

# Evaluation of the Most Common Dental Procedural Errors Leading to Lawsuits and the Relevant Reasons in Three Dental Clinics in Tehran

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## Abstract

One of the most important occupational stresses that dentists encounter in their profession is patients' lawsuits. The present study aimed to evaluate common procedural errors that lead to lawsuits in dentistry. In the present cross-sectional study, all the patient files of three large dental clinics in Tehran were evaluated from 2014 to 2019, in which a dentist's negligence had been confirmed by the specialty dental committee. Files with incomplete clinical data, without the dentist's name, and the type of the lawsuit were excluded. After extraction of the data from the existing files and completing the relevant checklist, data were analyzed with SPSS 23. Most lawsuits were of the therapeutic type (82%), with 31.9%, 24.2%, and 17.6% related to prosthodontics, endodontics, and surgery, respectively. Most plaintiffs were 30–49 years of age (52%), and most were women (65%). Over half of the lawsuits had been filed against dentists with a job experience of <10 years and against general dental practitioners (76%). One of the most important ways to prevent errors leading to lawsuits is to increase dentists' knowledge about previous lawsuits. Knowledge about the most common lawsuits and the provision of organizational guidelines will help manage and decrease such lawsuits.

**Keywords:** Dentistry; error; patient complaints.

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## Introduction

Human errors are one of the most important current issues in the medical and dental profession; therefore, it is of utmost importance to identify and decrease these errors [1]. Human errors are defined as the deviation of human performance from the regulations and the defined responsibilities that go beyond the system's accepted norm,

negatively affecting the system's efficacy [2]. Occupational responsibilities and their complexity might, in some cases, affect human performance and behavior in some occupations, resulting in procedural errors and unsafe procedures. These errors and their unfavorable consequences will negatively affect the operator's and other's health [3].

Based on a report by the American Institute of Medicine in 2008, on average, one million people are hurt all over the world annually due to medical errors, with an annual cost of \$17,000,000[4, 5]. Based on the WHO report, of every 10 people, one is affected by medical errors [6]. Recent studies on medical errors have shown that the reasons for 88% of the procedural errors are unsafe procedures, 10% due to unsafe

conditions and 2% due to unknown factors [7].

Various surveys worldwide have shown that human errors in the medical profession have inflicted high financial and human costs in different communities. Procedural errors by the medical staff and dentists lead to a lack of confidence among the community members in this personnel, increases stress in patients, and increases lawsuits against the medical and dental personnel [4, 5]. Errors in different occupations do not have a single reason and usually occur due to several reasons. They are usually the result of errors in the system and latent errors [8].

Kiani et al (2009) investigated dental patients' lawsuits in Tehran. Their retrospective study evaluated dental patients' lawsuits in Tehran from 2002 to 2006 according to the decision of the Specialty Committee on Medical Negligence of Tehran Medical Council. The results showed that during the 5-year period, 412 lawsuits had been filed against dentists, the majority of which were related to fixed prosthodontics and oral surgery treatments. Besides, the majority of complaints were related to therapeutic activities in the private sector. Most lawsuits were

against general dental practitioners, and in 56.7% of the clinical files and 40% of the non-clinical files, the dentists had been convicted [9].

Pereail et al (2014) determined the characteristics of dental procedural errors and classified them in terms of origin and type. They evaluated 4159 lawsuit filed due to dental errors from 2000 to 2910 in Spain. The results showed that implant treatments, root canal therapy, and oral surgeries comprised the most common dental procedural errors (25.5%, 20.7%, and 20.4%, respectively). Besides, 44.3% of the errors were due to predictable errors and could be prevented [10].

Prevention of errors increases patient and personnel satisfaction, decreases surgery costs, and increases the validity, and decreases stress in healthcare providers. In most organizations, the prevention costs are significantly less than the costs of procedural accidents [11]. Some errors during dental procedures are due to human errors, and some are due to other factors, including the environmental conditions, dental tools, and equipment, and the system prevailing in dentistry, finally resulting in patient injuries [12]. Despite the limited studies on the

most common errors leading to lawsuits in dentistry, no study has evaluated the details and the exact nature of these errors and the relationship between different types of errors and the patients' and clinicians' demographic factors in each dental specialty. Therefore, the present study aimed to evaluate errors leading to lawsuits against dental practitioners and their etiologic factors so that methods can be suggested to prevent these errors and lawsuits.

