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Level of resilience in nurses working at COVID-19 referral centers in Iran

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Abstract

Background: The coronavirus disease 2019 (COVID-19) pandemic has led many healthcare systems to become overwhelmed, and caused many frontline providers to feel fatigued and exhausted and experience severe emotional trauma. Nurses are the largest group of the world's frontline providers and it is clear that their resilience to threatening factors is critical in the current crisis. Therefore, the purpose of this study was to determine the level of resilience in nurses working in COVID-19 centers in Iran.

Methods: A cross-sectional study was conducted with 250 nurses working at three COVID-19 centers in northwest Iran. The participants were recruited using simple random sampling. The Connor–Davidson Resilience Scale was used to collect the data.

Results: The highest level of resilience was related to spiritual influences, while the lowest was the trust in their instincts and tolerance of negative emotions. Furthermore, the level of resilience was significantly higher in nurses with better family support ($p < 0.01$).

Conclusion: Given the role of resilience in nurses' mental health, it is vital to support the nursing staff in critical situations and improve their resilience by focusing particularly on psychological and spiritual support.

KEYWORDS

COVID-19, Iran, nurse, resilience, spirituality

1 | INTRODUCTION

In mid-November 2019, a pandemic of the emerging coronavirus broke out in the Chinese city of Wuhan. The pandemic began with the outbreak of an unknown type of coronavirus, later called coronavirus disease 2019 (COVID-19).¹ Chinese officials announced the discovery on January 4, 2020, and on January 30, the World Health Organization (WHO) declared a state of “international public health emergency” in the world, citing the spread of the disease. The initial

symptoms of the disease are similar to influenza (fever, fatigue, body aches, cough, and sore throat), and then respiratory symptoms such as shortness of breath and difficulty breathing can intensify. In critical cases, the infection can result in pneumonia, severe acute respiratory syndrome, renal failure, and even death. Due to the high transmissibility of the virus, the disease has spread rapidly worldwide and to date has affected all countries and regions of the world. The number of patients with COVID-19 disease at the date of writing the current research project (June 11, 2021) is more than 175 million people

according to the WHO, and so far, more than 3.7 million people have died of the disease.² To date, the highest incidence rates have been in the United States, India, and Brazil.³

Iran, which is currently ranked 13th in terms of the incidence of COVID-19 disease, was one of the first countries to be affected by the virus after China, and it soon became the main center of the COVID-19 outbreak in West Asia. The news of the arrival of this virus in Iran was first reported in the media on February 20, 2020. Furthermore, the first definite cases of this disease in Qom, Iran were announced by the Ministry of Health and Medical Education on March 24, 2020. All 31 provinces of the country have been affected by this disease and according to the Ministry of Health and Medical Education (the only official source for reporting cases and deaths in Iran), the number of definitive cases of COVID-19 disease is 3,013,078 to date and so far, 81,796 people have lost their lives due to the disease.⁴ The highly contagious and transmissible nature of this disease has led to the hospitalization of a large number of patients and, consequently, the death of a large number of hospitalized patients. As the most prominent member of the medical team, nurses' role and their care of the patients were critical, and nurses' fatigue and exhaustion can lead to a significant decline in the quality of healthcare services and adverse consequences for patients.⁵ It can even lead to severe emotional trauma in nurses, where cases such as suicide have been reported in nursing staff due to the prevalence of COVID-19 disease in different countries.⁶ It is clear that nurses' resilience to threatening factors is critical in the current crisis.

Resilience is a construct first introduced in 1992 by Werner and Smith in developmental psychology and gradually entered other fields.⁷ It represents a complex set of various personal qualities and protective and salutogenic factors and processes that enables one to thrive in the face of adversity⁸ and leads to a biopsychospiritual balance where an individual adapts body, mind, and spirit to current life situations.⁹ The significant outcomes or consequences of resilience are successfully adapting to change, resisting the negative impact of stressors, and avoiding the occurrence of significant dysfunctions.¹⁰ Resilience also represents the ability to return to the previous, so-called "normal" or healthy condition after trauma, accident, tragedy, or illness.¹¹ Resilient individuals are characterized by a variety of inter- and intra-personal characteristics, including a higher degree of flexibility. Further, individuals who have a higher level of resilience can apply more effective coping strategies than less resilient persons to overcome difficult and traumatic conditions.¹² Researchers believe that resilience is a form of self-healing with emotional and cognitive consequences that can help overcome challenging life situations.¹³⁻¹⁵

Despite agreement on the importance of resilience as a positive personality trait in the face of critical situations, an extensive review of the literature found no studies that investigated the level of resilience of nurses in the COVID-19 pandemic in Iran. Due to the lack of sufficient evidence in this regard and the necessity of adequate evidence for future decisions in the field of human resource management of the health system, this study aimed to determine the level of resilience in nurses working in COVID-19 centers in Iran.

