

Public Response to an Oral Health Promotion Disseminated Via YouTube during the COVID-19 Pandemic: A Study in an Indonesian Population

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Abstract

COVID-19 is a disease caused by the virus strain severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The COVID-19 pandemic has had a negative impact on access to public health facilities, including dental health clinics, with many practices closed to prevent the spread of the disease. Additionally, the trend of self-medication has also increased, which may cause further development into secondary disease responses and will make curing the disease more difficult. Teledentistry, where there is no direct contact with the dental practitioner, can serve as an alternative to conventional dental health care during the COVID-19 pandemic. The aim of this study was to investigate the correlation of self-medication behavior and response of the public (watched and commented on) to the promotion of oral health through YouTube social media during the COVID-19 pandemic and the characteristics of the Indonesian viewers who accessed oral health information via YouTube.

This study used a cross-sectional design, namely by looking at/observing the responses of the public to the oral health promotion video, which was broadcasted on a researcher channel on YouTube at a certain time. Three topics were discussed ("Types of dentures"; "Prevention of gingival inflammation"; and "Persistent dental pain after dental fillings"). Each video was broadcasted between 4-12 months. Number of viewers and comments were documented. Descriptive statistical analysis was performed.

The most watched topics in the oral health promotion video were as follows: types of dentures (viewers, n = 171,079), prevention of gingival inflammation (viewers, n = 154,230), and persistent dental pain after dental fillings (viewers, n = 40,346). The same topics were the most commented on, with 610, 392, and 336 comments on the prevention of swollen gums, types of dentures, and persistent dental pain after dental fillings, respectively.

Health promotional videos disseminated via YouTube can enhance access to health consultation services, especially during the COVID-19 pandemic. This is particularly true for males aged 18–34 years. However, "types of dentures" topic was the most watched video due to the possibility of young adults taking care for their elderly. Hopefully, by having access for oral health promotional videos, self-medication behaviours can be prevented.

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Introduction

Self-medication is common in Indonesia which have negative impact. Self-medication can be defined as choosing and using medicines to treat an illness or illness-related symptoms

without consulting a doctor.¹ Self-medication encompasses all aspects of general health care, including dental health. According to basic health research data (RISKESDAS) published in Indonesia in 2018, 42.2% of the Indonesian population practices self-medication in relation to dental health and considers it unnecessary to seek treatment at dental health facilities.² Several studies in developing countries, such as India (79%), Pakistan (84%), Saudi Arabia (78%), and Nigeria (67%), have reported a similarly high prevalence of self-medication practices in relation to dental care. In contrast, the prevalence of self-

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medication practice has been shown to be lower in developed countries, such as Lithuania (21%), Romania (19.8%), Spain 15.2%, Portugal (21%), and the Czech Republic (31%).^{3,4,5} Previous research demonstrated that the practice of self-medication was widespread with those with low incomes and low levels of education most likely to self-medicate. According to a number of studies, those with low levels of education tend not to have adequate information about health problems and may be unable to access health services.^{6,7}

Various reasons have been put forward to explain the practice of self-medication in dental health. Some individuals may view dental health problems as not serious. Thus, they may treat these problems themselves (i.e., self-medicate) rather than seeking the services of a dental practitioner. The high cost of dental treatments and lack of insurance cover may also explain self-medication practices. Other common reasons reported for self-medication in the community include time constraints, long waiting times in dental health facilities, and the need for urgent pain relief, in addition to the ability to purchase the same drug treatment (e.g., amoxicillin) from a pharmacy or online.^{6,3} Distrust of health workers has also been cited as a reason for self-medication.^{6,3}

Self-medication practice carries health risks, such as self-prescribed antibiotics leading to resistance to bacteria.⁸ Other risks of self-medicating are drug overdose and drug poisoning, adverse drug interactions, prolonged illnesses, drug dependence, incorrect diagnoses, digestive system bleeding, allergies, and an increased risk of neoplasia.⁹ An additional risk of self-medication practice is that it may provide temporary relief of symptoms but leads to non-treatment of the actual cause of these symptoms.^{6,3,4}

