Title: Coping Strategies and Mental Health Symptoms in Emergency Nurses during COVID-19 Pandemic

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Abstract

Background: Appropriate coping strategies employed by emergency nurses during a pandemic can help reduce their psychiatric issues and positively impact the quality of patient care. This study aimed to determine how different coping strategies of emergency nurses relate to their mental health symptoms during the COVID-19 pandemic.

Materials and Methods: This descriptive-correlational study was conducted on 125 emergency nurses in three teaching hospitals in Iran. The participants were included in the study using stratified random sampling. Data collection tools included the nurses' demographic and occupational characteristics questionnaire, the Perceived Stress Scale (PSS-14), the Hamilton Anxiety Rating Scale (HAM-A), the Hamilton Depression Rating Scale (HAM-D), and the Ways of Coping Questionnaire (WCQ). Significance was set at $p < 0.05$.

Results: According to the results, 97.5%, 66.4%, and 60.8% of the nurses experienced mild to severe stress, anxiety, and depression, respectively. In our study, nurses utilized emotion-oriented strategies mainly to manage their mental health symptoms. A statistically significant relationship existed between mental health symptoms and certain coping strategies ($p<0.05$). Increased stress, anxiety, and depression led nurses to adopt certain negative coping strategies, especially Escape-Avoidance, in addition to adopting positive coping strategies.

Discussion: Emergency nurses experience significant stress, anxiety, and depression, primarily using positive emotion-focused coping strategies. However, as their symptoms worsen, they shift towards negative coping behaviors.

Conclusions: Preventive interventions are crucial for emergency nurses, particularly during natural disasters, to reduce stress, anxiety, and depression by promoting effective coping strategies and mitigating negative ones, given the prevalence of mental health symptoms.

Keywords: mental health, coping strategies, emergency nursing, emergency services, pandemics, COVID-19

Introduction

Patients typically first visit the emergency department (ED) upon entering the hospital, where nurses as the largest professional group, play a crucial role. Their presence is essential for daily practices in this department, including triage, patient assessment, and care, especially following a disastrous pandemic [1-5].

Nursing is a stressful profession that often involves significant physical and mental strain, a situation exacerbated during disasters, such as the COVID-19 pandemic, when work pressures intensify [6, 7]. High stress, anxiety, depression, job burnout, and post-traumatic stress disorder (PTSD) were among the symptoms of nurses' mental health during the pandemic [8-12]. Studies indicated that emergency nurses in Iran experienced a high prevalence of stress, anxiety, depression, and burnout during the COVID-19 pandemic [13-16].

Mental health encompasses emotional, psychological, and social well-being, influencing thoughts, feelings, and performance. It aids in stress management, communication, and healthy decision-making [17]. Consequently, the high prevalence of psychiatric issues and ongoing job burnout among nurses can result in poor job performance, organizational inefficiency, high turnover rates, decreased job satisfaction, and increased workplace errors [14, 18, 19]. Therefore, effective methods to prevent psychiatric problems and improve the mental health of nurses should be prioritized [20]. A recent systematic review identified common risk factors for psychiatric issues among healthcare workers during disasters, including poor communication, inadequate social support, ineffective coping strategies, and insufficient training [21].

Emergency nurses in disaster situations should be able to use effective coping methods to maintain their mental health consciously. Coping strategies, which are cognitive and behavioral efforts, help alleviate the stress of challenging situations. According to Lazarus and Folkman's transactional

theory of stress and coping, there are two primary strategies: problem-oriented and emotion-oriented. Problem-oriented coping strategies, like planful problem-solving and confrontive coping, involve addressing the stressor directly to change or remove it. In contrast, emotion-oriented coping strategies, such as positive reappraisal, distancing, escape-avoidance, and self-control, focus on managing the emotional impacts of the stressful event. The primary function of emotion-oriented coping strategies is the emotional regulation and management of the stressful factor to maintain the individual's emotional balance. It is worth mentioning that the social support-seeking coping strategy is a subscale for both of them [22, 23].

