Article

Percieved Stress and Resilience among Dentists during the COVID-19 Outbreak

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Abstract: The novel coronavirus has affected the mental state of the general public, more so among healthcare workers. During the pandemic when the infectivity had become intense, dental professionals were at stake as their work demanded more proximity with oral and nasal secretions. Many dentists had to close their clinics for fear of infection. This had a significant impact on their financial, social and emotional wellbeing. Stress is what arises when something we care about is at stake. Dentistry which is already a stressful discipline, the pandemic has multiplied the already existing pressures of isolation, the focus on perfectionism, compromise on treatment, and time pressures. Our study has attempted to assess the perceived stress among dentists and the various correlates impacting the same. Resilience is the capacity to bounce back productively during stressful situations. Resilience acts like a buffer to wither stress. Resilience is neither permanent nor global. In our study, we have attempted to assess resilience among dentists using a standard validated scale and various sociodemographic factors impacting resilience. Further, we have tried to assess the correlation between stress and resilience. We found that senior dentists with more years of experience had more resilience and their perceived stress was less. Though we found increased perceived stress among women dentist, but resilience did not have any gender difference. It is essential to be pandemic prepared with implementation resilience building strategies at various levels.

Keywords: Dentist; stress; resilience; Covid 19; Pandemic

1. Introduction

The emergence and spread of the 2019 novel coronavirus [2019-nCoV] or the severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2] has created a new public health crisis. The outbreak of the virus was first reported in Wuhan, Hubei province, China in December 2019. The rapid spread and alarming death rates have created a global turmoil pressurizing the health systems By July 4, 2020, the WHO had reported 10,922,324 confirmed cases of COVID-19, and 523,011 deaths in the world [1].

The outbreak of the novel coronavirus disease 2019 [COVID-19] has also challenged health care professionals greatly affecting their personal and professional lives. The dentists had to widely restrict their dental practices worldwide, considering the nature of the virus and how easily it may be dispersed during common dental procedures. The COVID-19, SARS-CoV-2 virus, is profusely present in nasopharyngeal and salivary secretions of patients who are infected with SARS-CoV-2 to be transmitted among persons primarily through respiratory droplets and aerosol [2–5]. Even normal breathing and talking produce small droplets that carry aerosolized SARS-CoV-2 particles that remain suspended in the air for several hours. Dental professionals carry out procedures in close contact with the nose and mouth of the patient and are at constant risk of exposure to saliva, blood, and droplets. Most of the dental procedures also involve the use of airotors that generate more aerosols that get suspended in the operatory room. Studies have proposed the airborne spread of COVID-19 via droplets. Hence, the health regulatory bodies around the world as well as in India placed strict regulations for their registered dentists to perform only urgent dental procedures and

 doi:10.20944/preprints202305.2211.v1

to avoid all elective treatment procedures like restoration and aesthetic dental procedures, routine scaling, extraction of asymptomatic teeth, orthodontic procedures, and routine radiographs [6,7]. Later, as the situation worsened when the world witnessed a drastic spread of the disease with rising mortality rates, the nations went into the phases of lockdown to contain the pandemic. At this phase dental clinics, dental schools, and hospitals had to be shut down to provide only emergency procedures creating more uncertainties that a dental professional would have never envisioned.

Dentistry has always been considered as a stressful profession. With additional burden of the pandemic has contributed to the stressful situations in the lives of dentists. Consolo et al. found that approximately 85 percent of dentists in a district in Italy reported being worried about acquiring the infection during dental procedures [8]. Another study established mental anguish among dentists and found that a patient's fear of having COVID-19 infected creates high psychological tension.[9] There was also an acute shortage for personal protective equipment's that significantly affected the working environment of dentists. Meng et al. found that, despite the use of protective measures such as masks and gloves, several dental staff members in Wuhan were found to have been infected with COVID-19 as part of their work, along with some of their close relatives [2].On the other hand, a high number of patients cancelled their previous appointments, while others reported infection risk during dental work.

Psychological stress refers to an overload of mental, physiological, and behavioural responses resulting from how individuals perceive situations or events in their environment. The SARS-CoV-2 pandemic has likely increased the risk of mental health issues in health care workers across the world. Excessive workload or work hours, inadequacy in personal protective equipment, fear of contagion concerns for self/family well-being, increased need for infection control procedures domestics and at dental operatory, overhyped media news, feeling lack of social support, procedural errors, financial insecurity, and potential loss of income [10].

