

# Assessment of awareness, knowledge and attitude towards oral health among Sri Vishnu Educational Society students, Bhimavaram, India during COVID-19 health crisis

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**Background:** Coronavirus disease 2019 (COVID-19) pandemic continues to spread globally and it has become a major cause of concern for health care professionals all over the world. The aim of the study was to assess the awareness, knowledge, and attitude levels on oral health during COVID-19 pandemic critical times among the students of Sri Vishnu Educational Society (SVES).

**Methods:** A total of 650 mails containing the questionnaire link were sent to the SVES students who participated in the cross-sectional survey. A self-administered, multiple choice type questionnaire forms administered (validated by a specialists) to obtain responses from the participants. The questionnaire was divided into three parts and included 20 questions on awareness, knowledge and attitude towards oral health during COVID-19 health crisis. As this is only descriptive cross-sectional observational survey, we have not registered under clinical trial platform but clearance obtained from the institutional ethics and review board platforms. Statistical analysis was done using analysis of variance (ANOVA) and Student's *t*-test.

**Results:** Out of 650 responders, only 500 were valid after initial and final scrutiny. Percentage of subjects who responded regarding their knowledge about different specialties in dentistry were yes: 177 (35.4%) & no: 323 (64.6%) with  $P=0.05$  and their attitude towards visiting dental clinic until they get dental pain during critical times of COVID-19 pandemic was yes: 188 (37.6%) & no: 221 (44.2%) respectively with  $P<0.001$ .

**Conclusions:** The current study findings revealed that there are few accurate responses regarding understanding of oral health and the proper actions to be implemented to avoid COVID-19 infection at the institutional level. Therefore, there is an urgent need for improving non-dental professional's knowledge by health education and training programs.

**Keywords:** Coronavirus disease 2019 (COVID-19); oral health; questionnaire; survey

Received: 13 October 2022; Accepted: 09 July 2023; Published online: 06 September 2023.

doi: 10.21037/fomm-22-56

View this article at: <https://dx.doi.org/10.21037/fomm-22-56>

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## Introduction

Periodontal disease is one of many dental disorders that afflict vast populations of people all over the world. Periodontal disease is on the rise in India, owing to a lack of public awareness about oral health. Dental issues are becoming one of the most serious issues in both developing and industrialized countries (1).

Oral hygiene (OH) is the practice of keeping one's oral cavity neat and clean in order to prevent the production of microbial plaque on the teeth, which in turn helps to prevent the onset and progression of disease. To maintain this, one must be conscious of OH routines in order to maintain personal OH and oral health (2).

Dental health knowledge is a key component for improving an individual's oral health and general health. The primary goal of the Indian dental health profession is spreading knowledge and raising awareness about OH practices (3).

While there are studies on the relationship between oral health and dental and medical professional students, few are aware of the OH-related perceptions of non-dental professional students (4).

Awareness and practice of the importance of OH in the current coronavirus disease 2019 (COVID-19) pandemic is of utmost concern to non-dental care professionals, and creating awareness and knowledge for relevant group members in the hands of dental care specialties (5,6).

Though infection control is important in dental practice, extra precautions are mandatory to prevent COVID-19 infection during pandemic among general public, patients,

dentists and associated members (7,8). When compared to other studies, the present study, assessed OH-related perceptions of non-dental professional students and the precautionary measures followed during COVID-19 pandemic. Therefore, this study was initiated and provided the level of awareness, knowledge and attitude towards maintaining oral health and hygiene in the current COVID-19 pandemic of SVES student groups. The current study was conducted in accordance with the STROBE reporting checklist (available at <https://fomm.amegroups.com/article/view/10.21037/fomm-22-56/rc>).

## Methods

A descriptive cross-sectional observational survey was conducted at Sri Vishnu Educational Society (SVES), Bhimavaram, Andhra Pradesh, India. In this study data was collected on the awareness, knowledge and attitude towards oral health among the students followed overtime during the period of October 2021 to September 2022. The current study was approved by the Institutional Review board of Vishnu Dental College (No: VDC/RP/2021/82). All the procedures were followed according to the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975 that was revised in 2013.

Face validity was assessed by incorporating a small number of respondents. A total of 90 participants were considered for the pilot research. The content validity was assessed using the content validity index (CVI) with a score of >3.5, and the effective team was requested to rate different characteristics such as relevance, clarity, simplicity, ease of understanding, time consumed, uncertainty among items, comment on language, and questionnaire length.

