

Occupational Stress Amongst Dental Professionals During COVID-19: A Questionnaire Based Study

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Abstract

Healthcare staff, especially dentists, are subject to a higher risk of COVID-19 infection due to close contact with infected patients. This study aimed to determine the stress amidst dentists of being infected while working during the current outbreak of new coronavirus diseases and the impact of treatment protocol change along with the financial concerns and measures taken to deal with the same. A questionnaire-based survey was carried out among 180 dental practitioners. Information was entered into Microsoft Excel 2007 and examined in SPSS 18.0. All the categorical factors were communicated in terms of numbers and rates. Affiliations between categorical factors were decided to utilise Chi-square. The prevalence was measurably noteworthy when the value was less than 0.05. Most participants were in clinical practice and attached to the academic institution (78.3%), and most were in the 20-30 age group. More participants had a bachelor's degree and were within 1-5 years of age (68.3%). During dental practice, the chances of transmission of COVID-19 (98.9%) are believed to be from a patient or co-worker. This reveals that COVID has added to dentists' mental health. This stress could affect the personal or patient relationship, affecting the treatment outcome with a significant difference between perceived stress between males and females. Even concern about personal health and the health of family members during a pandemic is taking a toll. Further, managing the rising cost of infection control procedures was challenging.

Keywords: COVID 19, Dental practice and Mental health, Occupational stress, Pandemic.

Introduction

In Wuhan, China, the coronavirus was identified and declared in December 2019. The infected individuals presented with pneumonia-like symptoms of unknown origin. In January 2020, after a rapid surge, the World Health Organization announced the discovery of coronavirus, initially labelled as 2019-nCoV and later formally named SARS-CoV-2, which had not been previously detected in humans. The SARS-CoV-2 infection was later called COVID-19 (coronavirus disease) on February 11 (1, 2).

COVID-19 has had a devastating effect on dentistry, and it is challenging to discover the magnitude and severity of its long-term effects, with the pandemic boosting the growth curve. A significant concern is the future of dental professionals and the restrictions on their practices. The remuneration and clinical costs

must be reported monthly, even though payments have yet to be received, which causes a massive loss and severe economic implications. In this case, practising COVID-19 requires cautious practising steps, as even a slight carelessness in following protocols and precautions may reveal the virus. Strict hygiene protocol, sanitisation, and sterilisation need to be adhered to. Today, dentistry requires a complete institutional reform to keep doctors and patients from getting infected (3). Dental practitioners' role in transmitting COVID-19 will hurt infection prevention. It is important to observe at risk the dental office, institution, and home surroundings of the dental practitioners. Adequate sanitisation with sterile instruments following safety measures in managing patients and staff is essential to decrease the transmission of infection. Advocating

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routine oral hygiene initiatives favours improving well-being and reducing the risk of disease transmission. Thus, increasing patient knowledge of infection transmission and virus characteristics is essential in managing COVID-19 transmission (4-6). Four standard levels of risk during practice have been published by the Occupational Safety and Health Administration, ranging from low to very high among employees. Healthcare workers, morgue workers, and laboratories fall into the high-risk groups. Health care staff, intensive care unit doctors, otolaryngologists, and nurses are considered the most at risk of infection, followed by dentists operating under aerosol-generating procedures (3). Dental procedures can cause practitioners to inhale aerosols as the oral cavity is considered a route of viral transmission. Inhalation of instrument / dental procedure-produced aerosols on COVID-19 patients will determine a high-risk transmission.

Furthermore, as a reliable diagnostic device, it has been documented that the virus and its particles can be isolated in saliva; thus, dental operators must always be cautious in protecting against the spread of infection and provide guidelines to manage the patients (7). This study aims to determine the occupational factors during COVID-19 leading to stress. Further, it also focuses on financial concerns and measures taken to deal with them.

Materials and Methods

A descriptive cross-sectional survey was conducted amongst dentists working with graduate and postgraduate degrees. An 18-item questionnaire was developed by revising literature and previous articles and guidelines. The data were pooled, and the investigator prepared the questionnaire. These questions were further reviewed, pilot-tested, and modified to 14 items. It was distributed, and 180 validated entries were collected. The inter and intraobserver reliability had a kappa value of 0.8. The questionnaire was divided into three categories: professional practice factors, financial burden and dentists' reaction to stress, and management measures. As it is a questionnaire-based study, the questionnaire was sent to 250 participants randomly; those fell in the abovementioned category, and a period of 7 days was given for them to respond. A minimum of 150

responses were expected. The confidentiality of the participants was strictly maintained, and the study was carried out with the permission of the Institutional Review Board.

