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ORIGINAL ARTICLE

COVID-19 Related Knowledge, Attitude, Practice Evaluation among Indian Dental Patients: A Cross-Sectional Survey

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ABSTRACT

Objective: To assess the awareness about COVID-19 among dental patients and determine the association between COVID-19 awareness and perceived stress among dental patients. **Material and Methods:** A self-administered knowledge, attitude and practices (KAP) questionnaire and perceived stress scale (PSS) were employed to assess the knowledge and attitude among dental patients visiting the outpatient department. A p-value of ≤ 0.05 was considered statistically significant. An independent t-test was used to compare the KAP and PSS scores based on age, gender, occupation and the responses to unscorable questions. Spearman's correlation was employed to assess the association between KAP and PSS scores. **Results:** The older participants (mean KAP score = 16±2.2), the participants who answered that the Coronavirus outbreak changed their daily routine (mean KAP score = 15.8±2.2) and the participants who answered that they changed their plans due to the Coronavirus outbreak (mean KAP score = 16±2.14) had significantly higher KAP scores when compared to their respective counterparts. The Spearman's correlation value of -0.45 suggested a moderate negative association between the KAP and PSS scores, but this correlation was not statistically significant. **Conclusion:** The participants had a moderate to good level of knowledge related to COVID-19 and were positive in their approach and outlook on overcoming the pandemic.

Keywords: SARS-CoV-2; Patients; Stress, Physiological; Health Literacy.

Introduction

In December 2019, several cases of pneumonia of uncertain aetiology were reported in Wuhan, Province of Hubei, China. After an initial investigation by Chinese health authorities, the pneumonia cases were reported to be caused by a novel Coronavirus, and initial reports described those common symptoms as fever, cough, myalgia or fatigue, and headache. Dyspnoea developed in 55% of the cases; all patients had pneumonia with abnormal CT findings, and 32% needed intensive care [1-3]. The novel Coronavirus quickly spread to other China provinces and other countries in East Asia, and the risk of a fast global spread was predicted [4].

Dentists, auxiliaries, and patients undergoing dental procedures have a high cross-infection risk. Since dental procedures require close contact with the patient's oral cavity, saliva, blood, and respiratory tract secretions [5], saliva is a body fluid that contains COVID-19 viral load, and also many patients who are asymptomatic may be carriers [6]. Considering these facts, it is recommended for due precautions be taken while treating patients in a dental set-up.

Apart from providing regulations to dentists and dental health care professionals in rendering oral health care, which encompasses screening of patients, avoiding aerosol-generating procedures, carrying out emergency treatments only and usage of personal protective equipment; the Ministry of Health and Family Welfare (MoHWF) in India also recommended dental patients to take precautions before visiting a dental clinic which includes gargling the oral cavity and throat with 10ml of 0.5% povidone-iodine mouth rinse diluted 1:20 with water for 30 seconds each, eliminating the use of accessories, wearing a facemask, having checked the body temperature and using a sanitiser at the doorway and also maintaining social distance while being present in the dental clinic [7].

During the COVID-19 outbreak, despite the guidelines and messages being conveyed to the general population through mass media, people have received substantial information that could lead to uncertainty [8-10]. Therefore, there was a need to determine whether dental patients have been adopting good hygiene practices and respiratory etiquette while visiting the dental clinic so that dental professionals can provide indispensable patient treatment.

Thus, the present study aimed to assess the awareness about COVID-19 among dental patients and determine any association between COVID-19 awareness and perceived stress among dental patients visiting the out-patient department during the pandemic. The objectives were (i) to assess the awareness of COVID-19 (in terms of knowledge, attitude and practice) among dental patients; (ii) to evaluate stress perceived regarding COVID-19 by each individual using the perceived stress scale (PSS), and (iii) to analyse any association between awareness and perceived stress among dental patients.