There are many available options to combat self-medicating practices. Health promotion is one way in which the public can be educated to change self-medicating behavior. These include health promotion initiatives aimed at educating the public and eliciting behavioral change. Such awareness-raising initiatives may target specific groups or individuals within the community. Another approach that can be used to change public behavior in terms of self-medicating is to improve health facilities and infrastructure. This can encourage individuals to

seek treatment in an appropriate health facility rather than self-medicate. Furthermore, the provision of health insurance is important to ensure that all members of the community, especially low-income groups, have access to appropriate health care.⁴

Ever since the COVID-19 pandemic hits in the early 2020s, there has been an increasing self-medicating behavior occurred amongst the commoners due to the restrictions of social and physical distancing to prevent COVID-19 transmission. The common people became worried of going outside, even to visiting doctors. In addition, due to the ease of internet access, drug prescription can be accessed by the commoners and therefore further increase self-medication to prevent COVID-19 infection.¹⁰ Because COVID-19 was still a novelty at the time, there were varying prescriptions (antibiotics, pain reliever, antimalaria, antiretrovirals) with minimal proven information whether the drug could reduce COVID-19 infection. This may lead to even worsen the symptoms of COVID-19 or be potentially lethal with the wrong dose, hence it is very dangerous.¹¹ Several studies showed that the prevalence of self-medication during the COVID-19 pandemic is very common but varying between countries, for example, Serbia (79.9%),¹² India (78.6%),¹³ Nepal (81.9%),¹⁴ and Egypt (62.9%).¹⁵ Therefore, it is of utmost importance for medical experts to devise certain measures in hopes to prevent self-medication behavior in any health aspect, including dental health. However, self-medicating behavior in dental health among Indonesians during the COVID-19 pandemic is still scarce.

YouTube can serve as a vehicle for health promotion initiatives. At present, some 65 million Indonesians are active YouTube users. YouTube can reach a wide range of groups of different ages, social statuses, and educational levels in both urban and rural communities. In a similar manner to discussion forums, YouTube provides a platform where users can share ideas, opinions, and information, all in a readily accessible audio-visual format.¹⁶ In this way, users can communicate and exchange ideas with one another.¹⁶ Teledentistry via YouTube can increase public access to oral health services, especially during the COVID-19 pandemic. The aim of this study was to investigate the response of the public (watched and commented on) to the

promotion of oral health through YouTube social media during the COVID-19 pandemic and the characteristics of the Indonesian viewers who accessed oral health information via YouTube.

Materials and methods

This research used a cross-sectional design. The study group comprised YouTube users who accessed a researcher channel (<https://www.youtube.com/channel/UCFrRRYC-STZuOXrhQcrETA>, subscribers: $N = 4,430$) on the social media platform and watched an oral health promotion video during the COVID-19 pandemic. Data were collected on viewer numbers, including the numbers of viewers of the different topics, in addition to the video broadcast duration (months), running time (minutes) and duration watched, percentage of likes and dislikes, numbers of comments, and substance of the comments. Data on socio-demographic samples were collected from the researcher studio on YouTube and recorded. No ethical clearance was needed due to data collection from the researcher's YouTube channel.

The analysis of the viewer data included the number of viewers, video watching duration, number of likes, and substance of the comments. In relation to the substance of the comments, the following data were recorded: follow-up questions about the topic discussed, responses of the presenter to the viewers' comments and questions, and shared experiences with fellow viewers. The number of viewers who liked the video topics, as determined by the number of "likes" was recorded and expressed as a percentage. To determine the viewing duration, the video watching time was subtracted from the total video broadcast duration time.

Data analysis

The data were analyzed using Statistical Package for the Social Sciences (SPSS) software (IBM, Armonk, NY, USA) to obtain the percentage of the substance of the comments, namely consultations on dental health problems experienced by the viewers, follow-up questions from the viewers, answers from sources, sharing experiences with fellow viewers, and gratitude to the speaker.