Studies indicate that during the COVID-19 pandemic, nurses employed a range of coping strategies—both problem-oriented and emotion-oriented—to enhance their mental health, with mixed outcomes. These strategies included planful problem-solving, positive reappraisal, seeking social support, accepting responsibility, family support, positive thinking, maintaining a positive self-attitude, religious coping, adequate rest and nutrition, limiting media exposure, sharing pandemic information, practicing distancing, altruism, commitment to social and professional responsibilities, adhering to protective measures, all aimed at reducing stress and anxiety [19, 24-26].

While numerous studies in various contexts have explored the mental health and coping strategies of emergency nurses, few have specifically investigated the interplay between stress, anxiety, and depression as the main components of mental health and different coping strategies. Understanding the mental health status and coping strategies of emergency nurses in disaster situations and different contexts is crucial for planning to support their well-being. Identifying the factors related to mental health and exploring the links between symptoms such as stress, anxiety, and depression with various coping strategies will offer valuable insights for health sector decision-makers. This

knowledge can inform strategies to prevent mental health issues among nurses, enabling them to respond more effectively to future disasters [11, 12].

Previous studies have shown varying results regarding the relationship between nurses' mental health and their coping strategies during the COVID-19 pandemic. While increased psychological issues—such as emotional stress, PTSD, anxiety, depression, and fatigue—often lead nurses to adopt more negative coping strategies like avoidance, some research suggested that these negative styles, such as suppressing unpleasant feelings and thoughts, can also effectively reduce psychological distress [27-29].

Understanding the primary coping strategies used by emergency nurses during COVID-19, given the prevalence of mental health issues in this population and the scarcity of data on their coping strategies in the context of emergency departments in Iran, can inform the selection of optimal strategies for future pandemics and disasters. In addition, determining which coping strategies nurses use most as their mental health status changes can help decision-makers develop more effective interventions to support nurses during disasters. This study aims to determine the relationship between the coping strategies of emergency nurses and their mental health symptoms during the COVID-19 pandemic.

Materials and Methods

Research design, participants, and setting

This descriptive-correlation study was conducted on nurses working in the emergency departments of three teaching hospitals affiliated with Zanjan University of Medical Sciences (ZUMS) from January 2022 to July 2022 in Iran. The sample size was calculated to be 125 participants using the formula $n = \left[\frac{Z_{1-\alpha/2}+Z_{1-\beta}}{0.5\ln\left(\frac{1+r}{1-r}\right)}\right]^2 + 3$ [30] and considering r = .25 [29], α = 0.05, and в = 0.1.

Participants were included in the study using a stratified random sampling method. The sample size in each hospital was calculated as a proportion of the total number of nurses working in the emergency departments of the teaching hospitals. All teaching hospitals affiliated with ZUMS, excluding the psychiatric hospital, were included in the study. The inclusion criteria comprised nurses with over six months of experience in the emergency department and those holding a bachelor's or master's degree in nursing. Exclusion criteria included the existence of known disorders in nurses' mental health, death of nurses' relatives, and exposure to other stressful situations except for COVID-19 six months before data collection according to nurses' self-conviction.

Questionnaires

The study utilized a questionnaire divided into five sections. The first section gathered demographic and occupational information about nurses, including age, gender, work experience, employment status, experience caring for COVID-19 patients, etc. The second section evaluated perceived stress with the Perceived Stress Scale (PSS-14), the third assessed anxiety using the Hamilton Anxiety Rating Scale (HAM-A), the fourth measured depression through the Hamilton Depression Rating Scale (HAM-D), and the final section examined coping strategies with the Ways of Coping Questionnaire (WCQ).

The PSS-14 scale, which includes 14 items, was used to assess the general stress perceived by nurses. Each item was scored on a scale of 0 to 4 with a 5-point Likert scale, including never (0), rarely (1), sometimes (2), fairly often (3), and very often (4). In this questionnaire, questions 4, 5, 6, 7, 9, 10, and 13 were scored in reverse. The total score ranges from 0 to 56. Since the original PSS-14 did not specify a cut point [31], we adopted the cut points from Şanlıtürk (2021), which indicate mild stress for scores of 11–26, moderate stress for 27–41, and high stress for 42–56 [32].

In other words, Şanlıtürk (2021) defined stress severity across four levels, from no stress to severe stress, using quartiles as cut points. In the study by Cohen, Cronbach's alpha of the 14-item version was reported as 0.86 [31]. This questionnaire has been psychometrically tested in different societies and has good validity and reliability [33].

