

# Impacts of COVID-19 Pandemic on Oral Health of Patients Visiting Penang International Dental College (PIDC) Clinic

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## Abstract

**Background:** The COVID-19 pandemic has become a major public health crisis for countries all around the world and has brought major challenges to the dental sector, including maintaining dental care coverage throughout Malaysia. The objectives of this study are to identify major dental problems faced and relief measures adopted during lockdown.

**Methods:** A cross-sectional study was done using questionnaires containing 2 sections with a total of 16 questions with 3 on personal information and 13 on oral health complications faced during the imposed lockdown. The questionnaires were distributed among 100 patients seeking dental treatment in Penang International Dental College (PIDC).

**Results:** 100 responses were collected which included 37 males and 63 females from 13 years to 72 years of age. The most common oral problems faced by participants was toothache (31%) followed by gingivitis (16%) and mouth ulcer(s) (12%). The main relief measures taken by participants was by visiting the dental clinic, which included half of the participants (50%).

**Conclusion:** It is essential that during times of crisis such as the COVID-19 pandemic, that dental care will always be available and in reach to the public, so that patients do not suffer from the complications of their oral health problems.

**Keywords:** COVID-19; Oral health; Survey; Questionnaire

## Introduction

The COVID-19 pandemic has become a major public health crisis for countries all around the world. The World Health Organization (WHO) had to declare a public health emergency of international concern as a response to this global outbreak [1]. With dentistry being a context of high contraction risk and the international supply of Personal Protective Equipment (PPE) compromised, the pandemic has brought major challenges to the dental sector, including maintaining dental care coverage throughout Malaysia [2]. The impact of COVID-19 on dental patients is that they have noticed patients presenting with more severe oral diseases such as bleeding gums, swollen gums, toothache, wisdom tooth pain, foul mouth odor, mouth ulcer(s) and jaw pain (restricted mouth opening/discomfort while eating) [1]. Patients who were undergoing dental treatment when the lockdown was announced have been the worse affected due to discontinued treatment and persistent dental problems. Those who have missed routine dental check-ups or have neglected minor oral health issues have had to either resort to home remedies or continue previously prescribed medication. Patients who have developed dental problems during this partial shutdown of services have had to adopt newer methods of dental consultation [3].

Zhang S et al., conducted a nationwide online cross-sectional questionnaire survey based on 22 questions. A total of 3352 valid questionnaires were collected and results showed that gingival bleeding, bad breath and oral ulcers were the three most common oral problems encountered by participants from Wuhan. The study also displayed that adults in Wuhan were suffering more oral problems compared to people from other places in China [4]. Swift et al., conducted a scoping review

process where they mapped and summarized the evidence to identify the impact of COVID-19 on individual oral health. It included 85 studies conducted in 23 countries across the world using the United Nations Geoscheme system. The results show that the pandemic has impacted the oral health of individuals where there was significant decline in utilization of dental services due to lockdown, increase in frequency of oral hygiene maintenance at home, increase use of teledentistry and increase in use of online searches and social media regarding oral health related concerns during the pandemic [5-7].

The objective of this study is to identify major dental problems faced and relief measures adopted during lockdown. This study is a cross-sectional study with questionnaires distributed among patients of Penang International Dental College (PIDC) from the years 2021-2022 nearly 15 months after completion of the imposed lockdown in Malaysia. The objective pattern survey titled "Impact of COVID-19 lockdown on Oral Health of patients visiting PIDC Clinic" had been distributed among 100 patients who visited PIDC clinic during the year 2021-2022. The questionnaire consists of two sections; the first section containing a detailed description of the survey stating the aim of the study as well as the informed consent of the participant. The second section consists of 16 questions (3 on personal information and 13 on oral health complications). The questionnaire is generalized for all age groups. The objective

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of the survey was explained to the participants and informed consent was gained before proceeding with the questions.

## Methodology

The study is a cross-sectional study with questionnaires distributed among 100 patients of Penang International Dental College (PIDC) from the years 2021-2022 nearly 15 months after completion of the imposed lockdown in Malaysia. This survey was carried out at the patient waiting area in PIDC. The objectives of the study were briefly explained to each patient and their consent was gained before proceeding with the questions. Patients above 13 years of age were selected to be the participants of this study so that they are capable of answering the questions themselves without depending on a parent or guardian. The questionnaire consists of two sections. The first section containing a detailed description of the survey stating the aim of the study as well as the informed consent of the participant. The second section consists of 16 close ended questions where 3 questions are based on personal information and 13 on oral health complications. The participants were asked to sign and include the date of filling the questionnaire at the right corner of the final page for patient identification purposes and to avoid the repetition of participants.