All the SVES students participated in this study and the dental students of SVES and the students and associated groups who are not willing to participate were excluded from the survey.

Verbal informed consent is taken from all the participants before the start of the survey. Modified questionnaire from the key references, sent through Google forms to all the different professional groups included in the study, *Figure 1*. Within a week time to 3 months, we received all the information. On an average 10 minutes it had taken to fill the complete Google form. All the 20 close ended questions related to attitude, knowledge and awareness regarding oral health during COVID-19 critical times was collected and assessed (available online: <https://cdn.amegroups.cn/>

### Highlight box

#### Key findings

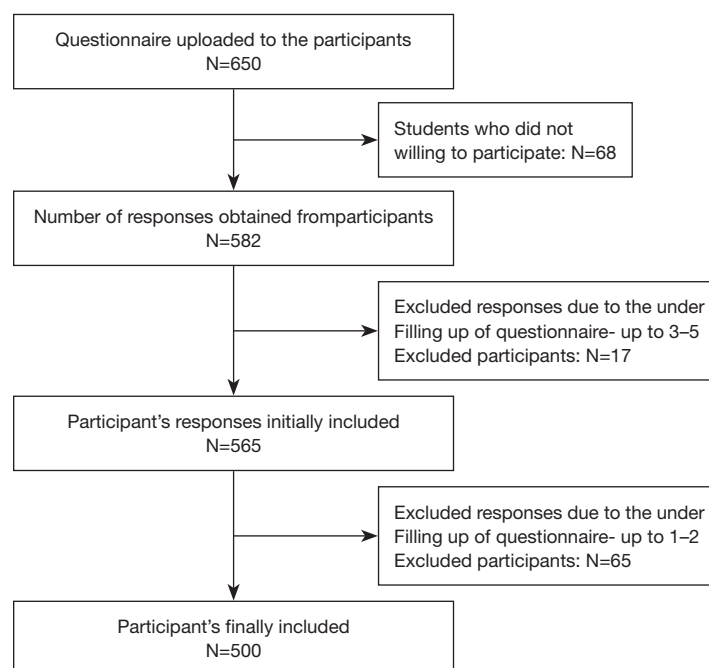
- The results of this study show that there are deficiencies in the awareness, knowledge and attitude towards oral health.

#### What is known and what is new?

- COVID-19 pandemic continues to spread globally and it has become a major cause of concern for health care professionals all over the world.
- The current study findings revealed that there are few accurate responses regarding understanding of oral health and the proper actions to be implemented to avoid COVID-19 infection at the institutional level.

#### What is the implication, and what should change now?

- There is an urgent need for improving non-dental professional's knowledge by health education and training programs.



**Figure 1** Flow chart.

static/public/fomm-22-56-1.xlsx; as this is only descriptive cross-sectional observational survey, we have not registered under clinical trial platform but clearance obtained from the institutional ethics and review board platforms of Vishnu Dental College). The explanation for anonymity in our study was that all students from different institutes of SVES do not have to disclose who they are, which leads to much more students taking the survey and more sincerity in their comments.

The stricter infection control protocols of COVID-19 pandemic and orientation programs about the importance of OH during COVID-19 evaluated at the institution level and how far these measures helped all the students groups in their institutes to be safer, healthier and responsible during COVID-19 pandemic will be assessed.

The perception of the general and oral health of the SVES students was the primary objective, whereas secondary objective was the importance of OH in the current COVID-19 situation.

### **Statistical analysis**

Implementation of a data collecting technique by any of the study's researchers, and statistical data preparation by a person with professional understanding of statistics is included in the study methodology. The data was collected,

exported and analyzed through the Statistical Package for Social Sciences (SPSS) version 23 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were done. Statistical differences between the various awareness, knowledge and attitude subscales and gender and institution wise were determined by Chi-square test. A P value of <0.05 is considered statistically significant.

