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Assessment of stress, anxiety and depression during COVID-19 among dental students of Bhubaneswar City, Odisha

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***Abstract*---**Introduction: COVID-19 began in Wuhan, China in the month of December 2019 and over a period of time, the infection outspread across the world in a rapid pace. It has put the entire world's population at risk of infection, which is a huge source of worry, particularly for vulnerable populations like dental students. This study is aimed for the assessment of stress, anxiety and depression during COVID-19 on dental college students of Bhubaneswar city. Methods: This was a cross-sectional, questionnaire survey conducted over the internet. It administered 222 students. The

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students were assessed by a proforma containing demographic details and DASS 21. Statistical analysis was done using the SPSS version 26.0 using Chi square test. Results: In our study females were 57.7% (n=128) and 42.3% (n=94) were males In the study maximum number of participants were found to be in the age range of 19-22 with 48.6% (n=108) followed by age range of 23-26 with 46.8% (n=104).The mean Age of the study population is 22.75±1.937 and the mean score of depression, stress and anxiety was 19.66±10.923, 20.43±10.330 and 15.14±9.263 respectively. Conclusion: COVID-19 caused a range of anxiety, stress, and depression among dental students. Females were more anxious and stressed than males. Interns and final year students suffered from extremely severe stress and anxiety. As a result, efforts should be made in institutions to reduce student stress and anxiety through counselling sessions

***Keywords*---**COVID-19, Students, anxiety, Stress, Depression.

Introduction

Coronavirus disease 2019 (COVID-19) is a pneumonic like illness which spreads by the coronavirus 2 that causes (SARS- CoV-2). During December 2019, the very first new case of COVID-19 was discovered in Wuhan, China. [1,2] It was declared as a pandemic by WHO on March 11.[3] There are many different types of symptoms of COVID-19 but most common are cough , fever , loss of taste sensations , irritation in the throat . Various complications are also seen such as respiratory distress and respiratory failure. The usual onset is 2-14 days (typically five) from infection.[4]The transmission of COVID-19 virus occurs through contaminated air containing the virus . Due to these small air borne virus particles and contaminated fluids containing the virus transmission becomes more easy.

On March 16th and as part of the first lockdown,for theoretical classes, dentistry institutes in Bhubaneswar city have stopped taking physical classes and have gone entirely online. As a result, dental schools halted all clinical and preclinical instruction for the sake of student safety and due to this fear of missing out on clinicals, practicals, exams and online learning the dental students in Bhubaneswar were mentally disturbed. As it is known, online teaching is not sufficient for professional courses like dentistry,clinical exposure is necessity as much as possible. The fear of not getting enough clinical exposure,lack of clinical guidance, and practice contributed to stress and anxiety among dental students. They already faced a lot of mental pressure due to academic burden, pre-clinicals ,completion of quota in colleges ,lack of confidence, internals and professional exams pressure and Covid-19 added more to it.[5,6]Furthermore, the disruption of most occupations, as well as the negative impact of the lockdown on the economy, created an atmosphere of worry and sadness. As a result, the goal of this study was to see how COVID-19 and the lockdown affected dental students' stress, anxiety, and depression.

Methodology

An online based cross-sectional, questionnaire study was conducted among the undergraduate students from second year to Interns and Postgraduate dental students of Kalinga Institute Of Dental Sciences, Bhubaneswar city for a span of 3 months (January to March 2022).The formula 'n=z2pq/d2' yielded a sample size of 222, where n represents sample size, p is the illness prevalence, q is disease-free state, d is the acceptable error, and z is the point on normal deviation. Multistage stratified random sampling technique was followed, illustrated in Figure 1.Bhubaneswar city is divided into three zones namely North, South-west and South-east zone. Each zone has one prestigious dental colleges namely Kalinga Institue Of Dental Sciences (KIDS), Hi-Tech Dental College and Institute of Dental Sciences. KIDS was selected randomly through lottery system .Dental students from second year till postgraduates were included in the study as they offered their informed consent.The first-year students were excluded from the study since they were not present in the college at the time of the study as they were still undergoing their counselling procedures for college admissions. Ethical Clearance was obtained prior to the start of the survey from the Institutional Review Board.