The HAM-A scale consists of 14 items rated on a 5-point Likert scale to assess both psychic and somatic anxiety. A score of zero indicates no anxiety, one indicates mild anxiety, two indicates moderate anxiety, three indicates severe anxiety, and four indicates very intense anxiety. The total score ranges from 0 to 56. A score of 7 or less signifies no to minimal anxiety, 8–14 indicates mild anxiety, 15–23 indicates moderate anxiety, and 24 or more indicates severe anxiety [34, 35].

The 17-item HAM-D uses a three- to five-point scale to assess the severity of each item, with scores ranging from 0-2, 0-3, and 0-4. A score of 0-7 indicates no depression, 8-16 indicates mild depression, 17-23 indicates moderate depression, and a score above 24 indicates severe depression, with a maximum total of 52 points. The questionnaire evaluates various factors, including depressed mood, guilt, suicide, insomnia (early, middle, and late), work and activity, psychomotor slowness, restlessness, psychological and physical anxiety, general physical symptoms, genital symptoms, hypochondriasis, weight loss, and vision issues [36, 37]. Both the HAM-A and HAM-D have demonstrated strong reliability and validity across diverse populations [38, 39].

The WCQ consists of 8 scales and 50 items from a total of 66, assessing various behavioral and cognitive coping strategies. The confrontative coping (6 items) and planful problem-solving scales (6 items) are problem-oriented, while the distancing (6 items), self-controlling (7 items), accepting responsibility (4 items), escape-avoidance behaviors (8 items), and positive reappraisal (7 items) scales are emotion-oriented. The seeking social support scale (6 items) incorporates both orientations. This questionnaire employs a four-point Likert scale with scores of 0 (not used), 1

(used to some extent), 2 (used quite a bit), and 3 (used a great deal). The subscale scores are presented as raw scores, reflecting individuals' use of each coping strategy, and relative scores, which indicate the proportion of each strategy used compared to others, expressed as a percentage or a range from 0 to 100. A higher relative score indicates greater reliance on that coping strategy. To calculate the relative score of each subscale, the following formula was used: Relative score = $\frac{\text{Raw score of subscale}/\text{Items of subscale}}{\sum \text{Raw score of subscale}/\text{Items of subscale}} \times 100$. First, the raw score of each participant in each subscale was divided by the number of items in the same subscale, and then the numbers obtained in all subscales were added together. Finally, the number obtained in each subscale was divided by the sum of the calculated numbers of all subscales and multiplied by 100. This questionnaire lacks a mean total score [23, 40-42]. The original version of the WCQ demonstrated acceptable internal consistency reliability (a =0.61–0.79) [42].WCQ had good validity and reliability in different studies [43].

The reliability of the PSS-14 and WCQ questionnaires was assessed using Cronbach's alpha coefficient, given their structure, without a pilot study. Cronbach's alpha coefficient for the PSS-14 and WCQ questionnaires was 0.76 and 0.92, respectively. In a pilot study, inter-rater reliability for the HAM-A and HAM-D was determined by two researchers independently interviewing ten participants and completing the questionnaires. The Pearson correlation test was then applied to compare the mean scores of the two evaluators, resulting in a reliability of 0.8 for HAM-A and 0.85 for HAM-D. Ten participants from this pilot study were excluded from the main study. Two independent translators used the forward-backward method to translate the study's instruments between English and Persian, ensuring the compatibility of the questionnaire versions.

Data collection

Nurses who met the inclusion criteria were given the demographic and occupational questionnaires, PSS-14, and WCQ to complete during their shifts. Each nurse took approximately 15-20 minutes to finish the questionnaires. Anxiety and depression were assessed via 20-30 minute interviews using the HAM-A and HAM-D scales in a quiet hospital room. Interviews were conducted by an experienced PhD-prepared nurse with a master's in psychiatric nursing.

Data analysis

Descriptive statistics, such as means and standard deviations for continuous variables and frequencies and percentages for categorical variables, were used for data analysis. The Kolmogorov-Smirnov test indicated that the main variables followed a normal distribution, which permitted the application of inferential statistics, specifically parametric tests like Pearson's correlation coefficient, independent-samples T-test, and one-way ANOVA. Pearson's correlation coefficient evaluated the relationship between nurses' demographic and occupational variables and their mean scores on mental health and coping strategies subscales. An independent-samples T-test and one-way ANOVA compared the mean scores of mental health and coping strategies across qualitative demographic and occupational variables. A significance level of $p < 0.05$ was adopted for all tests. Data analysis was conducted using the 24th version of the Statistical Package for Social Sciences (SPSS).

