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ORIGINAL ARTICLE

A COMPARATIVE STUDY TO EVALUATE COVID-19 RELATED ANXIETY AND FEAR AMONG PHYSICIANS AND DENTISTS

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ABSTRACT

Introduction: *Worse mental health outcomes appear to be related to COVID-19 as the virus is perceived as severe. Pakistan, being a developing country, had an immense burden on health care due to COVID-19. Healthcare professionals dedicatedly performing their duties carry a high risk of getting infected. Our study aimed to analyze the fear and anxiety among Pakistani physicians and dentists and also highlight the factors causing it.*

Methodology: *It was an online survey-based cross-sectional study. Fear and anxiety among physicians and dentists were observed with the help of previously validated fear of coronavirus-19 scale (FCV-19s) and Coronavirus Anxiety Scale (CAS). Data was analyzed on SPSS 21. Chi-square test, Independent sample t-test and Pearson correlation tests were applied.*

Results: *The study included 267 dentists and 220 physicians. Results demonstrated that severe fear (27.422 ± 4.455) and anxiety (14.80 ± 2.88) among the participants. Significantly higher levels of anxiety were found in dentists ($t_{(427.809)} = -2.498$, $P=0.013$. Females showed significantly higher fear and anxiety scores as compared to males ($p< 0.05$). A strong and significant positive correlation between Fear and Anxiety was established ($r=0.798$, $p<0.0001$).*

Conclusion: *COVID-19 poses a major challenge to the mental health of Healthcare professionals . A considerable proportion of our participants showed high values for fear and anxiety. Psychological help or support should be offered to all Healthcare professionals with importance on effective coping tactics.*

Keyword: *Dentists, Physicians, Anxiety, Fear, COVID-19*

INTRODUCTION

The global community came mindful of an outbreak of a novel coronavirus pathology called COVID-19, which is thought to originate in Hubei province in December 2019. It was declared a public health emergency of international concern by the World Health Organization (WHO) in January 2020, and it was soon characterized as a pandemic by the WHO in March 2020 (1-3).

Worse mental health outcomes appear to be related to COVID-19, as the virus is perceived to be severe. Myths and unfiltered non-scientific information amidst the pandemic largely concern the population, which has an impact on mental health (4, 5). Moreover, measures taken by the governments globally to contain the virus including lockdown, social distancing, closure of schools, remote work, and quarantine has further spread negativity. Meanwhile, healthcare professionals (HCPs) are still performing their duties and providing care to patients in a highly stressful environment (6-9).

Furthermore, psychological issues including anxiety, fear, depression etc. are common among the HCPs due to the direct exposure and interaction with the patients or suspected individuals (10). Moreover, a significant element for HCPs is the fear that relates to COVID-19 exposure and subsequent worry of transmitting the infection to their families (11, 12). Uncertainty about several elements related to disease like the mood of transmission, an infection transmitted by asymptomatic and pre-symptomatic patients, also contribute to stress among HCPs (13).

Past quantitative researches have demonstrated that HCPs interacting with patients infected with COVID-19 are at higher risk of mental health issues like stress, depression, anxiety, and insomnia (14). Moreover, frontline HCPs who have no experience of infectious pathologies face additional challenges while adjusting to a new work environment during the current pandemic (15).

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To overcome the negative effects on mental health and contain the spread of COVID-19, it is important to consider unfavorable psychological issues and take appropriate measures at an initial stage (16, 17). The well-being of HCPs during the current pandemic necessitates just not them being sufficient but also maximum efficiency for providing profound care to the patients over burdened volume (11).

Previous studies conducted in Pakistan targeted COVID-19 knowledge, attitudes, practices, and anxiety among physicians, dentists, nurses, and pharmacists, or the general public (18-20).

This study aimed to evaluate and compare the fear and dysfunctional anxiety related to COVID-19 among the two main pillars of healthcare i.e., physicians and dentists, serving in Pakistan.

MATERIAL AND METHODS

Study Design: This was an online survey-based cross -sectional study. This study was conducted during the period of lockdown in May 2020.

Sampling: To find out the required sample, Rao soft (www.raosoft.com) was used. Considering the HCPs population 125 000, 95% confidence interval, 5% margin of error, the calculated sample size was 383. To cover inconsistencies and discrepancies, an additional 25% (n=96) was added. So the sample size of 479 was found sufficient for the current study.

