

# Assessing Community Awareness Regarding Hepatitis C in Gadap Town, District Malir, Karachi

Almas Rahim Balouch<sup>1\*</sup>, Syed Muhammad Zulfiqar Hyder Naqvi<sup>2</sup> and Syed Imtiaz Ahmed Jafry<sup>2</sup>

<sup>1</sup>Health Department, Government of Sindh, Karachi, Pakistan

<sup>2</sup>Department of Community Medicine, Baqai Medical College, Karachi, Pakistan

## ABSTRACT

**Background:** Hepatitis C is a major public health issue across the globe, with approximately 58 million individuals estimated to have chronic Hepatitis C virus infection while every year 1.5 million new cases emerge. Locally in Pakistan, the prevalence of Hepatitis C in the general population has recently been reported to be 16.4%. As there are currently no effective vaccines available for precaution against Hepatitis C infection, the role of prevention such as increasing awareness among the masses is even more significant.

**Objective:** To assess the awareness regarding Hepatitis C among the residents of Union Council 3, Gadap Town, District Malir, Karachi.

**Methods:** A cross-sectional study was conducted at Gadap Town, District Malir, Karachi from September 2022 to November 2023. The study population comprised people aged 18 years or above of either gender living in Union Council 3, Gadap Town, District Malir, Karachi. Data were collected by using a pre-tested questionnaire. Data were analyzed on SPSS version 20.

**Results:** A total of 601 participants were included in the study. The mean age of respondents was 30.99±10.58 years and 268 (44.6%) of them belonged to the 26 to 39 year age group, 326 (54.2%) of them were male whereas 236 (39.2%) of them had a positive family history of Hepatitis C. Moreover, 395 (65.7%) of the study participants were found to have inadequate awareness regarding Hepatitis C. Furthermore, on multivariable analysis, both education level ( $p<0.001$ ) and family history of Hepatitis C ( $p<0.001$ ) were found to be significantly associated with the awareness level of participants.

**Conclusion:** The study results revealed that almost two-thirds of the participants had inadequate awareness regarding Hepatitis C. Furthermore, both education level and family history of Hepatitis C were significantly associated with the awareness level of the participants.

**Keywords:** Community, awareness, hepatitis C, risk factors, preventive measures.

## INTRODUCTION

Hepatitis C is a major public health issue across the globe. According to the World Health Organization, approximately 58 million individuals are estimated to have chronic Hepatitis C infection while every year 1.5 million new cases are reported. Moreover, approximately 290,000 individuals died in 2019 as a result of Hepatitis C infection, the cause of which was identified as hepatocellular carcinoma and cirrhosis of the liver [1]. Locally in Pakistan, a recent estimate put the prevalence of Hepatitis C in the general population of Pakistan at 16.4% [2]. The healthcare system is therefore significantly affected by the financial burden of Hepatitis C management [3].

Hepatitis C is a common blood-borne viral infection, transmitted *via* contact with blood with most of the cases occurring due to drug use through injections, needle stick injuries, unscreened blood transfusions, unsafe health care exposures, non-sterilization of medical equipment, unsafe sexual practices, or getting a tattoo or piercing done by unsterilized equipment. Mild non-specific symptoms of acute infection remain undiagnosed in low-

resource areas leading to chronic infection in patients, evident only after the onset of complications such as liver failure, cirrhosis, and hepatocellular carcinoma [4-6].

A key measure to stop the spread of Hepatitis C infection is community-based preventive care programs [7]. According to available literature, our population lacks awareness regarding the spread of the Hepatitis C virus and is at risk of getting Hepatitis C [4]. As there are currently no effective vaccines available for the prevention of Hepatitis C infection, prevention is even more significant in managing this major public health issue; for this purpose, increasing awareness among the masses regarding Hepatitis C prevention is of utmost importance [8, 9].

Though certain studies on this topic have been conducted locally during the last decade, most of them targeted selective population subgroups and thus have limited generalizability [10-19], and from the perspective of assessing community awareness in this regard, there is little recent evidence available, particularly from the rural areas of Sindh [4, 20, 21]. This study was therefore conducted to explore the awareness regarding Hepatitis C among the residents of Union Council 3, Gadap Town, District Malir, Karachi. The findings of this study will help in establishing a local evidence base so that effective

\*Corresponding author: Almas Rahim Balouch, Health Department, Government of Sindh, Karachi, Pakistan, Email: [almassrahim@gmail.com](mailto:almassrahim@gmail.com)

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strategies can be developed to educate the general population regarding disease transmission, early detection and treatment of hepatitis C and eventually modify their practices to prevent further transmission of this disease.

