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Assessment of COVID-19 Infection Control Awareness, Attitudes, and Performance Among Dentists in Designated Clinics in Tehran

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A B S T R A C T

Introduction: The World Health Organization declared the COVID-19 pandemic in 2020, emphasizing the ongoing importance of understanding and managing infections. Dentists, facing a direct infection risk, require proper training, making an educational needs assessment essential to address knowledge gaps.

Materials & Methods: A comprehensive questionnaire assessing COVID-19 awareness, attitude, and performance among dentists was developed and validated. Administered to 181 participants in Tehran, the data underwent quantitative analysis using nonparametric tests.

Results: Participants (98 men, 86 women) from healthcare centers in Tehran, with a mean age of 44 and 15.29 years of service, scored averages of 51.97, 77.01, and 61.92 in awareness, attitude, and performance, respectively. Significantly, the study revealed a relationship between years of service plus age and awareness scores. Gender also played a role, with men exhibiting higher performance mean values.

Conclusion: The study highlights the imperative for interventions to boost dentists' knowledge. Recommendations include workshops and informational brochures to enhance awareness and performance, particularly in the context of emerging pandemics.

Keywords: Attitude, Awareness, COVID-19, Dentist, Performance

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Introduction

In late 2019, Wuhan, China, emerged as the epicenter of the Coronavirus 2019 outbreak, marking the onset of a novel coronavirus family. The World Health Organization (WHO) officially declared it a pandemic on March 11, 2020, and its spread is now effectively controlled (1,2).

The spectrum of symptoms induced by this virus varies, ranging from asymptomatic or mild manifestations to severe clinical conditions, such as acute respiratory distress necessitating mechanical ventilation (3). Respiratory symptoms encompass anything from common cold-like symptoms, dry cough, to more severe presentations like bronchitis, pneumonia, shortness of breath, and rapid breathing (4). Additionally, digestive symptoms, temporary loss of smell and taste, fever, sore throat, difficulty swallowing, fatigue, muscle pain, weakness, confusion, irritability, runny nose, chest pain, and conjunctivitis are also observed (4,5).

Person-to-person transmission occurs through respiratory droplets expelled during coughing, sneezing, or speaking. Furthermore, the virus can spread through physical contact with an infected person or by touching contaminated surfaces (6).

While the disease is no longer classified as a pandemic and is largely under control, understanding and managing its transmission remain paramount, akin to any other communicable diseases. The virus has undergone evolutionary stages, resulting in new subvariants with varying symptoms, severity, and mortality rates, and it continues to evolve (7).

Given that dentists are at a direct risk of infection due to their close interactions with patients, it is imperative for them to possess comprehensive knowledge and skills to effectively control infections related to this disease during dental treatments.

Materials and Methods

A total of 181 dentists from selected centers in Tehran participated in this study (8). Calculations for the required sample size, considering a type I error of 0.05, standard deviation of 2.25, and accuracy of 0.382, resulted in a calculated size of 171. Ultimately, the study included the intended 181 subjects. The research was conducted in accordance with the ethics code IR.AJAUMS.REC.1401.147.

A researcher-made questionnaire was developed, incorporating input from similar papers and consultations with specialist dentists. The questionnaire consisted of 69 items covering awareness, attitude, and clinical performance domains in controlling COVID-19 infection. Validity and reliability were assessed through the content validity index and a pilot study, resulting in the removal of 25 items, leaving 44 suitable items. Additional demographic characteristics items were included.

Content validity was examined using the content validity index method, evaluated by 10 dentistry faculty members specializing in various domains. In the validity measurement stage, 44 items scored above 0.79, leading to the removal of 25 items. The remaining 44 items underwent a pilot study for reliability measurement. The designed questionnaire was provided to 20 dentists, and two weeks later, it was administered again. The high Intraclass Correlation Coefficient (ICC)

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values indicated suitable reliability in all three domains of awareness, attitude, and performance (Table 1).

