

BMJ Open Developing a core competency training curriculum system for emergency trauma nurses in China: a modified Delphi method study

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ABSTRACT

Objectives To develop a core competency training curriculum system for emergency trauma nurses in China.

Design A modified Delphi study design.

Participants The selection criteria for participants identified in practitioner roles were to be currently engaged in trauma care for over 5 years, to serve as the manager of emergency or trauma surgery department, and to have a bachelor's degree or higher. A total of 15 trauma experts from three grade A tertiary hospitals were invited to participate in this study by email or face to face in January 2022. The expert group comprised four trauma specialist doctors and 11 trauma specialist nurses. There were 11 women and 4 men. The age ranged from 32 to 50 (40.27±5.120) years. The number of years worked ranged from 6 to 32 (15.87±7.110).

Results Two rounds of questionnaires were issued to 15 experts in each round, and the effective recovery rate was 100.00%. In this study, expert judgement=0.947, expert familiarity with the content=0.807 and authority coefficient=0.877, and the results are highly reliable. The Kendall's W of the two rounds in this study ranged from 0.208 to 0.467, and the difference was statistically significant ($p<0.05$). In the two rounds of expert consultations, four items were deleted, five items were modified, two items were added and one item was merged. Ultimately, the curriculum system of core competency training for emergency trauma nurses includes training objectives (8 theoretical knowledge and 9 practical skills), training contents (6 first-level indicators, 13 second-level indicators and 70 third-level indicators), training methods (9), evaluation indicators (4) and evaluation methodologies (4).

Conclusions This study proposed a core competency training curriculum system with systematic and standardised courses for emergency trauma nurses, which could be applied to assess trauma care performance, highlight areas for improvement for emergency trauma nurses and contribute to the accreditation of emergency trauma specialist nurses.

INTRODUCTION

Trauma is a major public health problem that all countries in the world face and urgently need to be solved. The death and disability caused by trauma have brought heavy burdens

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study used a modified two-round Delphi method, including two parts: focus group interviews and expert consultation.
- ⇒ As the first complete training system for emergency trauma nurses in China, it can be applied to assess emergency trauma care performance and highlight areas for improvement for emergency trauma nurses, thus ensuring adequate education and training.
- ⇒ This study could contribute to the certification of emergency trauma specialist nurses in China.
- ⇒ The research team have not carried out experimental research, and its practicability and effectiveness in the emergency trauma nursing population need to be verified by further research.
- ⇒ The study needs to be carefully extended to other countries and regions, as it was developed based on a unique medical context in China.

to society and families. The WHO estimated that 8% of global deaths are caused by trauma, and more than 4 million people died of trauma in 2019.¹ Trauma has become the number one cause of death for people under the age of 45 years in developed countries, and it is also one of the main causes of death for people in developing countries.¹ Among the main causes of death among urban and rural residents in China in the past 5 years, trauma has consistently ranked among the top five. In 2017, the number of deaths caused by trauma exceeded 700 000, and the direct medical expenditure reached ¥65 billion.² Trauma is characterised as dangerous, complicated and changeable, which could lead to immediate death and severe complications, such as sepsis, septic shock and multiple organ dysfunction syndrome.³ Since major trauma can be life or limb threatening, simultaneously affecting multiple systems and body regions, its treatment and care have stringent timeliness. Nurses, as evaluators, implementers, coordinators, managers and



educators, play a vital role in reducing patient mortality and morbidity. Many studies have confirmed that trauma patients treated in well-organised trauma care systems with trained trauma health professionals have significantly lower mortality or morbidity rate.^{4,5} Trauma is an emerging discipline in China, and most nursing staff have not received formal trauma-related education or adequate trauma-related training. Trauma nurses are an important part of the trauma treatment team, and how to improve nurses' ability of trauma first aid is an urgent problem to be solved.