## METHODS

A cross-sectional study was conducted from September 2022 to November, 2023 at Gadap Town, District Malir, Karachi. Individuals aged 18 years or above of either gender, residing in Union Council 3 of Gadap Town, District Malir, Karachi were included whereas those who refused to give verbal informed consent were excluded from the study.

Using 50% as the percentage frequency of the study outcome with a 95% confidence level and 4% precision, the required sample size was calculated to be 601 participants using the following formula:  $n = z^2 (p)(1-p)/c^2$  Non-probability convenience sampling technique was used to include participants in the study.

A questionnaire was specifically designed for the study that was pre-tested on 10% of the sample size to check for face validity and reliability. Face validity was assessed by asking respondents if they think the questionnaire is designed to assess their awareness regarding hepatitis C. The reliability of the questionnaire was assessed by calculating Cronbach's alpha whose value came out to be 0.846 indicating a good level of internal consistency.

The study questionnaire consisted of two sections; section A contained eight questions about the socio-demographic characteristics of the respondents while section B contained 20 questions to assess awareness regarding Hepatitis C. Participants who correctly answered 80% of the awareness questions *i.e.* 16 out of 20 questions were considered as having adequate awareness regarding Hepatitis C. The study questionnaire is attached as a supplementary file.

The data were entered and analyzed on SPSS software version 20. Frequencies and percentages and means and standard deviations were calculated for categorical and continuous variables respectively. For inferential analysis, binary logistic regression was applied to compute univariate odd ratios with a 95% confidence interval for determining the association of participants' characteristics with their awareness level. Variables with  $p < 0.25$  and other important variables irrespective of  $p < 0.25$  in univariate analysis were used to build a multivariable regression model to compute adjusted odd ratios with a 95% confidence interval. A two-tailed  $p$ -value of  $\leq 0.05$  was considered statistically significant.

To the best of the authors' knowledge, the study procedures were in line with the institutional ethical standards for human experiments and the Helsinki Declaration, including obtaining verbal informed consent from all the participants. The ethical approval from

Baqai Institute of Health Sciences was also duly taken (Reference # FHM 74-2022).

## RESULTS

The response rate of the study was 100%. The mean age of respondents was  $30.99 \pm 10.58$  years and 268 (44.6%) of them belonged to the 26 to 39 year age group, 326 (54.2%) of them were male, 374 (62.2%) were married, 234 (38.9%) had intermediate education, 345 (57.4%) had monthly household income of less than 20,000 rupees, 495 (82.3%) of them lived in a joint family, 263 (43.7%) were employed whereas 236 (39.2%) of them had a positive family history of Hepatitis C (**Table 1**).

Moreover, 426 (70.9%) respondents were aware that Hepatitis C is a viral disease, 284 (47.2%) were aware that Hepatitis C can occur in any age, 438 (72.8%) were aware that Hepatitis C primarily affects human liver, 374 (62.2%) were aware that Hepatitis C can cause liver cancer, 378 (62.8%) were aware that Hepatitis C infected person is a risk for others, 274 (45.6%) were aware that Hepatitis C can be transmitted through sexual contact, 442 (73.5%) were aware that Hepatitis

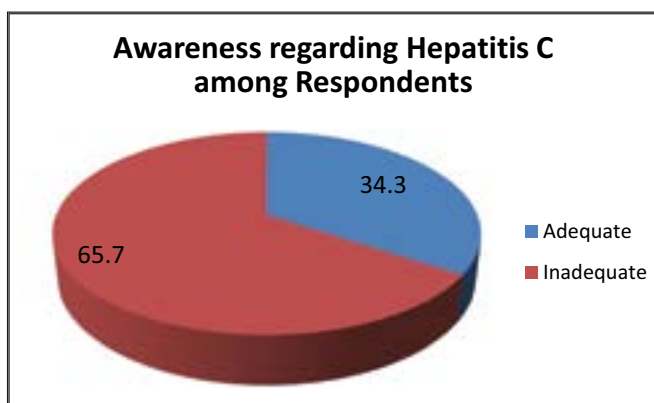
**Table 1:** Participants profile.

