



# African Journal of Biological Sciences



<https://doi.org/10.33472/AFJBS.6.5.2024.2587-2600>

## KNOWLEDGE ON POST - COVID SYNDROME AMONG DENTAL STUDENTS

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### ABSTRACT

There is an established literature on the symptoms and complications of COVID-19 but the after-effects of COVID-19 are not well understood with only few studies reporting the persistent symptoms. The term Post-COVID syndrome is described for presence of symptoms post recovery of COVID-19. The aim of the study is to assess and create awareness about Post-COVID syndrome among dental students. A questionnaire survey was conducted among dental students of a private dental college and hospital in Chennai on Post-COVID syndrome. When asked about the duration for onset of Post-COVID about 47% had responded after 2 weeks of persistent symptoms following COVID infection. 90% had selected fatigue as the most commonly reported symptom in Post-COVID syndrome. 69% had opted that there might be an alteration required in the dental treatment plan of a Post-COVID syndrome patient. Our study findings show that awareness on Post-COVID syndrome among dental students is not adequate. The dental professionals should be aware of the symptoms, pathophysiology and management of Post-COVID syndrome for successful dental treatment.

### KEYWORDS:

COVID-19, Post-COVID syndrome, Long COVID, Post-COVID symptoms.

Article History

Volume 6, Issue 5,

Received: 01 May 2024

Accepted: 09 May 2024

doi:10.33472/AFJBS.6.5.2024.2587-2600

## INTRODUCTION:

The World Health Organization (WHO) declared the novel Coronavirus (COVID 19) outbreak as a pandemic on March 11 2020. Since the declaration of pandemic, even after three years the devastating impact of the virus on the world continues till date globally, not only on morbidity, mortality and healthcare services but also on the social and economic infrastructure (Ciotti et al., 2020). The pathogenic agent of COVID 19 is the novel Severe Acute Respiratory Syndrome - Coronavirus 2 (SARS-CoV-2). As the “A” in the name of the virus suggests the acute nature of the respiratory disease (Hu B et al.,2021), but the cases of COVID 19 lasting longer than acute duration, started gaining attraction among healthcare groups. Initially the doctors dismissed their issues as symptoms related to psychological health such as anxiety or stress, in a phenomenon called “medical gaslighting” (Maxwell,2020;Rubin,2020). But the condition changed soon. Several terms like long COVID, long-haul COVID-19 or Post-COVID Syndrome started gaining increased attention among the scientific and medical communities(Callard et al.,2021).

Various descriptions for Post-COVID have been proposed, but the Center for Disease Control (CDC) has described “Post-COVID conditions are a wide range of new, returning or ongoing health problems that people experience following COVID-19 virus. Most people with COVID-19 get better within a few days to few weeks after infection, so at least 4 weeks after infection is the state of when post-COVID conditions could first be identified” (CDC,2022). While an actual definition is still lacking, an array of symptoms for post-COVID 19 have been identified. The chances of developing Post covid-19 syndrome are not thought to be related to the severity of acute infection.

The most frequently encountered symptoms are fatigue, dyspnoea (shortness of breath), headache, myalgia, chest and joint pains, smell and taste dysfunctions, persistent cough, chest pain, palpitations, hair loss, insomnia, wheezing and rhinorrhea. They also experience cognitive and mental disorders such as anxiety or depression, gastrointestinal symptoms such as abdominal pain and diarrhea(Shah et al.,2021;;Cares-Marambio et al.,2019). The less frequently encountered symptoms are chills, flushing, ear pain and visual impairment(Stavem et al.,2021;Xiong et al.,2021;McMahon et al.,2021). This demonstrates the multifaceted nature of Post COVID that involves multiple organ systems.

Recent evidence states that alterations in the clotting system, such as disseminated intravascular coagulopathy (DIC), decreased platelet count and prolonged prothrombin time (PT) have been observed in Post-Covid patients. Also these patients are usually in a hypercoagulable state and are at increased risk of developing thromboembolic disorders (Adam et al., 2020;Varga et al.,2020).