Material and Methods

Study Design and Ethical Clearance

The cross-sectional study was approved by Institutional Ethics Committee, Kasturba Hospital and Medical College, Manipal (IEC 376 – 2020) and was conducted in 2021 from the second week of January to the last week of January.

Sample Size Estimation and Participants

Assuming that 50% of the population is aware of the pandemic, a sample size was arrived at 378. Thereafter, accounting for a non-response of 10%, a total sample size of 400 was estimated.

The study was conducted using google forms among patients who sought dental treatment on an out-patient basis during the COVID-19 pandemic. Those who could read and write English and willingly provided informed consent were included in the study. Patients needing emergency treatment; those who could not read and write English, have had problems with comprehension and those who were not willing to give informed consent were excluded from the study.

Data Collection

A self-administered questionnaire was developed keeping in mind the pandemic situation and based on similar studies [9,10]. Two subject experts verified the face validity and content validity of questions before finalizing the questionnaire. A pilot survey was also conducted before the start of the study to confirm any background preparations and ambiguity of specific terms that seem unclear. It comprised three sections: Section one gathered information on age, gender and occupation. The second section comprised a 22-item questionnaire regarding COVID-related knowledge, attitude and practice (KAP). The third section consisted of a 10-item questionnaire (PSS) and the responses were recorded on a 5-point Likert scale, i.e., "Never"; "Almost never"; "Sometimes"; "Fairly often", and "Very often" [11]. A greater score indicated higher perceived stress.

Validity

The Perceived stress scale (PSS) is a pre-validated questionnaire; the KAP questionnaire was validated by means of face and content validation.

Reliability

The test-retest of the KAP questionnaire was done on a sample of 40 dental patients after a time interval of 1 month to assess the reliability of the questionnaire. Spearman's correlation value was -0.11 and no statistically significant difference was found between the responses of the two questionnaires.

Statistical Analysis

Statistical analysis for the study was performed using the Statistical Package for Social Sciences (SPSS for Windows, version 20, SPSS Inc, Chicago, Ill, USA). A p-value of ≤ 0.05 was considered statistically significant. The test-retest reliability of the knowledge, attitude, and practice questionnaire was assessed using Spearman's correlation coefficient. Descriptive analysis reported the frequencies of various socio-demographic variables and represented participants' responses to different questions. An Independent t-test was used to compare KAP and PSS scores based on age, gender, occupation, and responses to unscored questions. Spearman's correlation was employed to assess any association between the KAP and PSS scores.

Results

The age of the participants in this study ranged from 17 to 67 years (Mean age: 33.9 years). Among 399 study participants, 218 were females and 181 were males. The participants secured a minimum score of 9, whereas the maximum KAP score was 20 and the mean KAP score was 15.5. Similarly, the PSS score among participants ranged between 5 and 36, with the mean PSS score being 19.3.

The mean KAP score was 14.8 ± 2 among the participants below 34 years of age. In contrast, the mean KAP score was 16 ± 2.2 among the participants aged 34 years and above, with the difference being statistically significant. The mean PSS score was 19.6 ± 4.1 among the participants aged below 34 years, whereas among the

participants aged above 34 years, the mean PSS score was 19.1 ± 5.3 but was not significant. Among the male participants, the mean KAP and PSS scores were 15.4 ± 2.1 and 19.2 ± 4.8, respectively and among the female participants, the mean KAP and PSS scores were 15.6 ± 2.3 and 19.3 ± 4.9 respectively, but not significant (Table 1).

The mean KAP scores were 15.3 ± 2.2 among the participants belonging to social class I, 14.9 ± 2.2 among the participants belonging to social class II, 15.7 ± 2.1 among the participants belonging to social class III, 16 ± 2.4 among participants belonging to social class IV and 15.6 ± 2.2 among the participants who belonged to social class V. The mean PSS scores were 18.7 ± 4.9, 18.9 ± 5.3, 19.4 ± 4.4, 18.3 ± 5.9 and 19.7 ± 4.9 among the participants of social classes I, II, III, IV and V, respectively. There were no significant differences in KAP and PSS scores among the various social class groups (Table 1).

