ORIGINAL ARTICLE

Comparison of distribution and frequency of impacted teeth before and during COVID-19 pandemic in dental hospital: a descriptive study

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ABSTRACT

Introduction: The occurrence of the COVID-19 pandemic may affect the prevalence of patients with complaints of impacted teeth in dental hospital Faculty of Dentistry University of Indonesia (FKG UI), and there is no recent research on the distribution and frequency of impacted teeth based on age, gender, and teeth type in this hospital during the COVID-19 pandemic. This study aims to determine the distribution and frequency of impacted teeth during the COVID-19 pandemic in dental hospitals. **Methods:** A descriptive study uses the secondary data on impacted teeth patient's medical records. Utilizing purposive sampling, we selected participants for the research by carefully examining medical records to identify individuals that had undergone impacted tooth removal. The study used secondary data from the medical records of oral surgery patients at dental hospital FKG UI from June 2019 to June 2021, including complete patient identity, clinical diagnosis, and panoramic radiograph of the impacted teeth in June 2019 to June 2021. Diagnosis was determined through screening of medical records and panoramic radiographs. Data were analyzed using the statistical analysis software (SPSS version 21, IBM Corp.) **Results:** From 3,225 medical records of oral surgery patients at dental hospital FKG UI before and during COVID-19 pandemic, A total of 1292 patients were included in the study and 1496 impacted teeth cases were found. The frequency of impacted teeth cases before the pandemic was 825 (55.1%) cases; there were 671 (44.9%) cases during the pandemic. **Conclusion:** COVID-19 has caused a decrease in the distribution and frequency of impacted teeth cases, mostly in the middle aged patients, while more female as compared to male. The most common occurrence was in the third molars and the lowest was in the second molar tooth.

KEYWORDS

tooth, impacted, COVID-19

INTRODUCTION

The COVID-19 pandemic caused by the coronavirus results in respiratory tract infections. Transmission of this coronavirus in dentistry can occur through direct contact (person-to-person) and also indirectly through aerosols and droplets that can be inhaled. A non-emergency dental practice should be postponed to prevent the spread of the virus. Based on a research study at the University of Washington Department of Oral and Maxillofacial Surgery in 2020, it was concluded that the number of patients with cases of odontogenic infection had decreased compared to before the COVID-19 pandemic.[1–3]

An impacted tooth is a tooth that fails to erupt entirely in the dental arch within the expected timeframe. If impacted teeth are left untreated, the patients are at high risk for odontogenic infection, periodontal disease, cyst or tumour formation, and caries. This is why impacted teeth need to be removed as soon as possible. Teeth become impacted because of less dental arch length and space for the tooth to erupt.[4-6] Third molar have more incidence of getting impacted eruption due to the obstruction in the

path of eruption. The prevalence of impacted teeth in several studies may vary, which can be seen from various variables.[7] Study research showed 1602 cases of an impacted tooth from 3632 patients with a patient age range of 17 to 30 years. It was found that more cases of impacted teeth occurred in women (57.4%) than men (42.6%).[6,8]

All impacted teeth should be carried out for removal, unless removal is contraindicated. The mandibular third molar impaction is higher than any other teeth in the oral cavity. It is said that due to the inadequate space between the distal of the second molar and the anterior ascending ramus. Impacted teeth can cause an inflammatory process, resulting in pain, swelling and may destroy adjacent teeth and bone. Study in Pakistan showed the most common presenting chief complaint of the patient with impacted mandibular third molar was pain 39.8% followed by caries of distal surface of second and mesial surface of third molar 18.8% followed by pericoronitis (15.2%) and periodontal disease (13%).[9-11] It may also predispose to an advanced periodontal disease and caries to the adjacent teeth and surrounding bone. Therefore, ideally all impacted third molar should be removed, unless contraindicated.[12-15] The frequent indication of third molar removal is pericoronitis, dental caries, orthodontic treatment, periodontal disease, facial pain, root resorption and odontogenic cyst and tumour, and pain of unexplained origin.[16-20]