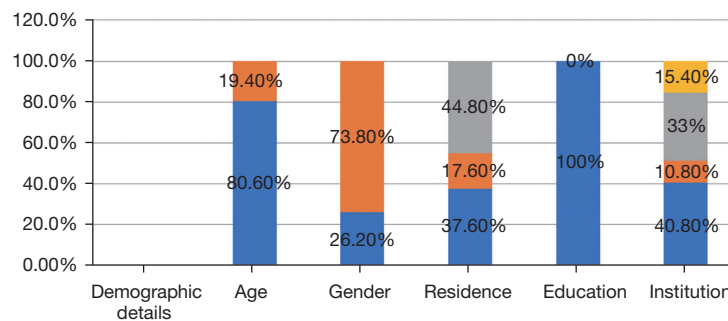
### **Results**

The questionnaire was sent to 650 students, and the total number of 500 responses was obtained after initial and final scrutiny from SVES, aged from 17–20 years (n=403, 80.6%) and 21–24 years (n=97, 19.4%). A total of 131 and 369 (26.2% and 73.8%) male and female students participated in this survey.

All the respondents are doing graduation from the same Society with different professions. Most number of responses had come from Degree College (n=204; 40.8%) and the least from Sri Vishnu College of Pharmacy (SVCP) (n=54; 10.8%). The participants' demographic information is tabulated in the following (Figure 2).

### **Awareness towards oral health**

More than half of the participants (n=311; 62.2%) have



**Figure 2** Demographic characteristics. Age group: (a) 17–20 years: 80.60%; (b) 20–24 years: 19.40%. Gender: (a) male: 26.20%; (b) female: 73.80%. Residence: (a) rural: 37.60%; (b) semi-urban: 17.60%; (c) Urban: 44.80%. Education: all are undergraduate student. Number of participants from each institution: (a) Degree: 40.80%; (b) SVCP: 10.80%; (c) SVECW: 33%; (d) VIT: 15.40%. Degree, Degree College; SVCP, Sri Vishnu College of Pharmacy; SVECW, Sri Vishnu Engineering College for Women; VIT, Vishnu Institute of Technology.

not undergone any type of dental treatment and more than half that is 309; 61.8% individuals have not visited dentist during their life time. Out of 191 students, who visited dental clinic, most of them periodontal treatment ( $n=95$ ), restoration ( $n=50$ ) and extraction ( $n=46$ ) (Tables 1,2).

### Knowledge towards oral health

Out of the participants who visited dentist, 113 members visited specialists and 78 visited general dentist. Among the 500 respondents, 418 said that proper brushing method will reduce tooth decay and remaining 82 said that it will prevent gum diseases. When asked about their opinion regarding link between general health and oral health, 392 respondents said there is a link between general health and oral health. Whereas 108 said that there won't be any such association (Tables 1,2).

### Attitude towards oral health

When asked about the factors responsible for the delay in getting dental treatment, 156 members said time factor, 91 said it is due to negligence and 93 of them said it's due to the fear factor. Four hundred and twenty-nine members out of 500 respondents agreed that it is mandatory to visit dentist for every 6 months (Tables 1,2).

### Awareness towards OH maintenance during COVID-19 health crisis

Majority of the participants reported that touching the surfaces ( $n=243$ ), hand shaking ( $n=112$ ), coughing ( $n=76$ ) and sneezing ( $n=69$ ) are the routes of transmission of

COVID-19 infection. Moreover, a total of 491 (98.2%) participants reported that the main symptoms of corona virus infection are fever, tiredness, dry cough and body ache.

When asked about whether oral health gets affected during COVID-19 infection, most of the participants reported that 386 (77.2%) oral health alters during COVID-19 infection. The use of mouth rinse ( $n=222$ ; 44.4%), keeping the OH aids separate ( $n=450$ ; 90.0%) and replacing the OH kit after COVID-19 recovery ( $n=426$ ; 85.2%) were believed as the important OH practices by the participants during and after COVID-19 pandemic.

Most of the respondents believed that role of dentist in providing guidelines to prevent COVID-19 infection and the measures of providing precautions to maintain good oral health after COVID-19 infection are about 481 (96.2%) out of 500 respondents (Tables 1,2).

Significant difference was shown with P value as  $<0.001$  in relation to gender when asked about whether it is necessary to visit a dentist until they get a toothache. When compared in percentage, 33% of females disagree with this. Whereas only 11% of males disagree with the question we posed.

Significant difference was shown with the  $P<0.001$  when asked about the awareness related questions like whether they have undergone any dental treatment before; the type of treatment undergone; and the qualification of the doctor they have chosen.