Table 1. Intraclass Correlation Coefficient (ICC) Values Assessing Question Consistency within Each Domain

Domain	Intraclass Correlation Coefficient (ICC)	P-Value
Awareness	0.801	<0.001
Attitude	0.875	<0.001
Performance	0.819	<0.001

The questionnaires were distributed to 200 dentists, with 90.5% participating and 9.5% dropping out. Exclusion criteria included a lack of willingness to participate and a limited two-week response period, resulting in the exclusion of participants who did not answer at least one item within the specified timeframe. Ultimately, 181 subjects participated in the research in an acceptable manner.

The normality of distribution for quantitative variables was assessed using the Kolmogorov-Smirnov test, indicating a non-normal distribution. Consequently, nonparametric tests, including Mann-Whitney and Kruskal-Wallis, were employed for the analytical section of the study (8).

The study's limitation was the busy nature of clinics, leading to some dentists having insufficient time to complete the questionnaire, resulting in non-cooperation.

Results

The participants in the study had a mean age of 40.44 ± 9.53 years, ranging from 25 to 61 years. Their average years of service as dentists were 15.29 ± 9.42, with a range from 1 to 36 years.

In the domains of awareness, attitude, and performance, the minimum and maximum scores varied. Awareness scores ranged from 13.33 to 93.33, attitude scores ranged from 50 to 98.21, and performance scores ranged from 30 to 91.67. The highest mean score was in the attitude domain at 77.01, followed by performance (61.92) and awareness (51.97).

Figure 1 illustrates the distribution of scores in these domains, with Figure 2 providing a visual overview of the grouping of scores.

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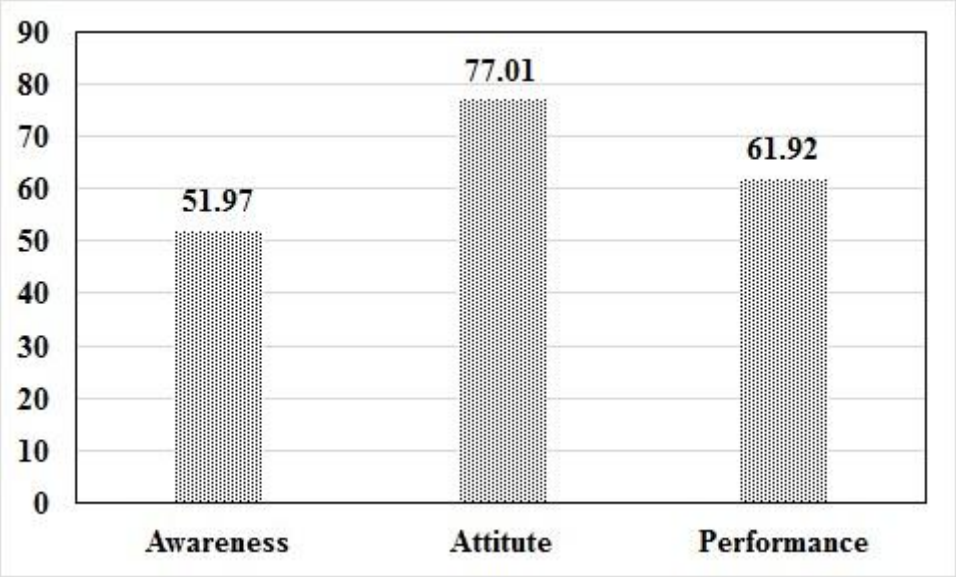


Figure 1. Comparative Analysis of Average Scores in Knowledge, Attitude, and Performance Areas among Participants