The high prevalence of impacted teeth and the COVID-19 pandemic interest the authors in seeking more information about this. This study aims to know the effect of the COVID-19 pandemic on the distribution and frequency of impacted teeth at dental hospital faculty of dentistry university Indonesia compared to before the pandemic. Non-emergency dental practice should be postponed to prevent the spread of the virus, therefore the distribution and frequency in impacted teeth cases could be affected. The novelty of our study lies in the exploration of the distribution and frequency of impacted teeth before and during the COVID-19 pandemic within a dental hospital setting. By comparing these patterns, we aim to provide valuable insights into how the pandemic may have influenced the prevalence and characteristics of impacted teeth, contributing to a better understanding of oral health trends during this unprecedented global health crisis.

METHODS

This research was a descriptive retrospective study. The study used secondary data from the medical records of oral surgery patients at the Oral Surgery Clinic at dental hospital FKG UI from June 2019 to June 2021. Utilizing purposive sampling, we selected participants for the research by carefully examining medical records to identify individuals that had undergone wisdom tooth removal. Inclusion criteria include medical records of oral surgery patients at PPDGS Oral Surgery Clinic dental hospital FKG UI with complete patient identity, clinical diagnosis, and panoramic radiograph of the impacted teeth from June 2019 to June 2021. This research was conducted at the Oral Surgery Clinic, Rumah Sakit Khusus Gigi dan Mulut FKG UI from May to August 2021.

The data were determined by screening patient medical records and panoramic radiographs that had been collected by the author directly and divided into two groups: before and during the pandemic. Total data collected were 3255 medical records from June 2019 until June 2021. This was done to determine the difference in the distribution and frequency of impacted teeth cases from both time frames. Data calculated as data before the pandemic were from June 2019 to March 2020, and during the pandemic was from June 2020 to June 2021.

Data before the pandemic were only until March 2020 because, in April and May 2020, dental hospital FKG UI was closed due to the COVID-19 pandemic and only accepted patients via telemedicine. Telemedicine consultations in dental hospital FKG UI at that time were recorded in 29 patients, with 11 cases of impaction found. After April to May 2020 data that were collected were not from telemedicine because the dental hospital FKG UI had opened the hospital again.

The data were analyzed with IBM SPSS Statistics v. 26.0 software. A descriptive analysis was used in this study. Each group was analyzed with the existing variables in this study. Nominal data were reported as percentage frequency or as number and percentage n (%) with a table of analysis results.

RESULTS

After the research process, by observing data from a total of 3255 patients' medical records, there were a total of 2080 cases of impacted teeth. However, the total sample that met the inclusion criteria was 1496 cases because the data for the rest of the cases did not have completed data with a panoramic radiograph. The impacted tooth cases that met the criteria were found in a total of 1292 records of medical patients at Oral Surgery Clinic dental hospital FKG UI from June 2019 to June 2021. From these data, it could be concluded that there was a decrease of 18.7% in impacted tooth cases from before the pandemic and during the pandemic due to fewer number of patients coming for dental treatment

Table 1. Distribution and frequency of impacted teeth based on visiting period in oral surgery department at dental hospital FKG UI

Visit period	Frequency	Percentage (%)
Before pandemic	825	55.1
During pandemic	671	44.9
Total	**1496**	**100**

Table 1 describes data on impacted cases that occurred before the pandemic from June 2019 to March 2020 and during the pandemic from June 2020 to June 2021. From the table, it can be observed that there was a significant decrease in the number of cases of the impacted tooth before the pandemic and during the pandemic. Before the pandemic, which was calculated from June 2019 to March 2020, as many as 825 (55.1%) impacted tooth cases were found. Meanwhile, during the pandemic, from June 2020 to June 2021 671 (44.9%) cases of an impacted tooth were found.