Inclusion criteria of our study include patients who faced oral health complications during COVID-19 pandemic such as trismus, pericoronitis, abscess, radicular cysts and periodontitis as well as patients above the age of 13 years. Exclusion criteria include patients who prefer not to participate in the study and patients below 13 years of age. The advantage of our study method is uniformity, where all respondents were asked exactly the same questions and given restricted answers. Our method is also cost effective because only the patients who visited PIDC clinic were considered as potential respondents. As the questions are close ended type, patients have sufficient time to think and provide immediate answers so that is time saving as well.

## Results

We obtained a total of 100 valid questionnaires in this survey. A total of 63 participants were female and the rest were male with age ranging from 13 years to 72 years old (Table 1). Maximum people belong to age group of 23 years to 32 years (58 responses) and the least is from the age group 63 years to 72 years old (2 responses).

Table 2 shows age distribution according to survey questions. In question 4, most respondents from each age group evaluated their oral health to be average with 52 responses whereas from the highest age group which is 23 years to 32 years old, 27 respondents evaluated their oral health as good (46.55%). In question 5, for the age group 13 years to 22 years and 23 years to 32 years, majority brushes their teeth twice daily, whereas for age group 33 years and above, most of them brush their teeth only once daily. In question 6, majority of the age groups are more concerned about their oral health during the pandemic, except for the age group 43 years to 52 years where most respondents were not concerned (55.55%). Next, in question 8, for the age group 13 years to 22 years and 23 years to 32 years, their oral complication did not affect their quality of life with 8 respondents (61.54%) from 13 years to 22 years old and

40 respondents (69%) from 23 years to 32 years old whereas the majority of the other age groups answered that their oral complication does affect their quality of life. In question 9, 60 respondents from all age groups were worried about not being able to get dental professional diagnosis and treatment in time during the pandemic with the highest being from age group 23 years to 32 years (53.45%). Furthermore, in question 10, most respondents from all age groups answered yes to knowing that through dental diagnosis and treatment operations, infectious diseases may spread (COVID-19, hepatitis, Human Immunodeficiency Virus (HIV)). In question 12, Most of the participants agreed that their oral health problems improved after ignoring it/using home remedies/consulted professionals online/going to the dental clinic. However, a small amount of participants which are 2 (100%) from age group 63 years to 72 years did not agree to the question. For question 13, most respondents from age group 13 years to 22 years and 23 years to 32 years did not feel reluctant to visit the dental clinic during the pandemic with 61.54% and 53.45% respectively, whereas for the other age groups, majority feel reluctant to visit the dental clinic during the pandemic. Lastly, for question 14, majority of respondents from all age groups will pay more attention to their oral hygiene.

Table 3 shows the age distribution of different oral problems faced by patients. In the youngest age group which is from 13 years to 22 years old, a majority of them being 4 (30.77%) did not experience oral problems and for the age group with the highest number of participants which is from 23 years to 32 years old, most of them also did not experience any oral problems which was a total of 16 (27.59%). For the age groups 33 years to 42 years, 43 years to 52 years, 53 years to 62 years and 63 years to 72 years, the main oral problem encountered by participants is toothache with 6 (75%) of respondents from age group 33 years to 42 years, 6 (66.67%) respondents from age group 43 years to 52 years, 8 (80%) of respondents from age group 53 years to 62 years and 2 (100%) of respondents from age group 63 years to 72 years.

Table 4 shows the frequency and percentage of oral problems faced by participants. 31 (31%) of participants had toothaches while 1 (1%) of participants had halitosis.

Table 5 displays the age distribution of different relief measures taken by participants. In the youngest age group of 13 years to 22 years, majority of 9 (69.23%) participants went to the dental clinic. In the age group 23 years to 32 years, 29 (50%) of participants went to the dental clinic while in the age group 33 years to 42 years, 5 (62.5%) of participants went to the dental clinic. Next, 4 (44.44%) of participants went to the dental clinic from the age group of 43 years to 52 years. A total of 4 (40%) of participants from the age group of 53 years to 62 years went to the dental clinic as a relief measure. Lastly, from the age group 63 years to 72 years, 2 (100%) of participants used home remedies to relieve their oral problems.

Table 6 shows the frequency and percentage of relief measures taken by participants. A total of 50 (50%) of participants went to the dental clinic, followed by 32 (32%) using home remedies, 13 (13%) ignoring it and 5 (5%) decided to consult professionals online.