Study Population: In this study, participant were the physicians and dentists with minimum qualification of Bachelor of Medicine & Bachelor of Surgery (MBBS) for physicians or Bachelors of Dental Surgery (BDS) for dentists respectively and more than 1 year of experience. Retired and non-practicing physicians and dentists were excluded. The investigators approached participants through their personnel contacts as per convenience snowball technique and also recruited through different social media platforms.

Questionnaire Design

To check the fear and anxiety among the physicians and dentists of Pakistan we used previously validated scales. Fear of Coronavirus Scale (FSC-19S) (21) and Coronavirus Anxiety scale (CAS) (22).

The FCV-19S is 7 items measured on five points Likert Scale. The FCV-19S is ranging between 7 and 35, the greater the score, the higher the fear. The CAS is a 5 item scale ranging between 4 and 20 and with a cut-off score of ≥ 9.

The scale discriminates between those with dysfunctional anxiety and non-anxiety.

After thorough literature search and discussion and a pilot study, the survey instrument of this study was finalized. The first part of the survey instrument comprises of the demographic data, including age, gender, specialty, city, and country of residence. The second part had questions from FCV-19S and CAS.

The reliability coefficient of the survey instrument for the current study was computed using SPPS V.21 (Cronbach's $\alpha = 0.884$) which is considered good.

Ethics: Data collection using an online questionnaire was conducted after ethical clearance was granted by the Ethics and review committee of Altamash Institute of Dental Medicine, Karachi, Pakistan.

Statistical Analysis: Sociodemographic data were reported as percentages and frequency. The independent sample t-test was performed to observe the difference in scores among dentists & physicians and between males and females for fear and anxiety. The linear correlation between fear and anxiety was evaluated using Pearson's correlation test. Multiple linear regression analysis was applied to observe the relationship of sociodemographic variables with anxiety and fear scores. A P-value of less than 0.05 was considered significant.

RESULTS

For the current study, data of 512 participants were collected. After sorting out due to some discrepancies, the data of 483 participants were analyzed. Significantly higher number of dentists, females and participants individuals under 30 years participated ($p<0.05$) **(Table 1).**

In Table II, the measures of central tendencies along with skewness and Kurtosis of each item of FCV-19S has been reported. The total mean score of FCV -19S was 27.422 ± *4.455 which is towards the higher side. . No statistically significant difference was observed between physicians and dentists* ($t_{(485)} = -0.952$, $p>0.05$). However, the mean fear score of dentists ($\bar{X} = 27.59 \pm 4.209$) *was found slightly higher as compared to the physicians* ($\bar{X} = 27.20 \pm 4.737$) ***(Table 2)***

Table 1: Demographic Characteristics, Pakistan, May 2020

Character	Frequency	Percentage	X2	p-value
Total	487	100.0		
Category				
Physicians	220	45.2%	4.536	0.033
Dentists	267	54.8%		
Gender				
Male	184	37.8%	29.078	<0.001
Female	303	62.2%		
Age Group				
Up to 30	268	55.0%		
31-40	135	37.7%		
41-50	36	7.4%	462.743	<0.001
51-60	22	4.5%		
61+	26	5.3%		