2 | METHODS

2.1 | Study design

A descriptive cross-sectional study was conducted to determine the level of resilience in nurses providing healthcare services to patients at COVID-19 referral centers in Iran.

2.2 | Setting and participants

The study was conducted on a sample of nurses working at three urban teaching hospitals in the northwest of Iran, from May 21, 2020 to February 21, 2021. To estimate the sample size, a pilot study was conducted with 30 randomly selected eligible nurses working at the study setting. This initial data was used to perform a proper sample size calculation and to test for the applicability and clarity of the data collection instrument before proceeding with the main study. The data from the pilot study were not included in this study because it represented an initial validation of our methods. Using the G*Power 3.1.2 software and the following parameters: (a) standard deviation value of 3.85 obtained from the pilot study, (b) confidence level of 95%, and (c) estimation error of less than 0.5 yielded a sample size of 228 participants. The final sample size was determined to be 250 participants, assuming a nonresponse rate of approximately 10%. To increase participation, the research team gave five stethoscopes to five participants by drawing at the end of the study.

The participants were chosen using a simple random sampling method. The first and second authors obtained a list of all nurses working in the COVID-19 wards of the three hospitals, revealing 500 eligible nurses. The first author coded all eligible nurses from 1 to 500 and used computer-generated numbers to identify 250 participants to recruit. Inclusion criteria included currently working as a nurse at the study setting and having at least a bachelor's degree in nursing. Nurses who did not participate in the study questionnaires and those in which more than 20% of the questions on the resilience scale were not answered were excluded.

2.3 | Data collection and procedures

A two-part questionnaire was used to collect data: the first part was related to demographic characteristics such as age, gender, marital status, work experience, and so on; the second part was the Connor-Davidson Resilience Scale (CD-RISC). This scale was designed by Connor and Davidson (2003) and is able to distinguish resilient individuals from non-resilient individuals in clinical and nonclinical groups. The CD-RISC consists of 25 items with five subscales.⁸

The first subscale "the notion of personal competence, high standards, and tenacity" reflects having high standards, tenacity, and competence and consists the following eight items: best effort no matter what; you can achieve your goals; when things look hopeless,

I don't give up; not easily discouraged by failure; think of self as strong person; I like challenges; you work to attain your goals; and pride in your achievements. The second subscale "trust in individual instincts, and tolerance of negative emotions" reflects handling negative emotions, trusting one's instincts, and perceived benefits of stress and consists of the following seven items: see the humorous side of things; coping with stress strengthens; under pressure, focus and think clearly; prefer to take the lead in problem solving; make unpopular or difficult decisions; can handle unpleasant feelings; and have to act on a hunch. The third subscale "positive acceptance of change and secure relationships" reflects having a positive attitude to change and secure relationships and consists of the following five items: able to adapt to change; close and secure relationships; can deal with whatever comes; past success gives confidence for new challenge; and tend to bounce back after illness or hardship. The subscale dimension "control" reflects the individual's perceived control in the face of a new crisis and consists of the following three items: know where to turn to for help; strong sense of purpose; and in control of your life. The fifth subscale "spiritual influences" reflects the individual's level of spirituality when faced with a new crisis and consists of the following two items: sometimes fate or God can help and things happen for a reason. Response to each item is rated on a 5-point Likert scale from 0 (completely false) to 4 (completely true). The overall score range on the scale is 0 to 100, and higher scores indicate greater resilience.⁸

The English version of the questionnaire was translated into a Persian version using forward and backward translation process,¹⁶ and face and content validity were confirmed by a panel of experts consisting of ten nursing professors and ten nurses working at COVID-19 referral centers. Some minor wording changes were applied according to expert recommendations. To evaluate the reliability of the final Persian versions of the instrument, internal consistency method was used and Cronbach alpha coefficient was calculated as 0.87 for the CD-RISC scale, based on the above-mentioned pilot data.

