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RESEARCH ARTICLE

The Relationship between Emotional Reactions and Coping Strategies of Nurses during the Outbreak of COVID-19 in Ganjavian Hospital in Dezful in 2020

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Abstract:

Background:

Nurses face challenges when they are in a stressful situation and therefore use strategies to adapt.

Objective:

Considering the importance of the type of strategy used by nurses to maintain their mental health and considering the differences in the results of studies on the applicability of coping strategies, the present study investigates the emotional reactions and coping strategies of nurses during the COVID-19 pandemic.

Methods:

The present study is a cross-sectional (descriptive-analytical) study involving 208 nurses working in Ganjavian Hospital in Dezful in 2020. The instruments used in the questionnaire are: emotional reactions, demographic and coping style questionnaire preference for modified coping practices.

Results:

The results showed that the mean age of nurses participating in the study was 31.15±7.25 years. Most emotional reactions were related to nurses' feelings of desire with an average of 3.44 ±1. 23 and the lowest related to disgust with a mean of 2.44 ±1.26. The highest coping actions of nurses were related to nurses' emotional coping strategy with a mean of 26.87 ± 4.5. There was a significant relationship between problem-solving coping strategies with emotional disgust and direct anxiety.

Conclusion:

Due to the high level of hope and anxiety in nurses and the adoption of coping strategies focused on emotion, hospital managers and mental health managers should focus on providing psychological support to nurses and teaching problem-oriented coping strategies. They should also encourage the nurses to deal with their high level of hope for the high anxiety caused by Covid disease.

Keywords: Nurse, Emotional reaction, Coping strategies, Anxiety, COVID-19, Patients.

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1. INTRODUCTION

As providers of direct care for patients, nurses encounter numerous risks and stressful occasions in their professional activities. One of them is exposure to infectious diseases that can cause severe damage and stress and disrupt health care [1]. Previous studies have shown that when nurses contact patients with emerging infectious diseases, such as SARS, MERS [2, 3], Ebola [4], and H1N1 flu [5], they suffer from various physical and mental problems, including loneliness, anxiety, fear, fatigue, and sleep disorders [6]. Studies have shown that

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the rates of insomnia, depression, and post-traumatic stress disorder in nurses involved with SARS patients were 38.5%, 37%, and 33%, respectively [6].

One of the reasons for nurses' concerns in the current situation is that the person-to-person transmission of the coronavirus is like the transmission of influenza and other respiratory pathogens. Hence, when a person coughs or sneezes, respiratory droplets form, and these droplets are inhaled by the individuals around [7]. The second reason is that the disease has a latent period. One study has found that this period could be 1-14 days long with an average of 5.2 days. Moreover, the aforementioned study showed that 97.5% of people who develop symptoms become infected within 10.5 days [8]. In addition, it has also been found that the mortality rate of the disease is high and no specific treatment for coronavirus has yet been approved by the US Food and Drug Administration [9].

Nurses use different strategies to manage the emotions, stress, and psychological crisis caused by the unfamiliar COVID-19 pandemic. Due to the high prevalence of death due to COVID-19 among hospital staff, they faced a lot of emotional as well as physical stress. Due to the nature of their job, nurses were in close contact with infectious patients for a long time. In addition, many hospital staff members resigned during the outbreak of the disease, or the number of volunteers was reduced. Therefore, the workload had to be handled by existing nurses which led to an increase in their emotional problems during the COVID-19 pandemic.

Nurses use a variety of strategies to manage the excitement, stress, and psychological crisis caused by COVID-19 pandemic. Due to the high prevalence of mortality caused by COVID-19 among hospital staff, specialist physicians faced a lot of psychological as well as physical stress. Due to the nature of their job, nurses must be in close contact with infectious patients for a long time. In addition, many hospital staff members resigned during the outbreak of the disease, or the number of volunteers was reduced. Therefore, the workload had to be handled by existing nurses, which led to an increase in their emotional problems during the COVID-19 pandemic. COVID-19 affects not only the emotions, but also the coping strategies of the public.

Nurses use different problem-solving styles to manage the current situation. The emotional reactions and problem-solving styles of nurses can affect their behavior toward patients with acute respiratory infections. Healthcare providers are vital resources for any country, not only because they are very important for the health, safety, and continuous care of the patients, but also because of their significant role in controlling any outbreak of the disease [10]. Therefore, it is necessary to study the coping behaviors of nurses in the current situation.