Research papers that discuss the risk factors, pathophysiology, symptoms and management of Post-COVID syndrome have been increasing in the past few years(Yong,2021). However the impact of Post-COVID syndrome on dentistry is not yet explored. With development of multiple new symptoms no proper guidelines have been established in dental management of these patients. Dentists should be aware of the varied presentation of Post-COVID syndrome and be prepared for handling any medical emergencies during their dental treatment in dental clinics. Hence this study was aimed to create awareness on Post-COVID syndrome among dental students.

## **MATERIALS AND METHODS:**

A cross-section online questionnaire-based survey was conducted among dental students of a private dental college and hospital in Chennai. The present study extended for a period of 3 months (January, February and March 2023). The study included undergraduate dental students (only final years and house surgeons) who were willing to participate in the survey. The post-graduates, faculties were excluded from the study. A total of 200 dental professionals participated in the survey. Since COVID-19 struck in India many millions of people including the dental professionals and their families were affected. So hence considering the pandemic status of COVID-19, dental students with or without previously diagnosed COVID-19 irrespectively who were willing to participate in the study were included.

The survey consisted of 11 close ended questions. The objective of the survey questions was to create awareness about symptoms and dental management of patients with Post-COVID syndrome.

1) The term Post-COVID syndrome is described for the onset of symptoms post recovery of COVID after a duration of

- a. 2 weeks

- b. 4 weeks
- c. 6 weeks
- d. 8 weeks

2) Who is likely to get Post-COVID Syndrome ?

- a. Patients who had mild symptoms due to COVID
- b. Patients who had severe critical illness due to COVID
- c. Patients who had moderate symptoms due to COVID
- d. Anyone who were affected by COVID

3) The most commonly reported symptom of Post-COVID syndrome?

- a. Fatigue
- b. Loss of memory or amnesia
- c. Facial pain
- d. Unexplained redness or swelling of the skin

4) Post-COVID syndrome is likely to affect the

- a. Cardiovascular system
- b. Respiratory system
- c. Neurological system
- d. All of the above

5) Which of the following is not a symptom of Post-COVID syndrome?

- a. Difficulty in thinking or concentrating (brain fog)
- b. Difficulty in breathing or shortness of breath
- c. Heart palpitations
- d. Frequent vomiting

6) Is there any specific test available to diagnose Post-COVID syndrome?

- a. Yes
- b. No

7) Have you suffered from any symptoms of Post-COVID syndrome?

- a. Yes
- b. No

8) Have you ever done dental treatment for a Post-COVID syndrome patient?

- a. Yes
- b. No

9) Do you think there will be a need in alteration of your dental treatment plan if a patient is known to suffer from Post-COVID syndrome?

- a. Yes
- b. No
- c. Maybe

10) How important do you think it is for dentists to be aware of symptoms present in Post-COVID syndrome?

- a. Very important
- b. Important
- c. Not important

11) Do you think COVID vaccines can prevent the development of Post-COVID syndrome?

- a. Yes
- b. No

c. Maybe

## RESULTS AND DISCUSSION:

The terminology long COVID has been used to describe the patients who present with symptoms after the end of the acute phase of COVID-19 (Mahase 2020). Other terms which are commonly used are chronic COVID-19 syndrome (CCS), post-COVID syndrome or post-acute sequelae of SARS-CoV-2 infection. The term long hauler is another popular name which describes the long duration of the symptoms present in these patients (Jimeno-Almazán 2021).

When asked about the duration of presence of persistent symptoms in Post-COVID syndrome, about 46% of the dental students had selected a duration of 2 weeks and 39% duration of 4 weeks (fig 1.1). According to the literature, post-COVID syndrome is the presence of persistent symptoms and/or delayed or long-term complications of SARS-CoV-2 infection beyond 4 weeks from the onset of symptoms. Correlating with our study findings, about 56% had responded to the symptoms persisting for 4 weeks or more (Nalbandian, 2021).