Resilience is the capacity to bounce back productively during stressful situation. Resilience acts like buffer to ward off stress during stressful situation. In our study we have tried to assess stress and resilience among dentist and their possible correlation during COVID 19 pandemic [11].

This questionnaire study evaluates the perceived stress and resilience among dentists in India during Covid -19 Pandemic

2. Results

2.1. Socio demographic details

[Table1]: In the study 51% of the participants belong to 25 to 29 years of age group. Females constitute 78% of the sample. Study constitutes equal number of participants who are doing/ have completed bachelor's and master's degree. Majority of the participants are practicing as dentists, followed by academicians who constitute 20% of the sample. Majority have less than three years of practicing experience. In the participants, 72% are attached to a private setting/ workplace. Majority of the participants have dependents staying with them, be it be children less than 10 years of age or adults more than 60 years of age when the survey was conducted. Nearly 20% have their spouse also working as a healthcare worker.

Table 1. Comparison of socio demographic variables with PSS 10 and CD-RISC 10.

Variable [n= 123]		**Frequency [percentage]**	**PSS 10**		**CD-RISC 10**	
			Mean [SD]	p- value	Median	p- value
Age [years]	20 - 24	31 [25.2%]	21.51 [4.37]	0.011*	21.0	0.096
	25 - 29	51 [41.5%]	20.41 [5.95]		21.0	

 doi:10.20944/preprints202305.2211.v1

	30 - 34	13 [10.6%]	17.69 [8.27]		22.0	
	> 35	28 [22.8%]	18.00 [5.81]		25.5	
Gender	Female	96 [78%]	20.46 [5.92]	0.027*	22.0	0.530
	Male	26 [21%]	17.57 [5.65]		21.5	
Education	Bachelor's	63 [51.2%]	21.42 [4.20]	0.002*	21.0	0.055
	Master's	60 [48.8%]	18.20 [7.04]		25.0	
Designation	Student	29 [23.6%]	21.58 [4.83]	0.022*	21.0	0.051
	Academician	24 [19.5%]	16.87 [6.73]		26.0	
	Practitioner	70 [56.9%]	20.15 [5.82]		21.5	
Years of experience [years]	< 3	67 [54.5%]	20.37 [5.42]	0.553	21.0	0.048*
	3 to 5	23 [18.7%]	20.13 [5.50]		20.0	
	5 to 10	10 [8.1%]	19.60 [9.13]		24.0	
	> 10	23 [18.7%]	18.17 [6.37]		26.0	
Affiliation	Private	89 [72.4%]	20.13 [5.91]	0.647	22.0	0.363
	Government	3 [2.4%]	16.00 [7.93]		32.0	
	Others	31 [25.2%]	19.41 [5.99]		22.0	
Dependants	Yes	71 [57.7%]	18.80 [6.02]	0.020*	22.0	0.582
	No	52 [42.3%]	21.28 [5.63]		21.0	

Test used: t test, ANOVA, Wilcoxan and Kruskall-Wallis. ug- undergraduate, pg- postgraduate, p- value < 0.05 is significant.

Among the participants, we have asked questions related to COVID19 and workplace. On the personal protective equipment provided at workplace, 57% were satisfied. The number of patients seen during the pandemic by any dentist ranged from 3-30. Majority [60%] have restricted their practice to seeing only emergency cases. Following the protocols imposed by the government nearly half of the dentists have spent their majority [51%] of the time at home. Only 40% of the dentists have taken prophylaxis for the COVID19. The mean working hours reported during the pandemic was 5.6 hours. Average amount of sleep reported during the pandemic was 7 hours.

Comparing the various socio demographic variables with the PSS 10- We found that significant association between age groups, gender, education, designation and presence of dependants. Among the age groups, those between 20 and 24 years have reported higher perceived stress when compared to others. Also, we observe that the mean of PSS scores decreases as age increases. Females have reported higher mean PSS score when compared to males. Among the educational background, participants possessing/ doing higher degree have reported less stress scores. Similarly, those who are working as academicians have reported lesser mean PSS scores. Those who have higher years of experience have reported lesser mean PSS scores when compared to those with lesser years of

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experience, but this is not statistically significant. Those who have dependants staying with them have reported less stress when compared to those who do not.