## Material and Methods

### *Study design*

In the present cross-sectional study, all the lawsuit files (n=462) in Imam Khomeini, Shahid Chamran, and Shahid Shokri dental clinics in Tehran were collected from 2014 to 2019. A total of 120,000 patients refer to these three clinics annually. The inclusion criteria consisted of dentists' negligence cases confirmed by the Special Committee of Dental Specialists, consisting of 280 files. The exclusion criteria consisted of files with incomplete clinical data, a lack of the dentist's name and his/her demographic data, and a lack of the plaintiff's demographic data. After the application of

inclusion and exclusion criteria, 107 files were finally evaluated.

### *Data collection tool*

A researcher-made checklist was used to collect data and research variables. Content validity was used since the aim was to design a special checklist to extract data and the demographic variables of the clinicians and patients (as plaintiffs). First, previous studies on the most common errors in the dental clinics and hospitals were reviewed to prepare a list of required parameters. Then, some of the files with confirmed dental errors were thoroughly reviewed to complete the checklist, consisting of plaintiffs' demographic data (age, gender, education, insurance), the clinicians' academic degree/level, clinicians' gender, clinicians' experience, the error location, error type, the steps taken to compensate for the error and the shift of the error (morning/afternoon). Three specialists evaluated the checklist, including a healthcare specialist (KB), an oral disease specialist (ER), and a healthcare management specialist (ER), and the necessary amendments were made and confirmed to validate the tool.

The researchers were then granted permission by the three clinics mentioned above to gain access to the relevant files, and each file was evaluated in the presence of the Deputy Dean for Treatment of each clinic. The study was carried out for 14 months, and the data were collected in two months. After extracting the required data from the available files and completing the checklists, the data were analyzed with SPSS 23.

### *Ethics*

The Ethics Committee of the Baqiatollah University of Medical Sciences approved the protocol of the study. For the sake of confidentiality, the files were evaluated in the presence of the Deputy Dean for Treatment of each clinic, and by only completing the designed checklist.

### **Results**

Of 107 lawsuit files confirmed by the Special Committee of Dental Specialists from 2014 to 2019 in the three large dental clinics in Tehran, 88 files were related to treatment errors (82.2%), and 19 files were related to diagnostic errors (17.7%). The most frequent reason for filing lawsuits was the root perforation during post space preparation (13 cases, 12%), extracting the wrong tooth (9

cases, 8.4%), implant fixture loosening (9 cases, 8.4%), and root canal perforation, resulting in abscess formation and tooth loss (8 cases, 7.4%). Of all the lawsuits related to treatment, the most frequent one was related to the root perforation during the preparation of post spaces (13 cases, 12%). Of all the complaints related to diagnosis, the most frequent complaint was related to unjustified and unnecessary crown lengthening procedures (interdisciplinary error) (6 cases, 5.6%) (Table 1).

Evaluation of the frequencies of the evaluated variables showed that 67 (62.6%) of the plaintiffs were female, and 40 (37.2%) were male. More than half of the plaintiffs were in the 30–49 age range, and only 19.7% of them were <30 years of age. The youngest plaintiff was 21, and the oldest was 81; 10% of the plaintiffs had some high school education, 66% were high school graduates and had associate's and bachelor's degrees, and 24% had masters and doctorate degrees. 67% of the plaintiffs had insurance coverage, and 33% had no insurance coverage.

Of all the dental practitioners evaluated, 45% were female, and 55% were male. Besides, 76% were general dental practitioners,

and 24% were specialists. The majority of the dentists in the lawsuit cases had <10 years of experience (51%).

The minimum number of lawsuits had been filed against dentists with >20 years of experience (20%).

The results showed that 40% of the dentists had committed the errors in the morning shift, and 33 dentists had committed the errors in the afternoon shift. The most frequent dental fields involved were prosthodontics (31.9%), endodontics (24.2%), surgery (17.6%), restorative dentistry (14.3%), periodontics (8.8%), and periodontics (3.3%) (Figure 1).

The measured adopted to compensate for the errors consisted of paying the implant cost to the patient (56 cases, 52%), returning the cost of the treatment to the patient (28 cases, 26%), and compensating the error with re-treatment (23 cases, 21%).