Participant Characteristics (n=601)	Count (%) / Mean $\pm$ S.D.
Age (Years)	30.99 $\pm$ 10.58
<b>Age Groups</b>	
Up to 25 Years	217 (36.1)
26 to 39 Years	268 (44.6)
40 Years or Above	116 (19.3)
<b>Gender</b>	
Male	326 (54.2)
Female	275 (45.7)
<b>Education Level</b>	
Illiterate	60 (10.0)
Able to Read and Write	31 (5.2)
Primary	148 (24.6)
Secondary/Intermediate	234 (38.9)
Graduate or Above	120 (20.0)
Religious Education only	8 (1.3)
<b>Marital Status</b>	
Married	374 (62.2)
Unmarried	218 (36.3)
Divorced/Widowed/Separated	9 (1.5)
<b>Monthly Household Income (Rs.)</b>	
Less than 20,000	345 (57.4)
20000 to 50,000	167 (27.8)
More than 50,000	89 (14.8)
<b>Employment Status</b>	
Employee/Self-Employed	263 (43.8)
Unemployed	191 (31.8)
Student/Housewife	147 (24.5)
<b>Type of Family</b>	
Nuclear	106 (17.6)
Joint	495 (82.3)
<b>Family History of Hepatitis C</b>	
Positive	236 (39.2)
Negative	365 (60.7)

**Table 2:** Awareness profile of the participants.

Questions Assessing Awareness	Correct Response Count (%)
Is Hepatitis C a viral disease?	426 (70.9)
Can Hepatitis C occur at any age?	284 (47.2)
Does Hepatitis C primarily affect human liver?	438 (72.8)
Can Hepatitis C cause liver cancer?	374 (62.2)
Is Hepatitis C infected person a risk for others?	378 (62.8)
Can Hepatitis C be transmitted by sexual contact?	274 (45.6)
Can Hepatitis C be transmitted by sharing tooth brush with an infected person?	442 (73.5)
Can Hepatitis C be transmitted by using contaminated blood for transfusion?	386 (64.2)
Hepatitis C doesn't transmit by water and food	419 (69.7)
Can Hepatitis C be transmitted by use of unsterilized syringes, equipment and instrument?	514 (85.5)
Can Hepatitis C be transmitted by use of infected blades?	500 (83.1)
Can Hepatitis C be transmitted by using infected needles for tattooing and piercing?	483 (80.3)
Can Hepatitis C be transmitted by contact with open wound/cuts?	389 (64.7)
Can Hepatitis C be transmitted from mother to baby during pregnancy?	370 (61.5)
Can Hepatitis C be prevented by using sterilized/new needles and syringes?	406 (67.5)
Can Hepatitis C be prevented by using sterilized/new razors and blades?	375 (62.3)
Can Hepatitis C be prevented by using one's own tooth brush only?	361 (60.0)
There is no vaccine available for Hepatitis C?	276 (45.9)
Is Hepatitis C treatable?	491 (81.6)
Is Hepatitis C a major public health problem in Pakistan?	508 (84.5)

C can be transmitted by sharing tooth brush with an infected person, 386 (64.2%) were aware that Hepatitis C can be transmitted by using contaminated blood for transfusion, 419 (69.7%) were aware that Hepatitis C does not transmit by water and food, 514 (85.5%) were aware that Hepatitis C can be transmitted by use of unsterilized syringes, equipment and instruments, 500 (83.1%) were aware that Hepatitis C can be transmitted by use of infected blades, 483 (80.3%) were aware that Hepatitis C can be transmitted by using infected needles for tattooing and piercing, 389 (64.7%) were aware that Hepatitis C can be transmitted by contact with open



**Fig. (1):** Awareness regarding Hepatitis C among respondents.

wound/cuts, 370 (61.5%) were aware that Hepatitis C can be transmitted from mother to baby during pregnancy, 406 (67.5%) were aware that Hepatitis C can be prevented by using sterilized/new needles/new syringes, 375 (62.3%) were aware that Hepatitis C can be prevented by using sterilized/new razors/blades, 361 (60.0%) were aware that Hepatitis C can be prevented by using one's own tooth brush only, 276 (45.9%) were aware that there is no vaccine for Hepatitis C, 491 (81.6%) were aware that Hepatitis C is treatable whereas 508 (84.5%) were aware that Hepatitis C is a major public health problem in Pakistan (**Table 2**).