After obtaining the necessary permissions from the Vice Chancellor for Research and the Regional Ethics Committee of the University of Medical Sciences in a city in the northwest of Iran, the first and second authors obtained the shift schedule of the nurses selected to participate. They visited and recruited nurses on different shifts (morning, evening, and night) at the COVID-19 wards of the three urban teaching hospitals. They distributed the questionnaires to recruited nurses at the beginning of the shift and collected them at the end.

2.4 | Statistical analysis

The data were analyzed using SPSS 25, descriptive statistics (frequency, percentage, mean, standard deviation, etc.), and inferential statistics (according to the normal distribution of data, parametric statistical tests such as independent *t*-test and one-way analysis of

variance were used; $p < 0.05$). Since the CD-RISC subscales have different ranges, the min-max normalization method of feature scaling was also applied to normalize scores of each subscale and the total score within a range of 0 to 100, thereby making the different subscales comparable.

2.5 | Ethical considerations

The study was approved by the Institutional Review Board of the University of Medical Sciences in a city in the northwest of Iran. Moreover, permissions were obtained from the officials of the university hospitals. The first and second authors described the purpose of the study to all participants and answered any questions they had. Each nurse who chose to participate was asked to sign a consent form before they completed the questionnaires. The questionnaires were coded according to each participant so they could be completed in an anonymous manner and respondents were assured of the confidentiality of their responses. They were also notified that they could leave the study at any given time without any consequences. The researchers informed the participants that they would be provided a link to the summary of the article after it is published.

3 | FINDINGS

Out of 250 nurses participating in the study, 233 returned completed questionnaires (93.2% response rate). The mean age of participants was 33.1 ± 8.4 years, ranging from 22 to 64 years. The average work experience was 9.6 ± 7.7 years, with a range of 1 to 30 years. Demographic characteristics of the participants and the average overall scores of nurses' resilience by demographic variables are reported in Table 1. Comparing the average overall resilience scores of nurses by categories of each of the demographic variables indicated a statistically significant difference only for the dimension of family support, that is, the level of resilience was significantly higher in nurses who reported better family support ($p = 0.01$).

The mean normalized overall resilience score indicated a moderate to high level of resilience in nurses working at the study setting (63.8 ± 16.2). Comparing the mean normalized scores of the resilience subscales showed the highest mean resilience score was related to the subscale of spiritual influences, and the lowest resilience mean scores were related to the subscale of trust in individual instincts and tolerance of negative emotions (Table 2).

4 | DISCUSSION

This study examined the resilience of nurses working in three referral COVID-19 hospitals in two cities in the northwest of Iran during the COVID-19 pandemic.

TABLE 1 Demographic characteristics of participants with corresponding overall resilience scores