Comparing the various socio demographic variables with the CD-RISC 10-, as the scores of resilience score do not follow the normal distribution, we have resorted to median and non-parametric test. There is significant association between the years of experience and resilience, the median scores increase with the increase in the years of experience. We did not find any significant association between rest of the variables and the resilience scores.

2.2. Comparison of PSS 10 and CD-RISC 10 with comparison sample

The author for PSS 10 had provided the comparison mean values based on the age and gender. We have compared our participants mean scores with the author quoted mean scores. We find statistically significant difference in age [p= 0.000] and gender [males p= 0.000, females p= 0.000]. The study participants have significantly higher perceived stress scores when compared to general population. [Table 2, Figure 1]

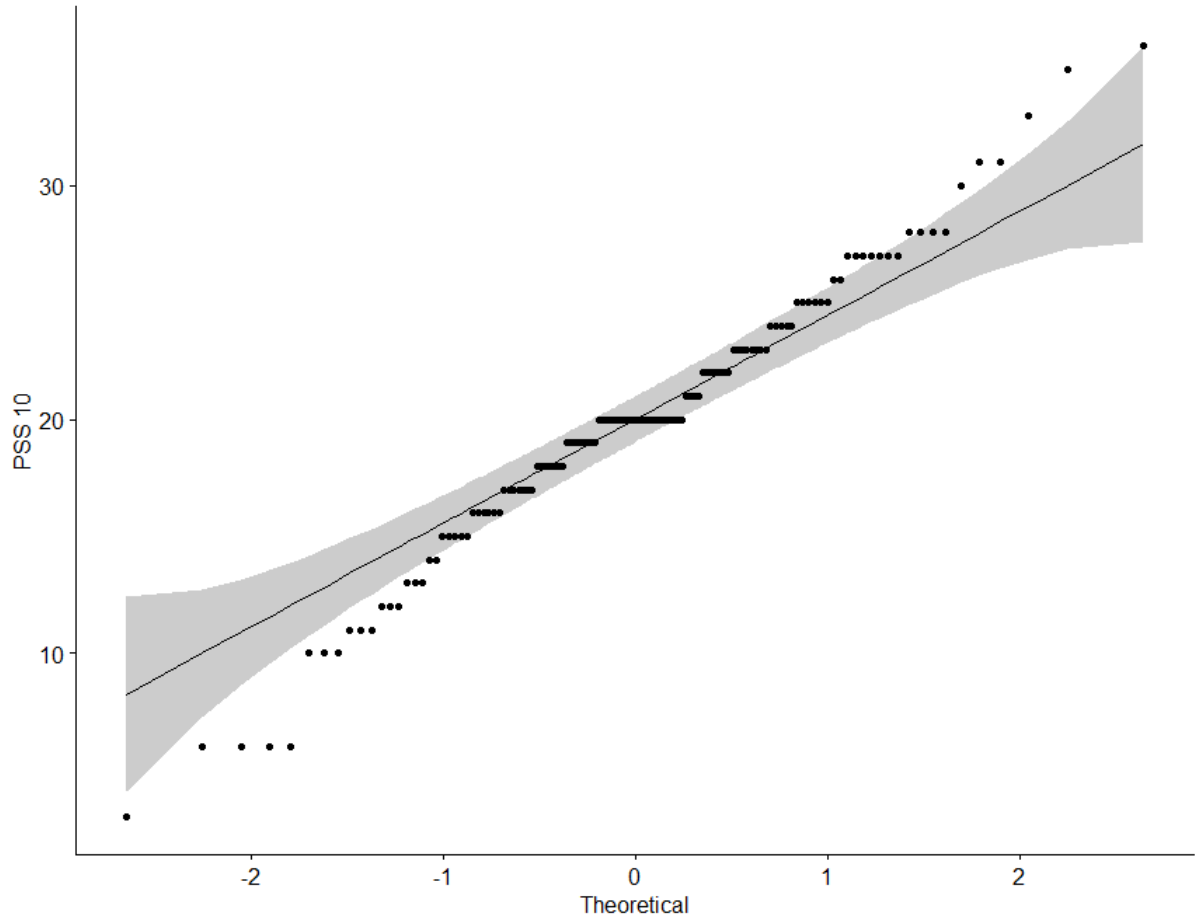

Figure 1. Comparison of Perceived stress score of study participants with normal population.

