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SHORT COMMUNICATION

ORAL DISEASES WILEY

COVID-19 affected patients' utilization of dental care service

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The novel coronavirus disease 2019 (COVID-19), characterized by symptoms of fever and pneumonia, was reported in Wuhan, China, at the end of 2019 (Phelan, Katz, & Gostin, 2020). Given the likely transmission of COVID-19 via droplets and aerosols during dental clinical procedures, dental practitioners are at a high risk of COVID-19 infections (Ather, Patel, Ruparel, Diogenes, & Hargreaves, 2020). According to the guidelines of the Chinese Stomatological Association (CSA), dental clinics in China suspended the routine dental services and only provided emergency dental care between January and April 2020 (CSA, 2020). The objective of the study was to investigate the influence of COVID-19 on patients' utilization of dental services during the COVID-19 pandemic.

This study was carried out from April 20 to April 27 after the hospital reopening to the public and was approved by the Ethics Committee of Nanjing Stomatological Hospital. A total of 1,032 patients with a dental appointment record in the Nanjing Stomatological Hospital were recruited in the study. A 24-item questionnaire was used to survey patients' demographics, psychological state, behaviour and awareness of COVID-19, and their evaluations on the current dental services (Appendix S1). Sample size was calculated based on the data obtained from the hospital registration system, using a power of 95% and a 3.07% margin of error. Statistical analysis was performed using SPSS 16 (IBM, USA). Kruskal–Wallis H tests were performed to explore the associated factors of different degrees of stress during dental health care visit. p-Value <.05 was considered significant.

A total of 956 valid questionnaires were collected, yielding a response rate of 92.6%. Most respondents were females (65.1%), adults < 40 years old (72.3%), living in this city (82.9%) and revisit patients (75.5%) (Table 1). The main reason for patients' visit

TABLE 1 Characteristics of the patients included in the study

Variable	Categories	*N* (%)
Gender	Male	328 (34.9%)
	Female	611 (65.1%)
Age	<20	81 (8.5%)
	20–39	608 (63.8%)
	40–59	206 (21.6%)
	60–79	57 (6.0%)
	≥80	1 (0.1%)
Residence	Nanjing, China	780 (82.9%)
	Other cities	161 (17.1%)
Education background	Postgraduate or above	85 (9.0%)
	Undergraduate	382 (40.3%)
	Junior college	294 (31.0%)
	High school or under	187 (19.7%)
Employment status	Unemployed	355 (37.2%)
	Working/studying	599 (62.8%)
Impact on income	Major impact	307 (32.3%)
	No or minor impact	644 (67.7%)
First visit to our hospital	Yes	233 (24.5%)
	No	717 (75.5%)
Reasons of the appointment	Tooth filling	165 (17.3%)
	Tooth extraction	114 (11.9%)
	Dental prosthesis	72 (7.5%)
	Orthodontics	271 (28.4%)
	Teeth cleaning	47 (4.9%)
	Tooth implant	87 (9.1%)
	Surgery	16 (1.7%)
	Others	183 (19.2%)

Jiang and Tang contributed equally to this work.

TABLE 2 Patients' psychology, behaviour, awareness and feedback of the COVID-19 pandemic

Variables	Personal psychological states	*N* (%)
Psychology	Nervous	75 (7.9%)
	A little worried	660 (69.1%)
	Not afraid	220 (23%)
Risk of infection during dental visit	High risk	96 (10.3%)
	Moderate risk	815 (87.1%)
	No risk	25 (2.7%)
Main factor affecting your visit	Afraid of potential pandemic in the hospital	747 (80%)
	Crowded people in the hospital	466 (49.9%)
	Preventive measures of the hospital	362 (38.8%)
	Socioeconomic status	177 (19%)
Ways to know about COVID−19	Media	909 (95.5%)
	Chat or online chat	365 (38.3%)
	Propaganda from hospital	256 (26.9%)
	No idea	15 (1.6%)
PPE besides facial masks	Yes	186 (19.5%)
	No	751 (80.1%)
Frequency of hand washing	Increased	924 (98.9%)
	Not increased	10 (1.1%)
Views on asymptomatic infections	High risk and improve protections	803 (85.8%)
	Low risk	75 (8%)
	No idea	58 (6.2%)
Nucleic acid test before dental treatment	Agree	557 (59.8%)
	Disagree	374 (40.2%)
Influence on the dental visit	Go to a nearby clinic with fewer patients	303 (32.4%)
	Postpone dental visit	347 (37.2%)
	No influence	284 (30.4%)
Estimated duration of the COVID−19	Within three months	299 (32%)
	Within six months	381 (40.8%)
	Within a year	208 (22.3%)
	More than a year	45 (4.8%)
Usage of the hospital online consultation system	Yes	251 (26.3%)
	No	703 (73.7%)
Satisfaction with the hospital online consultation system	Satisfied	106 (42.2%)
	Not satisfied	145 (57.8%)
Satisfaction with the current appointment system	Satisfied	454 (47.6%)
	Not satisfied	499 (52.4%)

