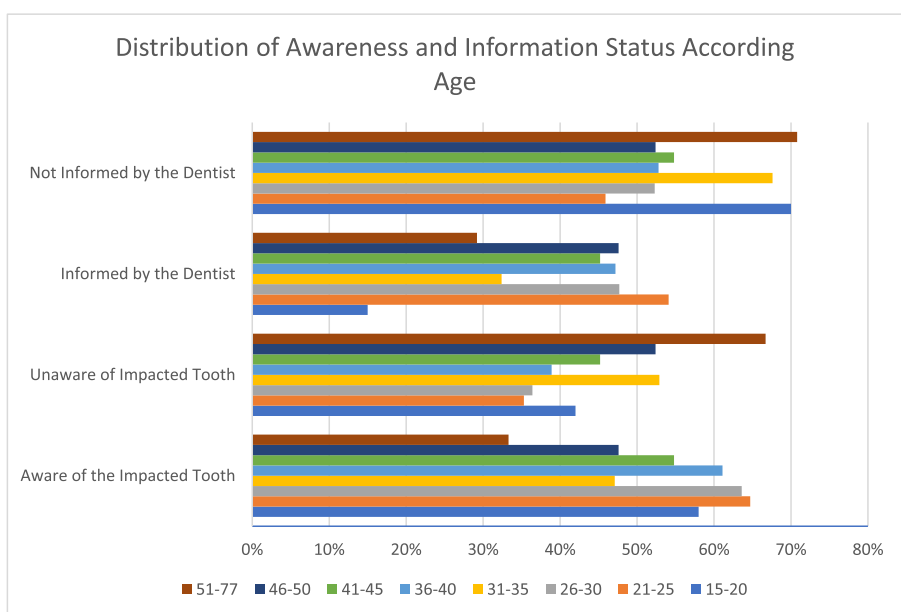


Fig. 1. Distribution of awareness and information status according age.

private sector.

The rate of being aware of impacted teeth was found to be 74 % among those applying to the Faculty of Dentistry, 47 % among those applying to private institutions and 53 % among those applying to the public sector.

Based on data from the Turkish Statistical Institute, the number of patients admitted to the institutions in a year was divided by the number of units, and the number of patients per unit was determined. While the number of patients per unit was approximately 1850 in public institutions, it was determined as 1110 in the faculty of dentistry [20,21]. The fact that fewer patients apply to dental faculties compared to public institutions reduces the time pressure on the dentist. Therefore, it may help them to find more time during the patient examination. The increase in patient examination time may have increased the diagnostic performance of dentists and their ability to inform patients on various issues. Plessas et al. [22] showed that time pressure negatively affects dentists' diagnostic

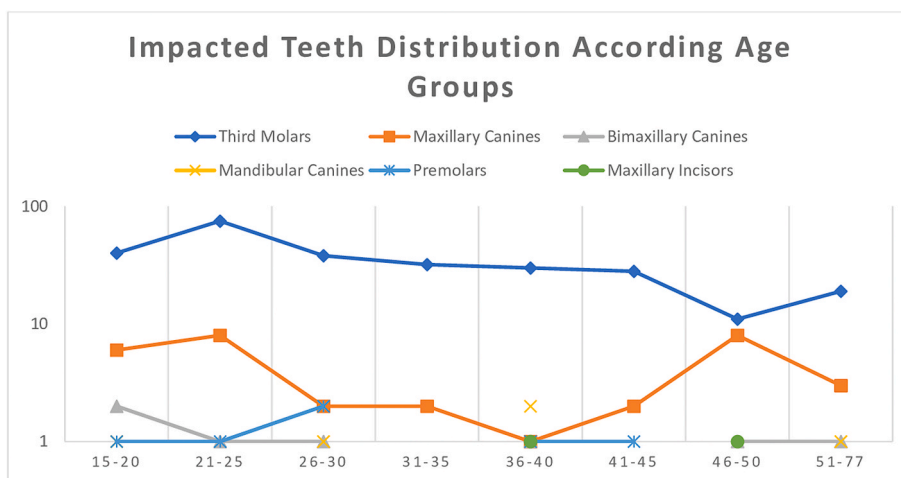


Fig. 2. Impacted teeth distribution according age groups.