Table 2. Distribution and frequency of impacted teeth based on patient's gender before and during the pandemic

Visit period	Gender	Frequency	Percentage (%)
Before pandemic	Female	452	63.3
	Male	262	36,7
	Total	**714**	**100**
During pandemic	Female	385	66,6
	Male	193	33,4
	Total	**578**	**100**

After observing a total of 1292 medical records of patients who met the criteria. In the study sample, it was found that there were 714 patients who experienced cases of an impacted tooth before the pandemic and 578 patients during the pandemic. From Table 2 it can be seen that the gender of 714 patients who experienced impaction cases before the pandemic 452 (63.3%) of them were women and 262 (36.7%) were men. Table 2 shows a table of patients during the pandemic. From 578 patients, there were 385 (66.6%) female patients and 193 (33.4%) patients male.

Table 3. Distribution and frequency of impacted teeth based on patient's age in oral surgery patients at dental hospital FKG UI before and during the pandemic

Visit period	Age	Frequency	Percentage (%)
Before pandemic	11-20	60	8,4
	21-30	492	68,9
	31-40	130	18,2
	41-50	24	3,4
	51-60	7	1
	61-70	1	0,1
	Total	**714**	**100**
After pandemic	11-20	58	10
	21-30	406	70,2
	31-40	84	14,5
	41-50	18	3,1
	51-60	9	1,6
	61-70	2	0,3
	71-80	1	0,2
	Total	**578**	**100**

From 1292 patient medical records, the age range of patients who experienced impacted teeth was also observed. Table 3 shows the age of patients who experienced impacted tooth cases before the pandemic. The number of patients who experienced the most cases of impacted tooth aged 21-30 was 492 (68.9%) patients, followed by patients aged 31-40 years with 130 (18.2%) patients; then for patients aged 11-20 years, there were 60 (8.4%) patients; for patients aged 41-50 years, there were 24 (3.4%); for patients aged 51-60 years were 7 (1%), and for patients aged 61-70 years, there was 1 (0.1%) patient.

Also in table 3, the age of patients who experienced impacted tooth cases during the pandemic can be seen. Patients who experienced the most impacted tooth cases were patients with an age range of 21-30 years with 406 (70.2%) patients, followed by patients aged 31-40 years with 84 (14.5%) patients; then for patients aged 11-20 years, there were 58 (10%) patients; for patients aged 41-50 years, there were 18 (3.1%) patients; for patients aged 51-60 years, there were 9 (1.6%) patients, and for patients aged 61-70 years, there were 2 (0.3%) patients, and 1 (0.2%) patient for age 71-80 years.

Table 4.Distribution and frequency of impacted teeth based on tooth type in oral surgery patients at dental hospital FKG UI before and during the pandemic

Visit period	Tooth type	Frequency	Percentage (%)
Before pandemic	Incisive 1	1	0,1
	Molar 2	1	0,1
	Molar 3	818	99,2
	Premolar 1	2	0,2
	Supernumerary	3	0,4
	Total	**825**	**100**
During pandemic	Caninus	4	0,6
	Incisive 1	2	0,3
	Incisive 2	1	0,1
	Molar 2	1	0,1
	Molar 3	659	98,2
	Premolar 2	1	0,1
	Supernumerary	3	0,4
	Total		**100**

From Table 4, the results of the data on the variable type of teeth impacted before the pandemic can be observed. The most common type of impacted tooth before the pandemic was third molars 818 (99.2%) teeth, followed by supernumerary tooth with 3 (0.4%) teeth, then for first premolars, there were 2 (0.2%) teeth, and for second molars 1 (0.1%) and primary incisive 1 (0.1%) tooth.

Also in Table 4, the type of impacted teeth of patients who experienced impacted teeth during the pandemic can be seen. The most common occurrence was in the third molars 659 (98.2%) teeth, followed by 4 canines (0.6%) teeth, then 3 supernumerary teeth (0.4%), primary incisive were 2 (0.3%) teeth, second premolars was 1 (0.1%) tooth, lateral incisive was 1 (0.1%) tooth, and the second molar was 1 (0.1%) tooth.