Data were sorted using Microsoft Excel 2007, and SPSS version 18.0 was used. All the categorical factors were communicated in terms of numbers and percentages. Statistical parameters like mean and standard deviation (SD) for stress-induced factors and analysis of differences between categorical variables were calculated by student t-tests with two categories or F test for variables with three or more categories. Associations between categorical variables were determined using Chi-square. A value was considered significant when the P-value was less than 0.05.

Results

Demographic Data

The study consisted of 180 participants, of which the majority were within 40 years (74.4%) and more than 1/3rd (63.3%) were females and with graduates (67.2%) degree and master's degrees (32.8%). The majority of the participants had passed their graduation within five years. (68.3%) followed by more than 10yrs (19.4). The practice experience also was 1- 5 years (76.1%), 6- 10 years (12.2% followed by more than ten years (10.6). Most participants were in clinics and academics (78.3%) (Table 1).

Professional practice factors

Most participants were frightened of being infected with COVID-19, which could be transmitted from a patient or fellow worker (98.9%), followed by 81 % who were worried about the transmission of infection to their family. Although 81% were stressed at work, they were not anxious while treating patients. Similarly, 66 % thought dentists were exposed to the virus and faced extreme difficulty working in a PPE (Figure 1).

Financial Stress

COVID-19 has made dental practice difficult as it has caused an increase in treatment expenditure (63.9%). This is due to the investment in PPE and adequate aerosol disposal followed by extra care and concern by keeping a proper record and sanitisation norms. Most participants thought there would be career stagnation and uncertainty (52.2%) and a financial burden (68.9%) (Figure 2).

Table 1: Demographic Data

Parameter		Frequency	Per cent
Age	20-30	141	78.3
	31-40	29	16.1
	41-50	9	5.0
	51-60	1	0.6
Gender	MALE	66	36.7
	FEMALE	114	63.3
Degree	BDS	121	67.2
	MDS	59	32.8
Years	1-5YRS	123	68.3
	6-10YRS	22	12.2
	>10YRS	35	19.4
Practice Experience	1-5yr	137	76.1
	6-10yr	24	13.3
	>10yr	19	10.6
Type of Work	CLINICAL	37	20.6
	CLINICAL ACADEMIC	141	78.3