Table 2: Fear among the Physicians and Dentists, Pakistan, May 2020

FCV-19S Items	Category	MIN	MAX	Mean	SD	Kurtosis	Skewness	T-score	P-Value
I am most afraid of coronavirus-19.	Physicians	1	5	4.04	0.893	1.083	-1.012	-0.569	0.570
	Dentists	1	5	4.09	0.856	0.838	-0.927		
It makes me uncomfortable to think about coronavirus-19. **	Physicians	1	5	3.83	0.910	0.558	-0.751	-2.258	0.024**
	Dentists	1	5	4.01	0.882	1.381	-1.015		
My hands become clammy when I think about coronavirus-19.	Physicians	1	5	4.03	0.953	1.040	-1.119	-0.534	0.594
	Dentists	1	5	4.07	0.828	1.004	-0.901		
I am afraid of losing my life because of coronavirus-19.	Physicians	1	5	3.41	1.045	-0.287	-0.361	0.373	0.709
	Dentists	1	5	3.38	1.038	-0.592	-0.199		
When watching news and stories about coronavirus-19 on social media, I become nervous or anxious	Physicians	1	5	3.68	1.037	0.018	-0.718	-1.894	0.059
	Dentists	1	5	3.85	0.897	0.379	-0.740		
I cannot sleep because I'm worrying about getting coronavirus-19.	Physicians	1	5	4.01	0.912	1.339	-1.113	-1.212	0.226
	Dentists	1	5	4.10	0.830	0.678	-0.875		
My heart races or palpitates when I think about getting coronavirus-19	Physicians	1	5	4.20	0.799	0.697	-0.873	1.500	0.134
	Dentists	1	5	4.09	0.871	0.831	-0.966		
COVID-19 FEAR	Physicians	11	35	27.20	4.737	0.758	-0.884	-0.952	0.341
	Dentists	11	35	27.59	4.209	1.250	-0.836		
	Total	11	35	27.42	4.455	1.030	-0.877		

The total mean score of CAS was 14.80 ± 2.88 which is far beyond the cut off value of ≥9. Based on the cut-off score of ≥9.0 in the COVID-19 Anxiety Scale, 474 (97.3%) individuals were found to have dysfunctional levels of anxiety **(Figure 1).** We observed that dentists showed higher mean scores of anxiety in all the 5 items of CAS. We further analysed the difference between physicians and dentists for the total score of CAS. As per independent sample t-test, we found a significant t value ($t_{(427.809)}$ = -2.498, p=0.013).

It indicates that anxiety among the dentists is significantly higher than physicians. The analysis further revealed that dentists exhibited higher anxiety score ($\bar{x}$ =15.03 ± 2.722) as compared to physicians ($\bar{x}$ =14.47 ± 3.129) **(Table 3).**

Pearson's correlation analysis revealed there is a strong and significantly positive correlation between Fear and Anxiety (r=0.798, p<0.0001).

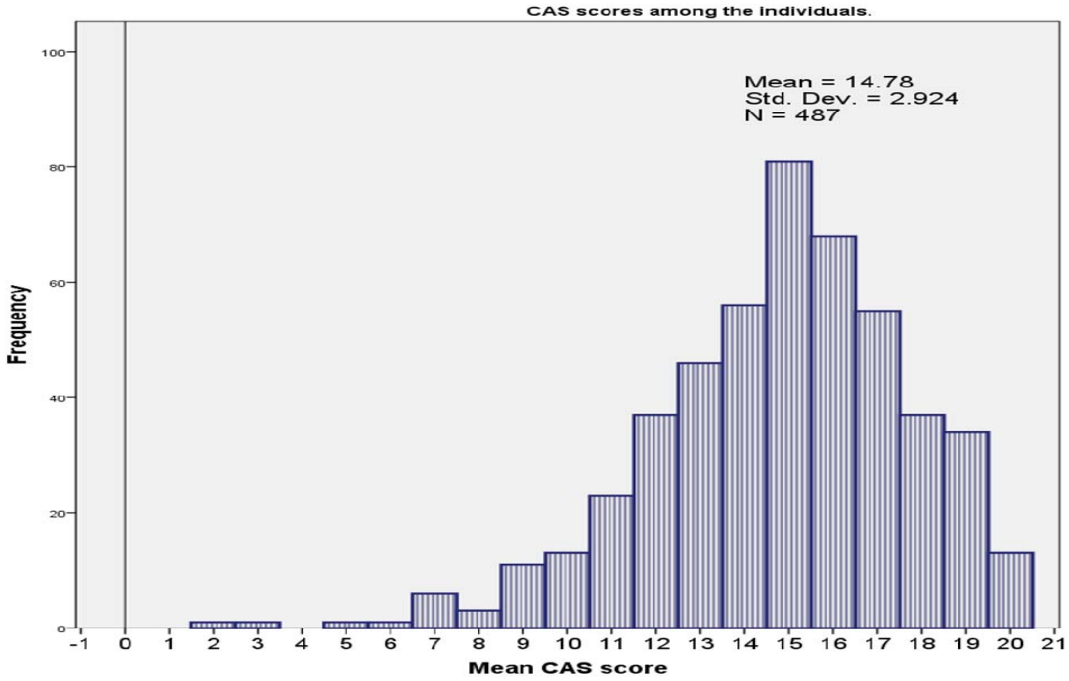

Figure 1: Histogram showing the mean Coronavirus anxiety score of the participants, Pakistan, May 2020