Variable	Category	Number (Percent)	Resilience score Mean \pm SD	Test statistics	<i>p</i>
Gender (<i>n</i> = 233)	Female	188 (77.7)	62.8 \pm 15.4	<i>t</i> = -1.82	0.07
	Male	52 (22.3)	67.4 \pm 18.7	<i>df</i> = 231	
Marital status (<i>n</i> = 233)	Single	74 (31.8)	66.5 \pm 14.2	<i>F</i> = 1.80	0.17
	Married	157 (67.3)	62.5 \pm 17.1	<i>df</i> = 232	
	Divorced/ separated	2 (0.9)	72 \pm 14.1		
Having child (<i>n</i> = 233)	Yes	123 (52.8)	62.8 \pm 16.1	<i>t</i> = -0.97	0.33
	No	110 (47.2)	64.9 \pm 16.4	<i>df</i> = 231	
Number of children (<i>n</i> = 123)	1	63 (27)	62.8 \pm 16.1	<i>F</i> = 0.21	0.98
	2	58 (24.9)	62.5 \pm 16	<i>df</i> = 121	
	3	2 (0.9)	73.5 \pm 19.1		
Position (<i>n</i> = 233)	Nurse	218 (93.6)	63.5 \pm 16.5	<i>F</i> = 1.08	0.36
	Head Nurse	10 (4.3)	71.1 \pm 10	<i>df</i> = 232	
	Supervisor	5 (2.1)	65.2 \pm 11.7		
Shift (<i>n</i> = 233)	Fixed	26 (11.2)	62.4 \pm 17.8	<i>t</i> = -0.48	0.63
	Rotational	207 (88.8)	64 \pm 16.1	<i>df</i> = 231	
Employment status (<i>n</i> = 233)	Permanent	144 (61.8)	64.4 \pm 15.3	<i>t</i> = 0.72	0.47
	Temporary	89 (38.2)	62.8 \pm 17.6	<i>df</i> = 231	
Working ward (<i>n</i> = 233)	Emergency Department	40 (17.2)	60.6 \pm 11.9	<i>F</i> = 2.16	0.93
	Inpatient ward	119 (51.1)	62.9 \pm 17.3	<i>df</i> = 231	
	Intensive Care Unit	69 (29.6)	67.1 \pm 16.4		
	Nursing office	5 (2.1)	65.2 \pm 11.7		
Education level (<i>n</i> = 233)	Bachelor's degree	221 (94.8)	63.9 \pm 16.4	<i>t</i> = 0.12	0.89
	Master's degree	12 (5.2)	63.2 \pm 13.4	<i>df</i> = 231	
University of Education (<i>n</i> = 233)	State	110 (47.2)	63.8 \pm 17.8	<i>t</i> = 0.003	0.99
	Private	123 (52.8)	63.8 \pm 14.8	<i>df</i> = 231	
Place of Living (<i>n</i> = 233)	Native	182 (78.1)	63.8 \pm 16.2	<i>t</i> = 0.005	0.99
	Nonnative	51 (21.9)	63.8 \pm 16.6	<i>df</i> = 231	
Spouse level of education (<i>n</i> = 233)	Diploma	15 (6.4)	60.4 \pm 14.7	<i>F</i> = 1.08	0.37
	Bachelor's degree	118 (50.6)	63.7 \pm 16.4		
	Master's degree	19 (8.2)	59.1 \pm 22.4	<i>df</i> = 156	
	Doctoral degree	5 (2.1)	50.2 \pm 11.5		
Spouse occupation (<i>n</i> = 233)	Same profession	46 (19.7)	58.8 \pm 19.4	<i>t</i> = -1.68	0.09
	Different profession	111 (47.6)	63.8 \pm 15.8	<i>df</i> = 155	
Financial status (<i>n</i> = 233)	Income more than expense	16 (6.9)	63.6 \pm 19.7	<i>F</i> = 1.06	0.35
	Income equal to expense	127 (54.5)	65.2 \pm 16.2	<i>df</i> = 232	

Variable	Category	Number (Percent)	Resilience score Mean \pm SD	Test statistics	<i>p</i>
	Income less than expense	90 (38.6)	61.9 \pm 15.6		
Family support (<i>n</i> = 233)	Very bad	12 (5.2)	59.3 \pm 16.4	<i>F</i> = 3.21	0.01
	Somewhat bad	11 (4.7)	59.3 \pm 20.6		
	Neutral	48 (20.6)	59.3 \pm 15.3	<i>df</i> = 232	
	Somewhat good	133 (57.1)	64.5 \pm 15.8		
	Very good	29 (12.4)	71.6 \pm 15.6		

Note: SD, standard deviation; Neutral, neither good nor bad.

TABLE 2 Mean scores of nurses' resilience

CD-RISC subscales	Items	Min–Max	Mean \pm SD	Mean of normalized scores
The notion of personal competence, high standards, and tenacity	8	0–32	20.7 \pm 5.8	64.7
Trust in individual instincts, and tolerance of negative emotions	7	0–28	16.2 \pm 4.9	57.8
Positive acceptance of change and secure relationships	5	0–20	13.3 \pm 3.7	66.7
Control	3	0–12	7.8 \pm 2.5	65
Spiritual influences	2	0–8	5.8 \pm 1.6	72.9
Total	25	0–100	63.8 \pm 16.2	63.8

Note: Min, minimum; Max, maximum; SD, standard deviation.