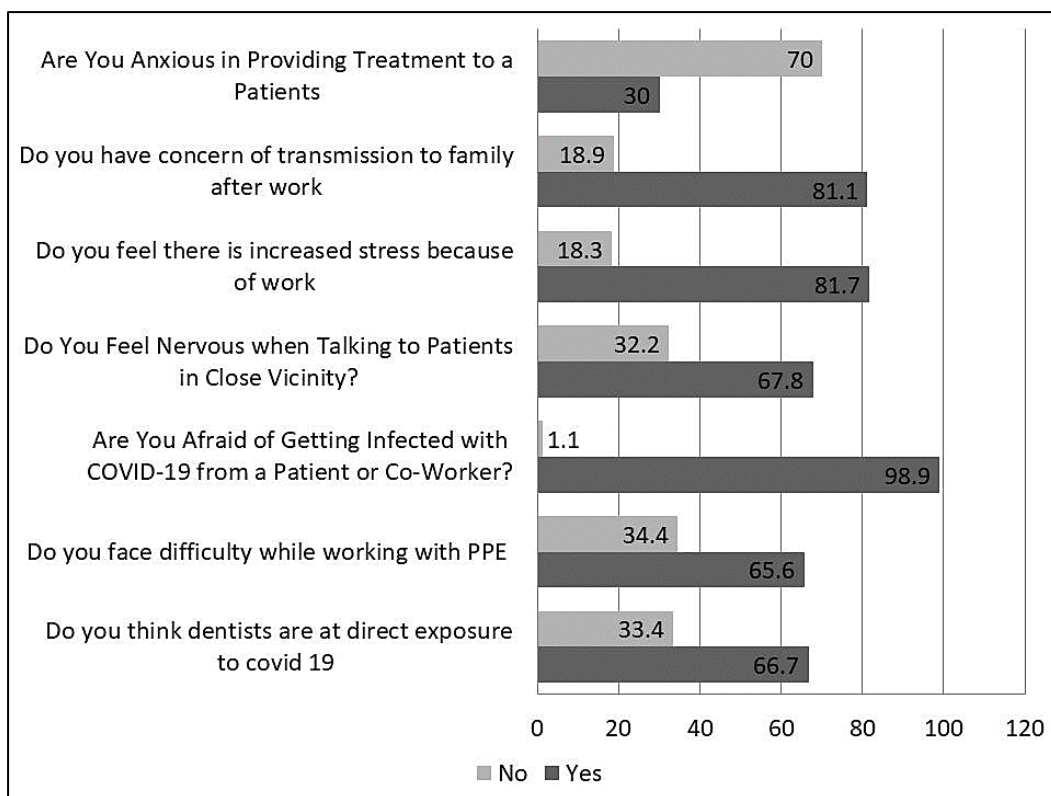


Figure 1: Professional practice factors

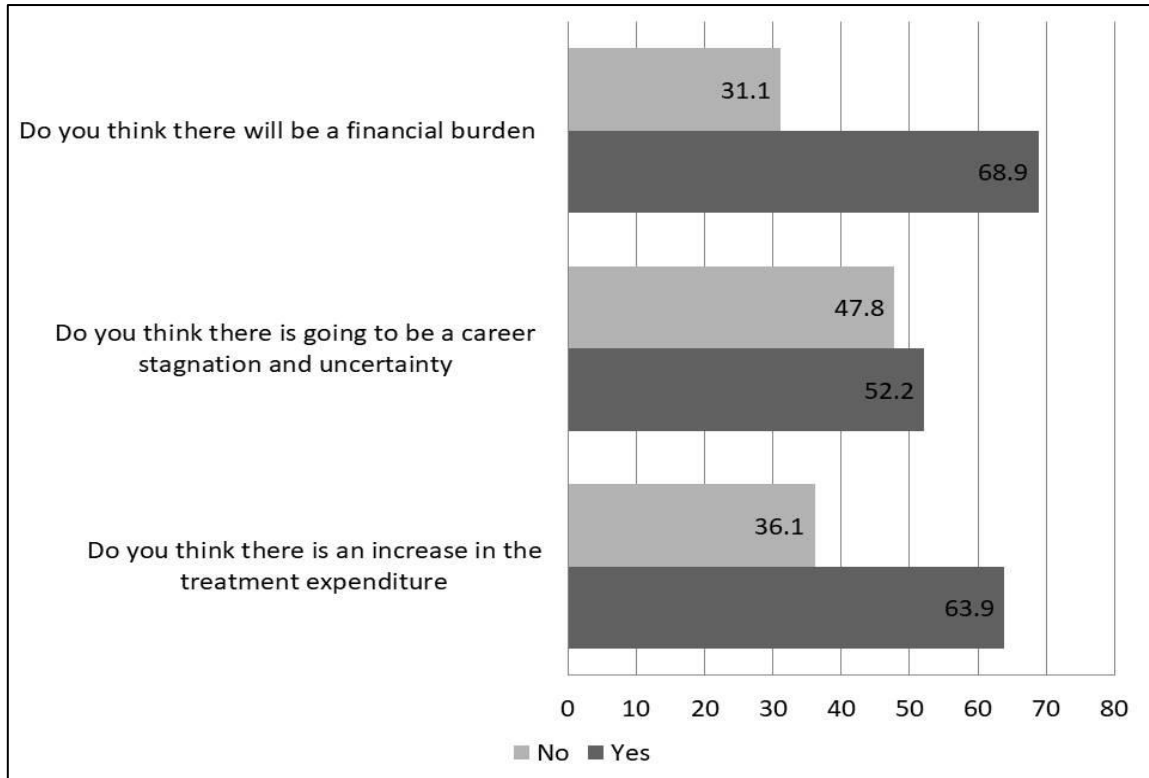


Figure 2: Financial stress

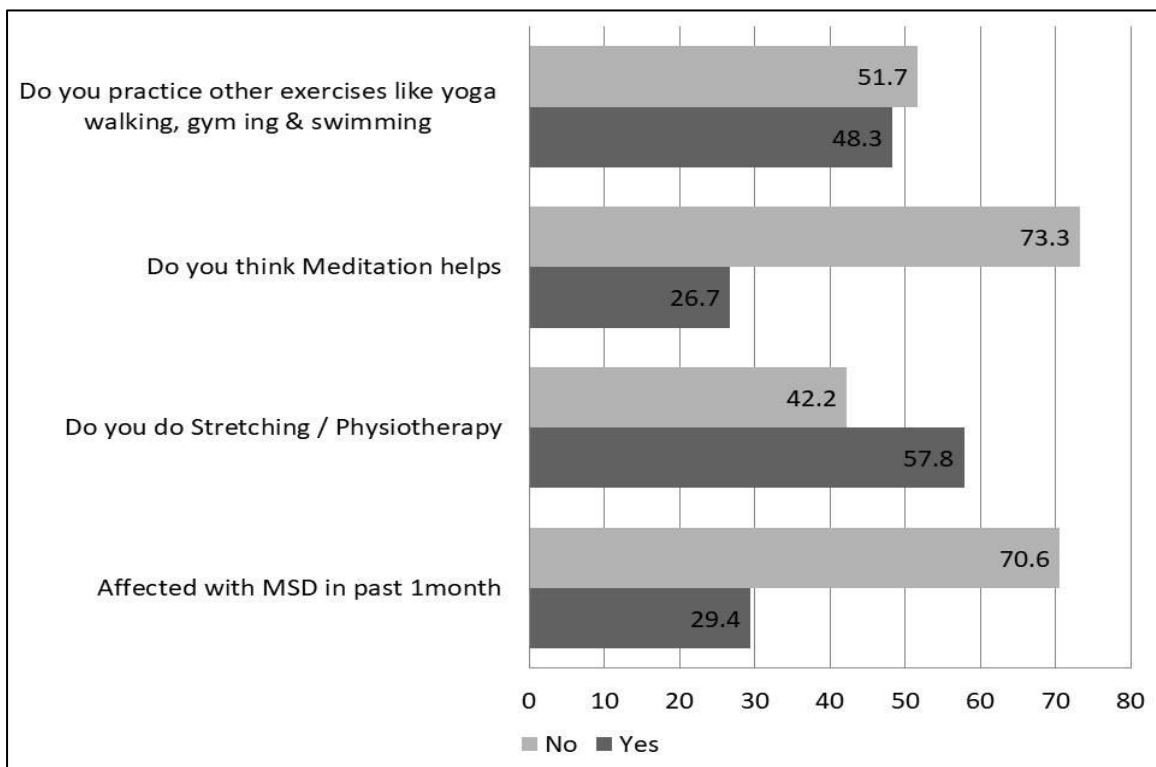


Figure 3: Dentists' reaction to stress management

Table 2: Comparison of gender and degree of stress

Sl.no	Gender			Degree		
	t	Sig. (2-tailed)	Mean Difference	t	Sig. (2-tailed)	Mean Difference
1	-0.653	0.514	-0.0478	1.120	0.264	0.0840
2	-1.389	0.167	-0.1021	1.227	0.221	0.0927
3	-0.391	0.696	-0.0064	-0.990	0.323	-0.0165
4	-0.241	0.810	-0.0175	-0.342	0.733	-0.0255
5	-2.382	0.018	-0.1411	0.893	0.373	0.0550
6	-0.210	0.834	-0.0128	-1.274	0.204	-0.0793
7	-1.968	0.051	-0.1388	1.281	0.202	0.0933
8	-0.695	0.488	-0.0518	0.228	0.820	0.0175
9	-0.967	0.335	-0.0566	0.906	0.366	0.0545
10	-2.014	0.046	-0.1547	2.848	0.005	0.2222
11	-2.200	0.029	-0.1539	-0.218	0.828	-0.0158
12	-0.665	0.507	-0.0510	0.990	0.323	0.0779
13	1.541	0.125	0.1053	-0.811	0.419	-0.0572
14	1.581	0.116	0.1220	-1.104	0.271	-0.0878

Dentist's Reaction to Stress and Management

Dentists are frequently exposed to musculoskeletal disorders (MSD), but during lockdown and shutdown, the percentage of participants affected with MSD in the past month was less (29.4%). Most participants were involved in stretching / Physiotherapy, 57.8% even other exercises like yoga, walking, gymming and swimming (48.3%), with the minor participants involved in meditation (26.7%) (Figure 3).