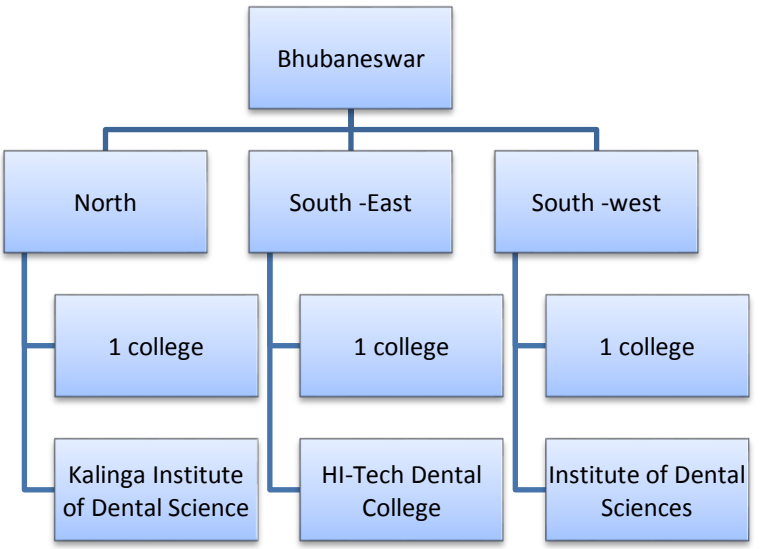

Figure 1- Sampling Technique

Instruments

Data was collected using DASS 21 questionnaire. The questionnaire was designed using Google forms and circulated through online platforms like Email and Whatsapp of known contacts. The questionnaire form was divided into two sections, the first of which contained socio-demographic information such as

name of the students, age of the students, gender of the students, and qualification/affiliation of the students. The DASS-21 approved questions were used in the second section. The scores for the three subscales of the DASS-21 were calculated by adding the respective scores of the seven statements linked to each of the construct (Stress, Anxiety and Depression). Because the (DASS-21) is a condensed version of the (DASS-42), the subscale scores were multiplied by 2 to indicate the total for the entire (DASS-42) subscale. The ratings ranged from 0 to 42, with higher scores indicating higher degrees of the disease. The scores for each of the subscale are then grouped to show the severity of each condition, with normal, mild, moderate, severe, and extremely severe being the most severe.[7,8]

Statistical Analysis

The data was gathered and entered into a spreadsheet programme (Microsoft Excel 2010) before being analysed with version 26 of the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL. 2020). As part of the descriptive statistics, percentages, mean, and standard deviation were calculated. The Chi-square test was utilised to conduct the research. The Level of Significance and the Level of Confidence were set at 95% and 5%, respectively.

Results

For this survey a total of 222 students took part. In our study females were 57.7% (n=128) and 42.3% (n=94) were males (Figure 2). Mean and Standard Deviation of Age (Mean±Standard Deviation) is 22.75±1.937, depression is 19.66±10.923, stress is 20.43±10.330 and anxiety is 15.14±9.263.

In the study maximum number of participants were found to be in the age range of 19-22 with 48.6% (n=108) followed by age range of 23-26 with 46.8% (n=104) and the least number of participants were in the age range of 31-34 with 0.5% (n=1) followed by 27-30 with 4.1% (n=9). The present study comprised of 4th year students who participated the most with 33.3% (n=74)) followed by Interns with 26.6% (n=59) followed by 2nd year with 17.6% (n=39) ,3rd years with 14.4% (n=32) and PGs with 8.1% (n=18) .