According to the CDC anyone who was previously infected with SARS-CoV-2 can develop Post-COVID syndrome. When asked about increased risk of developing Post-COVID, 54% had selected anyone who were affected by COVID and 35% had selected patients who had severe critical illness due to COVID. About 11% had selected patients who had mild and moderate symptoms due to COVID (Fig 1.2). Our study response correlates with the literature which states that irrespective of the severity of the disease, anyone who was previously infected with COVID is prone to develop Post-COVID syndrome (CDC, 2022).

According to recent evidence, the most frequently reported symptoms in Post-COVID syndrome are fatigue, shortness in breath, cough, psychological stress (anxiety, depression), posttraumatic stress disorder, poor concentration and sleep abnormalities (Mahmud et al., 2021). Fatigue was selected as the most commonly reported symptom in Post-COVID syndrome by about 91% of the study participants which correlates with literature (Fig 1.3). On questioning which of the following is not a symptom associated with Post-COVID syndrome, 46% had selected frequent vomiting and 30% had selected difficulty in thinking or concentrating (brain fog) (Fig 1.4)

Post-COVID-19 syndrome is a disorder with multi-systemic involvement. The most commonly affected systems are the respiratory, cardiovascular, and hematopoietic systems. Additionally, neuropsychiatric, renal, and endocrine systems are also involved to a lesser extent (Chippa et

al.,2022). When asked which system is likely to be affected by COVID among the cardiovascular, respiratory and neurological, 57% had selected all the three systems (Fig 1.5)

In our study, 24% of the study participants have suffered from symptoms of Post-COVID syndrome previously (Fig 1.6). According to a recent study, researchers have estimated that more than 200 million people globally suffer from long-term effects of COVID-19. But literature on the symptoms and presentation of post-COVID syndrome is still deficient(Stulpin,2022).

On questioning the dental students, if they have previously done dental treatment for a Post-COVID syndrome patient, about 14% had answered yes (Fig 1.7). About 63% of the study participants had opted for an alteration in the dental treatment plan if the patient is suffering from Post-COVID syndrome (Fig 1.8). In the coming years, the prevalence of Post-COVID syndrome might increase which alarms the dentists to be more prepared by knowing more about the symptoms, pathophysiology and its management while treating these patients.

On questioning the dental students if the COVID vaccines can prevent the development of Post-COVID syndrome, about 55% had responded maybe and 24% had responded yes (Fig 1.9). According to literature, receiving 2 doses and a booster dose of COVID vaccines reduces the risk of COVID infection, thus reducing the risk of developing long COVID.

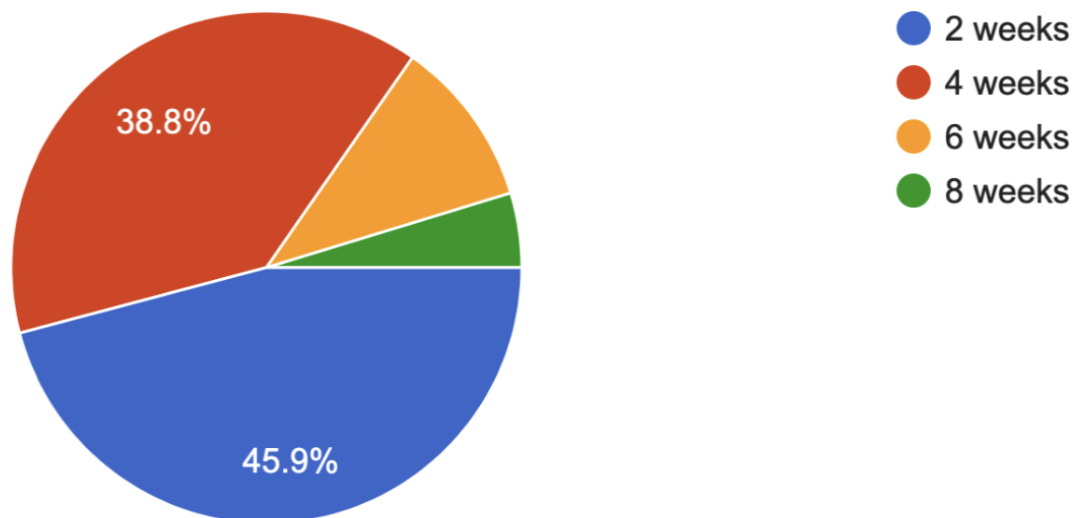


Figure 1.1 showing response to the duration of onset of symptoms post recovery of COVID.