Table 3: ANXIETY among the Physicians and Dentists. Pakistan, May 2020

CAS Items	Category	MIN	MAX	Mean	SD	Kurtosis	Skewness	T-score	P-Value
I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus.	Physicians	0	4	2.61	1.074	-0.373	-0.577	-3.146	0.002*
	Dentists	0	4	2.89	0.833	-0.192	-0.494		
I had trouble falling or staying asleep because I was thinking about the coronavirus.	Physicians	0	4	3.05	0.913	1.437	-1.154	-1.135	0.257
	Dentists	0	4	3.14	0.785	0.926	-0.860		
I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus.	Physicians	0	4	3.00	0.860	1.024	-0.869	-2.101	0.036*
	Dentists	1	4	3.16	0.774	0.577	-0.819		
I lost interest in eating when I thought about or was exposed to information about the coronavirus.	Physicians	0	4	2.44	1.034	-0.549	-0.340	-.246	0.805
	Dentists	0	4	2.46	1.059	-1.022	-0.174		
I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus	Physicians	1	4	3.35	0.793	0.625	-1.088	-1.692	0.091
	Dentists	0	4	3.46	0.689	2.346	-1.316		
COVID19 ANXIETY Total Scores	Physicians	2	20	14.44	3.13	1.404	-0.958	-2.498	0.013*
	Dentists	7	20	15.10	2.62	-0.176	-0.226		
	Total	2	20	14.80	2.88	1.028	-0.705		

To check the association of sociodemographic variables (gender, age, and profession) on anxiety and fear scores, multiple linear regression analysis was applied.

The results demonstrated that gender has a highly significant association with anxiety and fear scores with p-value < 0.001 **(Table 4).**

Table 4: Multiple linear regression analysis of fear score and sociodemographic variables, Pakistan, May 2020

FEAR				**Anxiety**			
Adjusted R2	SEE	F	P-value	Adjusted R2	SEE	F	P-value
0.033	4.38	6.536	<0.001	0.028	2.841	5.685	0.001
Coefficients							
Variables	β	SEE	P-value	β	SEE	P-value	
(Constant)	24.343	1.175	<0.001	12.485	0.762	<0.001	
Age	0.026	0.203	0.899	.037	0.132	0.781	
Gender	1.826	447	<0.001	.903	0.290	0.002	
Profession	045	.0 426	0.916	.513	0.276	0.064	
Gender has a statistically significant association on the outcome variable (p<0.05).				Gender has a statistically significant association on the outcome variable (p<0.05).			
R= 0.198 showing a positive linear relationship				R= 0.185 showing a positive linear relationship			
3.3% of the variance of dependent variables is explained by the independent variable.				2.8% of the variance of dependent variables is explained by the independent variable.			

In our study, we evaluated the fear and anxiety score among male and females participants. A significant difference has been observed. As per independent sample t-test Females showed higher fear ($t_{304.034}$ = -4.126, p <0.001) and anxiety ($t_{319.555}$= -3.469, p =0.004).

Mean fear and anxiety score among gender is also significantly different (p<0.05) (**Figure 2).** In the current study, we found that HCPs below 30 years of age are more anxious and afraid of COVID-19.