Results

In this study, the average age of nurses was 29.98 ± 5.20 years, with an average work experience of 6.26 ± 4.49 years. The majority were female (72.8%) and married (59.2%). Most held a bachelor's degree (90.4%) and had temporary employment status (62.4%). Additionally, 76% worked in general emergencies. Notably, 76% had a history of COVID-19 infection, and 91.2%

had provided direct care to COVID-19 patients. Furthermore, 56.8% expressed dissatisfaction with their jobs (Table 1).

Table 1- Sociodemographic and occupational characteristics of nurses (n=125)

Variable		Frequency/ Mean	Percent/SD
Gender	Female	91	72.8
	Male	34	27.2
Marital status	Single	51	40.8
	Married	74	59.2
Number of children	Without children	91	72.8
	A child	22	17.6
	Two children	12	9.6
Education level	Bachelors	113	90.4
	Masters	12	9.6
Employment status	Permanent employment	78	62.4
	Temporary employment	47	37.6
Job Satisfaction	Yes	54	43.2
	No	71	56.8
Type of emergency department	General emergency	95	76
	Respiratory emergency	20	16
	Pediatric emergency	5	4
	Gynecological emergency	5	4
History of being infected with COVID-19	Yes	95	76
	No	30	24
History of caring for patients with COVID-19	Yes	114	91.2
	No	11	8.8
Age (year)		29.98	5.20
Nursing work experience (year)		6.26	4.49

Note: Percentages may not sum up to 100% due to rounding.

Abbreviation: SD, standard deviation

The findings related to the mental health of nurses depicted that 97.5%, 66.4%, and 60.8% of nurses had experienced mild to severe levels of stress, anxiety, and depression, respectively (Table 2).

Table 2: Mental health status of nurses including stress, anxiety and depression (n=125)

Variable		Frequency	Percentage	Mean±SD
Stress	No stress (0-10)	3	2.5	24.78 ±6.34
	Mild stress (11-26)	65	53.3	
	Moderate stress (27-41)	53	43.4	
	Severe stress (42-56)	1	0.8	
Anxiety	No anxiety/minimal anxiety (≤ 7)	42	33.6	13.24 ± 10.50
	Mild anxiety (8–14)	37	29.6	
	Moderate anxiety (15–23)	23	18.4	
	Severe anxiety (≥ 24)	23	18.4	
Depression	No depression (0-7)	49	39.2	12.73±9.67
	Mild depression (8-16)	38	30.4	
	Moderate depression (17-23)	14	11.2	
	Severe depression (≥ 24)	24	19.2	

Abbreviation: SD, standard deviation

In our study, the highest mean raw score of coping strategies used by nurses was related to Positive reappraisal (11.07 ± 3.32) and Self-controlling (10.32 ± 2.91), which are considered part of Emotion-oriented coping strategies. Relative scores of coping strategies showed that nurses used positive reappraisal, Seeking social support, Planful problem-solving, and Self-controlling more than other coping strategies, including Accepting responsibility, Distancing, Escape-avoidance, and Confrontative coping, respectively (Table 3).

Table 3. Mean scores and relative scores on the Ways of Coping sub-scales (n=125)

The Ways of Coping sub-scales		Mean ± SD	Relative score (%)
Problem-oriented coping strategies	Planful problem-solving	8.70±2.66	13
	Confrontative coping	7.37±2.93	11
Problem and Emotion oriented coping strategies	Seeking social support	9.01±2.99	14
Emotion-oriented coping strategies	Distancing	7.78±2.90	12
	Self-controlling	10.32±2.91	13
	Accepting responsibility	5.22±2.07	12
	Escape-avoidance	9.61±3.78	11
	Positive reappraisal	11.07±3.32	14

Note: Relative Score (%): Percentage based on the total possible score for each sub-scale.
Abbreviation: SD, standard deviation

A statistically significant relationship existed between mental health symptoms and certain coping strategies ($p<0.05$). The results showed that there was a weak positive relationship between stress and coping strategies of confrontative coping, distancing, and accepting responsibility, while there was a moderate positive relationship between stress and escape-avoidance ($p<0.05$). Anxiety also had a weak positive correlation with responsibility acceptance and escape-avoidance, and a weak negative correlation with social support seeking ($p<0.05$). In addition, there was a weak negative relationship between depression and seeking social support, and a weak positive correlation between depression and escape-avoidance ($p<0.05$).