Furthermore, 395 (65.7%) of the study participants were found to have inadequate awareness regarding Hepatitis C (**Fig. 1**).

Both education level and family history of Hepatitis C on logistic regression analysis were found to be significantly associated with the awareness level of participants where participants who had primary, secondary/intermediate and graduation or above education had significantly higher odds of having adequate awareness regarding Hepatitis C than those who were illiterate (AOR=2.84, 95% CI: 1.32-6.08, p=0.007, AOR=2.96, 95% CI: 1.40-6.26, p=0.004 and AOR=3.87, 95% CI: 1.70-8.79, p=0.001 respectively) and participants who had a positive family history of Hepatitis C had significantly higher odds of having adequate awareness regarding Hepatitis C than those who had a negative family history (AOR=1.75, 95% CI: 1.22-2.52, p=0.002) (**Table 3**).

**Table 3:** Logistic regression analysis of associations between participants characteristics and their awareness level.

Participants Characteristics	Crude Odds ratio	95% CI		p-value	Adjusted Odds ratio	95% CI		p-value
		Lower	Upper			Lower	Upper	
<b>Age Groups</b>								
Up to 25 Years	0.99	0.61	1.61	0.985	0.79	0.44	1.40	0.423
26 to 39 Years	1.27	0.80	2.01	0.309	1.15	0.70	1.89	0.579
40 Years or Above		Ref				Ref		
<b>Gender</b>								
Male		Ref				Ref		
Female	1.02	0.72	1.43	0.898	1.06	0.70	1.59	0.768
<b>Education Level</b>								
Illiterate		Ref				Ref		

Participants Characteristics	Crude Odds ratio	95% CI		p-value	Adjusted Odds ratio	95% CI		p-value
		Lower	Upper			Lower	Upper	
Able to Read and Write/Religious Education Only	0.97	0.34	2.77	0.961	0.99	0.34	2.87	0.988
Primary	2.55	1.22	5.33	*0.012	2.84	1.32	6.08	*0.007
Secondary/Intermediate	2.54	1.25	5.14	*0.010	2.96	1.40	6.26	*0.004
Graduate or Above	3.07	1.45	6.49	*0.003	3.87	1.70	8.79	*0.001
<b>Marital Status</b>								
Married/previously married	1.05	0.74	1.50	0.758	1.10	0.71	1.70	0.660
Unmarried	Ref				Ref			
<b>Monthly Household Income (Rs.)</b>								
Less than 20,000	0.86	0.52	1.39	0.541	1.24	0.71	2.19	0.442
20,000 to 50,000	0.87	0.51	1.50	0.638	1.04	0.58	1.85	0.878
More than 50,000	Ref				Ref			
<b>Type of Family</b>								
Nuclear	Ref				Ref			
Joint	1.07	0.68	1.67	0.764	1.31	0.80	2.15	0.274
<b>Employment Status</b>								
Employee/Self Employed	Ref				Ref			
Unemployed	0.81	0.54	1.21	0.319	0.84	0.52	1.35	0.476
Student/Housewife	1.06	0.69	1.61	0.781	1.22	0.71	2.10	0.468
<b>Family History of Hepatitis C</b>								
Positive	1.54	1.09	2.17	*0.013	1.75	1.22	2.52	*0.002
Negative	Ref				Ref			

CI: Confidence interval, Ref: Reference category, \*Significant at  $p < 0.05$

## DISCUSSION

Alarmingly, only 65.7% of the study participants had inadequate awareness regarding Hepatitis C. An earlier study by Nawaz K *et al.* in 2018 from Lahore, Pakistan reported 49.0% whereas another study by Sohail A in 2023 from Lahore, Pakistan reported 94.3% of community respondents to have poor knowledge regarding Hepatitis C [4, 21]. The finding of our study falls between these two estimates. These wide-ranging values point out important underlying differences between the study methodologies and target populations. This in turn highlights the need for further comprehensive evaluation of this important public health concern in more representative population samples across Pakistan.

Additionally, 70.9% of participants were aware of the cause of Hepatitis C. Similarly, Nawaz K *et al.* in 2018 also reported that 64.0% of participants knew that Hepatitis C is a viral infection [4]. Pirani S *et al.* in 2016 though reported only 34.0% of respondents to have such awareness [19]. The disparity in results may stem from the distinct sample sizes of the two investigations, as the later study had a far lower sample size.