Table 1. Demographic variables, KAP and PSS scores of participants.

Variables	KAP Score Mean ± SD	PSS Score Mean ± SD
Age	15.37 (±2.09)	19.24 (±4.77)
<34 years	14.79 (±2.04)	19.55 (±4.14)
>34 years	15.96 (±2.18)	19.08 (±5.29)
p-value	<0.049*	0.33
Gender		
Male	15.37 (±2.09)	19.24 (±4.77)
Female	15.57 (±2.28)	19.29 (±4.93)
p-value	0.36	0.91
Occupation		
Social Class I	15.34 (±2.18)	18.76 (±4.86)
Social Class II	14.92 (±2.24)	18.97 (±5.29)
Social Class III	15.73 (±2.12)	19.35 (±4.45)
Social Class IV	16.00 (±2.44)	18.33 (±5.92)
Social Class V	15.62 (±2.22)	19.69 (±4.89)
p-value	0.14	0.64

*Statistically Significant.

Three hundred and ninety nine (99.8%) participants could rightly identify difficulty in breathing as one of the symptoms of COVID-19. Three hundred and ninety six (99%) of them would follow social distancing from other people in public places like markets and hospitals and 393 (98.3%) participants felt the necessity for patients to report their travel history to the dental personnel, whereas 295 (73.8%) participants were unaware of what percentage of people were confirmed to have developed mild or moderate symptoms of COVID-19. 246 (61.5%) participants did not know for how long the Coronavirus can survive outside the body and 204 (51%) were not aware if there was a specific vaccine or treatment for COVID-19 (Table 2).

Table 2. Frequency distribution for responses to KAP questionnaire.

Questions	Right Answer N (%)	Wrong Answer N (%)
Dental procedure that may proceed uninterrupted during pandemic	308 (77.0)	92 (23.0)
Identification of the most common symptom of the Coronavirus	392 (98.0)	8 (2.0)
Identification of preventive methods of Coronavirus	354 (88.5)	46 (11.5)
Survival period of novel Coronavirus outside the body	154 (38.5)	246 (61.5)
Confirmation of having developed mild or moderate symptoms of COVID-19	105 (26.3)	295 (73.8)
Identification of individuals at highest risk of developing severe COVID-19 disease	289 (72.3)	111 (27.8)
Identification of causes of COVID-19	374 (93.5)	26 (6.5)
Knowledge about vaccines for COVID-19?	196 (49.0)	204 (51.0)
Ability to identify symptoms that are not common for COVID-19?	399 (99.8)	1 (0.3)

Role of antibiotics inthe novel Coronavirus disease?	172 (43.0)	228 (57.0)
Hospitalization of COVID-19 patients	257 (64.3)	143 (35.8)
Spread of Coronavirus	264 (66.0)	136 (34.0)
Safety measure in public places	302 (75.5)	98 (24.5)
Traveling during the pandemic	393 (98.2)	7 (1.8)
Attitude while visiting the dentist	372 (93.0)	28 (7.0)
General practices to be avoided during dental visit	369 (92.2)	31 (7.8)
Practices in public spaces	335 (83.7)	65 (16.3)
General hand hygiene measures	380 (95.0)	20 (5.0)
Hygiene practices	382 (95.5)	18 (4.5)
Practices in public spaces	396 (99.0)	4 (1.0)

Forty two point eight percent of the participants reported that only sometimes they have been upset due to something happening unexpectedly and only 39.3% of the participants responded that they were unable to control important things in life during the pandemic. Sixteen percent of them reported that they never felt nervous or stressed and also 16.8% of them reported that very often they felt confident about their ability to handle their problems. On the contrary, 16% of the participants felt they were left uninformed about the situation and had to go out of their way in order to get control over several situations. Also, 14% of them answered that very often, difficulties were piling up and they could not overcome them (Table 3).