In case of CD-RISC 10 scale, the author had not given comparison scores, but had directed to compare with a resilience study done in Indian population. Mathad et al have done a study exploring the correlates and predictors of resilience in nursing students, as the study age group and profession matches; we have compared their mean score [26.30] with our study. We found a statistically significant difference [p= 0.000] in the resilience scores, the resilience scores were less in the study when compared to Mathad et al study. [Table 2, Figure 2]

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Table 2. Comparison of the participants PSS 10 and CD-RISC 10 with comparison sample.

Variable		**PSS 10**	
		Mean	p- value
Age [18 to 44 years]	Study	19.85 [5.96]	0.000*
	Comparison	13.60	
Gender – Male	Study	17.57 [5.65]	0.000*
	Comparison	12.10	
Gender – Female	Study	20.46 [5.76]	0.000*
	Comparison	13.70	
		CD-RISC 10	
Study		23.56 [6.07]	0.000*
Comparison [Mathad et al 2017]		26.30 [6.3]	

Test used: unpaired t test, p- value < 0.05 is significant.

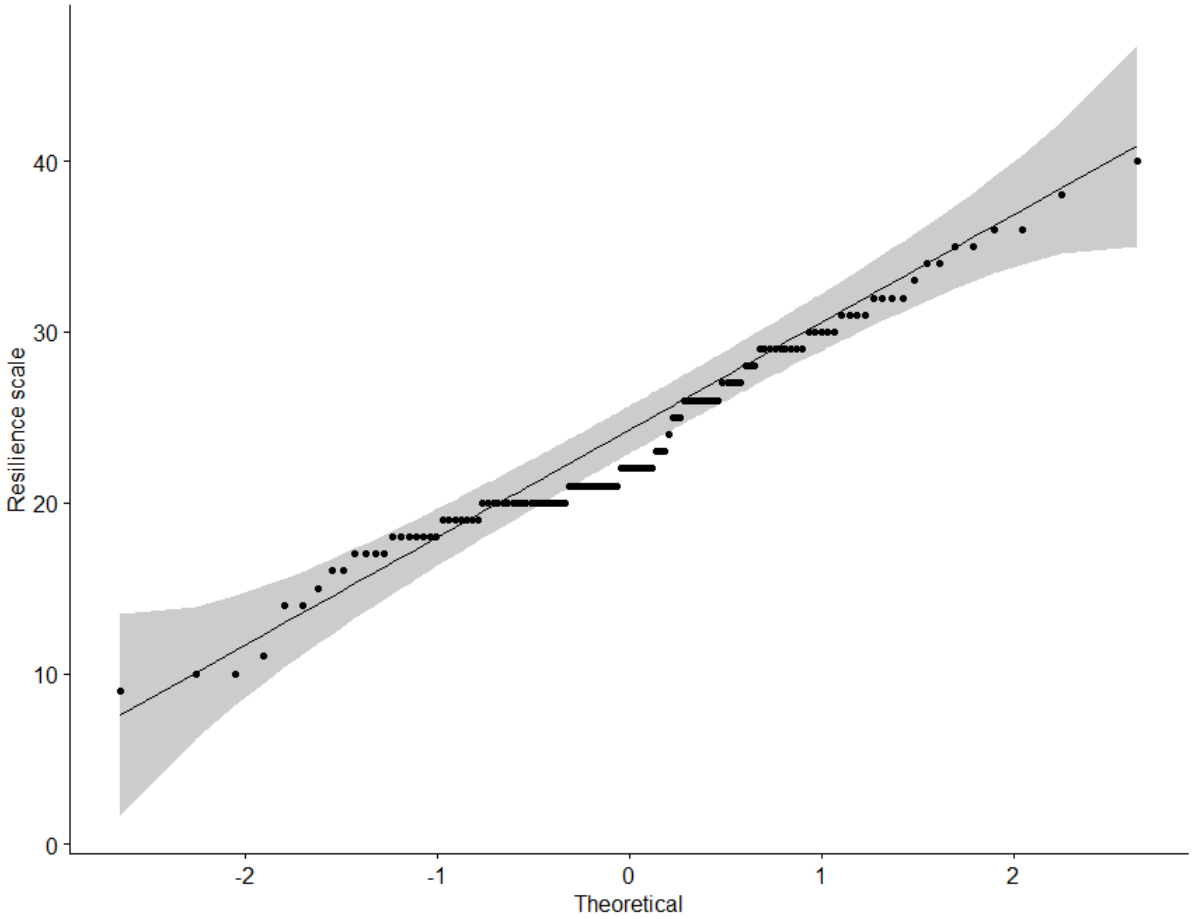

Figure 2. Comparison of Resilience score of study participants with comparison group.

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2.3. Correlation between perceived stress and resilience

[Table 3 and Figure 3]: Both the scales scores were checked for normality distribution [Shapiro-Wilk test; for PSS it was p= 0.116 and CD-RISC it was p= 0.006] and found that resilience scores were not normally distributed. Accordingly we applied Spearman correlation test and found that there is a moderate negative linear correlation [r= -0.551, p= 0.000] between the two scales. The same is depicted in the scatterplot as a slant line with PSS along the x axis and resilience along the y axis. On performing linear regression [R2 = 0.415, p= 0.000] to arrive at an expression of y = 35.28 – 0.590x, where y is the resilience score, and x is PSS score.

Table 3. Correlation between PSS 10 and CD-RISC 10.

PSS 10 * CD-RISC 10	Correlation coefficient [r]	p- value
	-0.551	0.000*

Test used: Spearman correlation test, p- value <0.05 is significant.