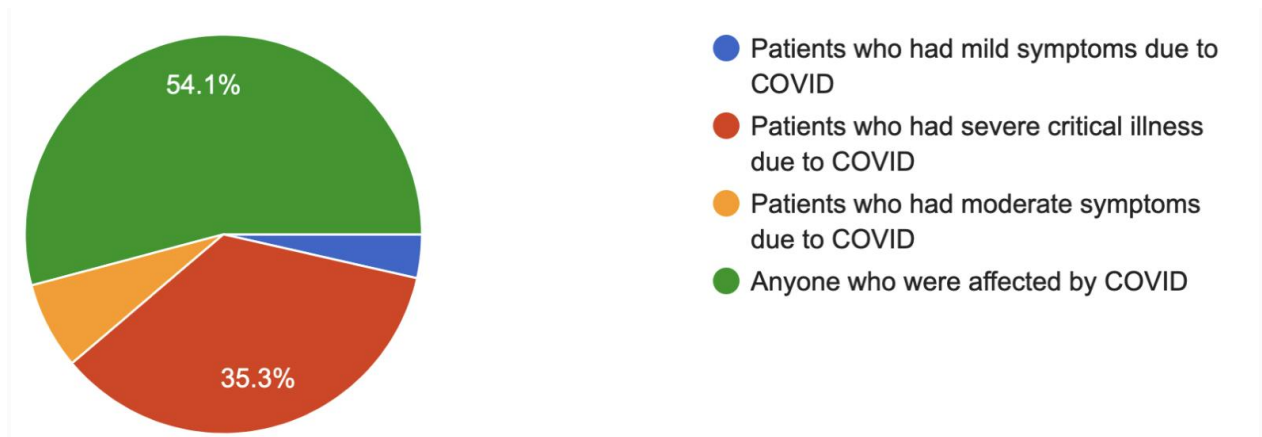


Figure 1.2 showing response to patients who are at increased risk of developing Post-COVID.

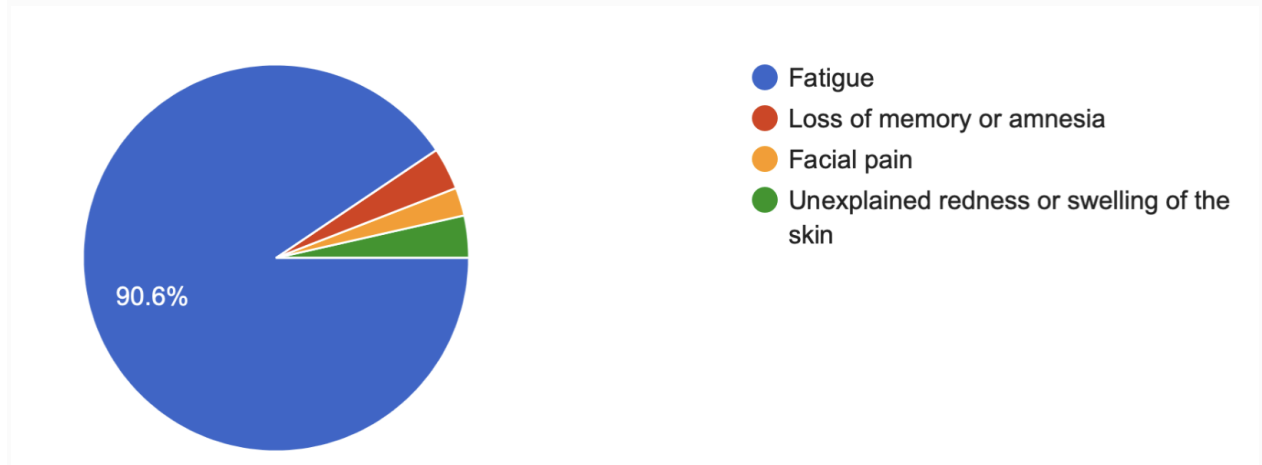


Figure 1.3 showing response to the question on the most commonly reported symptom in Post-COVID syndrome.