included orthodontic treatment (28.4%), followed by dental pulpal lesion (17.3%) and tooth extraction (11.9%). Table 2 showed patients' psychological state, behaviour, and awareness of COVID-19 and their evaluations on the current dental service. Respondents showed different caution levels to COVID-19 after the outbreak. Most of them (69.1%) were a little worried about the risk of infection in the clinic, and 87.1% thought there was a moderate risk of infection during the dental visit. All patients were required to wear a facial mask in the hospital, and some of them (19.5%) also used their own personal protective equipment (PPE). Almost all of the patients (98.9%) increased the frequency of hand-washing. Their satisfaction with the current appointment system and online consultation system was 47.6% and 42.2%, respectively. Factors associated with patients' psychology of COVID-19 were summarized in Table 3. Females were significantly associated with an increased level of stress and fear ($p = .005$).

There were few elderly respondents in the study, which may be because the elderly people were reluctant to use the online appointment system and the young people were more used to and familiar with the online platform (Jung & Padman, 2014). There were more revisit patients came for orthodontic treatment and more first-visit patients for pulpal lesion and tooth extraction. This may be because the orthodontic patients usually have regular adjustment visits, and the dental pulpal lesion and tooth extraction were most common reasons for the first-visit dental service in the hospital.

This study was conducted after the prevailing peak period of COVID-19, when the general population already experienced sufficient alerts and essential preventive measures were in place. But most respondents in the study still showed worries about the potential risk of COVID-19 during their dental visits. It has been found that females were more apprehensive about the risk of an aerosolized spreading of infection during dental procedures (Ashok et al., 2016) and suffered a greater psychological impact and a higher level of stress during dental visits (Wang et al.., 2020).

The online consultation and appointment systems have shown benefits for medical and dental services (Dave, Seoudi, & Coulthard, 2020; Yang, Zhou, Liu, & Tan, 2020). About half of the respondents in the study were satisfied with the current online platforms; however, the characteristics of these online healthcare users and the improvement in patient's experience need further study in the future (Jung & Padman, 2014).

The awareness of personal protection rose up since the COVID-19 outbreak. All patients in the study followed the hospital regulation to wear facemasks, and most of them increased their hand-washing frequency. Enhancing patient's awareness and personal protection could be beneficial for the management of a virtual pandemic (Ather et al., 2020; Warnakulasuriya, 2020).

In summary, the COVID-19 pandemic significantly affected patients' dental care-seeking psychology and behaviour. The lone-term impact of the virtual pandemic still needs further study.

TABLE 3 Factors associated with patients' psychology of COVID-19

Variables	Psychological state			*p*-value
	Not afraid	A little worried	Nervous	
Gender				
Male	101 (30.8%)	197 (60.1%)	30 (9.1%)	**.005**
Female	118 (19.3%)	448 (73.4%)	44 (7.2%)	
Age				
<20	22 (27.2%)	55 (67.9%)	4 (4.9%)	.529
20–39	125 (20.6%)	441 (72.7%)	41 (6.8%)	
40–59	52 (25.2%)	134 (65%)	20 (9.7%)	
60–79	21 (36.8%)	27 (47.4%)	9 (15.8%)	
≥80	0 (0%)	1 (100%)	0 (0%)	
Residence				
Nanjing	189 (24.3%)	536 (68.8%)	54 (6.9%)	**.021**
Other cities	30 (18.6%)	111 (68.9%)	20 (12.4%)	
Education				
High school or under	41 (22%)	130 (69.9%)	15 (8.1%)	.342
Junior college	59 (20.1%)	212 (72.1%)	23 (7.8%)	
Undergraduate	100 (26.2%)	255 (66.8%)	27 (7.1%)	
Postgraduate or above	19 (22.4%)	58 (68.2%)	8 (9.4%)	
Employment status				
Unemployed	98 (27.6%)	224 (63.1%)	33 (9.3%)	.128
Working/studying	122 (20.4%)	435 (72.7%)	41 (6.9%)	
Impact on income				
Major impact	58 (18.9%)	211 (68.7%)	38 (12.4%)	**.001**
No/minor impact	162 (25.2%)	444 (69.1%)	37 (5.8%)	
First visit to our hospital				
Yes	47 (20.2%)	159 (68.2%)	27 (11.6%)	**.031**
No	173 (24.1%)	498 (69.5%)	46 (6.4%)	

The bold entries indicated the statistical significance when the *p*-value was below .05.

CONFLICT OF INTEREST

All authors have no conflicts of interest to declare.

AUTHOR CONTRIBUTION

Yuanyuan Jiang: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing-original draft; Writing-review & editing. **Tianyi Tang:** Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing-original draft; Writing-review & editing. **Li Mei:** Data curation; Formal analysis; Investigation; Methodology; Software; Supervision; Validation; Visualization; Writing-review & editing. **Huang Li:** Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing-original draft; Writing-review & editing.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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