

Anxiety, anger, and mindfulness as predictors of general health in the general population during COVID-19 outbreak: A survey in southeast Iran

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Abstract

Communities have been exposed to the complications and problems caused by COVID-19 disease, which has had various and complex effects on general health. The aim of this study was to investigate the relationship between anxiety, anger, mindfulness, and general health in the general population during the COVID-19 outbreak in Iran. This cross-sectional study was performed on 456 participants from September 2020 to April 2021. For data collection, Demographic Characteristics Form, General Health Questionnaire, Freiburg Mindfulness Inventory-Short Form, The trait anxiety section of the State-Trait Anxiety Inventory, The State-Trait Anger Expression Inventory-2 were used. General health was positively correlated with anxiety and anger and negatively correlated with mindfulness. Anxiety was positively correlated with anger and negatively correlated with mindfulness. No significant correlation was found between anger and mindfulness. Based on the multiple regression model, anxiety, anger and a family member infected with COVID-19 were the predictors of general health ($p < 0.001$). Given that anxiety, anger, and family members infected with COVID-19 are all predictors of public health, it is suggested that psychological programs and interventions be designed to reduce anxiety and anger, as well as to support family members infected with COVID-19, to promote general health.

KEYWORDS

anger, anxiety, COVID-19, general health, mindfulness

1 | INTRODUCTION

Coronavirus (COVID-19) is a new pandemic that was discovered in China. The highly contagious virus quickly spread to over 200 countries around the world (Organization, 2020a; Zumla & Niederman, 2020). The COVID-19 epidemic has had a far-reaching impact on many aspects of people's lives, including their health (Yıldırım et al., 2021). According to the most recent statistics on February 9, 2021, there were a total of 106,125,682 cases and 2,320,497 deaths due to COVID-19 in various countries. The increasing prevalence of this disease in various countries demonstrates that it is extremely dangerous and lethal (Organization, 2020c). According to the latest statistics of the WHO in Iran, 2,060,289 people were infected with COVID-19 and 60,159 deaths during in Iran until April 14, 2021 (Organization, 2020b).

Infectious diseases are usually a threat to human survival. Increased mortality rates, misinformation, grief, and a lack of knowledge about emerging infections, as well as the problems resulted from these diseases, cause social and psychological problems, as well as widespread fear and irrational reactions in people (Ko et al., 2006). Quarantine and other measures to prevent the spread of the virus, as well as social distance, can have negative psychological consequences (Zakeri, Maazallahi, et al., 2021). Furthermore, the disease's economic consequences, such as sudden industry collapse and related financial losses, may exacerbate negative psychological effects during the current epidemic (Ahorsu et al., 2020). People may experience emotional confusion and uncontrollable behaviors as a result of these conditions. Health policymakers must take appropriate measures to improve people's mental health in this situation (Khademian et al., 2020). During the epidemic, a number of studies examined the prevalence of psychological distress in various populations. More than half of respondents in China, for example, rated the psychological impact as moderate to severe (Wang et al., 2020). Mental health problems were prevalent in 7.30%–37.14% of participants in Italy (Rossi et al., 2020), and 35% of participants in Iran (Hossini Rafsanjanipoor et al., 2021).

Certainly, the general public has experienced anxiety, stress, fear, uncertainty, and insecurity as a result of the COVID-19 pandemic (Zakeri, Hosseini Rafsanjanipoor, Kahnooji, et al., 2021; Zakeri, Hosseini Rafsanjanipoor, Sedri, et al., 2021). Studies have shown that in times of crisis, particularly infectious crises, psychological responses such as anxiety, depression, stress, and fear can have a negative impact on people's health (Pappas et al., 2009).

Anxiety and fear are common reactions to a new and unknown situation. The current COVID-19 prevalence, like the prevalence of similar infections such as SARS (2003) and MERS-CoV (2014), has caused significant psychological distress in people, particularly in infected areas (Salazar de Pablo et al., 2020). Anxiety is the body's natural defense system, indicating the possibility of danger and providing practical solutions to the potential problem (Barlow et al., 2016). In the COVID-19 pandemic, 31.9% of participants in China (Ran et al., 2020), 25% in Spain (Rodríguez-Rey et al., 2020), 20.80% in Italy (Rossi et al., 2020), 26.8% (Hossini Rafsanjanipoor et al., 2021) and 38.8% in Iran had anxiety symptoms (Dehghan et al., 2021).