Trauma patients depend on an adequately educated multidisciplinary team to meet their complex physical and psychological needs.⁶ Professionally trained nurses are a vital part of the trauma multidisciplinary care team.⁷ The WHO Essential Trauma Care Guidelines emphasise the importance of training trauma nurses to optimise trauma patient outcomes,⁸ and some studies have indicated that specialised nursing personnel training is paramount to minimise preventable trauma deaths.⁹ In the development of trauma care systems, emergency nurses are considered vital in the successful care and treatment of trauma patients. Furthermore, emergency nurses can start initial treatment immediately while patients are still waiting for a doctor and before a final diagnosis is made. Therefore, the ability of emergency trauma nurses is very important for the early emergency treatment of trauma patients. Nevertheless, emergency trauma nurse education is inadequate.¹⁰ The International Council of Nurses developed the competency framework for trauma nurses in 2003, and some programmes trained specialist nurses based on the framework. Meanwhile, there are some training programmes for trauma nurses worldwide. Advanced Trauma Life Support (ATLS) and China Trauma Care Training are high-quality trauma-focused medical education programmes, but the original training target population are physicians rather than nurses.^{4,11} The Trauma Nursing Core (TNCC) and the Advanced Trauma Care for Nurses (ATCN), including airway, ventilatory, shock, head and spinal cord and paediatric injury scenarios, continue education courses that aim at improving trauma-related knowledge and psychomotor skills for registered nurses.⁸ The European Trauma Curriculum (ETC) was created by the European Recovery Council in 2006, which aims to form an effective and well-organised trauma team to provide assistance to emergency medicine specialists and other trauma-related healthcare professionals in the initial treatment of severe trauma patients.¹² Furthermore, ETC is a multidisciplinary course and open to non-medical staff as well as medical staff and is focused on leadership. Although these courses are being used globally, the effects of the training courses have not been widely evaluated.¹³ As these courses do not involve the teaching or research abilities required by Chinese emergency trauma nurses, they cannot meet the training needs of Chinese nurses.

Many emergency nurses have little or no formal education or training in the management of trauma patients in

China. Trauma nursing as a discipline is in its infancy in China, and continued professional development courses are the only means to advance training.¹⁴ However, there are currently no specialised training curricula for emergency trauma nurses in China. The aim of this study was to develop a core competency training curriculum system with systematic and standardised courses for emergency trauma nurses in China. A core competency framework can articulate an acceptable level of clinical knowledge and skills for emergency trauma nurses and allow competencies to be measured and evaluated. Strengthening the core competencies of emergency trauma nurses and establishing an evaluation system of core competencies can improve the treatment and nursing quality of trauma patients. Therefore, it is very important and significant to establish a core competency training curriculum system for emergency trauma nurses. Schultz *et al*¹⁵ developed a core competency teaching system for acute care physicians, nurses and Emergency Medicine Service System professionals based on knowledge, skills and attitudes, but only part of it is appropriate for emergency trauma nurses. Haley *et al*¹⁶ identified 42 trauma nursing educational objectives, such as trauma assessment and nursing intervention, but failed to build a complete training system. In China, one pressing concern is the lack of a trained workforce to meet the complex needs of emergency trauma patients, and many emergency trauma patients receive care from an undefined workforce, including nurses.¹⁷ Furthermore, training and certification for emergency trauma nursing have not been fully developed. Therefore, we should explore a core competency training curriculum system with systematic and standardised courses for emergency trauma nurses tailored to the Chinese context, strengthen the core competencies of emergency trauma nurses, establish an evaluation system for the core competencies of emergency trauma nurses, and improve the quality of medical care and quality of life of emergency trauma patients.

The aim of this study was to develop a core competency training curriculum system with China's own characteristics for emergency trauma nurses to meet the needs of clinical practice and provide guidance for the training and career development paths of emergency trauma nurses.