Irrespective of gender or degree, participants felt there was increased stress because of work and a financial burden amongst the participants. Here, the value was significant with a p-value less than .5. Similarly, a significant result was obtained when gender was considered affected by musculoskeletal disorders in the past month (Table 2).

Discussion

COVID-19 prevention in dentistry requires effective strategies. Thus, the primary challenge to

prevent the spread of infection in dental practice is identifying the infected patient. Thus, every person reporting for treatment should be considered a potential carrier of infection, so diagnostic test swabs are to be used. No reports have even been confirmed that a patient recovering from a prior COVID-19 infection developed complete and permanent immunity to the disease. Alternatively, it has documented reactivation of the disease or even re-infected cases (3).

Around the world, over 13.1 million cases have been reported for Coronavirus; of them, over 572k people have died due to COVID-19. It is estimated that the asymptomatic incubation time is between 2 and 12 days and symptoms include fever, nausea, exhaustion, dry cough, and shortness of breath. Most of the cases are mild and require no special care for recovery. However, 15 % of cases are classified as seriously ill, and the remaining 5 % are classified as critically ill. In such cases, acute respiratory disease sometimes leads to pneumonia, kidney failure, and death (8).

Most practitioners believed they were directly exposed to infection (66.6%), although no transmission cases in the dental surrounding have been reported. Nonetheless, considering the high transmissibility of the disease and the fact that regular dental procedures produce aerosols, dental care improvements should be contemplated during this pandemic to ensure a safe environment for patients and the dental team (9). Cochrane Review evaluated the full-body PPE and which method of donning or doffing PPE had the minimum risk of contamination or infection. 65.6% of dentists have reported difficulty working with a PPE and difficulty visualising (8, 10).

The PPE necessitates the prevention of droplets from entering the mouth, nose, or eyes and skin. Dentists work near patients for prolonged periods, are exposed to saliva and blood, and perform aerosol-generating procedures (10). But, with the PPE, it becomes difficult for the dentist to visualise the tooth as it produces a mist, and it becomes challenging to communicate with the patient. There is also a loss in dexterity with double gloves and risk of error. Prolonged wearing creates heat stress, skin breakdown, and musculoskeletal injuries and so avoid drinking water and washrooms during duty hours (10, 11). 98.9% of the participants were worried about getting affected by COVID-19, either by the patient or co-workers. It is due to the close contact with patients and the constant use of sharp instruments that regularly expose us to respiratory secretions, blood, saliva, and other infected body fluids (12). Transmission occurs mainly in dental settings by direct exposure to respiratory secretions that include droplets, blood, saliva, or other patient materials; indirect contact with infectious surfaces and devices; inhalation of suspended airborne viruses; and mucous secretion from either nasal, oral, or conjunctive. This contact with the aerosols and bacterial droplets and speaking without a mask allow virus transmission (13).

Silent carriers or spreaders are infected with Coronavirus but show little or no disease symptoms. As a result, these people carry on with their daily lives, meeting family and friends, going to work, and spreading the disease without their knowledge. Most asymptomatic carriers are healthy young adults and children. If

you come into contact with people who are positive for COVID-19, you may be positive despite not showing any disease symptoms (14). 80% of the participants were apprehensive about working because they feared transmitting the infection to their family members. The patients reporting could be asymptomatic silent carriers or spreaders. Dentists could come in contact with people who are positive for COVID-19, transmitting the virus despite not showing any symptoms of the disease. This means people placed in the category of asymptomatic carriers should be shifted to the mildly symptomatic category until symptoms appear and follow strict personal hygiene practices and Government protocols for quarantine and lockdown (15). 80 % of participants were under stress during COVID-19. The other most likely source of stress among dentists may be persistent time constraints, apprehension about their ability to provide dental services in the future, increasing costs and, most importantly, getting infected and communicating infection to others (10).