Results

As shown by the results, 74.9% of those

who accessed the oral health promotion video on the YouTube channel were aged 18–34 years, and more males than females accessed the channel. Most of those who accessed the oral health promotion were residents of Indonesia. (Table 1).

Characteristics of Respondents	Percentage (%)
Age (year)	
13-17	4,2
18-24	35,9
25-34	39,0
35-44	14,4
45-54	5,0
55-64	1,4
65+	0,1
Gender	
Male	61,5
Female	38,5
Residence	
Domestic	95,2
International	4,8

Table 1. Socio-demographics of The YouTube Viewers of The Oral Health Promotion Video.

As shown by the results, the topic "types of dentures" in the YouTube oral health promotion video was watched by 171,089 viewers and liked by 29.3% of the viewers. The broadcast duration was 12 months and the video running time was 13.22 minutes. In terms of the video viewing time, the average viewing duration was 4.28 minutes or 32.4% of the total viewing duration (Table 2).

In terms of the substance of the comments ($N = 392$) (Table 3) on types of dentures, 59.3% of the comments related to viewers' questions and the presenter's responses. Viewers' questions included denture-related problems, such as how to deal with gum discomfort and pain due to pressure from dentures, the costs of various types of dentures, and information on the location of the presenter's dental clinic. The responses of the presenter to the viewers' comments or follow-up queries accounted for 17.7% of the comments.

The oral health promotion video on the topic of swollen gums or tooth abscesses was watched by 62,292 people and liked by 95.7% of the viewers. The broadcast duration was 4

months, and the running time was 9.25 minutes. The average viewing duration was 3.06 minutes or 33.0% of the total broadcast duration. There were 610 related comments on this topic. In terms of the substance of the comments, 54.7% of the comments related to viewers' questions on dental abscesses and follow-up queries to the presenter. Other comments related to questions about the treatment for a tooth abscess during the COVID-19 pandemic at a time when dental clinics were closed, what to do if pain and suppuration persist, despite taking medication, and the link between abscesses and dental tumors. The responses of the presenter to the viewers' comments and questions accounted for 30.2% of the total comments.

Oral Health Promotion Topics	Video substance	Duration		Broadcast length/month	Number of Viewers (person)	Like vs dislike (%)
		Video/minute	Watched (minute) /%			
Types of dentures	Explanation of dentures type: implants, bridges, crowns and acrylics.	13:22	3,55/29,3	12	171,089	91,3
How to prevent and treat swollen gums (tooth abscess)	Explain how to prevent and treat an abscessed tooth	9:25	3,06/33,0	4	62,292	95,7
The tooth has been filled, why is it still hurting?	Explanation of root canal treatment	7:19	3,18/45,3	7	22,307	98,4
Dental fillings: How long do they last?	Explain how long dental fillings can last	7:39	3,07/40,8	4	53,401	97,5
The local anaesthetic did not hurt.	Explanation of local anaesthetic procedure	10:34	2,31/29,3	9	16,160	95,9
Teeth with only roots and crowns are badly damaged, extracted or can still be preserved	Explanation of root treatment, thus the tooth is not extracted	7:41	2,27/31,9	6	8,422	98,6
Free of cavities for life, indeed you can?	Explanation of how to prevent cavities	19:28	5,49/29,9	12	1,121	100
Average					333,831	96,8

Table 2. YouTube user responses to the oral health promotion topics.

The oral health promotion video on the topic of persistent pain following dental fillings was watched by 22,307 viewers and liked by 98.4% of the viewers. The broadcast duration of this video was 7 months, and the running time was 7.19 minutes. The average viewing duration was 3.18 minutes or 45.3% of the total running time. There were 336 comments on this video topic, with the substance of more than half these

comments being viewers' complaints/questions (52.6%). The responses of the presenter to these complaints/questions accounted for 28.4% of the comments. Viewers' questions regarding the topic of persistent pain following dental fillings included the following: the steps to take if a filled tooth is painful or infected after a filling, the need for tooth extraction or root canal treatment (RCT), and the alternatives to RCT if financial issues preclude such treatment.