METHODS

Design

This study used a modified two-round Delphi technique to establish a consensus among a panel of experts with rich experience in trauma care. The essence of the Delphi consensus method is to derive quantitative estimates through the qualitative assessment of evidence.¹⁸ After identifying the research issue, the moderator group compiled the questionnaire by consulting the literature and holding focus groups for consultation. Experts' estimates are aggregated and fed back anonymously to all participants, who then review their initial responses

because of group-wide choices.^{19,20} A consensus is reached through successive survey rounds whereby panellists are requested to generate and reassess findings.²¹ The group does not need to meet. This practice confers anonymity and allows opinions to be expressed free from peer-group pressure. It involves multiple rounds of consultation by using questionnaires to obtain the collective opinion of experts until a consensus is reached.²² The criteria standard included: mean value of importance assignment ≥ 3.5 , consensus rate reached 70.0% and coefficient of variation ≤ 0.25 . When non-consensus occurred, suggestions of external experts were considered. A consensus was reached in this study after two rounds.²² The final version of the core competency training curriculum system for emergency trauma nurses will be reviewed by three associate professors from the China Trauma Nursing Alliance.

Construction of the initial core competency training curriculum system for emergency trauma nurses

The moderator group consulted a large amount of literature from January to March 2021 and attempted to determine all sources about the core competency training curriculum for emergency trauma nurses. The main search terms “trauma nurse”, “emergency trauma nurse”, “trauma care”, “competency”, “core competency” and “competency framework” were matched to relevant Medical Subject Headings terms. The following databases were searched: Embase, CINAHL, PubMed, Web of Science, Chinese Biological Medicine Database, Wan Fang and China National Knowledge Infrastructure (n=537). Two researchers (LX and MF) screened the titles and abstracts of the articles, respectively, to exclude literature irrelevant to the inclusion criteria (n=491). After that, the two researchers independently studied the remaining literature (n=46) to determine all possible competencies for emergency trauma nurses. They grouped phrases and words about core competencies from the literature into different topics, such as trauma emergency treatment and cooperation. In the end, 59 competencies were confirmed from 9 studies.^{23–31}

Three focus groups were held to complement the core competencies after the literature review in September 2021. Using a convenience sample, the interviewees met the following inclusion criteria: working closely with specialist trauma care nurses and willing to participate in the group. The interviewees included trauma care head nurses (n=4), trauma specialist nurses (n=3) and trauma specialist doctors (n=3). Two researchers were trained beforehand and conducted three focus groups. The three separate groups of interviewees were organised according to profession.

At the beginning of each interview, which lasted approximately 30 min, the researchers introduced the whole process to the interviewee. Interviewers were asked to discuss the role and competency of emergency trauma nurses. The researchers showed the initial core competencies drawn from the literature review after the interviewees expressed their original ideas. All interviewees

commented on core competencies that they thought were missing or especially important.

Three focus group interviews were audio-recorded and transcribed verbatim by the researchers. Conference summaries were sent to interviewees to confirm accuracy within a week. The two researchers analysed transcription data with thematic analysis and encoded and classified transcribed data into topics. Differences were discussed until an agreement was reached. The research team discussed related topics and compared them with competencies generated through literature reviews. Eventually, 12 competencies were added to the initial core competence framework.

Based on the integrated course design model,³² the research team divided the core competencies of emergency trauma nurses into six domains, including basic knowledge, professional practice, leadership, communication and cooperation, education and care, and study and research. Each domain contained several core competency items.

The Delphi process

On the basis of determining the core competencies, the research team confirmed the training objectives, training methods, evaluation indicators and evaluation methodologies of the core competency training curriculum system according to the literature. The final initial core competency training curriculum system consisted of 126 statements, which were categorised into five domains (training objectives, training contents, training methods, evaluation indicators and evaluation methodologies) and entered into the modified Delphi process.

Panel member recruitment and data collection

Recruitment to the panel was via an expression of interest circulated to the trauma care specialists, as well as targeted invitations to experts. The selection criteria for participants identified in practitioner roles were to be currently engaged in trauma care or worked closely with specialist trauma care nurses for 5 years, to serve as the manager of emergency or trauma surgery department, and to have a bachelor's degree or higher. The size of the participant panel for Delphi is also highly variable. The greater the number of participants in the group, the greater the assumed reliability of the judgements made by that group. A panel of 10–15 members is usually recommended.³³ A total of 15 trauma experts from three grade A tertiary hospitals were invited to participate in this study by email or face to face in January 2022. The grade A tertiary hospital is the highest level hospital in China. The expert group comprised of 4 trauma specialist doctors and 11 trauma specialist nurses, all experienced in trauma care.