Table 3. Frequency distribution for responses to perceived stress scale.

Questions	Never N (%)	Almost Never N (%)	Sometimes N (%)	Fairly Often N (%)	Very Often N (%)
In the last month, how often have you been upset because of something that happened unexpectedly?	62 (15.5)	47 (11.8)	171 (42.8)	68 (17)	52 (13.0)
In the last month, how often have you felt that you were unable to control the important things in your life?	60 (15.0)	64 (16.0)	157 (39.3)	59 (14.8)	60 (15.0)
In the last month, how often have you felt nervous and stressed?	64 (16.0)	74 (18.5)	144 (36)	63 (15.8)	55 (13.8)
In the last month, how often have you felt confident about your ability to handle your personal problems?	60 (15.0)	43 (10.8)	109 (27.3)	121 (30.3)	67 (16.8)
In the last month, how often have you felt that things were going your way?	53 (13.3)	73 (18.3)	142 (35.5)	84 (21.0)	48 (12.0)
In the last month, how often have you found that you could not cope with all the things that you had to do?	58 (14.5)	69 (17.3)	153 (38.3)	66 (16.5)	54 (13.5)
In the last month, how often have you been able to control irritations in your life?	51 (12.0)	55(13.8)	136 (34.0)	96 (24)	62 (15.5)
In the last month, how often have you felt that you were on top of things?	64 (16.0)	63 (15.8)	158 (39.5)	65 (16.3)	50 (12.5)
In the last month, how often have you been angered because of things that happened that were outside of your control?	65 (16.3)	75 (18.8)	147 (36.8)	75 (18.8)	38 (9.5)
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	74 (18.5)	83 (20.8)	132 (33.0)	55 (13.8)	56 (14.0)

The mean KAP score was 15.8 ± 2.2 among the participants who answered that the Coronavirus outbreak changed their daily routine. In contrast, the mean KAP score was 14.3 ± 1.8 among those who reported that the Coronavirus outbreak did not change their daily routine and the difference between these two groups was statistically significant ($p<0.05$). The mean PSS scores were 19.4 ± 5 and 18.7 ± 4.1 among the participants who reported that Coronavirus changed their daily routine and those who reported that Coronavirus did not

change their daily routine, respectively. The mean KAP score was 16 ± 2.14 among the participants who answered that they changed their plans due to the Coronavirus outbreak, whereas the mean KAP score was 14.4 ± 1.9 among participants who reported that they did not change their plans due to the Coronavirus outbreak and their mean difference was statistically significant (<0.05). The mean PSS scores were 19.3 ± 4.9 and 19.3 ± 4.8 among the participants who reported that they changed their plans due to the Coronavirus outbreak (Table 4).

Table 4. KAP and PSS values of non-scorable questions.

Question	Mean KAP Score		Mean PSS Score	
Changes in daily routine	Yes	No	Yes	No
	15.77 (2.18)	14.28 (1.84)	19.4 (5.0)	18.74 (4.1)
p-value	<0.05		0.28	
Deviation from plan of action during pandemic	Yes	No	Yes	No
	15.98 (2.14)	14.43 (1.93)	19.28 (4.88)	19.25 (4.82)
p-value	<0.05		0.95	

Spearman's correlation was employed to evaluate the correlation between the KAP and PSS scores. The Spearman's correlation value obtained was -0.45, suggesting a moderate negative association between the KAP and PSS scores, but this correlation was not statistically significant.

The mean KAP scores were 15.37 ± 2.01 among the participants who belonged to the low perceived stress group, 15.96 ± 2.21 among the participants who belonged to the moderate perceived stress group and 16.22 ± 2.15 among the participants who belonged to the high perceived stress group but differences in KAP score across the three perceived stress groups was not statistically significant (p=0.16).