A summary of the relationships between coping strategies and mental health is presented in Table 4.

Table 4. Inter-correlations between the mental health status (stress, anxiety and depression) with the ways of coping sub-scales

	1	2	3
1. Stress	1		
2. Anxiety	0.308**	1	
3. Depression	0.179*	0.699**	1
Planful problem-solving	-0.038	0.031	-0.088
Confrontative coping	0.349**	0.172	-0.092
Seeking social support	-0.036	-0.197*	-0.205*
Distancing	0.256**	0.044	-0.158
Self-controlling	0.077	0.104	-0.063
Accepting responsibility	0.200**	0.206*	-0.029
Escape-Avoidance	0.485**	0.356**	0.193*
Positive reappraisal	-0.157	-0.066	-0.128

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Discussion

In our study, more than 60% of emergency nurses had mental health symptoms, including mild to severe stress, anxiety, and depression, during the COVID-19 pandemic. These results can indicate the poor mental health status of emergency nurses in our study. Some studies, such as those conducted in China, Ethiopia, and Italy on the mental health of emergency nurses during the COVID-19 pandemic, showed prevalence rates of symptoms that were consistent with our findings [8, 44, 45]. Studies in Iran and Turkey found that the prevalence of stress, anxiety, and depression among frontline nurses was higher than in our study [10, 15, 16, 46]. In contrast, others in China and Turkey showed lower prevalence [11, 12]. However, some systematic reviews and meta-analyses, such as Al Maqbali et al. (2021) and Varghese et al. (2021), have reported a lower prevalence of mental health symptoms in nurses than found in our study [47, 48]. The studies in these systematic reviews and meta-analyses primarily took place in China. The rate of mental

health symptoms among nurses varied across studies due to various factors, including sociodemographic, occupational, and organizational variables, as well as the time of study during the pandemic [10, 15, 44, 49].

This study found that nurses primarily employed positive coping strategies for their mental health issues, including positive reappraisal, seeking social support, planful problem-solving, and self-controling, respectively. They tailored their coping methods based on their experiences and reevaluation of stressful situations. To mitigate the emotional impact of stress, nurses employed self-control techniques, such as mentally reviewing their actions before executing them, which served as a positive coping strategy. Conversely, not expressing their feelings represented a negative approach. The nurses employed various problem-oriented coping strategies, such as identifying stressors, formulating comprehensive solutions, consulting with colleagues and psychologists, and finding empathy and solidarity with others. However, it appears that the stress resulting from pandemic conditions is perceived as largely unchangeable by nurses. According to Folkman and Lazarus's theory, when a situation is deemed unchangeable and highly uncontrollable, individuals tend to favor emotion-oriented coping strategies. Conversely, if the situation is viewed as changeable, problem-oriented approaches are preferred [23]. The pandemic's characteristics and the interplay of nurses' coping strategies with contextual and socio-cultural variables [19, 50] indicate that, despite findings from various studies across different countries and pandemic phases showing a greater prevalence of emotion-oriented coping strategies over problem-oriented ones, nurses employed a range of coping behaviors encompassing both types. The findings of Salman et al. (2023), Isa et al. (2019), Habibi et al. (2022), Mahgoub et al. (2021), Htay et al. (2021), and Munawar & Choudhry (2021) on the increased use of emotion-oriented coping strategies—especially through religious adaptation, prayer, experience utilization, seeking

social support, and proactive planning to address stressors—are consistent with our study's results [19, 25, 26, 50-52]. Other studies reported different coping behaviors among emergency nurses compared to our findings. These studies identified coping strategies that included seeking support from family, friends, and managers, planning daily activities, fostering open communication within the team for mutual assistance, managing emotions, gathering relevant information, avoiding stressors, limiting social interactions, employing protective measures, practicing mindfulness and moral resilience, engaging in physical activities and leisure pursuits, maintaining a healthy diet, ensuring sufficient rest, practicing social distancing, and expressing emotions [11, 24, 26, 53-57]. A key difference between these studies and ours was that participants in the current study used fewer social distancing methods, such as vacations and leisure activities. Additionally, the lack of emotional expression and prayer among the nurses in our study was significant compared to previous research. However, we found similar results regarding the use of social support, proactive stress management planning, and reduced reliance on negative coping strategies, such as escape-avoidance and unhealthy behaviors like substance abuse.