## Discussion

The impending COVID-19 pandemic is a unique time period marked by a slew of social, economic, and health

**Table 1** Gender wise awareness, knowledge and attitude responses towards oral health

Question	Frequency, n (%)	P value
<b>Awareness</b>		
Did you undergo any dental treatment earlier?		
Female		0.465
Yes	136 (27.2)	
No	233 (46.6)	
Male		
Yes	53 (10.6)	
No	78 (15.6)	
No. of times the subject had undertaken the dental treatment (no. of dental appointments)		
Female		0.485
Visited	137 (27.4)	
Not visited	232 (46.4)	
Male		
Visited	54 (10.8)	
Not visited	77 (15.4)	
Type of dental set-up where treatment was rendered		
Female		0.237
Corporate	19 (3.8)	
College	42 (8.4)	
Clinic	76 (15.2)	
Male		
Corporate	11 (2.2)	
College	22 (4.4)	
Clinic	21 (4.2)	
Type of treatment rendered		
Female		0.035
Cleaning	25 (5.0)	
Filling	31 (6.2)	
Extraction	35 (7.0)	
Male		
Cleaning	17 (3.4)	
Filling	19 (3.8)	
Extraction	11 (2.2)	

**Table 1** (continued)

**Table 1** (continued)

Question	Frequency, n (%)	P value
<b>Qualification of the treating doctor</b>		
Female		0.436
General dentist	53 (10.6)	
Specialist	84 (16.8)	
Male		
General dentist	25 (5.0)	
Specialist	29 (5.8)	
<b>Knowledge</b>		
Does the subject know that there is a different specialties in dentistry		
Female		0.041
Yes	121 (24.2)	
No	248 (49.6)	
Male		
Yes	56 (11.2)	
No	75 (15.0)	
<b>Brushing teeth daily prevents</b>		
Female		0.156
Tooth decay	315 (63.0)	
Gum disease	54 (10.8)	
Male		
Tooth decay	103 (20.6)	
Gum disease	28 (5.6)	
<b>Is there a link between general health and dental health?</b>		
Female		0.405
Yes	292 (58.4)	
No	77 (15.4)	
Male		
Yes	100 (20.0)	
No	31 (6.2)	
<b>Attitude</b>		
Do you delay getting dental treatment done for yourself		
Female		0.321
Time factor	118 (23.6)	
Negligence	62 (12.4)	
Fear of treatment	70 (14.0)	

**Table 1** (continued)

Table 1 (continued)

Question	Frequency, n (%)	P value
Male		
Time factor	38 (7.6)	
Negligence	29 (5.8)	
Fear of treatment	23 (4.6)	
Do you think it is necessary to have a dental checkup once in 6 months		
Female		0.438
Yes	320 (64.0)	
No	49 (9.8)	
Male		
Yes	109 (21.8)	
No	22 (4.4)	
It is not necessary to visit a dentist until I get a toothache		
Female		<0.001
Agree	130 (26.0)	
Disagree	166 (33.2)	
Undecided	73 (14.6)	
Male		
Agree	58 (11.6)	
Disagree	55 (11.0)	
Undecided	18 (3.6)	
Do you think spending too much time on brushing will damage the tooth structure		
Female		0.017
Agree	307 (61.4)	
Disagree	31 (6.2)	
Undecided	31 (6.2)	
Male		
Agree	103 (20.6)	
Disagree	13 (2.6)	
Undecided	15 (3.0)	
Awareness towards oral hygiene maintenance during COVID health crisis		
The route of entry of corona virus is through all except		
Female		0.804
Coughing	53 (10.6)	
Sneezing	53 (10.6)	
Hand shaking	83 (16.6)	
Touching surfaces	180 (36.0)	

Table 1 (continued)

Table 1 (continued)

Question	Frequency, n (%)	P value
Male		
Coughing	23 (4.6)	
Sneezing	16 (3.2)	
Hand shaking	29 (5.8)	
Touching surfaces	63 (12.6)	
The main symptoms of corona virus infection are fever, tiredness, dry cough and body ache		
Female		0.623
Untrue	6 (1.2)	
True	363 (72.6)	
Male		
Untrue	3 (0.6)	
True	128 (25.6)	
Do you think gargling mouth/throat with salt water is the best way to prevent corona virus infection?		
Female		0.086
Yes	156 (31.2)	
No	51 (10.2)	
Unsure	162 (32.4)	
Male		
Yes	66 (13.2)	
No	22 (4.4)	
Unsure	43 (8.6)	
What do you think about the dentist's role in educating people about COVID-19 and its related oral health problems?		
Female		0.379
Significant role	352 (70.4)	
No role	17 (3.4)	
Male		
Significant role	121 (24.2)	
No role	10 (2.0)	
COVID positive patients oral hygiene aids should be placed separately		
Female		0.973
Yes	332 (66.4)	
No	37 (7.4)	
Male		
Yes	118 (23.6)	
No	13 (2.6)	