Oral health promotion topics	Number of Comments	Substance of Comments (%)				
		Viewer's follow-up/question	Speaker's answers	Gratitude to speaker	Experiences of viewers	Etc
How to prevent and treat swollen gums (tooth abscess)	610	54,7	30,2	6,8	6,4	1,9
Type of denture	392	59,3	17,7	9,2	4,5	9,3
The tooth has been filled, why is it still hurting?	336	52,6	29,4	5,7	10,2	2,1
Dental fillings: How long do they last?	322	53,8	28,4	5,9	7,0	4,9
The local anaesthetic did not hurt.	105	54,6	39,2	4,9	0,7	0,6
Teeth with only roots and crowns are badly damaged, extracted or can still be preserved	46	64,1	25,2	9,7	1	0
Free of cavities for life, indeed you can?	12	50,0	50,0	0	0	0

Table 3. Comments of the viewers of the YouTube oral health promotion video.

The oral health promotion video on the topic of the longevity of dental fillings was watched by 53,401 viewers and liked by 97.5% of the viewers. The video broadcast duration was 4 months, and the running time was 7.39 minutes. The average viewing duration was 3.07 minutes or 40.8% of the total broadcast duration (Table 2). There were 322 comments on this topic, with the substance of more than half the comments (53.8%) being viewers' complaints/questions. The responses of the presenter to these complaints/questions accounted for 28.4% of the comments. The viewers' questions included issues concerning who should perform dental fillings (i.e., a dentist or dental hygienist). Their complaints included the lack of longevity of dental fillings (i.e., loss of tooth fillings 1-year

post-treatment) and cavities apparently increasing in size after dental fillings.

The oral health promotion video on the topic of local anesthetics was watched by 16,160 viewers and liked by 95.9% of the viewers. The video broadcast duration was 9 months, and the running time was 10.34 minutes. The average viewing duration was 2.31 minutes or 29.3% of the total broadcast duration. There were 105 comments on this topic, with 53.8% of these relating to viewers' complaints about prior consultations and follow-up questions to the presenter's responses. The responses of the presenter to the viewers accounted for 28.4% of the comments. Comments on the topic of local anesthetics included the experience of a patient who had been injected four times during a tooth extraction procedure but still felt pain. In this case, the patient decided to postpone the extraction procedure. Other comments related to pain control during the administration of a local anesthetic injection.

The oral health promotion video on the topic of a tooth with roots where dental crowns of the tooth was badly damaged and root canal treatment whether the tooth had to be extracted or could be preserved was watched by 8,422 viewers and liked by 98.6% of the viewers. The video broadcast duration was 6 months, and the running time was 7.41 minutes. The average viewing duration was 2.27 minutes or 31.9% of the total broadcast duration. There were 46 comments on this video, with the substance of 64.1% of the comments being viewers' complaints/questions. The responses of the presenter to the viewers accounted for 25.2% of the comments. The viewers' comments included questions about the cost of RCT, whether dental polyps are a contraindication for RCT and whether dentists recommend tooth extraction in such cases.

The oral health promotion video on the topic of cavity prevention was watched by 1,121 and liked by 100% percent of the viewers. The broadcast duration length was 12 months, and the broadcast duration was 19.28 minutes. The average viewing duration was 5.49 minutes or 29.9% of the total broadcast duration. There were four comments on this video, including the potential adverse effects of dental floss use. In total, 50% of the comments were viewers' comments and follow-up questions. The responses of the presenter to the viewers'

comments and questions accounted for the other 50% of the comments.

Discussion

Social media, such as YouTube, is a promising media for education and health promotion, especially during the COVID-19 pandemic, when the government implemented social restrictions in an effort to suppress the spread of the COVID-19 virus.^{17,18} The results of this study stating possibly what the *number* of viewers and video watching times indicated in terms of the usefulness of the oral health promotion video or health concerns of the viewers.