4.1 | Nurses' resilience

Resilience can be described as individuals' ability to recover after experiencing challenging life experiences or overcoming changes or crises.¹⁷ Caring for patients with COVID-19 is a serious challenge for all nurses worldwide,¹⁸ and this situation will worsen if nurses must fight this mysterious virus with a shortage of manpower and equipment.^{18,19} Nurses' ability to cope with challenging conditions such as the COVID-19 pandemic is critical, and their resilience plays a key role in increasing the adaptation of nurses in the face of this pandemic.²⁰

Similar to other studies, nurses' resilience was moderate in our study.^{21,22} In contrast, Robert et al.²⁰ reported that many of the nurses in their sample (46.7%) had low resilience when assessed during the COVID-19 pandemic. The authors concluded nurses' low resilience was probably because they included staff working in the respiratory wards who cared for patients in acute and critical conditions, nursing students, and newly graduated nurses.²⁰ Meanwhile, a study in China found that nurses working in isolated wards of COVID-19 patients had higher levels of resilience. Their finding of higher resilience level may be because novice nurses were excluded from the study, and the nurses had psychological counseling and

underwent a mandatory psychological training course to manage psychological problems that arose.²³

4.2 | Social support and nurses' resilience

Numerous factors can affect nurses' resilience.²⁴ In the present study, family support was significantly associated with nurses' resilience, and nurses who reported more family support had higher overall resilience mean scores. Similarly, Kılınc and Sis Çelik²¹ observed a positive and significant relationship between Turkish nurses' perceived social support and their level of psychological resilience, with increasing social support in these nurses, the level of resilience increased. A literature review showed that nurses working with patients with COVID-19 have a high level of stress^{6,25} which can negatively affect their personal and work life.^{18,26,27} Studies have reported that social support from family, friends, and relatives can reduce stress²⁸ and prevent psychological and physical consequences in nurses.²⁹ Therefore, it is essential to ensure nurses have adequate social support, especially in critical periods such as pandemics, to prevent the adverse effects of stress on nurses.

4.3 | Demographic characteristics and nurses' resilience

Although no other demographic variables were found to be statistically significant with regard to overall resilience scores, we did find that male nurses were overall more resilient than female nurses ($p = 0.07$) and the overall mean resilience scores of unmarried nurses and those who had no children were higher than married nurses and those who had children. These differences may indicate more resilience when there is less responsibility for caring for children. It is possible that these nurses also had less worries about possibly transmitting COVID-19 to their spouse or children if they were infected, thus they may have been working with less stress. Similar to our findings, Yang et al.³⁰ reported that married nurses with children might have less resilience and are at higher risk of burnout. Another study showed that married nurses who had children were at a higher risk of depersonalization at the workplace.³¹ Since depersonalization negatively relates to resilience, nurses who experience depersonalization at work tend to have less resilience.³⁰ In contrast, another recent study found that gender, marriage, and childbearing were not associated with nurses' resilience in the COVID-19 pandemic.²¹

4.4 | Spirituality and nurses' resilience

In examining the dimensions of resilience, the most influential factor in nurses' resilience was spiritual influences, and the lowest mean normalized subscale score was for trust in individual instincts and tolerance of negative emotions. This indicates that nurses who are spiritually strong and have strong beliefs can be more resilient. Spirituality has a broader definition than religious faith, and it is defined as having a dynamic connection with oneself, others, nature, or God.³² Researchers have found that people with high spirituality can better cope with stress and have a better ability to cope with serious illnesses and stressful situations.^{33,34} Spiritual resilience is the ability of a person to maintain their feelings and purpose in the face of problems, stress, and injury through a set of beliefs, principles, or values that originate from internal and external spiritual sources.³⁵ It seems that nurses' high spirituality scores in Iran's Islamic society are largely tied to their religion. The people's religiosity and belief that their destiny is in God's hand likely influenced scores for this subscale. The religious people of Iran believe that every crisis, such as this pandemic, comes from God to challenge them so that they are not negatively affected like other irreligious people. Similarly, Roberto et al.³² reported a positive association between spirituality and resilience during the COVID-19 pandemic.³² Researchers have demonstrated a correlation between spirituality and resilience in their studies and their effect on recovery, emotional and mental health, and coping with critical events such as pandemics.^{32,34}