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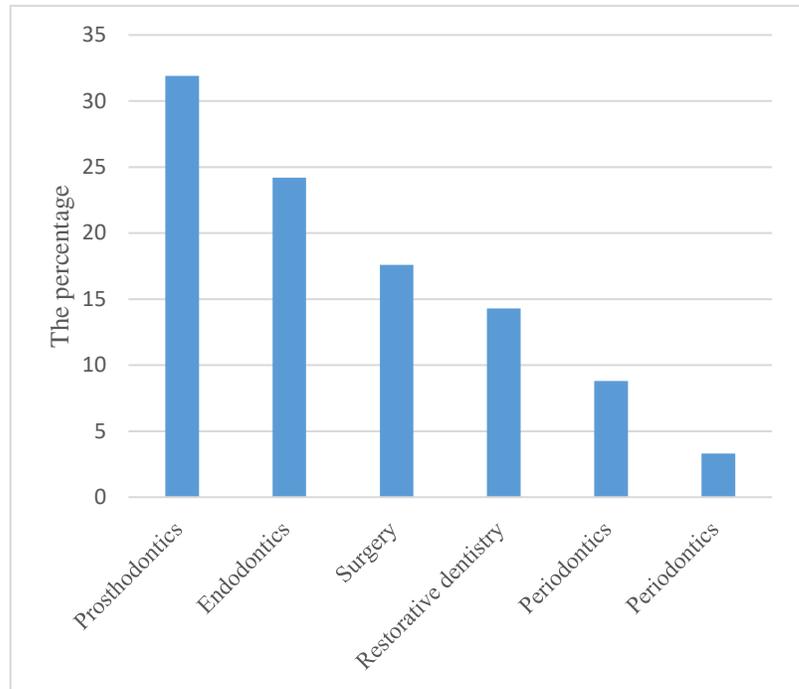


Figure 1. The frequency percentages of the lawsuits separately for each dental field

**Table 1.** Direct, indirect and total effects for the model (n=174)

	<b>Error types (complaints)</b>	<b>Number (frequency)</b>	<b>Percentage</b>
<b>Diagnostic error</b>	Unnecessary surgery (interdisciplinary error)	6	5.6%
	Unnecessary endodontic treatment (interdisciplinary error)	6	5.6%
	Wrong diagnosis (leading to unnecessary endodontic treatment)	2	1.8%
	Unnecessary endodontic treatment	2	1.8%
	Inattention to C/R ratio (leading to the fracture of cantilever bridge abutment)	1	0.9%
	Wrong diagnosis (restoration instead of endodontic treatment)	1	0.9%
	Wrong diagnosis (restoration instead of placing a crown)	1	0.9%
<b>Therapeutic error</b>	Root perforation during preparation of the root canal for a post	13	12%
	Extraction of the wrong tooth	9	8.4%
	Implant failure (fixture loosening)	9	8.4%
	Perforation of the root canal (leading to abscess formation, making the tooth hopeless)	8	7.4%
	Trauma to the adjacent tooth during tooth extraction	6	5.6%
	Restoration of the wrong tooth (wrong tooth)	5	4.6%
	Vertical root fracture (VRF) due to post placement	5	4.6%
	Crown under-occlusion	4	3.7%
	File separation within the root canal	3	2.8%
	An open contact of the crown with the adjacent tooth	2	1.8%
	Mild burning due to acid etching	2	1.8%
	Non-tooth-colored restoration without informing the patient	2	1.8%
	Cementation of the bridge with short margins (leading to caries and loss of the abutment teeth)	2	1.8%
	Not reducing the cavity walls (leading to cavity wall fracture, making the tooth hopeless)	2	1.8%
	Rendering treatment without informing the patient	2	1.8%
	Complete evacuation of gutta-percha during root canal preparation for a post-and-core treatment (leading to abscess formation, making the tooth hopeless)	2	1.8%
	Missed root canal(s)	2	1.8%
	Over-contoured implant-supported crowns	2	1.8%
	Dissatisfaction with crown color match	1	0.9%
	Trauma to the patient's lip due to anesthetic syringe needle stick	1	0.9%
	Fracture of the abutment tooth crown during removal of the bridge	1	0.9%
	Trauma to the adjacent tooth during surgery	1	0.9%
	Removing the bridge without informing the patient	1	0.9%
	Restoring the tooth without informing the parents	1	0.9%
	Extrusion of gutta-percha from the root end	1	0.9%
	Under-obturation (leading to abscess formation, making the tooth hopeless)	1	0.9%
	<b>Total</b>		107

## Discussion

Similar to other healthcare providers, dentists aim to promote patients' health. Despite all the efforts, unfavorable outcomes might be achieved. The present study is the first one to evaluate procedural errors leading to lawsuits in dentistry by evaluating the dentists' and plaintiffs' demographic data. The study was carried out in three large dental clinics in Tehran. The patients' complaints are not properly recorded and classified; therefore, only a limited number of studies are available to compare them with the present study.