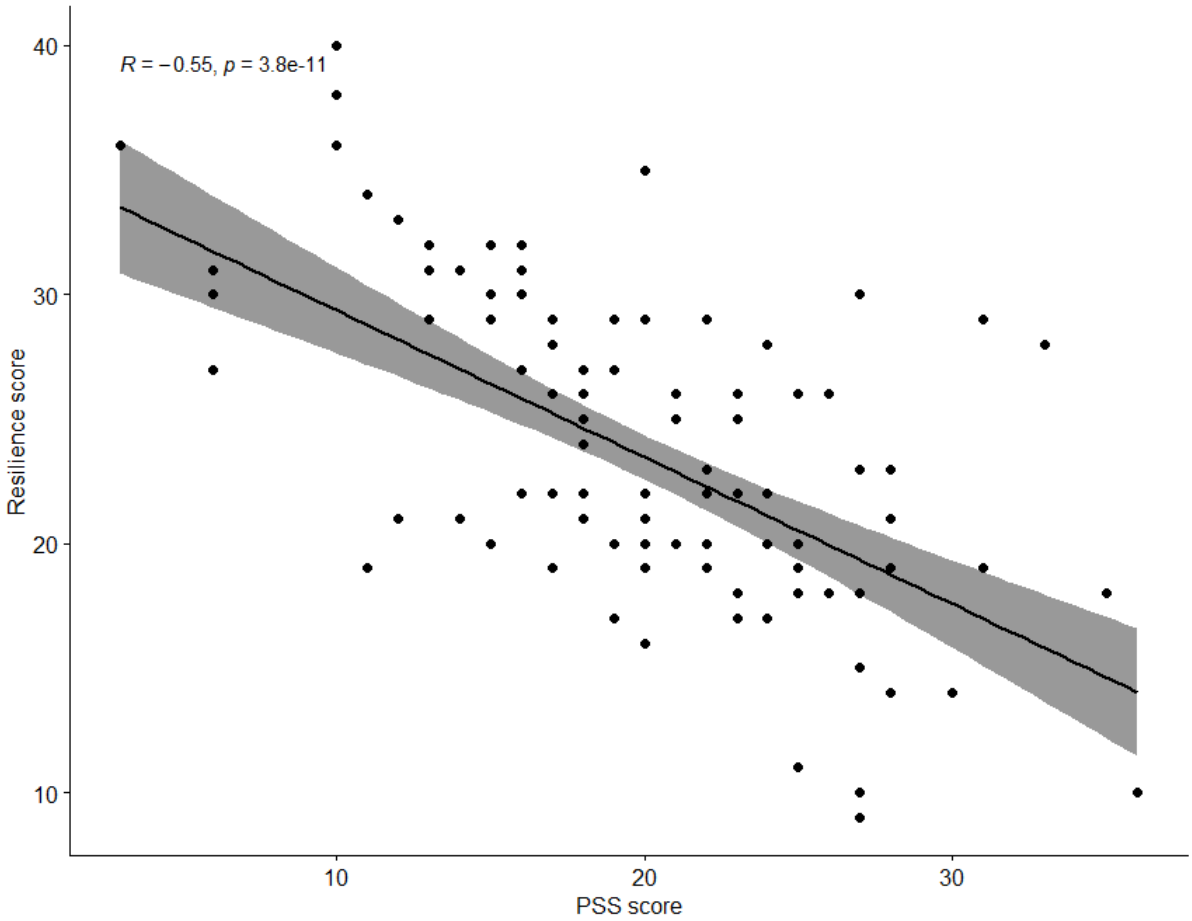

Figure 3. Correlation between perceived stress and resilience.

3. Discussion

Dentistry is a long demanding journey that includes didactic and clinical components. The stress of the pandemic has multiplied the already existing pressures of isolation, the focus on perfectionism, compromise on treatment, and time pressures among dentists. Higher stress levels, when compared to the general population, have been reported among dentists even from their undergraduate levels. Around 30% of dental practitioners suffer burnout. Burnout in turn leads to depression and anxiety.

 doi:10.20944/preprints202305.2211.v1

The prevalence of suicidal thoughts among general dental practitioners is around 10% which is double the general population [12].

The main goal of our study is to find the stress among the dentists of different age group, gender, type of work [academic vs private practice] and years of experience. In our study we used two validated scales which includes perceived stress scale and Connor Davidson resilience inventory. Permission was sought from the authors of both the scales. We selected short and easy scales with a goal to increase the number of participants.

Stress is how the body and mind respond to the demands or challenges. Stress happens when there is physical, emotional and psychological strain and it requires body's response to the same. Overall, our study participants had higher PSS score when compared to general population. A study published in 2021 found that nearly 70% of dental students were moderately stressed and nearly 20% of students had severe stress. This indicates that dentistry is a stressful discipline [13].

In our study we found PSS scores were high in the participants in the age group of 20-24 years. Students along with the didactic work must deal with clinical requirement of different specialities. Transitional periods of development can be moments of vulnerability. The emerging adulthood, along with stressful situations in the university can create disequilibrium. Demands exceeding available resources can lead to stress [14].