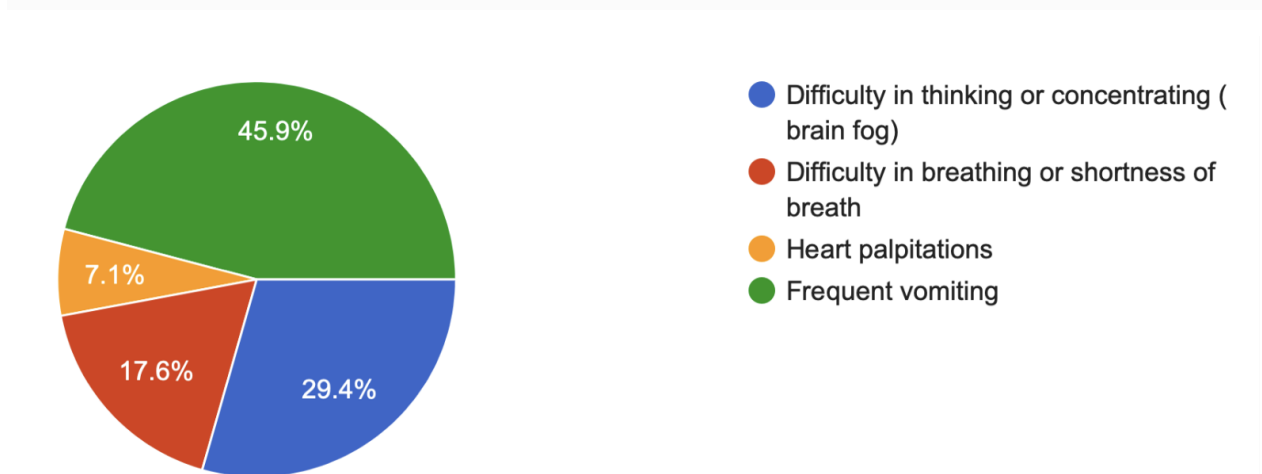


Figure 1.4 showing response to the question on which symptom not associated with Post-COVID syndrome