The project execution team applied the Delphi method to carry out two rounds of consultation. The questionnaire was numbered according to the order of distribution and sent to all participants via email or face to face. Participants were asked to complete each questionnaire

within 2 weeks. The 15 trauma experts completed both rounds of Delphi surveys with a response rate of 100%.

Consultation questionnaire and consensus

The core competency training curriculum system was presented in the form of a consultation questionnaire, including three parts: introduction, importance assessment of the curriculum system of core competency training for emergency trauma nurses and the expert characteristics. The initial curriculum system of core competency training included training objectives (18 indicators), training contents (6 first-level indicators, 13 second-level indicators and 71 third-level indicators), training methods (9 indicators), evaluation indicators (5 indicators) and evaluation methodologies (4 indicators).

The importance assessment adopted a 5-point Likert scale to rate answers, with the response options 1='not at all important' and 5='very important' to indicate their level of agreement with each topic in the training curriculum system. In addition, the column of modification opinions is attached for experts to supplement items, clarify reasons and provide suggestions.

The filtering consensus for items were the mean value of importance assignment ≥ 3.5 , coefficient of variation (CV) ≤ 0.25 and consensus rate (selection rate ≥ 4 points) $\geq 70\%$.

Delphi round 1

In the Delphi round 1, the moderator group summarised and analysed the experts' opinions. Furthermore, items are filtered according to their inclusion criteria. All items meeting the filtering consensus were retained in the core competency training curriculum system and were not entered into Delphi round 2.

Delphi round 2

In the Delphi round 2, experts were asked to consider their previous answers in light of the group's responses and the comment that had been made and again rate their level of agreement with the statements. If they wished to, they could change their answers and make any further comments. All opinions were summarised to form a curriculum system of core competency training for emergency trauma nurses.

After two rounds of Delphi study, the 15 experts almost reached a consensus and the consultation was stopped.

Data analysis

All statistical analyses were performed using IBM SPSS Statistics V.22.0 software and Microsoft Excel V.2007 (Microsoft, Redmond, Washington, USA). The expert characteristics were analysed by the mean, SD, frequency and constituent ratio. The reliability analysis of an expert is expressed by a positive coefficient, the authority coefficient (Cr), the concentration degree and the coordination coefficient. The effective recovery rate of the questionnaire was used to express the positive coefficient, which was higher than 70%, indicating that the experts had a high level of enthusiasm. The Cr was determined

by the expert judgement (Ca) and the expert familiarity with the content (Cs). The calculation formula of Cr is $(Ca+Cs)/2$, and $Cr \geq 0.70$ is considered meaningful.³⁴ The basis for experts to make judgements included theoretical analysis, experience, information and intuition, and the degree of influence was assigned according to the three levels of high, middle and low. The details are as follows: theoretical analysis (0.3, 0.2, 0.1), experience (0.5, 0.4, 0.3), information (0.1, 0.1, 0.1) and intuition (0.1, 0.1, 0.1). The degree of familiarity was divided into five levels, from 'very familiar' to 'very unfamiliar', corresponding to 0.9, 0.7, 0.5, 0.3 and 0.1, respectively. Mean and full score frequencies were adopted to indicate the concentration degree. The concentration degree was reflected by CV and Kendall's W.

Patient and public involvement

No patient was involved.

RESULTS

Expert information

A total of 15 experts participated in round 1 and round 2 of the study. There were 11 women and 4 men. The age ranged from 32 to 50 (40.27 ± 5.120) years. The number of years worked ranged from 6 to 32 (15.87 ± 7.110). Four of the participants had a medical degree, three had a master's degree and eight had a bachelor's degree. One of the participants had a senior title, eight had an associate senior title and six had an intermediate title. All the experts were experienced; 11 of them were engaged in clinical nursing, and 4 were engaged in clinical medicine. Three of them serve as postgraduate tutors.