The present study showed that the most frequent complaints were therapeutic, consistent with a study by Kiani et al [9]. The present study results showed that the most frequent dental fields involved in lawsuits were prosthodontics, endodontics, and surgery, consistent with a study in Spain [13, 14]. Besides, these findings are consistent with two studies in Tehran, in which the most frequent treatments leading to lawsuits were prosthodontic procedures [15]. In addition, in two previous studies in Sweden and the United States, too, the most frequent complaints were related to prosthodontics [16, 17], which might be because prosthetic

treatments are expensive, complex, and varied, and the dentist should cooperate with dental laboratories, too, increasing the odds of errors and patient complaints compared to other dental fields. Besides, patients' high expectations from the treatment results and psychological factors in some patients give rise to increased frequency of complaints in this field. The frequencies of complaints in the fields of restorative dentistry and periodontics were low in the present study, consistent with a study by Kiani et al. This might be attributed to a low rate of patients' awareness and knowledge about these fields. The lowest frequency of complaints was related to the field of pedodontics, which might be attributed to the short duration of the presence of deciduous teeth in children's oral cavities and the low expectation of parents from the treatment outcomes.

In the present study, most plaintiffs were in the 30–49 age range. In this context, in a study by Pakk et al, too, in Sweden, most plaintiffs were 40–59 years old, and in the study by Pinchi et al in Italy, they were mostly 30–40 years of age, consistent with the present study. This might be attributed to a higher rate of

dental caries in this age range and a higher need for dental treatments with a higher referral rate of the patients for dental procedures [13, 18].

In the present study, most plaintiffs were female, consistent with studies by Moles et al, Shahsavari et al, and Pukk et al [1, 3–5]. Women's predominance of filing lawsuits compared to men might be due to the greater attention and higher sensitivity of women to their health and esthetic appearance than men. However, in a study by Kiani et al in Tehran, most plaintiffs were male [9].

The plaintiffs in the present study were mostly high school graduates and associate and bachelor's degree holders. Unfortunately, no comprehensive study is available to have evaluated the demographic data of patients filing lawsuits against dental practitioners. Even in similar studies, too, the plaintiffs' demographic data have not been evaluated with such detail, which might be because the community members' educational levels are mostly in this range.

Studies in Tehran, Riyadh, and the United Kingdom have shown that the lawsuits have been filed against general dental

practitioners in most cases, and most convicts have been in this group, with the majority of specialists being acquitted. This is because dental specialists usually select patients according to their academic and practical abilities due to higher knowledge and skill levels, decreasing the frequency of complaints against them [15, 19].

In the present study, more than half of the complaints were against dental practitioners with <10 years of experience, indicating that dentists' procedural errors decrease over time with an increase in their clinical experience, resulting in a decrease in lawsuits against them. This finding is consistent with a study by Jafarian et al, who concluded that an increase in the dental practitioners' experience to >15–20 years decreased the frequency of lawsuits against them [20]. This might be attributed to dentists' greater skill and experience in rendering the treatment and interacting with patients more effectively.

In the present study, an attempt was made to evaluate the plaintiffs' demographic data details and treatment processes. The error type that has been evaluated in a limited number of studies was evaluated in the present study. The present study

showed that dentists should be very careful in proper patient selection (proportional to their academic and practical skills). Besides, it is necessary to increase dentists' theoretical knowledge and practical skills in the diagnosis and treatment planning and in establishing a rapport with the patients to decrease errors and patient dissatisfaction and lawsuits against them.

Lawsuits against dentists are increasing in Iran, which might be due to an increase in dentists' knowledge and dental treatments, patients' interest in preserving their teeth, and an increase in patients' dental visits. Besides, patients' knowledge of their legal rights has increased in recent years. Increasing dentists' awareness and knowledge about dental lawsuits might increase their awareness, resulting in increased attention to details during treatment. Unfortunately, a large number of dental clinics and centers lack a system to record lawsuits. Besides, some clinics were not interested in cooperating and allowing access to the lawsuit cases.

### Conclusion

One of the most important ways to avoid errors that lead to lawsuits is to increase dental

practitioners' awareness and knowledge about previous lawsuits. Knowledge about the most frequent causes of lawsuits and the provision of institutional guidelines will help decrease such cases.

### Conflicts of interest

The authors declare no competing interest.

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