**Table 1: Age and gender distribution of questionnaire respondents**

Age (Years)	13-22	23-32	33-42	43-52	53-62	63-72	Total
<b>Gender</b>							
Male	4	20	2	4	6	1	37
Female	9	38	6	5	4	1	63
<b>Total</b>	13	58	8	9	10	2	100

**Table 2: Age distribution according to survey questions**

Age	13-22 (n=13)	23-32 (n=58)	33-42 (n=8)	43-52 (n=9)	53-62 (n=10)	63-72 (n=2)
Question 4: During this pandemic, how would you evaluate your oral health?						
0- Very poor	–	–	–	–	–	–
1- Poor	–	2 (3.45%)	–	1 (11.11%)	1 (10%)	1 (50%)
2- Average	8 (61.54%)	24 (41.38%)	6 (75%)	5 (55.55%)	8 (80%)	1 (50%)
3- Good	5 (38.46%)	27 (46.55%)	2 (25%)	3 (33.33%)	1 (10%)	–
4- Very good	–	5 (8.62%)	–	–	–	–
Question 5: How many times a day do you brush your teeth/perform oral care						
0- Never	–	–	1 (12.5%)	2 (22.22%)	3 (30%)	–
1- Once a day	1 (7.69%)	3 (5.17%)	5 (62.5%)	5 (55.55%)	6 (60%)	2 (100%)
2- Twice a day	12 (92.3%)	51 (87.93%)	2 (25%)	2 (22.22%)	–	–
3- Thrice a day	–	4 (6.9%)	–	–	–	–
4- More than thrice a day	–	–	–	–	–	–
Question 6: During the pandemic, are you more concerned regarding your oral health?						
0- Yes	8 (61.54%)	31 (53.35%)	6 (75%)	4 (44.44%)	5 (50%)	1 (50%)
1- No	5 (38.46%)	27 (46.55%)	2 (25%)	5 (55.55%)	5 (50%)	1 (50%)
Question 8: During the pandemic, did your oral complication affect your quality of life?						
0- Yes	5 (38.36%)	18 (31.03%)	8 (100%)	5 (55.55%)	9 (90%)	2 (100%)
1- No	8 (61.54%)	40 (69%)	–	4 (44.44%)	1 (10%)	–
Question 9: Were you worried about not being able to get dental professional diagnosis and treatment in time during the pandemic?						
0- Worried	8 (61.54%)	31 (53.45%)	7 (87.5%)	4 (44.44%)	9 (90%)	1 (50%)
1- Not worried	5 (38.46%)	27 (46.55%)	1 (12.5%)	5 (55.55%)	1 (10%)	1 (50%)
Question 10: Do you know that through dental diagnosis and treatment operations, infectious diseases may spread?						
0- Yes	8 (61.54%)	43 (74.14%)	3 (37.5%)	7 (77.77%)	8 (80%)	1 (50%)
1- No	5 (38.46%)	15 (25.86%)	5 (62.5%)	2 (22.22%)	2 (20%)	1 (50%)
Question 12: Do you think your oral health problems improved after ignoring it/using home remedies/ consulted professional online/going to the dental clinic?						
0- Yes	8 (61.54%)	44 (75.86%)	4 (50%)	4 (44.44%)	6 (60%)	–

1- No	5 (38.46%)	14 (24.14%)	4 (50%)	5 (55.55%)	4 (40%)	2 (100%)
Question 13: Do you feel reluctant to visit dental clinics during the pandemic?						
0- Yes	5 (38.46%)	27 (46.55%)	4 (50%)	6 (66.67%)	6 (60%)	2 (100%)
1- No	8 (61.54%)	31 (53.45%)	4 (50%)	3 (33.33%)	4 (40%)	—
Question 14: After the pandemic is over, will you pay more attention to your oral hygiene?						
0- Yes	12 (92.31%)	57 (98.28%)	8 (100%)	9 (100%)	10 (100%)	2 (100%)
1- No	1 (7.69%)	1 (1.72%)	—	—	—	—

**Table 3: Age distribution of different oral problems faced by participants**

Age	13-22 (n=13)	23-32 (n=58)	33-42 (n=8)	43-52 (n=9)	53-62 (n=10)	63-72 (n=2)
Oral Problems						
Gingivitis	2 (15.38%)	10 (17.24%)	1 (12.5%)	2 (22.22%)	1 (10%)	—
Gingival enlargement	—	2 (3.45%)	1 (12.5%)	—	—	—
Toothache	3 (23.08%)	5 (8.62%)	6 (75%)	6 (66.67%)	8 (80%)	2 (100%)
Wisdom tooth pain	1 (7.69%)	8 (13.79%)	—	—	—	—
Halitosis	—	—	—	—	1 (10%)	—
Mouth ulcer(s)	1 (7.69%)	11 (18.97%)	—	—	—	—
Jaw pain (restricted mouth opening/discomfort while eating)	—	2 (3.45%)	—	—	—	—
Other oral problems	2 (15.38%)	4 (6.9%)	—	—	—	—
Did not experience oral problems	4 (30.77%)	16 (27.59%)	—	1 (11.11%)	—	—