Anger, in addition to anxiety, contributes to psychological complications in society. In the early stages of the COVID-19 epidemic, the most common traumatic emotional reactions in the general public were anger, fear, and frustration (Trnka & Lorencova, 2020). Poor knowledge and insight (Allington et al., 2020) and poor understanding of government actions (Smith, Amlôt, et al., 2020) may be accompanied by anger and conflict among individuals in the COVID-19 outbreak. Few studies on anger during the COVID-19 outbreak were found in a review of the literature. In a study conducted by Smith, Duffy, et al. (2020) 56% of participants reported arguing with others and feeling angry or struggling with others as a result of COVID-19. Today, with the outbreak of COVID-19, which can cause problems such as anxiety and anger in the community and have an impact on people's mental health, mental health care has been recommended, and mental health problems should be treated if necessary (Landi et al., 2020).

In this regard, there has been an increase in the use of alternative methods in conjunction with drug therapy processes such as mindfulness, meditation, and psychological methods that can be beneficial to human health (Behan, 2020). Mindfulness is a practice that can help health care professionals, patients, caregivers, and the general public in times of crisis, such as the COVID-19 epidemic (Behan, 2020). "Mindfulness" refers to being aware of the present moment, a term that has recently gained popularity. Mindfulness is defined as paying nonjudgmental attention to what you are doing right now (Kotzé & Nel, 2016). In other words, mindfulness can be defined as a process involving the attention, awareness, and acceptance of open mind in the present moment (Kabat-Zinn, 2015). According to Conversano et al., a high level of awareness improved people's well-being and assisted them in coping with stressful situations like COVID-19. Preventing the onset of posttraumatic stress disorder and the development of chronic mental disorders can both benefit from mindfulness-based training (Conversano et al., 2020). Conversano et al found that mindfulness was the best predictor of psychological distress (Conversano et al., 2020). Online mindfulness sessions also help to reduce anxiety, stress, and concern about the COVID-19 (Farris et al., 2021).

Studies on the COVID-19 pandemic have revealed that individuals' physical and mental health is critical to live a healthy life and cope with crises such as COVID-19 (Hossini Rafsanjanipoor et al., 2021; Rossi et al., 2020; Zakeri, Hosseini Rafsanjanipoor, Sedri, et al., 2021). Examining factors related to individuals' general health can be used in planning and potential interventions to improve it in individuals affected by the COVID-19 pandemic and similar crises. There is also a knowledge gap due to the lack of studies examining these factors on human health in the COVID-19 pandemic. Understanding the impact of these factors on mental health can aid in increasing and improving the general population's health during COVID-19. The present study aimed to answer the following questions during the outbreak of COVID-19: (a) what is the general health, anxiety, anger, and mindfulness of the participants? (b) What is the relationship between participants' demographic characteristics and general health? (c) Is there a correlation between general health, anxiety, anger, and mindfulness? (d) Which of the variables in the present study predicts general health?

2 | MATERIALS AND METHODS

2.1 | Study design and setting

This is a cross-sectional study to determine the general health of an Iranian general population during the COVID-19 pandemic in Iran. The research setting was Kerman, a city in southeast Iran.

2.2 | Participants, sampling, and sample size

Kerman residents made up the study population. All residents of Kerman who met the inclusion criteria were included in the study. The study required participants to be at least 18 years old, have basic reading and writing skills, and have no self-reported psychiatric disorders. More than 10% of the questions per questionnaire were left unanswered, which was an exclusion criterion.

The convenience sampling method was used. Questionnaires were distributed both electronically and on paper. The online form was distributed via social networks (WhatsApp, Telegram, Eta) and emails. For the paper form, Kerman was divided into four districts according to the municipal division, with each district considered as a cluster. Then, shopping malls, parks, recreation areas, and streets were considered as the research settings.

The sample size was estimated to be 384 ($\alpha = 0.05$, $d = 0.05$, $Z = 1.94$) using Cochran's formula. Due to the possibility of dropout, 470 questionnaires were distributed, 14 of which were excluded from the study due to confounding information and missing values. Finally, 456 questionnaires were used in the analysis.