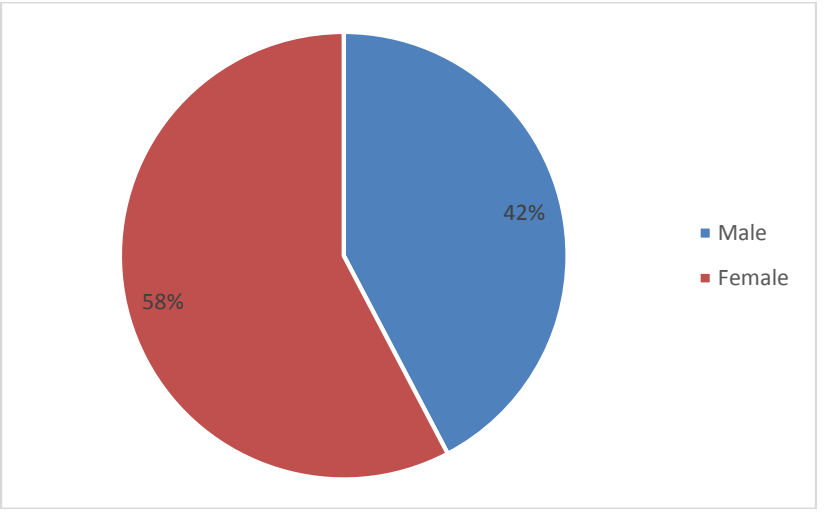

FIGURE 2: Percentage of males and females

Figure 3 illustrates the research participants' stress, anxiety and depression scores. Out of 222 participants, depression was found to be extremely severe in 52.7% (n=117) which was maximum, moderate in 19.8% (n=44), normal in 14.0% (n=31), severe in 10.8% (n=24) and mild in 2.7% (n=6). Stress was also found to be extremely severe in 56.8% (n=126), moderate in 21.2% (n=47), normal in 10.4% (n=23), severe in 9.0% (n=20) and mild in 2.7% (n=6). Anxiety was also found to be extremely severe in 36.9% (n=82), normal in 25.2% (n=56), moderate in 22.5% (n=50), severe in 9.9% (n=22) and mild in 5.4% (n=12).

FIGURE 3: Stress, anxiety and depression scoring among the study participants

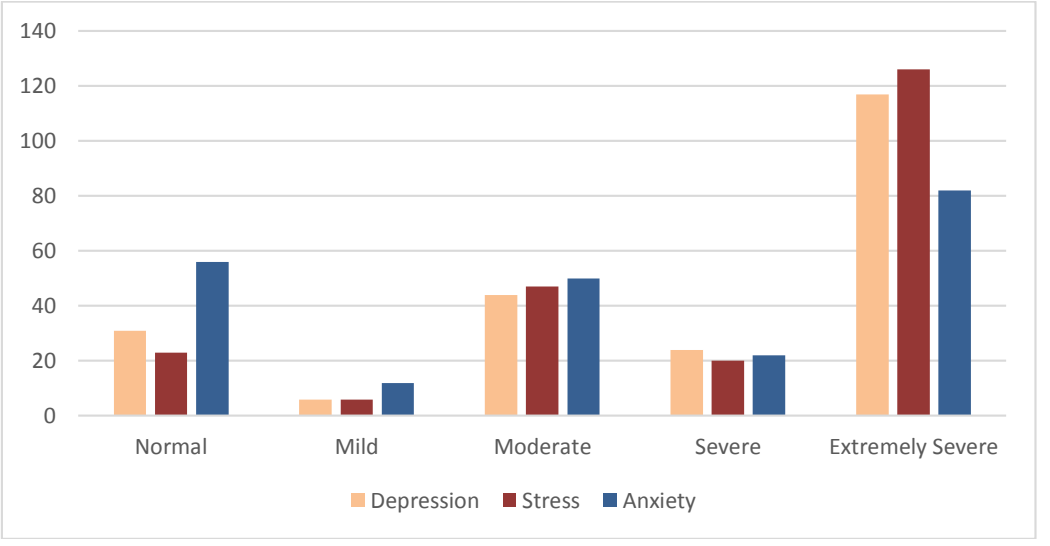

Table number 1 depicts the stress, anxiety and depression scores among gender of the study participants. Extremely severe Depression was seen highest among the females 69(53.9%), Moderate Depression was seen in 23(18.0%) females and 17(13.3%) females suffered from Severe Depression (p value=0.462). Extremely Severe depression was seen in 48(51.1%) males, Moderate Depression was seen in 21(22.3%) males and 16(17%) males were found to be Normal.

Extremely severe stress was seen highest among the females 68(53.1%), Moderate stress was seen in 27(21.1%) females and 16(12.5%) females were suffering from Severe stress (P value=.153). Extremely severe stress was seen in 58(61.7%) males, 20(21.3%) males suffered from Moderate stress and 11(11.7%) males were found to be Normal.

Extremely severe anxiety was seen highest among the females 42(32.8%), 37(28.9%) females were found to be normal and Moderate anxiety was seen in 29(22.7%) females (p value=.285). Males also suffered from extremely severe form of anxiety 40(42.6%). Moderate anxiety was found in 21(22.3%) males and 19(20.2%) were found to be normal .The correlation between males and females suffering from anxiety was calculated to be .044* which was significant.