To face a problem requires an attempt to overcome what has happened, reorient the attitudes of people toward the concept of the problem, guide individual lives, and maintain a stable physical, mental, and social status [11]. Coping strategies refer to rational and conscious ways of coping with life stresses [12]. The type of strategy adopted by each person to deal with stress is considered part of the emotional health and vulnerability of that person. Usage of inappropriate strategies to deal with stressors can increase problems [1], while using an appropriate coping strategy that plays a pivotal role in emotional intelligence of people can have beneficial consequences [13].

COVID-19 not only affected public emotions, but also their coping strategies. The emotional reactions and problem-solving styles of nurses can affect their behavior toward patients with acute respiratory infections. Healthcare providers are vital resources for any country, not only because they are very important for the health, safety, and continuous care of the patients, but also because of their significant role in controlling any outbreak of the disease [10]. Therefore, it is necessary to study the coping behaviors of nurses in the current situation.

An attempt to overcome a problem is required to comprehend what has happened, reorient the attitudes of people toward the concept of the problem, guide individual lives, and maintain a stable physical, mental, and social status [11]. Coping strategies refer to rational and conscious ways of coping with life stresses [12]. The type of strategy adopted by each person to deal with stress is considered part of the emotional health and vulnerability of that person. Usage of inappropriate strategies to deal with stressors can increase problems [1], while using an appropriate coping strategy that plays a pivotal role in emotional intelligence of people can have beneficial consequences [13].

There are different coping strategies, such as problem-solving, seeking social support, distraction, denial, and positive thinking. Despite the above-mentioned general conclusion, reducing psychological complications in different studies has been different [14]. One study has shown the effect of problem-solving on reducing grief [15], while other studies have shown that these strategies are not associated with increased anxiety levels [16, 17].

Since nurses are a professional group in the healthcare system, they are responsible for more than 80% of care in developed countries and are in a unique position and can impact public health [18]. When faced with stressful situations caused by different geographical and cultural conditions, they use different strategies to adapt [13].

There are differences in the results of studies on the applicability of coping strategies. Moreover, the type of strategy adopted by nurses to maintain their mental health is of great importance. Besides, COVID-19 has a high prevalence and mortality rate in Iran. Therefore, the present study aimed to examine the emotional reactions and coping strategies of nurses during COVID-19 pandemic. Emotional reactions and coping strategies can help nursing managers to provide the necessary information to support this vulnerable group effectively.

2. METHODS

2.1. Study Setting

The study population included all nurses of Ganjavian Hospital in Dezful.

2.2. Study Design

This cross-sectional study (descriptive-analytical) was conducted in 2021.

2.3. Study Population and Sampling

With the permission of the Vice-Chancellor for Education and Research and after determining the sample size, the researcher selected the participants using a stratified sampling method and prepared the people's names list in each hospital ward, using random number tables. After explaining the objectives of the study to the eligible participants and obtaining their informed consent, and ensuring the confidentiality of all their information, they entered the study. Due to the drop in the sample size, 208 people out of 215 participants completed the questionnaires during a 3-month period; inclusion criteria were the nurses working and present in the hospital. Also, a nurse absent in the hospital due to an extended leave of more than a month, those who did not complete the questionnaires and nurses with a history of depression and anxiety were excluded from the study. In each section, questionnaires were distributed by three (trained people) hospital nurses and collected after completion.

2.4. Sample Size Estimation

With a statistical population of 215 people, the sample size was calculated using Cochran's sample size formula and considering P <0. 05 and 95% confidence level.

2.5. Data Collection

In our study, the self-report method was used for data collection. Data collection tools consisted of three questionnaires.

The first questionnaire was a demographic information questionnaire that contained questions about age, gender, marital status, and level of education. The second questionnaire was Modified Coping Preference Questionnaires (Carver, 1997) [19,20]. This questionnaire consisted of 27 items related to coping with stress, problem-solving (problem-focused) and emotion-focused (excitement]. There were five scales for answering the questions: The answer never; score 1; rarely score; 2, occasionally score, 3, often score; 4, consistently score; and 5. The scoring in this questionnaire was obtained from 5 separate scores. The Cronbach's alpha coefficient of problem-focused and emotion-focused coping categories are 0.817 and 0.811, respectively.