performance (increased diagnostic errors and pathology omissions), and potentially affecting patient safety and examination quality. The less time per patient in public institutions may result with being under-informed about the risks of impacted teeth. The number and density of patients per unit may explain this significant difference ($P < 0.001$). In addition this difference between institutions may be attributed to the number of specialized dentists. 10% of dentists in public institutions are specialists, this rate reaches 50% in faculty of dentistry [23]. The presence of dentomaxillofacial radiology clinicians who specialize in the field of diagnosis helps patients who apply to the dental faculty become more aware and better informed. The small number of dentomaxillofacial radiology clinicians working in private institutions may be one reason for the lack of knowledge about impacted teeth. Overall, the presence and expertise of dentomaxillofacial radiology clinicians can significantly benefit patients. .

In this study, no significant relationship was found between gender and awareness of impacted teeth (p -value 0.943). A similar result was found in the study by Tywana et al. (2021) [10]. It was observed that dentists informed patients about impacted teeth in a similar manner. Dentists generally stated that impacted teeth should be followed up. The information given by dentists about impacted teeth was similar between institutions.

In this study, it was observed that patients with higher education levels were more likely to say “Yes, my dentist gave me information about impacted teeth” than patients with lower education levels. This may be explained by the fact that patients with higher education levels understand their dentists better. This may indicate that dentists should communicate separately with each patient. Similarly, Freeman et al. [24] emphasized in their study that “communication between dentists and patients is specific for each patient”.

In this study, 83.7 % of the patients who stated that they were not informed by the dentist stated that they did not have any information about impacted teeth. While the rate of patients who obtained information from the internet was 8.7 %, the rate of patients who obtained information from the social environment was 7.6 %. Like this study, it was observed that the internet is a source of information in the field of dentistry, albeit on different topics. In a study conducted by Bozkurt et al. [25] 27% of the videos of impacted maxillary canine and impacted maxillary canine surgery on YouTube were found to be very useful. Although there are useful resources about impacted teeth on the internet, the patients in this study did not use the internet as a source of information and they prefer dentists as the primary source of information.

The limitation of this study is that all data were based on patients' self-reports through a questionnaire. This study revealed that the patients had existing impacted teeth and the level and state of knowledge about their impacted teeth. These findings are important in terms of raising awareness of patients and improving health services. It also emphasizes the role of dentists and suggests that they should make more efforts to inform patients.

As a result, according to our knowledge, this is the first study to assess and reports patients' knowledge about the presence of impacted tooth. This study showed that although patients were aware of their impacted tooth, their knowledge about impacted tooth was limited. For a healthy oral care, patients must be adequately informed about this issue and explained why they should come for a routine examination.

Ethics statement

Permission for the study was obtained from Ordu University Clinical Research Ethics Committee with the decision number 2022/79.

Data availability statement

The data has not been deposited in a publicly accessible repository but will be made available upon reasonable request.

Additional information

No additional information is available for this paper.

Consent to publish

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CRediT authorship contribution statement

Furkan Ozbey: Writing - review & editing, Writing - original draft, Supervision, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Dilek Coban:** Writing - review & editing, Writing - original draft, Methodology, Investigation, Data curation. **Busra Nur Gokkurt:** Writing - review & editing, Writing - original draft, Methodology, Data curation. **Tunahan Tuna:** Writing - review & editing, Writing - original draft, Data curation. **Yasin Yasa:** Writing - review & editing, Writing - original draft. **Zerrin Unal Erzurumlu:** Writing - review & editing, Writing - original draft. **Elif Sadik:** Writing - review & editing, Writing - original draft.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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