In our study, trust in individual instincts and tolerance of negative emotions had the lowest mean normalized score. Two issues must be acknowledged to explain these results reasonably. First, in the recent pandemic, facing the vast dimensions and depth of the catastrophe,

while being exposed to the bombardment of bad news involving the lives of family, friends, and acquaintances with the disease likely led many of the nurses to feel completely overwhelmed. Thus, they are not able to listen and trust their inner voice the same as before. Second, in our region, most people are unable to tolerate their negative emotions and often commit extreme and out-of-control behaviors while facing crises and hearing bad news. It is also likely that the current crisis is leading Iranian nurses to have an intolerance of negative emotions. Our findings are consistent with a recent study in Turkey, which has similar religious and cultural contexts.²¹

Resilience is essential not only in the primary confrontation of a crisis but in the continuing confrontation. Healthcare professionals must manage their stress using different strategies and maintain their resilience after facing the COVID-19 pandemic. However, because this confrontation is lasting a long time, it will probably reduce their resilience, and eventually, they may be broken emotionally and suffer from mental and physical problems. Hence, efforts to promote high resilience are critical, especially during this ongoing pandemic, as well as to prepare healthcare professionals for possible future pandemics. Enhancing resilience can serve as a protective factor to promote self-care, altruism, and a positive outlook on life³⁶ and reduce mental illness risk.³⁷ Therefore, by considering resilience as an essential skill for nurses and taking measures to maintain or improve their resilience, they can be helped to effectively adapt to psychological and physical injuries and overcome work environment pressures.²³

4.5 | Limitations

This study has limitations that need to be considered. First, the study was conducted in a small region in Iran and cannot be generalized to all Iranian nurses. Second, a self-report questionnaire was used, which can be accompanied by bias, and due to individual judgments, the accuracy and precision of the findings may be questioned. Finally, other factors such as nurses' working hours, ethnicity, and religion may be related to their psychological health, but these factors were not included in the questionnaire.

5 | CONCLUSIONS

The results showed that nurse participants had moderate resilience and having family support positively affected nurses' resilience. Our study adds to the literature the value of spiritual resilience in facing crises, and nurses who reported high spirituality had higher resilience. Given the role of resilience in nurses' mental health, it is vital to support nursing staff in critical situations and increase their resilience. Our results provide important evidence for clinical managers and health policymakers to help them design strategies to prevent mental illness in nurses during the COVID-19 pandemic. Psychological support can be in a variety of formats tailored to individual needs. This support can be provided remotely via telephone, smartphones, virtual networks, and the Internet, or readable content in the form of

brochures and booklets. The presence of clergies in clinical settings is another measure that can be used as a strategy to increase spirituality to reduce and mitigate the heavy burden of death in the current crisis. In addition to psychological and spiritual support, resilience training can also be provided to prepare nurses to deal with pandemics as the positive effect of resilience training has been proven in previous pandemics.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Since working in a crisis affects nurses' physical, mental, and emotional health, it can lead to medical errors and affect the quality of nursing care and patient safety. Therefore, it is essential to improve nurses' resilience and prepare them for facing possible future crises. The research team recommends:

1. Developing and implementing education about strategies to reduce stress and promote resilience for nursing students.
2. Holding continuing education classes on stress reduction and disaster preparedness for nurses.
3. Paying attention to the spiritual needs of nurses and promoting their spiritual health to increase their mental well-being and resilience.
4. Conducting qualitative research to explore nurses' experiences in times of crisis, such as the COVID-19 pandemic, and use the results for developing evidence-based strategies to promote nurses' resilience.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Design of the study: Naser Parizad, Amin Soheili, Iraj Mohebbi, Golshan Moghbeli, Keyvan Hosseingolipour; *Data collection:* Naser Parizad, Amin Soheili, Golshan Moghbeli, Keyvan Hosseingolipour; *Analysis and interpretation of data:* Naser Parizad, Amin Soheili, Kelly Powers; *Manuscript preparation and revision:* Naser Parizad, Amin Soheili, Kelly Powers; *Final approval of the revised manuscript:* Naser

Parizad, Amin Soheili, Kelly Powers, Iraj Mohebbi, Golshan Moghbeli, Keyvan Hosseingolipour. All authors have read and approved the final manuscript before submission.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

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