The third questionnaire was a Referring to the positive and negative emotion (PANAS) scale, we designed a negative emotional response scale to measure the public emotional response to COVID-19, including eight questions: emotional; anger; hatred; fear; anxiety; sadness; desire; and peace, using a 5-point scale, ranging from 1 (no such emotion) to 5 (the most intense feeling of the emotion). Participants completed these quantitative projects and answered an open-ended question about their emotional response to the outbreak of COVID-19. Subsequently, The Cronbach's alpha coefficients of scale were 0.80 in this study [21].

2.6. Statistical Analysis

IBM SPSS 21 software was used for data statistics. Independent sample t analysis, correlation analysis and regression analysis were mainly used. P <0.05 was considered statistically significant.

3. RESULTS

Due to the drop in sample size, 208 questionnaires were completed, and statistical results were calculated based on it. According to Table **1**, the mean age of nurses participating in the study was 7.25 ± 31.15. Of all nurses, 173 (83. 2%) were female, 35 (16.8%) were male, 72 (34.6%) were single, 135 (64.9%) were married, and 1 (0.5%) were divorced. Two hundred and six nurses (99%) had a higher education than a diploma. 203 (97.6%) of the participants had a nursing job, and five (2.4%) had an emergency medical job with 46 (22.1%) formal employment, 62 (29.8%) contract employment. Sixty-three people (30.3%) were on a temporary plan, and 37 (17.8%) were contractors. One hundred and ninety-five people (93.8%) were in a rotational shift, and 13 (6.3%) were in the fixed shift. One hundred and nineteen people (57.2%) had 1 to 5 years of work experience, 35 (16.8%) had 6 to 10 years of work experience, 35 people (16.8%) had 11 to 15 years of work experience, seven (3. 4%) had 16 to 20 years of work experience, and 12 people (5.8%) had more than 20 years of work experience.

According to Table **2**, the highest emotional response of nurses was related to being emotional (3.29±0.95), and the most coping actions of nurses are related to the strategy of coping with nurses' emotions based on the average (26.87±4.5).

According to Table **3**, there was no significant relationship between age and nurses' emotional reactions (P-value <0.05). The level of anxiety of female nurses (3.07±1.22) was higher than male nurses (2.60±1.42), which was a significant difference (P-value= 0.032).

The level of sadness of female nurses (2.77±1.21) was more than male nurses (2.29±1.20), which was a significant difference (P-value= 0.031). Other nurses' emotional responses were not significantly different (P-value<0.05).

The rate of hatred in married nurses (2.63±1.30) was higher than single nurses (2.10±1.11), which was a significant difference (P-value = 0.004). The rate of fear in single nurses was higher than in married nurses (2.99±1.40), which was significantly different (P-value= 0.043). Other emotional responses of nurses were not significantly different (P-value<0.05).

The rate of hatred among nurses whose type of employment was contractual (2.82±1.36) was higher than other types of employment, which was a significant difference (P-value= 0.012). Other emotional responses were not significantly different between nurses (P-value<0.05).

The amount of desire and aspiration in circulating shift nurses (3.49±1.23) was more than fixed morning shift nurses (2.69±1.03). Other emotional responses were not significantly different between nurses (P-value<0.05).

There was no significant difference in the level of

emotional responses between nurses with different work histories (*P*-value<0.05). Anxiety was higher among nurses who had a patient with coronavirus at their workplace (3.06±1.26) than nurses who did not have a patient with coronavirus (2.58±1.23), which was a significant difference (*P*-value= 0.046).

Table 1. Descriptive findings of demographic variables.

% (n) / Mean (SD)	Variables
31.15 ± 7.25	**Age**
-	**Gender**
173(83.2)	Female
35(16.8)	Male
-	**Marital status**
72(34.6)	Single
135(64.9)	Married
1(.5)	Divorced
-	**Education**
2(1)	Diploma
206(99)	Above the diploma
-	**Job**
203(97.6)	Nurse
5(2.4)	Medical emergency
-	**Working hours**
195(93.8)	In circulation
13(6.3)	Fixed
-	**Work experience**
119(57.2)	1-5
35(16.8)	6-10
35(16.8)	11-15
7(3.4)	16-20
12(5.8)	Above 20
-	**Are Covid 19 patients admitted to your hospital?**
177(85.1)	Yes
31(14.9)	No

Note: Data are presented as M ± SD and N (%).