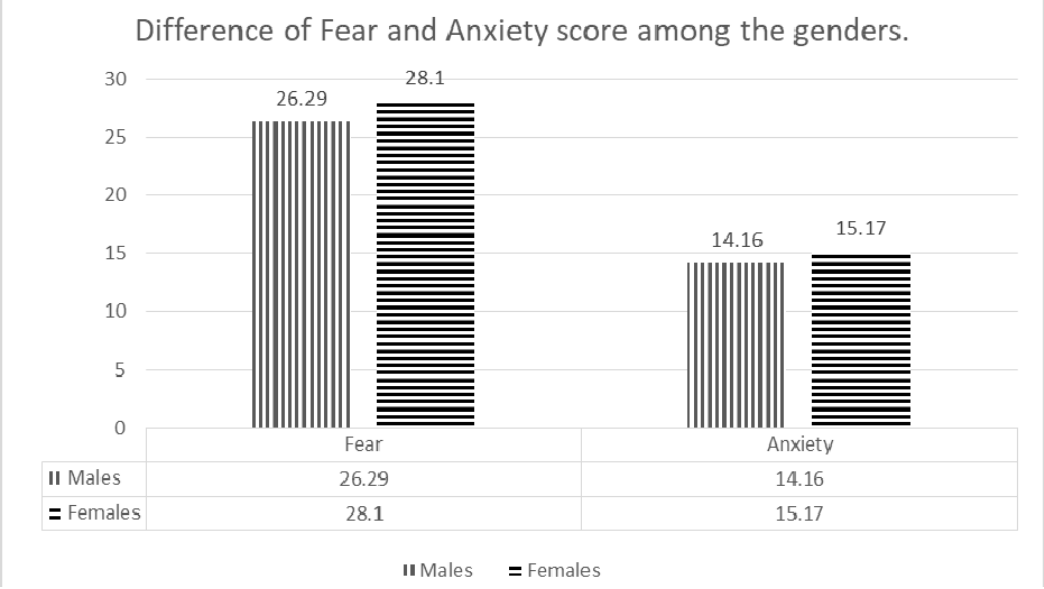

Figure 2: Fear and Anxiety score among male and female genders Pakistan, May 2020

DISCUSSION

The current pandemic has caused an immense strain on government, organization, and individuals (23, 24). According to the latest report (3rd August 2020) by the WHO, around 1.8 million cases have been reported globally with over 680000 deaths (25). In Pakistan 278,305 confirmed cases and 5,951 deaths due to COVID-19 has been reported (26). This has caused stress among the general public as well as health care professionals who are devotedly performing their duties despite the uncertainty about several factors related to the disease, including its infectivity, mode of transmission, and no available treatment option. Overall, the disease has put a burden on the country's healthcare system along with the strain on the country's economy by imposing lockdown and promoting social distancing, which has caused pay cuts and even unemployment in various regions. Pakistan is a developing country with limited health care facilities (27) and due to COVID-19 is experiencing various negative impacts.

Along with the general population, considering the mental health stability of HCPs is important so that maximum effort from them is achieved during the current situation when they are in need of the most for the well-being of their patients. Needless to say, all HCPs are playing their part to the best in overcoming the disease burden currently. However, in this study, we evaluated anxiety and fear specifically among dentists and physicians. Whether having previous experience of infection control or not, physicians and dentists are dealing with patients on a regular basis. Due to the potential of transmission despite being asymptomatic, dentists and physicians are taking all necessary precautions for all patients regardless of reporting no history for COVID-19 symptoms.

In the current study, we found that the mean fear score among the HCPs is towards the higher side. This coincides with the results of a cross-sectional study evaluating the psychological status of the healthcare workforce in China. (28). Another survey-based cross-sectional study carried out in Wuhan recorded the mental health status of health care professionals. The study reported symptoms of unstable mental health status among health care professionals, with 50.4% of participants reported depression, 44.6% anxiety, 34% insomnia and 71.5% reported distress (29). Similar results were also recorded in a study conducted in Pakistan, stated that 72.3% and 90.1% of HCPs suffering from moderate to extremely severe depression and stress, respectively. In the current study majority of the HCPs have specified disturbed sleep due to COVID-19, which is in accordance with the previous study (30).

Moreover, studies have testified that HCPs are in a state of fear and anxiety due to the contagious nature of this virus (3, 31). Correspondingly in the current study, we have observed similar findings. A recent study conducted in China demonstrated that more than 70% of HCPs reported moderate to severe fear and 22.6% of medical staff showed mild to moderate anxiety whereas 2.9% had severe anxiety (28).

In the current study we used Coronavirus Anxiety Scale to measure anxiety, based on the cutoff score of CAS, we found that more than 90% of the Physicians and Dentists of Pakistan have dysfunctional levels of anxiety. Likewise, a previous study conducted in Pakistan reported 85.7% HCPs who suffered from moderate to extremely severe anxiety, and 90.1% reported moderate to extreme stress levels. One study found similar results in Saudia Arabia where 31.5% showed mild, 36.1 had medium and 32.3% demonstrated a high level of anxiety(32). We also observed that fear and anxiety have a significant and strong positive correlation.