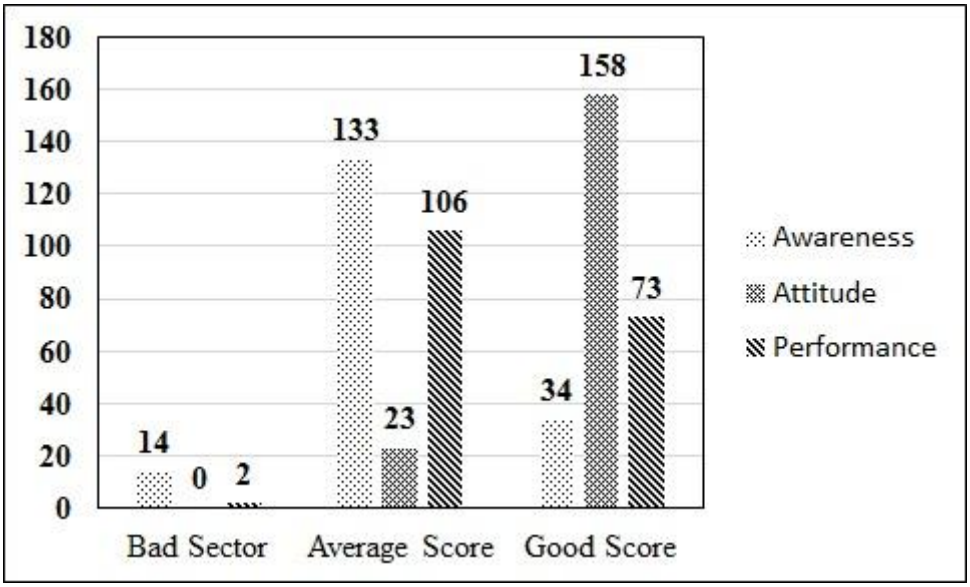


Figure 2. Comparative and Grouped Analysis of Participant Scores in Knowledge, Attitude, and Performance Areas

Regarding age, a significant relationship was found with awareness scores, but no significant associations were observed with attitude or performance scores (Figure 3). Men had significantly higher mean scores than women in the performance domain (Figure 4).

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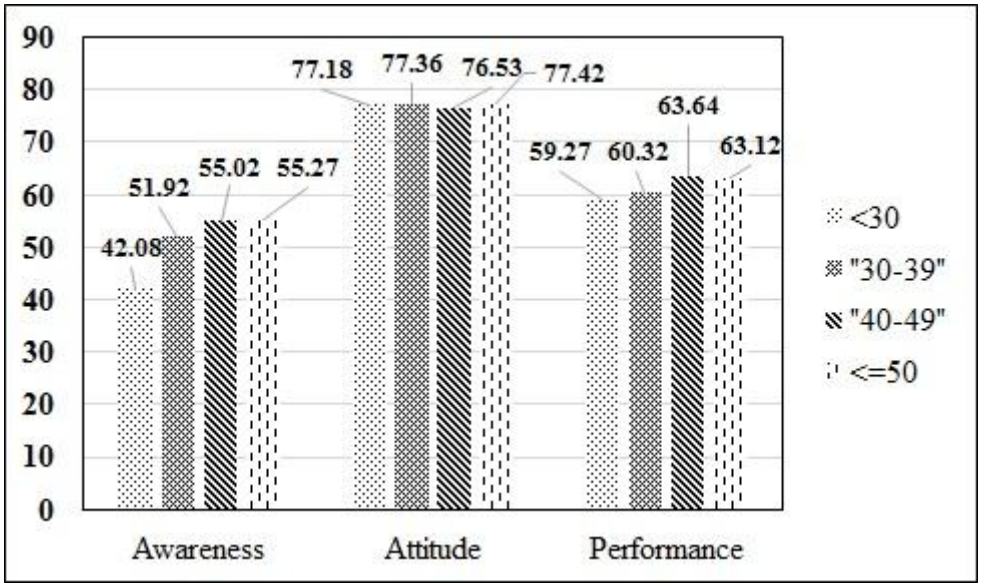


Figure 3. Comparison of Average Scores in Awareness, Attitude, and Performance Areas Based on Age Groups