According to Table **2**, the highest emotional response of nurses is related to being emotional, and the most coping actions of nurses are related to the strategy of coping with nurses' emotions based on the average.

Table 2. distribution of the mean factors of the emotional reactions and coping strategies questionnaire.

Maximum	Minimum	Std. Deviation	Mean	Variables
5.00	1.00	.95	3.29	**Emotions**
5.00	1.00	1.17	2.49	**Anger**
5.00	1.00	1.26	2.44	**Disgust**
5.00	1.00	1.34	2.72	**Fear**
5.00	1.00	1.26	2.99	**Anxiety**
5.00	1.00	1.22	2.69	**Sadness**
5.00	1.00	1.23	3.44	**Desire**
5.00	1.00	1.23	3.14	**Relaxation**
17.00	6.00	2.53	12.23	**Problem-focused coping**
42.00	13.00	4.50	26.87	**Emotion-focused coping**

Note: Data are presented as M ± SD and Std. Deviation

Table 3. Relationship between demographic factors and nurses' emotional reactions.

Emotions	Anger	Disgust	Fear	Anxiety	Sadness	Desire	Relaxation	Reactions
-	-	-	-	-	-	-	-	**Age**

(Table 3) contd.....

-.06	.024	.089	-.113	-.070	-.047	.062	.048	-
.329	.734	.20	.104	.313	.504	.373	.488	*P*-value
-	-	-	-	-	-	-	-	**Gender**
3.27±.99	2.50±1.14	2.49±1.27	2.75±1.35	3.07±1.22	2.77±1.21	3.43±1.26	3.10±1.25	Female
3.40±.73	2.43±1.33	2.20±1.18	2.57±1.31	2.60±1.42	2.29±1.20	3.51±1.07	3.3±1.13	Male
.41	.587	.214	.460	.032	.031	.846	.362	*P*-value
-	-	-	-	-	-	-	-	**Marital status**
3.19±.94	2.39±1.16	2.10±1.11	2.99±1.40	3.15±1.40	2.72±1.22	3.35±1.18	2.96±1.19	Single
3.34±.95	2.55±1.18	2.63±1.30	2.58±1.29	2.91±1.18	2.68±1.22	3.50±1.26	3.24±1.24	Married
.422	.362	.004	.043	.186	.764	.305	.117	*P*-value
-	-	-	-	-	-	-	-	**Working hours**
3.32±.93	2.47±1.18	2.43±1.25	2.69±1.34	2.99±1.29	2.68±1.23	3.49±1.23	3.17±1.23	In circulation
2.85±1.14	2.69±1.11	2.61±1.33	3.15±1.34	3.00±.82	2.85±.99	2.69±1.03	2.61±1.19	Fixed
.60	.543	.636	.226	.926	.601	.017	.103	*P*-value
-	-	-	-	-	-	-	-	**Work experience**
3.31±.96	2.49±1.14	2.39±1.28	2.87±1.39	3.07±1.31	2.82±1.24	3.40±1.22	3.08±1.24	1-5
3.29±.93	2.31±1.32	2.43±1.29	2.43±1.22	2.77±1.17	2.49±1.12	3.46±1.27	3.43±1.12	6-10
3.26±1.04	2.51±1.22	2.77±1.26	2.48±1.17	3.00±1.19	2.40±1.22	3.37±1.33	3.00±1.31	11-15
3.29±.49	2.71±1.11	2.14±1.07	2.43±1.40	2.71±.95	2.00±1.00	3.57±.79	3.43±1.13	16-20
3.17±.94	2.67±1.07	2.17±.94	2.92±1.51	3.00±1.48	3.25±1.14	3.92±1.16	3.08±1.24	>20
.981	.742	.450	.375	.768	.051	.722	.565	*P*-value
-	-	-	-	-	-	-	-	**Disease COVID-19**
3.24±.95	2.45±1.18	2.46±1.28	2.79±1.34	3.06±1.26	2.79±1.20	3.40±1.25	3.07±1.20	Yes
3.55±.93	2.68±1.17	2.35±1.14	2.32±1.30	2.58±1.23	2.13±1.17	3.68±1.08	3.52±1.36	No
.162	.367	.844	.072	.046	.004	.299	.064	*P*-value

Note: Significance: P < 0.05

Other emotional responses were not significantly different between nurses (*P*-value<0.05).