Table 1 (continued)

Table 1 (continued)

Question	Frequency, n (%)	P value
Oral hygiene kit should be replaced after COVID recovery		
Female		0.204
Yes	320 (64.0)	
No	48 (9.6)	
Male		
Yes	106 (21.2)	
No	28 (5.6)	
Do you think oral health gets affected during COVID infection		
Female		0.238
Yes	280 (56.0)	
No	89 (17.8)	
Male		
Yes	106 (21.2)	
No	25 (5.0)	

COVID, coronavirus disease.

issues. In order to meet the aforementioned problems and establish reasonable expectations about the disease's future course, affected populations must have an acceptable level of COVID-19 related understanding (9,10).

The pandemic's health and social consequences could be severe, especially if it is mishandled by the public and ignored by concerned authorities (11,12). Because any population that comes into touch with COVID-19 is prone to its effects, this study was done to assess the non-dental students understanding, views, and attitudes about the early dissemination of COVID-19 in SVES.

During the COVID-19 pandemic outbreak in 2020, all of the participants in this study had varying levels of awareness, knowledge, and attitude towards oral health and maintenance care. Males, in particular, have less knowledge about COVID-19, making them especially vulnerable to the outbreak (13). They are less concerned about oral health and are unaware of the connection between general health and dental health. This finding is consistent with earlier studies conducted in China (14,15) and Hong Kong on the relationship between socio-demographic characteristics and knowledge level during the COVID-19 epidemic (16).

During the COVID-19 pandemic outbreak, however, it is critical for all professionals to continue to take preventive

precautions. Conducting educational programs is necessary to gain a thorough understanding of hygiene maintenance and its relationship to general health. COVID-19 symptoms and transmission mechanism were familiar to SVES students. Students on the other hand, had inadequate awareness about infection control and COVID-19 protection measures to take during a COVID-19 pandemic health crisis (17).

During a crisis, such as this COVID-19 pandemic, guidelines released by reputable institutions should be sent to all students by regional and national dental associations to ensure that every student is well informed and aware of the best practices and recommended disease management approaches (18).

Knowledge was linked to attitudes and preventive behaviors', according to the findings of the present study. COVID-19 found the same correlations between knowledge, attitude, and behavior as prior polls. The impact of knowledge on health behavior is clearly influenced by how health professionals disseminate information for the general public to follow (19).

AlMugeiren conducted a study in 2022 to compare the oral health attitudes and behaviors of medical and dental students/interns during the Corona pandemic in Saudi Arabia using Hiroshima University Dental Behavioral Inventory (HU-DBI). Dental students and interns demonstrated better oral health attitudes and behaviours during the COVID-19 epidemic than did medical students and interns (20). Whereas as in this study the students were not from dental profession, that's why in order to improve oral health attitudes and habits, oral health promotion initiatives focused at medical and dental students and interns are crucial.

Abdulkareem conducted a study in 2021 to assess the impact of COVID-19 on OH awareness, attitude towards dental treatment, fear of infection and economic impact in the Middle East. Five components made up the questionnaire: the first was intended to gather demographic information, and the others were designed to measure OH awareness, attitude towards dental care, level of fear, and the economic impact of COVID-19. The epidemic had a damaging effect on OH awareness. The attitude regarding dental care, however, was only altered to an extent, which was also observed in this study (21).

Attitudes, particularly efficacy beliefs, and the impact of individual attitudes toward oral health, as well as the factors or barriers that prevent them from practicing OH measures, all play a role, and it was demonstrated in this study that practicing preventive behaviors' has a significant and robust