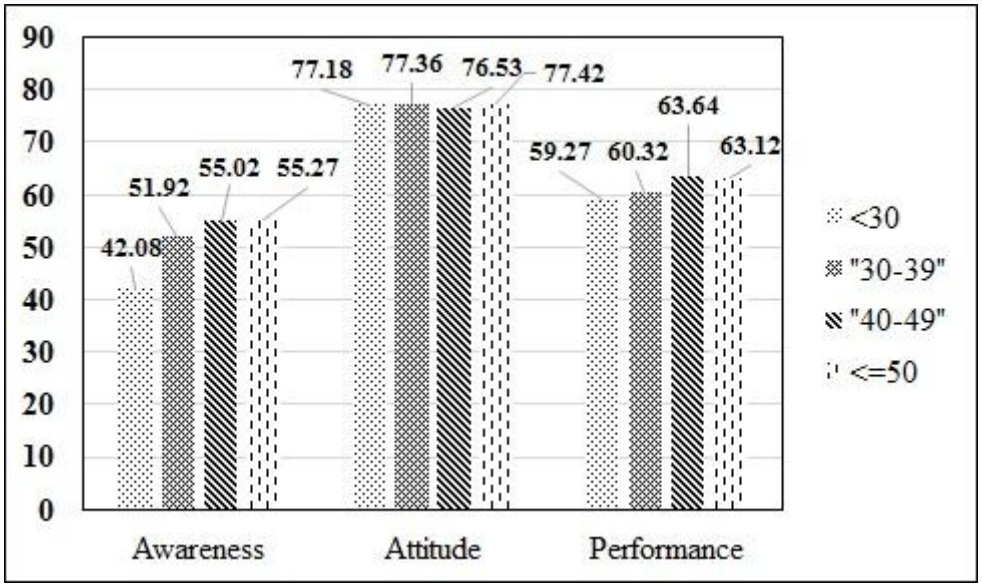


Figure 4. Comparison of Average Scores in Knowledge, Attitude, and Performance Areas Stratified by Gender

Figure 5 breaks down the mean scores of participants with a General Dentist (GD) degree in awareness, attitude, and performance. In the awareness domain, scores ranged from 13.33 to 93.33, in attitude from 60.71 to 91.07, and in performance from 30 to 90. Participants with a GD degree had lower mean scores in awareness and attitude but higher scores in the performance domain. Minimum and maximum scores in awareness, attitude, and performance for GD degree holders were 20 and 93.33, 50 and 98.21, and 33.33 and 67.91, respectively.

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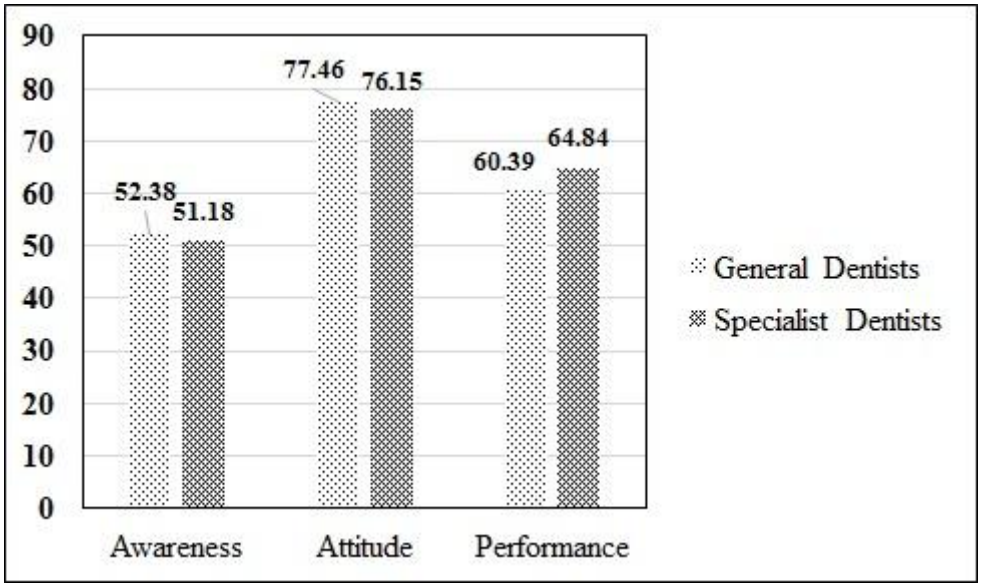


Figure 5. Comparison of Average Scores in Awareness, Attitude, and Performance Domains Based on Education Level

Discussion

Dentistry procedures, involving close patient interactions and the generation of aerosols and droplets, present a significant concern for disease transmission, particularly in the context of pandemics (9). Raising awareness among dentists is crucial due to their direct or indirect contact with human fluids, patient belongings, and infected tools, which could contribute to pandemic development. Understanding how dentists respond to pandemics is pivotal for reducing disease spread and associated mortality, making knowledge, attitude, and performance assessments vital in educational needs evaluation (9).