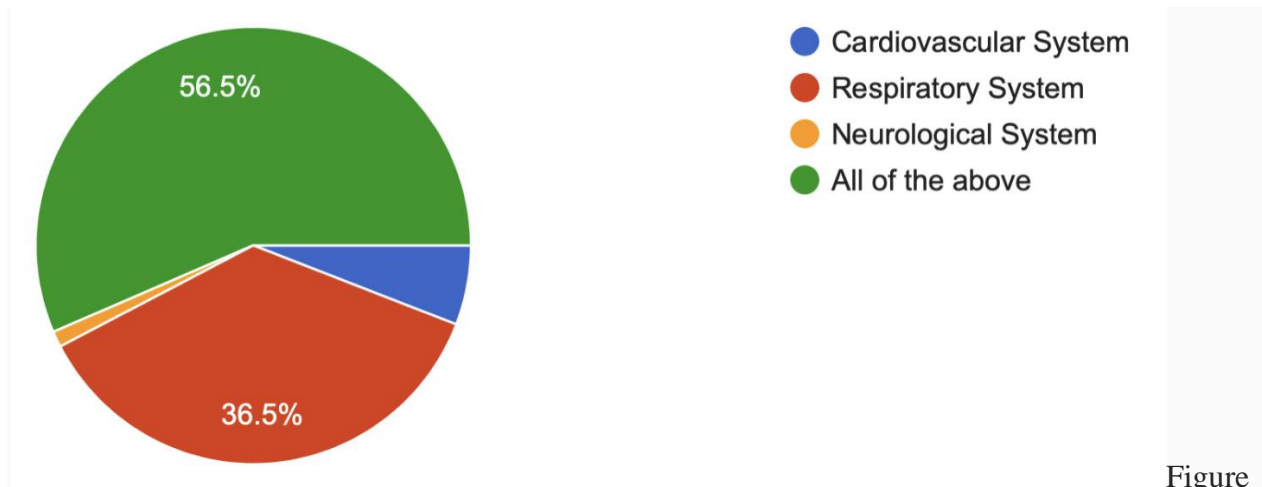


Figure 1.5 showing response to the question on which system is likely to be affected in the Post-COVID syndrome.

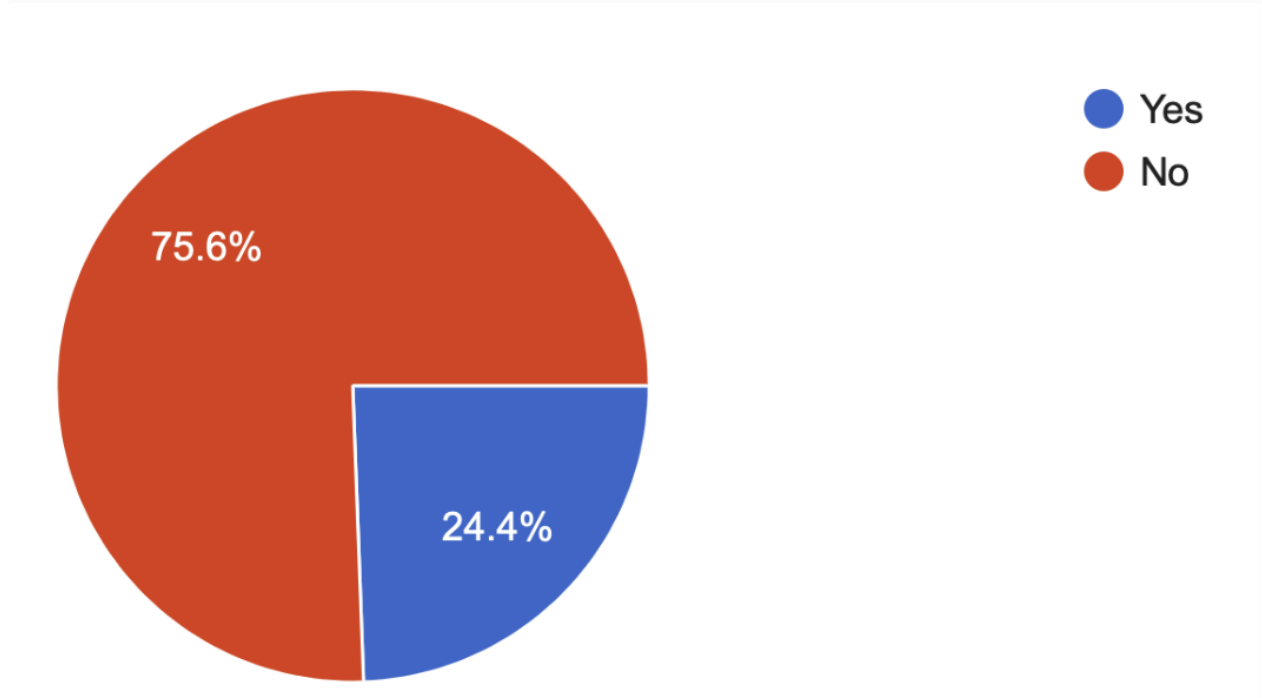


Figure 1.6 showing response of the dental students, if they have suffered from any symptoms of Post-COVID syndrome.