2.3 | Measurements

2.3.1 | Demographic Characteristics Form

Demographic Characteristics Form included information such as age, gender, marital status, educational level, occupation, income, prior knowledge of the mindfulness concept (yes/no), and use of any methods of mindfulness (yes/no).

2.3.2 | The General Health Questionnaire (GHQ)

The GHQ is a widely used tool to assess psychological distress in a variety of contexts. It consists of 60 items and is a self-report questionnaire. Shorter versions with 12, 20, 28, and 30 items are also available. The questionnaire items examine a person's mental state in the past month. The GHQ-12 consists of 12 items, six of which are positive and six of which are negative. The items are scored using a Likert scale of 0-3. In this method, the minimum and maximum individual scores will be 0 and 36, respectively, with a higher score indicating higher psychological distress (Goldberg, 1972, 1988). The validity and reliability of the Persian version of GHQ has been confirmed. In the present study, Cronbach's alpha was 0.78.

2.3.3 | The Freiburg Mindfulness inventory-Short Form (FMI-SF)

FMI has proven to be an effective psychometric tool for assessing mindfulness in both clinical and nonclinical populations and many researchers regard it as an accurate and appropriate tool for measuring mindfulness factors. Buchhold et al. created the first FMI, which included 30 items. Later, Walch et al. reduced the FMI to a shorter form (14 items), which is more suitable for use in the general population.

The FMI-SF items are graded on 4-point Likert scale (rarely = 1 to almost always = 4). The minimum score would be 14 and the maximum would be 56. A higher score indicates that you are more mindful (Walach et al., 2006). The validity and reliability of the Persian version of FMI-SF has been confirmed. In the present study, Cronbach's alpha was 0.76.

2.3.4 | The trait anxiety section of the State-Trait Anxiety Inventory (STAI)

Spielberger et al. developed the STAI in 1970 as a tool for measuring trait-state anxiety. This questionnaire includes separate self-assessment scales to measure both state and trait anxiety. Each scale includes 20 items, for a total of 40 items. The trait scale measures a person's general and normal emotions. All items are rated on a 4-point Likert scale ranging from "1 = Not at All" to "4 = Very Much." The higher scores indicate greater anxiety (Spielberger, 1983). The validity and reliability of the Persian version of STAI has been confirmed. In the present study, Cronbach's alpha was 0.79.

2.3.5 | The State-Trait Anger Expression Inventory-2 (STAXI-2)

Spielberger, Jacobs, et al. (1983) created the FSTAXI in 1983 to assess the severity of various states of anger. Based on research from 1995 to 1999, this Inventory was changed and revised into STAXI-2. The second version was designed with two goals in mind: (1) Identifying normal and abnormal personality traits based on anger factors, (2) Providing averages of various anger factors that contribute to medical problems. The STAXI-2 has 57 items organized into three sections, each measuring state anger, trait anger, and anger expression and control on a

four-point Likert scale (Spielberger, 1999). The validity and reliability of the Persian version of STAXI-2 has been confirmed. In the present study, Cronbach's alpha was 0.81.

2.4 | Data collection and data analysis

After obtaining the necessary permissions, the research team used Google Forms to create the online form of the questionnaires. The research team evaluated the online form's efficiency and responsiveness on ten participants. In addition, the paper version of the questionnaire was distributed in the study setting. Nearly 160 questionnaires were completed online, with the remainder completed on paper. Data were collected in the form of self-administered questionnaires from September 22, 2020 to April 20, 2021.

The data were analyzed using SPSS version 22. Frequency, percentage, mean and standard deviation were used to describe the participant's characteristics. Pearson correlation coefficients were used to determine the correlation between GHQ, anxiety, anger, and mindfulness scores because their distributions were normal (according to the Kolmogorov-Smirnov test, skewness, and kurtosis). Since the parametric conditions (i.e., normality and homogeneity of variances) were fulfilled, independent *t* test and analysis of variance test were used to determine the GHQ score according to the qualitative variables. Multivariate linear regression with the backward method was used to identify the GHQ predictors. A significance level of 0.05 was considered.