Previously as reported, the most common stress sources were time-related pressure experienced by dentists in New Zealand (48%) and the need to maintain high rates of commitment at work (43 %) similarly documented by dental practitioners in the United Kingdom consisted of patient demands (75 %), practice and staff complaints (56 %) and complaint and litigation fears (54 %). But in the current scenario, increased stress is because of work (81%) or transmission of infection to the family after work (81%). Previously, time constraints were a significant cause of stress, affecting family time and non-work-related interests. (12, 13, 15).

Therefore, these psychological distress experiences have such an adverse effect on interpersonal and professional relationships that include burnout, depression, diminished motivation, and esteem, while lower back pain, increased musculoskeletal symptoms, headaches, and gastrointestinal problems in the UK (68.4 %) are the most frequently reported stress-related health problems, Denmark (59.7%) and orthodontists in Morocco (44%) respectively (12, 13).

This stressful situation is further increased since dental practitioners are at the highest risk of communicating and transmitting Coronavirus.

With the countrywide closure of dental clinics for two months and more, there is no prospect of recovery anytime soon, exacerbated by zero earnings from dental practitioners and clinic staff. There is an increase in the treatment expenditure of 63.9%, career stagnation and uncertainty of 62% and financial burden of 69% (13, 14). SARS-CoV-2 isolated from the saliva of COVID-19 patients' salivary epithelial gland cells can be contaminated with SARS-CoV and become a significant source of the virus. Redundancy has been documented during the convalescence phase, even after patient recovery. This is plausible because some virus strains in saliva have been recorded for 29 days (16).

Apart from the significant monetary investments, a big concern is proper training and management of procedures in implementing these safety protocols to ensure minimum risk to patients and dentists. It is especially relevant because we are still determining how long COVID-19 will continue (17). Dentists have implemented various approaches to adapt to the challenges posed by the COVID-19 pandemic. These measures are aimed at ensuring the safety of both dental healthcare providers and patients. It's important to note that the specific measures may vary based on local regulations, the severity of the pandemic in a particular region, and the evolving understanding of COVID-19. Dentists are encouraged to stay updated on guidelines provided by health authorities, such as the World Health Organization (WHO) and local health departments, to ensure the ongoing safety of their patients and staff (18).

With this, it becomes essential to keep mental health in check. This can be achieved by practising activities like grounding, taking a break from the virtual, digital world, exercising, etc. Exercise plays a vital role in stress management, relieving symptoms of anxiety and depression, and may also help keep your mental health in check. Yoga is an exercise form that helps both the body and mind. Although only 29% reported being affected with musculoskeletal disorder in the past month, 58 % were involved in stretching/physiotherapy, and less than 50% were involved in meditation and other exercises like yoga walking, gyming and swimming (13).

Limitations of the study

It is a questionnaire-based study primarily based on dentists' approach during the COVID-19 pandemic, and it mainly highlights the problems of dentists/dental practitioners. For a purely private practitioner, the financial stress was much more as it was difficult to treat a patient with all safety measures. It was not cost-effective, and there was no sufficient flow of patients during lockdown to cover the basic expenses. However, dentists attached to hospitals and colleges had a steady source of income, so they were comparatively less stressed. So, the response to the questionnaire may become biased in some cases.

Conclusion

The approach to dentistry demands cultural changes, embraces virtual mentoring, and transitions priority to preventive dental treatment. Preventive procedures will curb the risk of cross-infection from aerosols and splatter that poses a significant health risk to dentists. Practitioners are moving internationally to teledentistry, which can be highly beneficial to triage and minimise excessive face-to-face patient time. Yet the problem for dentists is exacerbated because most jurisdictions still need to find them front-line workers. The Government will work with the dental and medical community to ensure dentists get all the help they need to endure these extraordinary circumstances. Most importantly, dental practitioners must be thoroughly informed of the transmission of 2019-nCoV. Identify patients with this infection, take appropriate self-protection, conduct a before-procedural mouth rinsing in dental practice, and carefully and appropriately treat patients.

Abbreviations

Nil

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Author contributions

SRP and PKS designed and conducted the study. They also collected the data. SP did the statistical

analysis. SRP and SR analyzed the results and drafted the manuscript. SR finalized the manuscript.

Conflicts of interests

The authors have no conflicts of interest.

Ethical approval

Approved Institutional Review Board, Institute of Dental Sciences, Siksha O Anusandhan (Deemed to be University)

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