The level of sadness among nurses who had a patient infected with coronavirus in their workplace hospital (2.79±1.20) was higher than nurses who did not have a patient infected with coronavirus in their workplace hospital (2.13±1.17), which is significantly different (*P*-value= 0.004). Other emotional responses were not significantly different between nurses (*P*-value<0.05).

According to Table **4**, there was no significant relationship between demographic variables and problem-focused coping strategies (*P*-value<0.05). Single nurses felt (27.79±4.99) more focused on the coping strategies of married nurses (26.41±4.16), and the difference was significant (*P*-value= 0.016). In nurses with 11 to 15 years of work experience, the level of coping strategy focused on feelings more (27.71±4.77), which was statistically significant (*P*-value<0.05). Other demographic variables had no significant effect on emotion-focused coping strategy(*P*-value < 0.05).

According to Table **5**, among the emotional reactions, the relationship between coping strategy focused on problem-solving with emotionality (*P*-value= 0.006). And hatred (*P*-value= 0.017), a direct and significant relationship and between coping strategy focused on emotion with anxiety, a direct and significant relationship was found (*P*-value= 0.004).

4. DISCUSSION

This study aimed to investigate the relationship between nurses' emotional reactions and coping strategies during the outbreak of COVID-19 in Ganjavian Hospital in Dezful in 2020. COVID-19 is a source of stress that the infection and harmfulness of the virus, the increase in the number of deaths, the ignorance of the virus and the negative emotions spread under this unfortunate situation, and its spread threatened the mental health of the people.

Table 4. Relationship between demographic factors and coping strategies.

Problem-focused Coping	Emotion-focused Coping	Reactions
-	-	**Age**
.019	-.045	The correlation coefficient
.782	.523	*P*-value
-	-	**Gender**
12.18±2.46	27.02±4.49	Female
12.51±2.86	26.14±4.51	Male
.426	.235	*P*-value

(Table 4) contd.....

-	-	**Marital status**
12.28±2.67	27.79±4.99	Single
12.24±2.46	26.41±4.16	Married
.722	.016	*P*-value
-	-	**Working hours**
12.31±2.55	26.93±4.55	Fixed
11.15±1.91	26.00±3.74	Fixed
.066	.363	*P*-value
-	-	**Work experience**
12.34±2.47	27.27±4.51	1-5
11.51±2.73	25.11±4.13	6-10
12.69±2.56	27.71±4.77	11-15
11.00±2.24	25.57±4.65	16-20
12.67±2.31	26.42±3.58	>20
.159	.039	*P*-value
-	-	**Are Covid 19 patients admitted to your hospital**?
12.10±2.55	26.85±4.49	Yes
13.03±2.29	27.03±4.61	No
.056	.722	*P*-value

Note: Significance: $P < 0.05$

Table 5. Correlations between emotional reactions and coping strategies.

Problem-focused Coping	Emotion-focused Coping	Emotions Reactions
-	-	**Anger**
-.064	-.071	The correlation coefficient
.361	.310	*P*-value
-	-	**Disgust**
-.165	-.064*	The correlation coefficient
.017*	.358	*P*-value
-	-	**Fear**
.061	.135	The correlation coefficient
.381	.051	*P*-value
-	-	**Anxiety**
.053	.201	The correlation coefficient
.450	.004	*P*-value
-	-	**Sadness**
-.063	.034	The correlation coefficient
.365	.626	*P*-value
-	-	**Desire**
.075	.112	The correlation coefficient
282	.108	*P*-value
-	-	**Relaxation**
.112	.007	The correlation coefficient
.108	.915	*P*-value

Note: The correlation coefficient ,Significance: $P < 0.05$.

Due to these conditions, many people became emotionally distressed and felt helpless, afraid, anxious, depressed, guilty, and nervous, especially those at the center of the epidemic. Nurses play an essential role in managing and controlling epidemics both in the community and in the hospital setting [18, 19, 21].