3 | RESULTS

3.1 | Participants characteristics

The mean age of the participants was 34.45 ± 10.82 years (Min = 18 and Max = 65). The majority of the samples were female, married, educated, and employed. COVID-19 infection had been diagnosed in 19.5% of the participants and 47.8% of their family members. The majority of the participants had no idea what mindfulness was or how to practice it (Table 1).

3.2 | General health, anxiety, anger, and mindfulness among the participants

The mean general health score was 14.09 ± 4.07 , which was less than the questionnaire's midpoint of 18. The mean anxiety score was 49.06 ± 4.46 . Eighty-two percent ($n = 374$) had moderate anxiety, while 16% ($n = 73$) had severe anxiety. The mean anger score was 23.43 ± 3.98 , which was less than the questionnaire's midpoint of 25. The mean mindfulness score was 32.56 ± 3.48 , which was less than the questionnaire's midpoint of 35 (Table 2).

General health was positively correlated with anxiety and anger and negatively correlated with mindfulness ($p < 0.001$). Anxiety was positively correlated with anger and negatively correlated with mindfulness ($p < 0.001$). No significant correlation was found between anger and mindfulness ($p = 0.05$) (Table 2).

No significant correlation was found between background information and general health, except for a family member infected with COVID-19 (Table 1).

3.3 | Regression results

Linear multiple regression model was used to determine the predictors of general health. In bivariate analysis, all variables with significant associations were included in linear multiple regression with the backward method.

TABLE 1 Sociodemographic characteristics of the participants (N = 456)

Variables	N (%)	General health		
		Mean (SD)	Statistical test	p value
Age (years)				
18–30	163 (35.7)	14.11 (4.44)	F = 1.12	0.34
31–40	145 (31.8)	14.44 (3.97)		
40–50	110 (24.1)	13.52 (3.98)		
>50	38 (8.3)	14.29 (2.83)		
Gender				
Male	178 (39.0)	14.02 (3.78)	t = -0.27	0.78
Female	278 (61.0)	14.13 (4.25)		
Marital status				
Married	280 (61.4)	14.21 (4.01)	F = 0.54	0.58
Unmarried	140 (30.7)	13.99 (4.43)		
Other	36 (7.9)	13.50 (2.99)		
Educational level				
< Diploma	23 (5.0)	14.91 (4.01)	F = 1.95	0.12
Diploma	149 (32.7)	14.15 (3.47)		
BSc	232 (50.9)	14.23 (4.11)		
>BSc	52 (11.4)	12.88 (5.27)		
Employment status				
Employed	293 (64.3)	13.95 (4.08)	t = 0.95	0.34
Unemployed	163 (35.7)	14.33 (4.07)		
Income (million tomans)				
< 1	133 (29.2)	14.48 (4.39)	F = 2.05	0.06
1–2	14 (3.1)	13.29 (5.01)		
2–3	38 (8.3)	13.24 (3.80)		
3–4	55 (12.1)	14.40 (3.03)		
4–5	63 (13.8)	15.19 (3.82)		
5–6	62 (13.5)	13.63 (4.49)		
>6	91 (20.0)	13.35 (3.82)		
Substance use				
Yes	69 (15.1)	13.94 (2.79)	t = 0.43	0.67
No	387 (84.9)	14.11 (4.26)		
Alcohol use				
Yes	19 (4.2)	13.58 (3.10)	t = 0.56	0.58
No	437 (95.8)	14.11 (4.11)		

(Continues)

TABLE 1 (Continued)

Variables	N (%)	General health		
		Mean (SD)	Statistical test	p value
Infected with COVID-19				
Yes	89 (19.5)	13.70 (4.48)	$t = 1.01$	0.31
No	367 (80.5)	14.18 (3.97)		
Family member infected with COVID-19				
Yes	218 (47.8)	13.65 (4.03)	$t = 2.22$	0.03
No	238 (52.2)	14.49 (4.08)		
Knowledge about mindfulness				
Yes	50 (11.0)	12.80 (6.09)	$t = 1.64$	0.11
No	406 (89.0)	14.25 (3.73)		
Using mindfulness methods				
Yes	15 (3.3)	11.33 (6.28)	$t = 1.75$	0.10
No	441 (96.7)	14.18 (3.95)		

Abbreviations: BSc, Bachelor of Science; F, analysis of variance; SD, standard deviation; t, Independent t test.