Only 47.2% of respondents were aware that Hepatitis C can occur at any age, a finding similar to previously published literature. Nawaz K *et al.* in 2018 reported that 58.0% of respondents were aware that Hepatitis C can occur at any age [4]. Pirani S *et al.* in 2016 reported 75.5% of respondents to be aware that Hepatitis C can occur at any age [19]. The disparity in findings could be again due to dissimilar sample sizes of both studies as the later research had a much smaller sample size.

Furthermore, 72.8% of the respondents were aware that Hepatitis C primarily affects the human liver. Similar findings were reported by Nawaz K *et al.* in 2018 and Pirani S *et al.* in 2016 [4, 19]. Moreover, 62.2% of participants had an awareness that liver cancer can be caused by Hepatitis C. Nawaz K *et al.* in 2018 also reported similar results [4]. As it is a common knowledge that Hepatitis is an infection of the liver therefore these findings are not unexpected.

Almost two-thirds of the participants were aware that Hepatitis C infected person is a risk to others. Nawaz K *et al.* in 2018 and Pirani S *et al.* in 2016 also reported similar findings [4, 19]. The presence of this high level of awareness is a welcome indication that a majority of masses has awareness regarding the threats of Hepatitis C spread through an infected person.

Disturbingly, only 45.6% of respondents were aware that Hepatitis C can be transmitted by sexual contact, a finding well in line with the published literature [11, 16, 19]. Furthermore, 73.5% of respondents were aware that the Hepatitis C virus can spread by using the toothbrushes of a diseased individual. Previous literature reports quite similar percentages in this regard [4, 19].

Moreover, 64.2% of participants knew that the virus can be spread by using of contaminated blood for transfusion. Likewise, Khan RZ *et al.* in 2022 reported 75.2%, Khan A *et al.* in 2018 reported 63.0% and Pirani S *et al.* in 2016 reported 74.4% of respondents had this awareness [11, 15, 19]. Unlike these results though, Rafiq A *et al.* in 2015 reported only 44.8% of participants were aware that Hepatitis C can be spread by using contaminated blood for transfusion [16]. It can therefore be concluded

that with time, the awareness of the masses about the potential risk of using unscreened blood for transfusion purposes in the context of hepatitis spread is increasing.

Interestingly, more than two-thirds of the respondents were aware that Hepatitis C is not transmitted by water and food. Nawaz K *et al.* 2018 reported that almost half of the respondents were aware that Hepatitis C is not transmitted by water and food [4]. This finding highlights that a reasonable proportion of the population knew the route of spread of Hepatitis C.

Encouragingly, 85.5% of participants were aware that Hepatitis C can spread by using contaminated syringes, equipment and utensils. Likewise, Nawaz K *et al.* 2018 reported 64.0%, Khan RZ *et al.* 2022 reported 80.0%, Khan A *et al.* in 2018 reported 64.0% whereas Pirani S *et al.* in 2016 reported 72.0% of respondents have such awareness [4, 11, 15, 19]. A recent local study also concluded that reusing needles and syringes is likely to be an important driver of HCV transmission in our setting [22].

Moreover, 83.1% of respondents were found to be aware that Hepatitis C can spread by the use of infected blades. Similarly, Nawaz K *et al.* in 2018 reported 64.0%, Khan A *et al.* in 2018 reported 62.0% whereas Pirani S *et al.* in 2016 reported 74.0% respondents have such awareness [4, 15, 19]. As previously stated, this is again a welcome finding that shows a higher level of awareness among respondents regarding the transmission of Hepatitis C.

Interestingly, 80.3% of participants were aware that Hepatitis C can spread by using infected needles for tattooing and piercing. This percentage of awareness among respondents is considerably higher than what has been previously reported in the literature [4, 11, 16, 19], indicating a welcome increase in this awareness with time.

Additionally, 61.5% of respondents were aware that Hepatitis C can spread from mother to baby during pregnancy. Likewise, Nawaz K *et al.* 2018 reported 54.0%, Khan A *et al.* in 2018 found 45.0%, Mallick *et al.* in 2018 found 73.4% whereas Pirani S *et al.* in 2016 reported 52.8% of respondents had such awareness [4, 15, 17, 19]. Unlike these results though, Khan RZ *et al.* in 2022 reported that only 25.6% of respondents whereas Rafiq A *et al.* in 2015 reported that only 31.8% of respondents had such awareness [11, 16]. Literature thus overwhelmingly supports the findings of this study.