**Table 4: Frequency and percentage of oral problems faced by participants**

Oral Problems	Frequency n=100	Percentage
Gingivitis	16	16%
Gingival enlargement	3	3%
Toothache	31	31%
Wisdom tooth pain	9	9%
Halitosis	1	1%
Mouth ulcer(s)	12	12%
Temporomandibular disorder	2	2%
Other oral problems	5	5%
Did not experience oral problems	21	21%

**Table 5: Age distribution of different relief measures taken by participants**

Age	13-22 (n=13)	23-32 (n=58)	33-42 (n=8)	43-52 (n=9)	53-62 (n=10)	63-72 (n=2)
Relief Measures						
Ignored It	4 (30.77%)	8 (13.79%)	1 (12.5%)	1 (11.11%)	1 (10%)	–
Used home remedies	–	19 (32.76%)	2 (25%)	3 (33.33%)	3 (30%)	2 (100%)
Consulted professionals online	–	2 (3.45%)	–	1 (11.11%)	2 (20%)	–
Went to the dental clinic	9 (69.23%)	29 (50%)	5 (62.5%)	4 (44.44%)	4 (40%)	–

**Table 6: Frequency and percentage of relief measures taken by participants**

Relief Measures	Frequency n=100	Percentage
Ignored It	13	13%
Used home remedies	32	32%
Consulted professionals online	5	5%
Went to the dental clinic	50	50%

## Discussion

This study aimed to evaluate the impacts of COVID-19 pandemic on oral health and the relief measures adopted by patients visiting Penang International Dental College (PIDC) Clinic. The sample was an acceptable representation of the different age ranges. In total, 79% (79/100) of participants experienced oral health problems during the pandemic. These values are higher than the results of a previous study conducted at the end of the quarantine period, in which less than 50% of participants felt they did not encounter any concerning oral health issues. The results showed that of the participants who expressed concern about having oral health problems and visited PIDC clinic, 63% (63/100) were women. This is in agreement in which it is reported that women had more anxiety and apprehension than men about oral health [8,9]. Noticeably, half of the participants 50% (50/100) answered that they're not reluctant to visit dental clinic during the pandemic and 31(31%) of them are from the age group of 23 years to 32 years. For the age groups 33 years to 42 years, 43 years to 52 years, 53 years to 62 years and 63 years to 72 years, the main oral problem encountered by participants is toothache (31%) followed by gingivitis (16%). Similarly, in a study conducted previously by Sing S in India, Among those who required dental consult, toothache was the most commonly encountered complaint (18.4%) followed by gingival swelling (15.8%).

More than half of the participants 55% (55/100), particularly in the age group of 23 years to 32 years said that they brush twice and more daily during the pandemic period showing more interest in oral health. Whereas in the age group of 53 years to 62 years, 90% of the participants either don't brush at all or brush just once a day. Similarly, Vercelino et al., noted that individuals

had a lower frequency of tooth brushing during the lockdown and this was closely associated with an increased prevalence of halitosis. All the participants (100%) from the age group of 33 years to 42 years agreed that their oral health condition during the pandemic did affect their quality of life. The quality of life in which, given its focus on physical functioning, psychological well-being and pain and discomfort, looks suspiciously like a measure of health status [10].

About 50% (50/100) of participants responded that they had visited a dental clinic as a measure to relieve their oral health problem during the lockdown. Notably, 29 (29%) of them were from the age group of 23 years to 32 years. Whereas, 29 (29%) of the participants used home remedies. Similarly, in the study conducted by Sing S, patients were forced to resort to home based remedies and self medication that was evident in 30.2% in the absence of access to regular dental care during the lockdown [3]. This study presents some limitations as it is a survey based study and thus information is self reported. However, it also presents some strengths, such as the reasonable number of participants, the good representation of the population and its depiction of the situation of patients visiting PIDC clinic.

## Conclusion

It can be concluded from our study that most participants did not encounter any oral health problems during the COVID-19 pandemic lockdown. However, based on the findings of our present survey, toothaches and gingivitis were the main oral problems faced by participants. Despite the imposed lockdown, a majority of the participants were willing to visit dental clinics to treat their oral problems. It is essential that during times of crisis such as the COVID-19 pandemic,

that dental care will always be available and in reach to the public, so that patients do not suffer from the complications of their oral health problems. By doing so, oral health and hygiene can be maintained well to ensure optimum quality of life of the population.

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