TABLE 2 The correlation among general health, anxiety, anger, and mindfulness among the general population

Variable	Mean (SD)	Pearson correlation coefficient (p value)			
		1	2	3	4
1. General health	14.09 (4.07)	1			
2. Anxiety	49.03 (4.46)	0.64 (<0.001)	1		
3. Anger	23.43 (3.98)	0.43 (<0.001)	0.42 (<0.001)	1	
4. Mindfulness	32.56 (3.48)	-0.16 (<0.001)	-0.41 (<0.001)	0.09 (0.05)	1

Anxiety, anger, and having a family member infected with COVID-19 were all the predictors of general health ($F = 123.48$, $p < 0.001$) (Table 3).

4 | DISCUSSION

The primary goal of this study was to examine the relationship between anxiety, anger, mindfulness, and psychological distress in the general population during the COVID-19 outbreak. The current study's findings revealed that anxiety, anger, and family members infected with COVID-19 were predictors of psychological distress. Anxiety had a direct and significant effect on individuals' general health in the current study, which is consistent with previous research findings (Baloran, 2020; Rogowska et al., 2020; Yildirim et al., 2021).

The extent and severity of anxiety caused by the COVID-19 pandemic, as well as the severity of anger, may differ depending on groups or roles. Employees, parents, teachers, and health care workers, for example, are expected to take on new responsibilities (Holingue et al., 2020). Anxiety and depression symptoms may increase the risk of psychological distress during an epidemic. Among the United States with 50 or more COVID-19 cases as of March 10, 2020, each additional day has been associated with an 11% increase in the odds of moving up a category

TABLE 3 Linear multiple regression analysis summary for predictors of general health

Variable		B	SE	B	t	p	95% CI for B	Adjusted R ²
General health	Constant	-8.55	1.23		-6.97	<0.001	-10.97 to -6.14	0.45
	Family member infected with COVID-19	-0.72	0.28	-0.09	-2.52	0.01	-1.28 to -0.16	
	Anxiety	0.39	0.03	0.56	14.63	<0.001	0.34-0.44	
	Anger	0.18	0.04	0.19	4.92	<0.001	0.11-0.25	

Note: Family member infected with COVID-19 (no = 0, yes = 1).

Abbreviations: CI, confidence intervals; SE, standard error.

of distress (Holingue et al., 2020). These conditions can isolate or make people angry who are more at risk for COVID-19.

Furthermore, as their disease worsens, people with chronic patients such as acute coronary syndrome, diabetics, heart failure, chronic liver disease, and cancer patients or more sensitive to medical conditions may experience higher levels of anxiety and anger during an epidemic (Zakeri & Dehghan, 2020). In general, population has experienced many traumatic experiences, such as COVID-19, in crises such as the Ebola Outbreak in South Africa. The inability to care for sick family members due to social distancing, the death of relatives, friends, and acquaintances, and the inability to hold funerals, burials, and mourning (Shultz et al., 2015) can increase the symptoms of anxiety and anger in people of the community leading to psychological distress. In the current study, family members infected with COVID-19 were found to be more vulnerable to psychological distress due to increased anxiety and concern about the presence of COVID-19 in their family, as well as other problems. This means that people who suffer from COVID-19 anxiety are not able to cope with anxiety, which leads to poor general health.

Communication with family members is also reduced in COVID-19-infected families, which can have an impact on people's health. According to Moghanibashi-Mansourieh's study on the prevalence of COVID-19 in Iran, the level of anxiety was significantly higher among people who had at least one family member, relative, or friend infected with COVID-19 disease (Moghanibashi-Mansourieh, 2020). Conversano et al. also demonstrated that social relationships with loved ones are a protective factor for mental health and increase resilience in Italian citizens consequent to COVID-19 social distancing and quarantining. Separation from loved ones appears to be the most common cause of psychological distress in the COVID-19 cases (Conversano et al., 2020).

Hosseini Rafsanjanipoor et al. (2021) in Iran, on the other hand, discovered that women living in low-income cities were more likely to develop psychosocial disorders, become infected with coronavirus, and concern about dying from COVID-19. Rodríguez-Rey et al. (2020) in Spain also found that women, young people, and those who lost their jobs during a health crisis had the most severe negative psychological symptoms. The discrepancies between the current study's findings and those of Hosseini Rafsanjanipoor et al. (2021) and Rodríguez-Rey et al. could be attributed to the fact that studies targeting psychological distress provide different responses based on the needs of the subjects. As a result, future research should focus on the needs of individuals in various societies (Rodríguez-Rey et al., 2020).