Mean scores in awareness domains were considered "average," while attitude scores were deemed "good," and performance scores were again "average." Notably, attitude scores surpassed those in the other domains.

For those with a General Dentist (GD) level, mean scores were average, good, and average in awareness, attitude, and performance, respectively. Similarly, for those with a specialized GD, mean scores were average, good, and average. No significant differences were found concerning education levels across the three domains. However, it's worth noting that other studies by Chowdhury et al. and Kanaparti et al. found a significant relationship between education levels and awareness scores, contrasting with the present study. This discrepancy suggests potentially higher awareness, specifically regarding COVID-19, among those with a PhD in the current study compared to the two others (10,11).

Mean awareness scores for individuals with less than 10 years of service were 44.85, 53.21 for those with 10-19 years, 57.57 for 20-29 years, and 49.33 for more than 30 years. The collected data indicated a significant increase in awareness scores with an increase in years of service ($p<0.001$). This aligns with findings from studies by Mohsin et al. in 2020 in Saudi Arabia and Kanapareti et al. in 2020 in Telangana, India, demonstrating a significant correlation between years of service and awareness scores (11,12).

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Comparisons of mean scores in attitude and performance domains showed no significant differences concerning years of service (Figure 6). In the awareness domain, mean scores significantly rose with age, indicating a direct relationship between increasing age and awareness scores (p=0.002). This finding is consistent with the study by Sarfaraz et al. (13). However, no relationship was found between mean scores in attitude and performance domains and age.

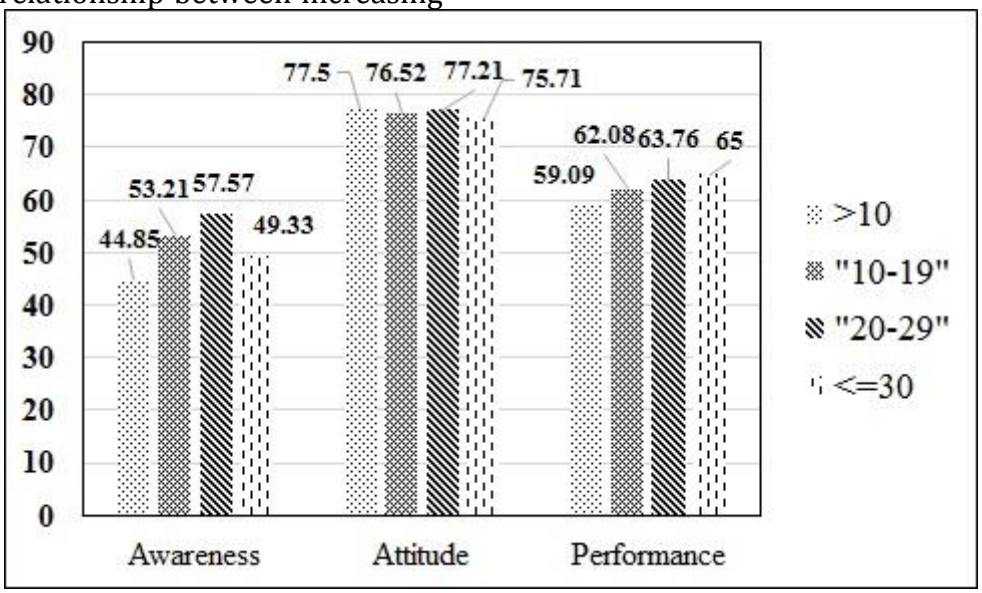


Figure 6. Comparison of Average Scores in Awareness, Attitude, and Performance Domains Based on Years of Service

In this study, mean differences were not significant concerning the place of service, indicating no association between mean scores in awareness, attitude, and performance domains and the five selected centers (Figure 7).

Regarding gender, a significant relationship was found only in the performance domain, which was higher among men compared to women (p=0.013). However, no significant relationships were found between gender and mean scores in awareness and attitude (Figure 4). In another study in 2020 at Beyruni University in Turkey by Sezgin et al., a positive relationship was observed between increased knowledge level and being female (14). Also, in the study by Kanaparti et al., female subjects had significantly higher mean scores than males regarding awareness about COVID-19 (11), contrasting with the present study. This discrepancy may stem from the fact that, at the time of this study, more research had been conducted on COVID-19 compared to the two other studies, leading to a general increase in public information, including among males, about COVID-19.