In the current study, dentists demonstrated more fear and significantly higher levels of anxiety as compared to the physician. Similar findings are also observed in previous studies conducted on HCPs, reported higher fear among the dentists as compared to physicians (12). Furthermore, different reports of the spread of this contagious disease due to dental procedure that generates aerosols as well as confined spaces of the dental surgery are also worrisome for the dental fraternity (33, 34).

Moreover, studies have reported anxiety among dentists due to the closure of dental clinics, institutes and hospitals during the pandemic and dentists suffered a lot of financial crises (35). Studies have documented that dental professionals are more prone to infections because of the aerosols generating procedures and confined environment of the dental offices (36, 37). In different studies, primarily focusing the fear among dentists during the current crisis revealed that fear of being infected from the patient or colleague, transmission of infection to family members, economic and financial insurgencies, panic and anxiety of getting quarantined, etc. are the major factors causing fear among the dentists (1, 31, 38). The major contributing factors to fear and anxiety among dentists in our study include lack of health facilities in our country, the undesirable effect of the disease on the economy, the thought of when the disease would get eradicated, and transmitting the disease to others. These contributing factors nearly matched the contributing factors mentioned in other literature (1, 39).

In our study, we observed significantly higher fear and anxiety among females as compared to males. In agreement with our findings, previous studies have also shown higher levels of anxiety among women (40) and female doctors (41,42).

The factors that significantly contributed to the increase in psychological pressure according to a previously conducted study included isolation ward duties, upsetting about getting infected, insufficient protective equipment, the thought that the current pandemic would never get under control, frustration related to unsatisfactory outcomes on work, and isolation away from loved ones (28, 29). Another study including participants from Pakistan and a few from the UK listed down the factors contributing to fear. The factors included family members getting an infection (79.7%), the rapid spread of disease (63%), complications of the disease (60.3%), becoming a carrier (28.8%), and missing the diagnosis (27.9%) (3).

A statistical test was run to observe the relations between anxiety and sociodemographic variables including, age, gender, and profession of the participants. The result demonstrated that there is a significant association between anxiety and fear score with gender. Female dentists and physicians demonstrating more anxiety and fear as compared to males.

Good mental health is essential for the well-being of the physicians and dentists during the current pandemic for maximum efficiency and to contain the virus. To combat the fear related to COVID-19 among physicians and dentists, several factors that lead to anxiety and fear should be considered and measures need to be taken to assure the healthcare providers.

The psychological issues due to COVID-19 among the physicians and dentist should be taken serious and longitudinal studies should be performed to document the prevalence of depression, disconnectedness, Sleep disturbances, psychoses, anxiety, fear, obsession, panic etc.

The strength of this study is that the data was collected from more than 35 cities from all the provinces of Pakistan. The limitation of this study is that due to the countrywide lockdown, only online data was gathered and those physicians and dentists who are not tech-savvy didn't participate, so results may not be generalized and may have source bias effects. Moreover, the findings of this study are based on self-reported data, and the participants may misjudge the answers in a way that they consider is socially acceptable rather than reporting authentic or honest answers.

Conclusion

Our study concludes the presence of severe fear and anxiety among Physicians and dentists. To obtain good mental health among dentists and physicians, factors that contribute to fear and anxiety should be considered and measures need to be taken to combat it.

Competing interest

The authors declare that this manuscript was approved by all authors in its form and that no competing interest exists.

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None

Authors' Contribution

SZ: Initial draft writing, literature search, data collection and final approval of the manuscript. **SH:** Data collection, write up, Critical revision and final approval of the manuscript. **RZ:** Study Concept and design and critically revised and approved the final draft of the manuscript. **TU:** Data collection, write up, tables and figure and final approval of the manuscript. **BMR:** Data collection, statistical work and final approval of the manuscript. **MMM:** Conceived the study, supervised the project and is responsible for the integrity of the research. Comprehensively contributed to Data collection, statistical work, writing of the manuscript and critically revised and approved the final draft of the manuscript.

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