Cross-cultural and ethnic differences must also be considered. Some communities, for example, are collectivist and more supportive of their members. Li et al. (2020) discovered that during the COVID-19 outbreak, Chinese people were more concerned about their health and family and less concerned about their leisure times and friends. Supporting family and acquaintances, as well as increasing the common sense with family members, can help individuals to reduce psychological problems and anxiety.

These findings are critical for developing and implementing coping strategies to reduce the impact of COVID-19 anxiety on general health. As a result, physicians and psychiatrists can be advised to develop and implement interventions to reduce anxiety and anger in crises such as the COVID-19 one (Landi et al., 2020).

The current study found that, while there was a weak inverse relationship between psychological distress and mindfulness, this relationship did not hold when other study variables such as anxiety and anger were present. In contrast to the current study's findings, Conversano et al. (2020) in Italian citizens demonstrated that a high level of mindfulness was beneficial in coping with stressful situations such as COVID-19 and prevented psychological traumas consequent to COVID-19 social distancing and quarantining. Mindfulness has also been shown to have a positive effect on cognitive flexibility, mental health, emotional balance, and the reduction of anxiety and depression, all of which affect people's mental health (de Frias & Whyne, 2015; Westphal et al., 2015; Xu et al., 2017). The desire for mindfulness as a psychological source can assist one in controlling stressful situations and adapting to crisis challenges (Bao et al., 2015; Dixon & Overall, 2016). Studies on people who have practiced mindfulness for a long time have revealed changes in brain areas associated with stress and anxiety, as well as increased activity of the frontal cortex and hippocampus (Afonso et al., 2020). Hölzel et al. (2011) proposed that mindfulness regulated attention, body awareness, emotion, and personal perceptions through subtle changes in mental and brain functions, thereby influencing people's health. Given that the main purpose of mindfulness programs is to correct individual inefficient strategies and regulate emotions, it may help people to regulate emotional capacities that lead to psychological distress and help improve their health. Due to the traumatic nature of COVID-19, it is necessary to pay more attention to mindfulness to control the psychological consequences, increase people's resistance to stressful events and prevent the onset of mental disorders.

5 | LIMITATIONS

The current study has several limitations. First, the cross-sectional research design limits our understanding of general health risk factors by not allowing us to determine the causal relationships between the variables studied. This necessitates the use of longitudinal studies. As a result, it is suggested that longitudinal or interventional research be done in the future. Second, self-report tools were used to assess psychological distress, anxiety, anger, and mindfulness, which necessitate specialized assessments in future studies. Third, because of respondents' attitudes toward themselves, the use of self-report tools may result in biased answers to questions. Fourth, in the present study, nearly 160 questionnaires were completed online. Thus, the possibility of selection bias should be considered, and results should be generalized with caution. Finally, because some psychological data were collected online without an independent assessment of the respondents' health status, generalization of the results should be done with caution.

6 | CONCLUSION

The study's findings revealed that anxiety, anger, and family members infected with COVID-19 were predictors of general health. Efforts to reduce anxiety and anger and provide psychological support to family members infected with COVID-19 can also improve individuals' general health. Researchers, health managers, and planners should pay more attention to the factors affecting general health and take an effective step in promoting general health in the community via continuous monitoring, timely treatment, and implementation of appropriate solutions, including training and counseling programs.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

INFORMED CONSENT

Informed consent was obtained from all individual participants included in the study.

ETHICAL APPROVAL AND CONSIDERATION

The study was approved by institutional/local review board (IR.KMU.REC.1398.673). After ethical considerations were approved, the researcher presented consent form to the participants. This form includes (1) the study purpose and objectives, (2) the information confidentiality and (3) the anonymous participants, who can withdraw from the study at any time. The participants also signed informed consent form. As nearly 160 questionnaires were completed online, the consent was included on the first page of the online survey so that the participants could complete the survey only by signing and confirming the informed consent form.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

Data are available by contacting with the corresponding author by email.

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