In this study, 96.8% of those who viewed the video on the YouTube researcher channel liked the oral health promotion (Table 2). The viewers were given the opportunity to post comments and questions, and the speaker then responded to these comments/questions.

Among the various topics discussed in the oral health promotion video, types of dentures were the most watched topic. As shown by an analysis of the viewers' comments, many viewers did not have a clear understanding of the topic before watching the oral health promotion video. This supports data from Basic Health Research in 2018 that very few Indonesian people use dentures (1.4%) or in other words, Indonesian people are not familiar with various types of dentures, such as implants and bridges. On the other hand, 19% of the Indonesian population has lost teeth due to tooth extraction, and almost all of those who lose their teeth do not use dentures. Previous research showed that only 13.6% of the Indonesian population had visited oral health facilities in their lifetime.¹⁹ This finding may explain the lack of information among the public about the various types of dentures.

Gingival inflammation or tooth abscesses were the second most watched and commented upon topic by the YouTube viewers in this study. This supports data from Basic Health Research in 2018 that 16.6% of the Indonesian population aged 34–35-year-old experience periodontal diseases. Gingival inflammation diseases or tooth abscesses are dental health problems that can be due to delays in visits to dental health facilities, especially during the implementation of social restrictions during the COVID-19 pandemic, where chronic pulpitis teeth progress

to pulp gangrene and become abscesses.²⁰ In our clinic in the second year after the COVID-19 pandemic, many of the patients who visited the clinic had swollen gums or tooth abscesses. Many of the patients reported that as the dental clinic was closed during the pandemic, they self-medicated, taking painkillers and antibiotics obtained from pharmacies.

Interesting viewers' comments or questions on this topic are what medications should be taken to treat gingival inflammation or tooth abscesses. The presenter responded to these comments and questions by suggesting that individuals should visit an oral health facility and not treat these conditions by taking antibiotics without a prescription. The presenter also emphasized that self-medicating by taking antibiotics without a prescription can be a risk factor for antibiotic resistance, and the viewers responded positively to this advice. The viewers' questions relating to this topic indicate that self-medication is common, with many individuals choosing not to visit a dental clinic. The findings of the present study in accordance with basic health research data published in 2018, which showed that 42.2% of the Indonesian population self-medicates.²

The viewers (n = 22,307) also liked the video with the title of a tooth had been filled but the patient still felt dental pain. Viewers' comment in the comment column, such as complaints that their teeth had been filled with permanent fillings but they still felt pain after permanent fillings and in the end asked the dentist to remove the teeth. This points to acute periodontitis causing pain after permanent fillings. Acute periodontitis after permanent teeth fillings can occur when RCT is not performed or RCT fails. The success rate of RCT of front teeth performed by general dental practitioners is only 67.4%.²¹ Thus, more than one-third of RCTs performed by general dental practitioners fail, with the potential to cause periodontitis and pain.¹⁵ Through the researcher's channel on YouTube, viewers can have access to a free teledentistry consultation regarding the necessary treatments to be performed if they experience acute periodontitis or pain, namely by visiting a dentist to obtain appropriate RCT before a permanent filling is performed and not rushing to decide on tooth extraction. Having access towards health promotional videos can also reduce the sense of fear going to a dentist, giving education and

understanding the necessity of maintaining oral health.²²

Conclusions

The results of this study support previous research that YouTube can be a medium for health promotion/education for YouTube users, especially during the COVID-19 pandemic. As shown by this study, the general public is interested in oral health promotion topics, especially those relating to types of dentures, swollen gums/tooth abscesses, and persistent pain after dental fillings. The substances of the viewers' comments in the researcher channel on the YouTube comment column were consultation and follow-up questions regarding topics discussed on the YouTube channel. YouTube social media has become an alternative to increase public access to oral health services. YouTube social media is highly recommended to be used as a channel for health promotion, including oral health, especially during the COVID-19 pandemic when individuals cannot schedule office appointments with health workers due to COVID-19 related restrictions. Hopefully, by having access for oral health promotional videos, self-medication behaviours can be prevented.

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Declaration of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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