Table 1:- Stress scores, Anxiety scores and Depression Scores among gender of the study participants (n=222)

* significant

Depression	**Normal State (%)**	**Mild State (%)**	**Moderate State (%)**	**Severe State (%)**	**Extremely severe State (%)**	**P value**	**Chi-Square**	**R**
Male	16(17%)	2(2.1%)	21(22.3%)	7(7.4%)	48(51.1%)	0.462	3.603	0.282
Female	15(11.7)	4(3.1%)	23(18.0%)	17(13.3%)	69(53.9%)			
Stress								
Male	11(11.7%)	1(1.1%)	20(21.3%)	4(4.3%)	58(61.7%)	.153	6.696	0.700
Female	12(9.4%)	5(3.9%)	27(21.1%)	16(12.5%)	68(53.1%)			
Anxiety								
Male	19(20.2%)	3(3.2%)	21(22.3%)	11(11.7%)	40(42.6%)	.285	5.025	.044*
Female	37(28.9%)	9(7.0%)	29(22.7%)	11(8.6%)	42(32.8%)			

Table 2 depicts the stress, anxiety and depression scores among qualification of the study participants. Extremely severe depression was seen highest among the Interns 39(66.1%) followed by 4th year 35(47.3%), 2nd year 16(41.%), 3rd year 15(46.9%) and Postgraduates 12(66.7%) (p value=0.125).

Extremely severe stress was seen highest among the final year UGs 38(51.4%) followed by Interns 31(52.5%), 2nd year 29(74.4%), 3rd year 16(50.0%) and Postgraduates 12(66.7%). The p value for stress among the study participants' qualifications was determined to be significant (p value = 0.047*).

Extremely severe anxiety was seen highest among the 4th year 27(36.5%) followed by Interns 25(42.4%) 3rd year 11(34.4%) and Postgraduates 8(44.4%) . Out of all the students who participated in the study 14(35.9%) of the 2nd year students were found to be normal in case of anxiety .Anxiety among qualification of the study participants was found to be significant* (R= .022*) .

Table 2 :- Stress, Anxiety and Depression Scores among qualification of the study participants
*significant

Depression	**Normal (%)**	**Mild (%)**	**Moderate (%)**	**Severe (%)**	**Extremely severe (%)**	**P value**	**Chi-Square**	**R**
2nd year	3(7.7%)	0(0.0%)	12(30.8%)	8(20.5%)	16(41.%)	0.125	22.609	0.81
3rd year	7(21.9%)	1(3.1%)	6(18.8%)	3(9.4%)	15(46.9%)			
4th year	15(20.3%)	4(5.4%)	14(18.9%)	6(8.1%)	35(47.3%)			
intern	4(6.8%)	1(1.7%)	10(16.9%)	5(8.5%)	39(66.1%)			
pg	2(11.1%)	0(0.0%)	2(11.1%)	2(11.1%)	12(66.7%)			
Stress								
2nd year	0(0.0%)	0(0.0%)	6(15.4%)	4(10.3%)	29(74.4%)	0.047*	26.541	.067
3rd year	4(12.5%)	1(3.1%)	5(15.6%)	6(18.8%)	16(50.0%)			
4th year	13(17.6%)	3(4.1%)	13(17.6%)	7(9.5%)	38(51.4%)			
intern	4(6.8%)	1(1.7%)	20(33.9%)	3(5.1%)	31(52.5%)			
pg	2(11.1%)	1(5.6%)	3(16.7%)	0(0.0%)	12(66.7%)			
Anxiety								
2nd year	14(35.9%)	4(10.3%)	6(15.4%)	4(10.3%)	11(28.2%)	0.405	16.709	.022*
3rd year	7(21.9%)	2(6.3%)	8(25.0%)	4(12.5%)	11(34.4%)			
4th year	23(31.1%)	3(4.1%)	13(17.6%)	8(10.8%)	27(36.5%)			
intern	10(16.9%)	2(3.4%)	19(32.2%)	3(5.1%)	25(42.4%)			
pg	2(11.1%)	1(5.6%)	4(22.2%)	3(16.7%)	8(44.4%)			

Discussion

The motive of this research was to determine the stress and anxiety levels of dentistry students in the COVID-19 stage. 'Stress' refers to a person's overall response or reaction to a tough bodily or emotional situation. It may make prone to anxiety, which has poor mental and physical implications due to a sense of unpredictability and powerlessness over potentially upsetting life experiences. [5,9,10,11]Fear of infection is a well-known stressor for dentistry students, and it can contribute to clinical anxiety.[9-11]

Females are more prone to anxiety than males, according to Liu et al. [12], which could be linked to psychological stress. In this study also we found similar results that is extremely severe anxiety was seen highest among the females as compared to males.

In one study, moderate anxiety and severe anxiety were reported in 17 percent and 4 percent of the students, respectively, with no clear link uniting anxiety and gender.[13] In contrary to our study where we found that anxiety levels in students were comparatively higher that is extremely severe in 36.9% , moderate in 22.5% , severe in 9.9% . We also noticed association of anxiety with gender where we found that females had more anxiety as compared to males.