Discussion

The present study assessed knowledge, attitude and practices regarding COVID-19 among dental patients visiting dental clinics on an outpatient basis. Out of 22 questions, 20 questions were scorable and two questions were not scorable. The perceived stress scale was used to evaluate perceived stress among participants. PSS is a validated 10-item questionnaire that comprises a 5-point Likert scale. The COVID-19 related KAP questionnaire score could range from 0 to 20 and the PSS score from 0 to 40. In the present study, KAP scores ranged between 9 and 20 and PSS scores ranged between 5 and 36.

Overall, participants had a high KAP score (87.8%) in our study, owing to the up-to-date and readily available information in print and electronic media. Similar results have been seen in studies conducted by Bains et al. [12] and Sun et al. [13]. Similarly, respondents also showed high Practice scores (89.7%). More than 95% of participants said that they maintain social distancing and wash their hands with disinfectants regularly (99% and 95.5%, respectively), which is in accordance with other studies [12,13].

The two questions that were not scored in the COVID-19 related KAP questionnaire were "Has the Coronavirus outbreak changed your daily routine?" and "Are you changing any plans that you have made due to the Coronavirus?" The participants who mentioned that Coronavirus outbreak had changed their daily routine had significantly higher KAP scores when compared to the participants following their daily routine (p<0.05) and also the participants who answered that they were going to change their plans due to Coronavirus had significantly higher KAP scores when compared to the participants who responded that they are not going to change their plans due to the pandemic. There was a similar relationship between the responses to the unscored questions and the PSS score, but there were no significant differences found in the PSS scores (p=0.28, p=0.95).

Participants ranged from 17 to 67 years and age was categorized into two categories based on the mean age of participants, i.e., less than 34 years of age and 34 years or older age group. In the current study, participants aged 34 years and older had significantly higher KAP scores when compared to those aged below 34 years. This is contradictory to the results shown by Bains et al. [12], where higher scores were seen among youngsters. This could be due to differences in categorization of age in the two studies. There were no significant differences in KAP and PSS scores between the male and female participants (p=0.36, p=0.91). Based on their occupation, participants were categorized into five social classes according to the UK Registrar General's classification. There were no significant differences in KAP and PSS scores across various social classes of participants. There was a moderate negative correlation between KAP and PSS scores [13]. This highlights that being aware and facing any situation with a right positive attitude lowers the fear and stress in an individual.

The present study suggested that participants who were not willing to change their daily routine or plan had a lower level of knowledge, but their counterparts who were seen to be more responsible and aware of the changes that they may have to make in their routine or future plans had a higher level of knowledge, better attitude and practised hygiene measures. Older participants (≥34 years) had better knowledge when compared to their younger counterparts. There were no significant differences in KAP score and perceived stress in terms of gender and occupation of participants. The results of this study were similar to other studies, which showed higher fear among participants and hindrance from visiting dental clinic [14,15]. But unlike in a study by Doshi et al., females had insignificantly higher PSS scores [15].

There were certain limitations in the present study. The study was done in a single centre and hence the results cannot be generalized to the whole population. A self-administered electronic questionnaire was used to gather data which may give rise to recall and social desirability bias. Despite the limitations of the study, the study was successful in educating the patients visiting the out-patient department so as to maintain the etiquette in dental set-up during the time of health crisis and furnished a complete examination of knowledge, attitude and practices of dental patients.

Conclusion

Dental patients had a moderate to good knowledge related to COVID-19 and were positive in their approach and outlook on overcoming the pandemic. No significant differences were found in the knowledge and stress scores among the social classes and between males and females. KAP scores were statistically significant among older age groups compared to young people.

Authors' Contributions

DK	https://orcid.org/0009-0008-2747-9038	Formal Analysis, Investigation, Data Curation, Writing - Original Draft and Writing - Review and Editing.
SA	https://orcid.org/0000-0002-2196-3979	Conceptualization, Methodology, Formal Analysis and Writing - Review and Editing.
PPN	https://orcid.org/0000-0002-1467-7130	Writing - Review and Editing and Visualization.

All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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None.

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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