DISCUSSION

The results of the study,by taking data from 3255 patient medical records, found a total of 2080 cases of impaction. There was an 18.7% decrease in impacted teeth cases during the pandemic when compared to before the pandemic. During the pandemic, there were only 671 (44.9%) cases, and before the pandemic, there were 825 (55.1%) impaction cases (Table 1). Previous study by Arabion, et al.,[6] in Medina et al.,[8] that was held before the pandemic showed 1602 cases of an impacted tooth from 3632 medical records with patient age range in 17 to 30 years. This decrease occurred due to the COVID-19 pandemic. In order to prevent the chain of virus spread, non-emergency dental care had to be postponed which resulted in fewer patients during the pandemic.[3] Impacted tooth treatment that was postponed could cause inflammatory process, resulting in pain, swelling and might destruct adjacent teeth and bone.[9] It might also predispose to an advanced periodontal diseases and caries to the adjacent teeth and surrounding bone. Therefore, ideally all impacted third molar should be removed, unless contraindicated.[12-15]

Based on gender (Table 2), the numbers of patients with impacted teeth both before and during the pandemic were 452 (63.3%) and 385 (66.6%), and were dominated by females. The study conducted in Kuwaiti by Ali, et al.,[7] had the same results too, from a total of 932 cases there were 411 (44%) males and 521 (56%) females. Study by Samrina, et al.,[8] also showed the same thing from a total of 43 cases studied there were 28 (65.1%) females and 15 (34.9%) male. These results were supported by Hellman's (1936) statement that the growth of the jaw in women stops before the third molar eruption, whereas in males, jaw growth continues even after the third molar eruption period.[8]

Based on the age of patients (Table 3) those with impacted teeth before the pandemic were 492 (68.9%) patients and during the pandemic 406 (70.2%) patients and they were most commonly found in the age range of 21 to 30 years. While the least group of age before pandemic of 1 (0.1%) patient and during pandemic 1 (0.2%) patients was over 60 years old. The results of this study are the same as the research conducted by Wazir, et al.,[9] out of a total of 89 patients who experienced impacted teeth, the most impacted teeth cases occurred with patients in the age range of 21-30 years; there were 60 (55.5%) patients and the fewest were patients aged 41-50 years; there were 4 (4.4%) patients.

In this study, it was found that the most common type of impacted teeth was third molars, 818 (99.2%) patients before the pandemic and 659 (98.2%) patients during the pandemic (Table 4). Research by Arabion, et al.,[6] also showed the same results, from 1602 cases it was found that the most cases of impacted teeth occurred in the third molars of 1156 (31.8%). Studies by Al-Ramil et al.,[10] showed the same results too from 355 cases of impacted teeth, the type of tooth that experienced the most impact was the third molar, which was 223 (62.8%). This can be related to the statement of Hupp et al.,[4] that the third molar is the most often impacted tooth because it is the last tooth that erupts so it is most likely to be affected and has insufficient space for a complete eruption.

The decrease of impacted tooth cases in pandemic was affected by COVID-19 pandemic (Table 4). Study at the University of Washington Department of Oral and Maxillofacial Surgery in 2020, also showed that the number of patients with cases of odontogenic infection had decreased compared to before the COVID-19 pandemic.[1–3] This resulted in respiratory tract infection where the transmission of this

coronavirus in dentistry could occur through direct contact (person-to-person) and also indirectly through aerosols and droplets that could be inhaled. As a result non-emergency dental practice had to be postponed to prevent the spread of the virus.[1–3]

The limitation of this research was that some data for patient medical records were not included because panoramic radiography were not available and some data were not completed. Some research samples did not meet the criteria because the panoramic radiograph and the data of diagnosis in the medical record were not complete, so the total number of samples that met the research criteria was only 1496 cases of impacted teeth. Impacted cases that meet these criteria were found in a total of 1292 medical records of patients at the PPDGS Oral Surgery Clinic of dental hospital FKG UI from June 2019 to June 2021.

CONCLUSION

In our study, COVID-19 pandemic had caused a decrease in the distribution and frequency of impacted teeth cases, mostly in the middle aged patients, while there were more females as compared to male. The most common occurrence was in the third molars and the lowest was in the second molar tooth.

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