Furthermore, 67.5% of participants were aware that Hepatitis C can be prevented by using sterilized/new needles/new syringes. A similar finding was reported by Nawaz K *et al.* in 2018 [4]. Moreover, 62.3% of participants were aware that Hepatitis C can be prevented by using sterilized/new razors/blades. Again, similar findings were reported by Nawaz K *et al.* in 2018 and Iqbal M *et al.* in 2018 [4, 12]. As it is common

knowledge regarding Hepatitis C prevention, these findings therefore were not unexpected.

Disturbingly, less than half of the respondents were aware that there is no vaccine for Hepatitis C. Rafiq A *et al.* in 2015 and Mallick N *et al.* in 2018 also reported quite similar percentages [16, 17]. Unlike these results though, Pirani S *et al.* in 2016 reported 90.8% of respondents were aware that there is no vaccine available for Hepatitis C prevention [19]. This disparity in results could be explained by the fact that the latter study was conducted in Hepatitis C positive patients.

Encouragingly, 81.6% of participants were aware that Hepatitis C is treatable, a finding in line with the previously published literature [19].

Moreover, 84.5% of the respondents were aware that Hepatitis C is a major public health problem in Pakistan. Similar findings were reported by Nawaz K *et al.* in 2018 [4]. Realization of the significant healthcare burden posed by Hepatitis C by a vast majority of our community members is a positive baseline to build further to improve their overall Hepatitis C-related awareness.

The study results showed that 26 to 39 years old respondents were more likely to have adequate awareness regarding Hepatitis C than other age groups, though not statistically significant. Likewise, it was reported by Gul F *et al.* in 2022 that the respondents aged 30 to 35 years had higher awareness regarding Hepatitis C as compared to other age groups [18]. This is an interesting finding, and needs further exploration as to why people belonging to this age group have better awareness regarding Hepatitis C than other age groups.

As expected, better-educated participants in this study were more likely to have adequate awareness regarding Hepatitis C than those who were not. Khan RZ *et al.* in 2022 also reported similar findings [11].

Moreover, participants with a positive family history of Hepatitis C were more likely to have adequate awareness regarding Hepatitis C than those without, again a finding in line with the published literature [13]. Because of having the experience of dealing with such patient, and accompanying him/her on the visits to healthcare professionals, a person with a positive family history of Hepatitis C is more likely to be aware of the transmission, signs and symptoms and prevention of this disease.

It is acknowledged that the study sample consists of the residents of a single union council of Gadap Town, District Malir, Karachi and that the results may differ in other areas based on their socio-demographic and ethnic composition. In light of the study results, it is recommended to conduct community-based health awareness sessions to spread awareness regarding Hepatitis C among the population, with a special focus on those with lower education levels and a positive

family history of Hepatitis C. Moreover, every interaction of patients with healthcare personnel should also be used as an opportunity to spread Hepatitis C-related awareness among them.

### CONCLUSION

The study results revealed that almost two-thirds of the participants had inadequate awareness regarding Hepatitis C. Moreover, both education level and family history of Hepatitis C were significantly associated with the awareness level of the participants.

### ETHICS APPROVAL

The ethical approval from Baqai Institute of Health Sciences was also duly taken (Reference # FHM 74-2022). All procedures performed in studies involving human participants were following the ethical standards of the institutional and/ or national research committee and the Helsinki Declaration.

### CONSENT FOR PUBLICATION

Prior informed consent was obtained from the participants of the study.

### AVAILABILITY OF DATA

Data cannot be shared publicly because it is the intellectual property of Baqai Institute of Health Sciences. Data are available from the Baqai Institute of Health Sciences (contact *via* manager.mph@baqai.edu.pk).

### FUNDING

None.

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Declared none.

### AUTHORS' CONTRIBUTION

ARB: Study concept, designing, and manuscript drafting.

SMZHN: Study designing, result analysis, interpretation, critical review and revision of the initial draft.

SIAJ: Study design, critical review and revision of the initial draft.

All authors have read and approved the manuscript.

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