Keskin G [11] conducted a study in Turkey in March 2021 and found that the Mean (Std. Deviation) of depression was 18.40 (11.328), anxiety was 16.37

(12.000) and stress was 19.48 (11.108). In the present study, we found mean score of Depression is 19.66±10.923, Stress is 20.43±10.330 and anxiety is 15.14±9.263 which was high and proves that dental students are still under stress and anxiety and its increasing day by day due to COVID-19 scenario.

In this study, depression was extremely severe in 52.7%, Stress was also found to be extremely severe in 56.8% and Anxiety was also extremely severe in 36.9%. Contrastingly,in another study of 110 dental students in Riyadh, Saudi Arabia, Khanagar SB et al.[14] discovered that depression, anxiety, and stress were 11.9 percent, 7.3 percent, and 0.9 percent, respectively which was quiet low.Kwaik et al.[15] in their study analysed that Extremely Severe Depression was seen in 14.4% dental students, anxiety was seen in 36.5% and to our surprise stress was seen in 0% of the dental students

Muhammad UN, Rajan JS.[13] in their study mentioned an association between qualification of dental students and anxiety in which it was found that 3rd years had no anxiety at all and Interns had 22.2% anxiety whereas in our study we found that 3rd year suffered from extreme severe anxiety (34.4%) and Interns (42.4%) . The increase in anxiety in 3rd years may be due to lack of exposure of clinical knowledge and training. The same goes with Interns but they have more anxiety due to fear of future and the reason that they have only one more year in college but still due to COVID-19 they didn't have that much clinical practice.

The increase in the stress and anxiety in the dentistry students in the recent times may be due to the fact that students are doubtful about their future because in dentistry we need practice and without ample ample amount of clinical knowledge and patient work we can't achieve anything. Due to COVID-19 scenario this nightmare is turning to be true . Dental students already face a lot of stress and difficulties in their academics and adding on to this comes the COVID-19 which is adding extra stress,depression and anxiety in them .[16,17]

To comply with the tight social distance rules aimed at minimising disease transmission, a switch to e-learning or online education was required. By any means, online schooling is not at all an option to cover dental training, resulting in increase in students' psychological stress and anxiety regarding how they would restart their clinical dental training securely.In this pandemic, training is undoubtedly a primary stressor. Due to the near closeness of patients, clinical training of students in clinics is regarded to represent a high chances of disease transference.The near proximity of the care provider to the patient, as well as the fact that most dental treatment procedures produce aerosols.[18,19]

Given their propensity to the mental health disorders, health faculty students, like the general public, should be informed about the health advantages on a regular basis. Regular exercising and yoga, a nutritious and healthy diet, and adequate amount of sleep are all factors that contribute to good health.Finally, dentistry students should have a lot of resources, clearer information about methods for determining fitness to practise. The transmission of this information in a timely manner may help to alleviate the concern. It's linked to seeking treatment, and it could make people feel better. Students should seek assistance sooner rather than later. [20,21]

Aside from the likely detrimental effects of the rampant COVID-19 on clinical students' mental well-being, students' participation in the disease's control and precaution offers certain advantages.Because they have a variety of transferable skills, medical students have adequate clinical and practical capability. Medical students are also capable of performing effectively under duress.with the gains they've made throughout their educational careers, and handle a hefty workload. However,It may take a long time to become comfortable with the task as well as the changing environment, especially if you are new to the field.in the case of a pandemic like COVID-19. [22]

There are certain limitations to the research. The character of the details gathering approach might not reveal the direction of the causation and effect in this cross-sectional study. The scope of this research was limited to a particular college. As a result, the outcomes may differ and may not be applicable to other universities. As a result, more research is needed to fully understand the influence of COVID-19 on dentistry students.

Conclusion

In essence, COVID-19 caused a range of anxiety, stress, and depression among the dental students at Kalinga Institute Of Dental Sciences, ranging from mild to extremely severe. Females were more anxious and stressed than males.Interns and final year students suffered from extremely severe stress and anxiety. As a result, efforts should be made in institutions to reduce student stress and anxiety through counselling sessions and the creation of a supportive environment. Furthermore, dentistry schools should be appropriately prepared to deal with COVID-19 and other new infectious disease outbreaks by having up-to-date information on the illness's modes of infection and preventive methods. Special webinars should be conducted about risk of infection of COVID-19 in dental practice and understanding its importance.

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