Based on the obtained data, 3.32% of the participants, all with general PhDs, were not willing to treat an individual who had recovered from COVID-19. In contrast, a study by Karaaslan et al. at Yusak University in Turkey in 2020 reported that 50.8% of clinical students and 34.6% of preclinical students were not willing to treat a recovered COVID-19 patient (9). The considerable difference in attitudes towards this issue could be attributed

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to the end of the COVID-19 pandemic at the time of this study, vaccination of all participants against the infection, along with increased understanding about COVID-19 through extensive studies, unlike the study by Karaaslan et al.

A total of 66.3% of the participants expressed the need for more education about COVID-19. This finding aligns with a study by Karaaslan et al. at Yusak University in Turkey in 2020, where 65.4% of clinical students and 52.8% of preclinical students reported needing more education about COVID-19 and other pandemics. Proper education plays a crucial role in changing attitudes and reducing discrimination against COVID-19 patients, contributing to the development of suitable attitudes for implementing infection control measures (9).

The strengths of this study included its comprehensive coverage of all three domains (awareness, attitude, and performance) regarding COVID-19, the involvement of prominent dentistry professors and faculty members in designing the study, sampling from multiple centers, conducting a pilot study, and ensuring the reliability and validity of the questionnaire at the baseline. However, the study faced limitations due to the busy nature of clinics, resulting in incomplete questionnaire responses and non-cooperation from some dentists.

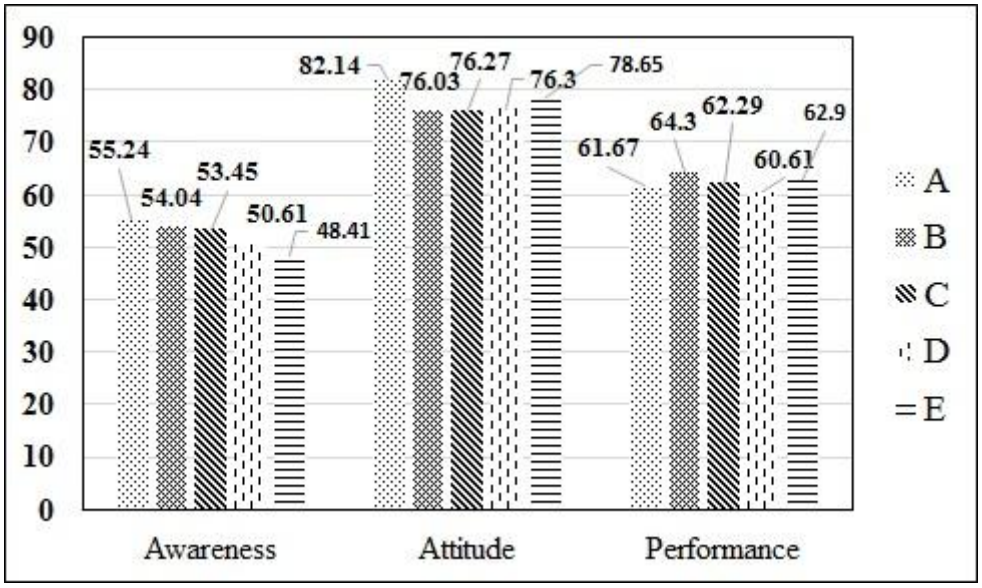


Figure 7. Comparison of Average Scores in Knowledge, Attitude, and Performance Domains Based on Place of Service

Conclusion

In conclusion, the findings of this study reveal lower mean scores in the awareness and performance domains among dentists. Therefore, it is imperative to implement interventions aimed at improving knowledge. Strategies such as organizing workshops, developing informative brochures, and similar initiatives are deemed essential to enhance the awareness and performance of dentists concerning emerging pandemics.

Conflict of Interests

The author affirms the absence of any conflict of interest pertaining to all aspects of this research.

Funding resource

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Authors' Contributions

SA contributed to the study design, concept, and manuscript writing. F performed data collection, contributed to the study design, and edited the manuscript

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