Alongside identifying these strategies during the pandemic, it is crucial to recognize how their usage has shifted about their mental health symptoms. Our study revealed that although nurses employed negative coping strategies less frequently, an increase in mental health symptoms led them to engage in more escape-avoidance and distancing behaviors, such as daydreaming, wishing for chance solutions, hoping for miracles, refusing to think too much about the pandemic, and leaving themselves to fate. Additionally, as anxiety and depression rose, nurses sought less social support. Our study aligns with Babore et al. (2022), which identified the escape-avoidance strategy as a stress risk factor for healthcare workers, including nurses. However, unlike our findings, their study found that as stress increased, nurses were more likely to seek social support [58]. The

misalignment likely arises from differing accessibility to social support and its significance in the organizational contexts of the two studies. Implementing effective programs that provide accessible social support resources and establish a straightforward mechanism for seeking social support can help maintain the mental health of emergency nurses. Pang et al. (2021) found that as anxiety and depression increased, frontline nurses caring for COVID-19 patients employed more negative coping strategies [53]. Inappropriate coping strategies in frontline nurses facing stress, anxiety, and depression highlight the need for greater focus on their coping strategies. Health managers and policymakers should implement interventions to educate and support emergency nurses in adopting positive coping strategies [14, 18, 20, 55]. Providing readily accessible support resources like social support networks and psychiatric counseling centers for nurses can improve patient care in emergency departments during pandemics by helping nurses manage emotional and psychological problems, utilize effective coping strategies, and enhance their resilience. It seems that conducting further studies on emergency nurses' experiences of the influencing factors and predictors of mental health and coping strategies during the COVID-19 pandemic can provide more information to improve nurses' mental health. Also, examining and determining effective solutions for using appropriate coping strategies in stressful situations, similar to the pandemic using interventional research designs can provide appropriate results for increasing the quality of care for critically ill patients in the emergency department.

Some limitations of the present study included the self-report nature of some questionnaires and the possibility of participants incorrectly completing these questionnaires due to the high workload of nurses in emergency departments during the pandemic, which could lead to potential bias. The researchers tried to collect data in conditions where the participants had a suitable opportunity. Also, researchers tried to collect and analyze more reliable data using standard instruments.

Conclusion

Identifying the symptoms of stress, anxiety, and depression, along with effective coping strategies for emergency nurses based on their mental health status, offers valuable insights for prioritizing the appropriate use of these strategies and enhancing the quality of nursing care in disaster situations. Our study revealed that a significant number of emergency nurses experience stress, anxiety, and depression. They primarily employed positive emotion-focused coping strategies, but as their symptoms intensified, they tended to adopt negative coping behaviors, such as escape-avoidance, and relied less on social support. This indicates the need for better planning for ongoing training for nurses to manage mental health symptoms and use effective coping strategies, as well as increasing access to and promoting the use of social support strategies. Planned and effective actions in this regard can ensure the quality of patient care in disaster situations while preserving the health of emergency nurses as the frontline of the health workforce.

Ethical considerations

Compliance with ethical guidelines

The Ethics Committee of ZUMS approved the study under ethics code IR.ZUMS.REC.1400.442. The researchers received a written introduction from the Vice President of ZUMS Research and Technology and the management of teaching hospitals. Participants received information about the purpose of the study, confidentiality of information, voluntary participation and their right to withdraw at any time. All participants provided written informed consent.

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Authors' contributions

Z.B contributed to the report's ideation, data collection, conducted methodology, drafting, and editing. F.R contributed to idea development, wrote original and final drafts, conducted formal analysis and methodology, provided supervision, and edited multiple sections. K.A was involved in data collection, analysis, and Writing – review & editing.

Conflict of interest

The authors report that there are no competing interests to declare.

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