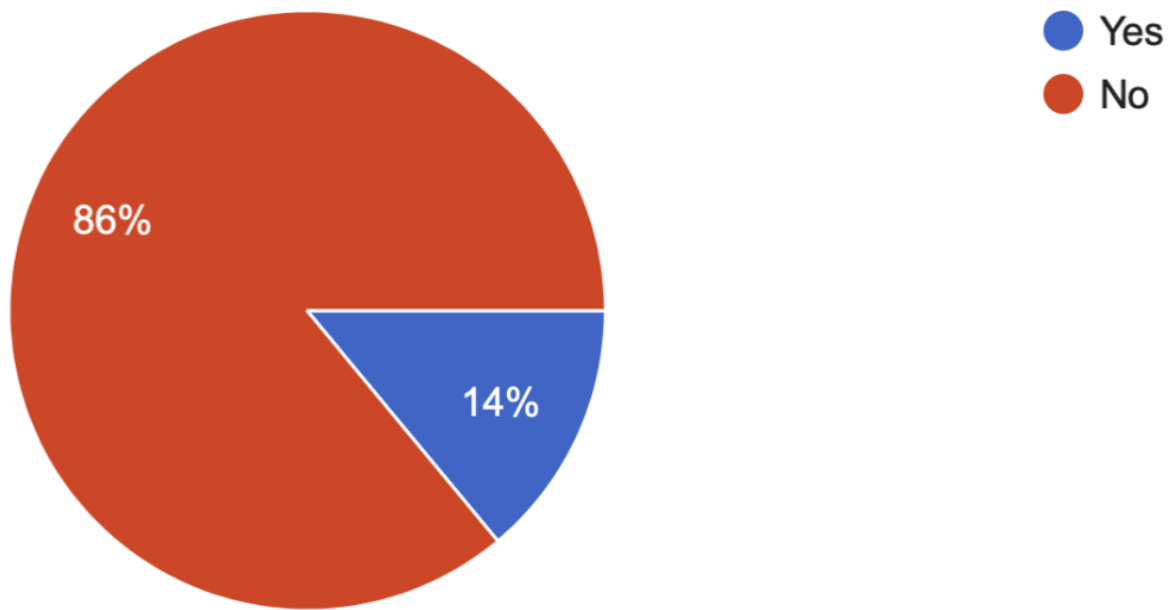


Figure 1.7 showing response of the dental students, if they have done dental treatment for a Post-COVID syndrome patient.

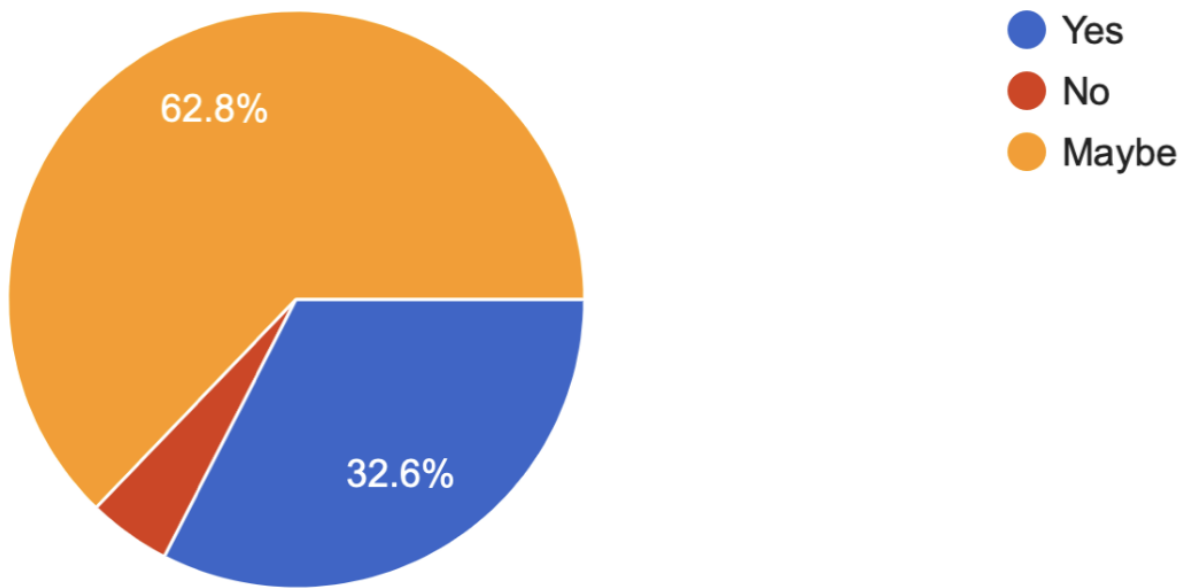


Figure 1.8 showing response of the dental students when asked whether there will be a need for alteration in the dental treatment plan if their patient is known suffering from Post-COVID syndrome.