Females reported more perceived stress when compared to males. This is in accordance with an Indian study done during the pandemic. According to this study, female gender is a significant predictor for stress and a risk factor for development of psychiatric symptoms during loneliness [15]. This may be attributed to the sex differences in the hypothalamic pituitary adrenal axis response to stress. It was found that women had higher salivary cortisol levels than men when challenged with stress. It is thought that females exhibit more reactivity in neural network when compared to males resulting in more arousal in response to fear[16].

In a study done on stress level among post-menopausal women, showed a prevalence of high to very high levels of stress among post-menopausal women when compared to general population[17].

Contradictory to our findings, a study among general practitioners in UK reported higher anxiety scores among men due to less job satisfaction and had more substance abuse than their women counterpart. Another study done among medical students in India also found higher stress levels among males[18].

It was also found that participants doing or possessing higher degrees had low PSS score. This could be attributed to the fact that people having higher degrees feel more secure and better acquainted to dental practice and its demands. People with more years of experience had less PSS score when compared with people less experience. This finding agrees with a study conducted in China, where experienced workers dealt with difficult situations better than less experienced workers. The inexperienced went with certain expectations, which made them to have difficulty in adjusting due to lack of skills [19].

Our study found participants who had cohabitants like spouse or parents had less PSS score compared with people living alone. This can be explained by the fact that both acute and chronic stress is related to loneliness [20]. This contrasts with finding by Aldarmasi that there were no significant differences in participants stress level in relation to marital status, people they are living with, monthly income, job title, shift type, pre-existing disease, or substance abuse [21].