The results of the present study showed that the most coping actions of nurses were related to emotion-based coping strategy, and the most emotional response of nurses was related to being emotional. Bella Savitsky *et al*. [22] found that the highest response was moderate anxiety at 42.8%. Gender, PPE deficiency and fear of infection were significantly associated with higher anxiety scores. More robust humor and flexibility were associated with significantly lower anxiety levels, while the loss of mentality was associated with higher anxiety levels. Also, Haneen Ali *et al*. [23] showed the level of feelings and job burnout and anxiety was high, and other reactions such as stress, sadness and despair were lower, which is in line with the

present study. Tobias *et al*. [24] showed that nursing, as the largest group of the health workforce in coping with epidemics, using emotion-oriented strategies such as empathetic listening, is a powerful strategy in caring for and strengthening nursing professionals.

The results of the present study showed that among the emotional reactions, the relationship between coping strategies focused on problem-solving with emotionality and hatred has a direct and significant relationship, and the relationship between coping strategies focused on emotion has a direct and significant relationship with anxiety. Lorente *et al*. [25] showed that all stressors have a significant, direct and adverse relationship with nurses' psychological distress. Emotion-focused strategies are directly and indirectly negatively related to nurses' psychological distress through resilience. Problem-oriented strategies are positive and negative, and indirectly related to nurses' psychological distress through emotion-focused strategies which is inconsistent with the present study. Huang *et al*. [19] showed that the stronger the emotional responses in nurses, the more they tend to use problem-focused strategies.

The results of our study showed that female nurses are more anxious than male nurses, and women feel sadder than men. Moreover, in the wards where Covd-19 patients were present, the nurses' anxiety in these wards was reported higher, which is in line with the results of our study. Studies by Long Huang *et al*. [19] and Pappa Despoina [18], and the National Health Commission [24 - 26] noted that having direct exposure to COVID-19 patients in intensive care units or long-term stay in wards due to continued treatment, nurses experience severe anxiety, depression, and distress.

The results of our study also showed that married nurses experienced more feelings of hatred and single nurses experienced more feelings of fear, which is in line with the present study. Long Huang *et al*. [19] and Khalid *et al*. [2] stated that special conditions such as pandemics threaten to affect both physical and mental health conditions of the individuals. Persistent worries and fears can be created among people, and everyone can understand this fact differently. Long Huang *et al*. [19] showed that fear can be the worst enemy for anyone, and as Zhong Nanshan [27] stated that psychological fear can be more frightening than the disease itself.

5. LIMITATION

In this study, one of the limitations was the lack of cooperation in answering the questions of the questionnaire due to work. Therefore, participants were eliminated by measures such as allocating enough time to participants, answering their questions, and referring to work cycles. Because this study was conducted in a cross-sectional design, it may be that the results could not be generalized to other provinces and ethnicities.

CONCLUSION

Due to the high level of anxiety and fear and the use of emotion-focused strategies in nurses, the Ministry of Health and nursing managers must prevent and reduce anxiety and provide adequate support for staff and training to deal with it. Due to nurses' use of various coping strategies in stressful situations, training in effective coping techniques is essential. Also, considering the importance of job anxiety and stress and coping strategies on mental health and the quality of nursing care services, further research with a quantitative and qualitative approach will clarify the nature of emotional reactions and how to use coping strategies.

AUTHORS' CONTRIBUTIONS

Leila Masoudiyekta, Nasrin Sarabi, Mahnaz Nosratabadi, and Fatemeh Jafari Pour were responsible for the study design. Nastaran Mirsamiyazdi, Saba Fathi, and Nasim Hamidipour performed the data collection. Leila Masoudiyekta did the data analysis. Nastaran Mirsamiyazdi, Leila Masoudiyekta, Fatemeh Jafari Pour, Nasrin Sarabi, Mahnaz Nosratabadi, Nastaran Mirsamiyazdi, Saba Fathi, and Nasim Hamidipour were responsible for manuscript writing.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The current research was approved by the Research Ethics Committee of Dezful University of Medical Science (IR. DUMS. REC. 1399. 019).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

FUNDING

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CONFLICT OF INTEREST

The authors declare no conflict of interest financial or otherwise.

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