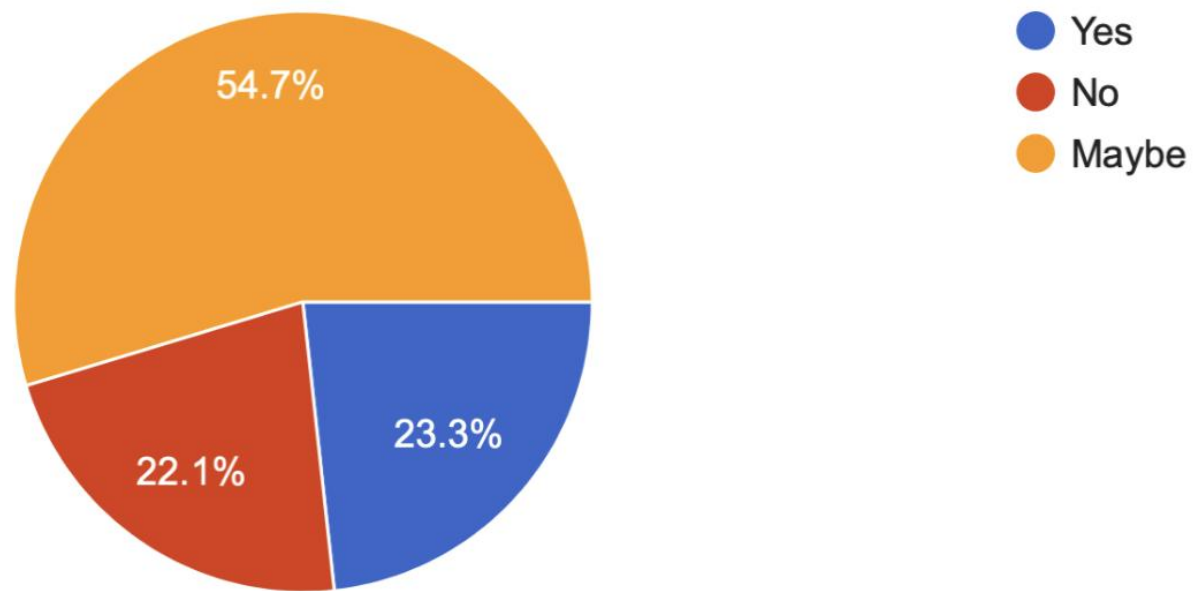


Figure 1.9 showing response of the dental students if they think whether COVID vaccines can prevent the development of Post-COVID syndrome

## **CONCLUSION:**

Post-COVID syndrome is a relatively new and mysterious condition which is still affecting many COVID-19 survivors regardless of their age and disease severity. This can be a result of multiple presentations of symptoms and pathophysiologies, ranging from long-term damage of multiple organ systems to unresolved inflammation from multiple sources. Almost 5 million people are likely to be diagnosed with long COVID globally, if we assume at least 10% of COVID-19 survivors develop the disease which is likely underestimated(Altmann and Boyton 2021).

Even though COVID-19 is an infectious disease which primarily affects the lungs, due to multiple organ involvement of the disease, attention is required while formulating a dental treatment plan for Post-COVID patients with prolonged symptoms. Proper identification and treatment of Post-COVID symptoms by the dental team will reduce the risk for complications associated with the dental treatment and provide superior dental care for these patients.

## **ACKNOWLEDGMENT:**

The authors would like to thank the college management for extending their support.

## **FUNDING:**

Nil

## **CONFLICT OF INTEREST:**

Nil

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