We found that academicians reported lesser PSS score. Similar findings were found in a study done at Chhattisgarh, people having both practice as well as academician role were most stressed followed by practitioners. They found that pure academician was less stressed. Earlier studies reflect lower levels of stress in older participants, possibly due to more years of healthcare experience, more stable mental health and being less distracted under stressful situations. This can also be owed to reduced working hours for seniors and their greater experience in handling critical situations [22].

A study reported that middle aged and younger individuals showed more stress compared to older population as the older population have reduced social responsibilities like work roles and raising children. They also are known to be reporting less complaints. Older people comparatively

 doi:10.20944/preprints202305.2211.v1

show less hostility to people around. They do not practice maladaptive coping strategies to escape work [23].

Resilience is an individual's ability to make constructive adjustments when facing adverse situations. It includes problem solving, individuals' perception of possible support from friends and family, and a likelihood of prosocial and altruistic response in case of adverse circumstances. Resilience also involves adjusting to the demands of the environment in prosocial and functional way. In a study, it was found that resilience is an inherited factor, and such inheritability was more among men than women [24]. Other studies found that men are more resilient than women. Our study did not find any gender differences in resilience [25].

While resilience is a fundamental pillar of childhood development, there is an increased attention in scientific literature on its role in early stages of development in adulthood. Individuals demonstrate resilience in certain domains and context, while face problems in others while risk is involved.

Author of Connor Davidson scale has not mentioned reference value for resilience but have directed to use studies done in local population. When compared with a study done by Mathad et al. about resilience in nursing students [26], resilience scores were significantly less among dental students. Studies have shown that nonresilient students when compared with resilient students presented with higher academic stress, higher scores in physical and psychological reaction to stress and lower perceived self-efficacy, while stressors were manifest similar in both the groups. Resilient students inferred to have both internal and external resources which favours to manage stress, which nonresilient students lacked. Resilience is neither permanent nor global. In a study it was found that nonresilient adolescents were observed to become resilient adults [27].

In our study we found significant association between years of experience and resilience. As the years of experience increased, resilience scores also increased. Adaptability is one of the key skills used by the older individual to deal with stress. The main sources of resilience among older individuals is constituted by the domains of individuality, interaction and context. One of the factors that fosters resiliency is the strength of the past success. As age advances, individual find themselves capable of using a coping strategy to handle their challenging situation. They also start believing in their own competency, analytical skills, perception of the current situation and capability to establish relationship [28].

In our study we found a moderate negative linear correlation between perceived stress scale and resilience scale. This is in line with earlier studies showing that only stressful situations can determine if a person is lacking sufficient resilience resources. Even if resilience resources existed, they have not been usefully implemented. In less resilient individuals one unpleasant ordinary stressful situation tends to be quickly followed by another thereby increasing stress levels. Studies have showed that resilience can be strengthened through programs and can be thought at various levels [29].

Earlier studies show approximately 28% of doctor's reports symptoms conformable with psychiatric illness including suicidal tendencies. In this regard many medical councils encourage resilience boosting sessions for medical professionals to deal with their stress [30].

4. Conclusion

Our study found that the stress levels among dental professionals during COVID19 pandemic was significantly higher when compared to general population. This confirms that dental profession is a stressful discipline. Stress was higher among younger age group, female, private practitioners, and lesser years of experience. Stress can lead to both physical and mental illness. 28% of doctor's reports symptoms conformable with psychiatric illness including suicidal tendencies. Stress can lead to reduced performance, reduced self-esteem and in turn lead to compromised patient care. Resilience is a factor which can buffer stress. The resilience scores were also significantly lower, more so in younger population. Resilience is neither global nor permanent. Exposure to adversity can improve resilience with adequate training and support. Studies have showed that resilience can be strengthened through programs and can be thought at various levels. To design programs assessment of resilience and its context is important. Our study population were not exposed to natural calamities

or adversity previously. The pandemic had detrimental effect on physical and psychological harmony. Pandemic preparedness is the need of the hour to mitigate the distress and adverse mental events.

Recommendations: All universities and ethical workplaces should have periodic assessments of students and workforce for psychological wellbeing. Promoting resilience at various levels will improve the preparedness of individuals to face adversity. Healthy working environment, exercise and proper diet can all promote resilience. Specific resilience strategies like problem solving, awareness about available external and internal resources, mindfulness, and positive outlook about self and future needs to be implemented at various levels and situations.

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