**Table 2** Institution wise awareness, knowledge and attitude responses towards oral health

Question	Frequency, n (%)
<b>Awareness</b>	
Did you undergo any dental treatment earlier?	
Yes	189 (37.8)
No	311 (62.2)
No. of times the subject had undertaken the dental treatment (no. of dental appointments)	
Visited	191 (38.2)
Not visited	309 (61.8)
Type of dental set-up where treatment was rendered	
Corporate	30 (15.7)
College	64 (33.5)
Clinic	97 (50.8)
Type of treatment rendered	
Cleaning	42 (32.8)
Filling	50 (39.1)
Extraction	36 (28.1)
Qualification of the doctor	
Dentist	78 (40.8)
Specialist	113 (59.2)
<b>Knowledge</b>	
Does you know that there are specialists in dentistry	
Yes	177 (35.4)
No	323 (64.6)
Brushing teeth daily prevents	
Decay	418 (83.6)
Gum disease	82 (16.4)
Does the subject know that there is a link between general health and dental health?	
Yes	311 (62.2)
No	189 (37.8)
<b>Attitude</b>	
Do you delay getting dental treatment done for yourself	
Time	156 (45.9)
Negligence	91 (26.8)
Fear of treatment	93 (27.3)
Do you think it is necessary to have a dental checkup once in 6 months	
Yes	429 (85.8)
No	71 (14.2)

**Table 2** (continued)**Table 2** (continued)

Question	Frequency, n (%)
It is not necessary to visit a dentist until I get a toothache	
Agree	188 (37.6)
Disagree	221 (44.2)
Undecided	91 (18.2)
Do you think spending too much time on brushing will damage the tooth structure	
Agree	410 (82.0)
Disagree	44 (8.8)
Undecided	46 (9.2)
<b>Awareness towards oral hygiene maintenance during COVID health crisis</b>	
The route of entry of corona virus is through all except	
Coughing	76 (15.2)
Sneezing	69 (13.8)
Hand shaking	112 (22.4)
Touching surfaces	243 (48.6)
The main symptoms of coronavirus infection are fever, tiredness, dry cough and body ache	
Untrue	9 (1.8)
True	491 (98.2)
Do you think gargling mouth/throat with salt water is the best way to prevent corona virus infection?	
Yes	222 (44.4)
No	73 (14.6)
Unsure	205 (41.0)
What do you think about the dentist's role in educating people about COVID-19 and its related oral health problems?	
Role	473 (94.6)
No role	27 (5.4)
COVID positive patient's oral hygiene aids should be placed separately?	
Yes	450 (90.0)
No	50 (10.0)
Oral hygiene kit should be replaced after COVID recovery	
Yes	426 (85.2)
No	74 (14.8)
Do you think oral health gets affected during COVID infection	
Yes	386 (77.2)
No	114 (22.8)

COVID, coronavirus disease.



impact on COVID-19 transmission prevention.

Study limited to one region and the questionnaire only offers a small sample of questions to measure the students' knowledge, the results should not be extrapolated as real knowledge of these students. Every dental health practitioner should pay special attention to people with very low COVID-19 knowledge, since they are less likely to have positive attitudes and preventative practices. Educating the general public on the amended COVID-19 guidelines will be beneficial to everyone to fight against the pandemic and we are sure that we can put an end to COVID-19 transmission.

## Conclusions

The results of this study show that there are deficiencies in the awareness, knowledge and attitude towards oral health and its relation to COVID-19 pandemic among non-dental professional students, which implies a commitment to all the institutions and organizations and universities to improve non-dental professional's knowledge towards COVID-19 infection by health education and training programs.

## Acknowledgments

We sincerely acknowledge all the students studying at the Sri Vishnu Educational Society (SVES), Bhimavaram, West Godavari District, Andhra Pradesh, India for participating in this study. Our sincere thanks to Prof. Nimmakayala Deepthi, working at Kendriya Vidyalaya School, Hyderabad, Telangana for proofing the manuscript.

*Funding:* None.

## Footnote

*Reporting Checklist:* The authors have completed the STROBE reporting checklist. Available at <https://fomm.amegroups.com/article/view/10.21037/fomm-22-56/rc>

*Data Sharing Statement:* Available at <https://fomm.amegroups.com/article/view/10.21037/fomm-22-56/dss>

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://fomm.amegroups.com/article/view/10.21037/fomm-22-56/coif>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related

to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All the procedures were followed according to the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975 that was revised in 2013. The current study was approved by the Institutional Review board of Vishnu Dental College (No. VDC/RP/2021/82). Verbal informed consent is taken from all the participants before the start of the survey.

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doi: 10.21037/fomm-22-56

**Cite this article as:** Pasupuleti MK, Penmetsa GS, Ponnampati K, Yalla S, Salwaji S, Kandikatla P. Assessment of awareness, knowledge and attitude towards oral health among Sri Vishnu Educational Society students, Bhimavaram, India during COVID-19 health crisis. *Front Oral Maxillofac Med* 2023.