Experts' positive coefficient

Experts' positive coefficient refers to the degree of the experts' interest in the study and is expressed by the recovery rate of the expert letter inquiry form.³⁵ Two rounds of questionnaires were issued to 15 experts in each round, and the effective recovery rate was 100.00%. Nine experts (60%) proposed suggestions in the first round, and one expert (6.67%) put forward suggestions in the second round.

Experts' Cr

Experts' Cr represents the reliability of the consultation results. Cr is by the expert to each index judgement coefficient (Ca) and to each index familiar coefficient (Cs) decision: $Cr = (Ca+Cs)/2$. The Cr is generally considered to be 0.70 for acceptable reliability.³⁴ In this study, $Ca = 0.947$, $Cs = 0.807$ and $Cr = 0.877$, and the results are highly reliable.

Experts' coordination coefficient

Experts' coordination coefficient is expressed by Kendall's W. The Kendall's W of the two rounds in this study ranged from 0.208 to 0.467, and the difference was statistically significant ($p < 0.05$). The results are shown in online supplemental table 1.

Selection of indicators

In the two rounds of expert consultation, four items were deleted, five items were modified, two items were added and one item was merged. (1) Deleted: one training objective ('understand the characteristics and progress of trauma nursing') and three third-level indicators ('the ability of trauma centre construction', 'make trauma prevention work according to national policy' and 'the ability of clinical teaching'). (2) Modified: experts have revised the wording and content of the five items. In the domain of training objectives, the term 'understand the pathophysiology, clinical manifestations, treatment and nursing of trauma' was modified to 'understand the pathophysiological and clinical manifestations of emergency trauma', the term 'understand the methods of trauma emergency assessment' was modified to 'understand emergency assessment, treatment and nursing of emergency trauma', and the term 'understand the rescue and coordination techniques of trauma patients' was modified to 'understand doctor–nurse cooperation in trauma emergency treatment'. Regarding basic knowledge, the term 'disaster management' was modified to 'disaster emergency rescue'. Regarding study and research, the term 'ability to identify scientific problems' was modified to 'ability to discover and solve scientific problems'. (3) Added: two items have been added to the third-level indicator of the training content, including 'emergency treatment and management of group injuries' and 'health education, such as trauma prevention and self-rescue, shall be carried out for the community population'. (4) Merged: in the domain of evaluation indicators, the terms 'team cooperation' and 'nurse work confidence' were merged into 'self-evaluations of team members'.

According to the index selection method, the research team summarised the opinions and suggestions. Ultimately, the curriculum system of core competency training for emergency trauma nurses includes training objectives (8 theoretical knowledge and 9 practical skills), training contents (6 first-level indicators, 13 second-level indicators and 70 third-level indicators), training methods (9), evaluation indicators (4) and evaluation methodologies (4). All topics achieved a high level of consensus (75%; mean ≥ 3.5 ; CV ≤ 0.25) based on the predetermined consensus criteria. Four third-level indicators belonging to trauma emergency treatment ability ranked highest in training content, including airway management and respiratory support, emergency trauma monitoring and nursing measures, identification and management of severe trauma complications (cardiac arrest, shock, lethal triad, etc), and nursing management of trauma emergency surgery. Online supplemental table 2 presents expert opinions on the indicators of training objectives. Online supplemental table 3 presents expert opinions on the indicators of training contents. Online supplemental table 4 presents expert opinions on the indicators of training methods. Online supplemental table 5 presents expert opinions on the indicators of evaluation indicators and methodologies.

DISCUSSION

According to statistical data released by the Ministry of Public Security of China, there are more than 700 000 motor vehicle crashes in mainland China annually, which cause approximately 1.3 million injuries and 80 000–100 000 mortalities. Trauma has become the third leading cause of death in China following stroke and coronary heart disease.³⁶ To reduce the mortality and disability rate of trauma patients, the National Health Commission of the People's Republic of China issued a document on improving the capacity of trauma treatment on 02 July 2018. The document proposed establishing a regional trauma treatment system and trauma centres and strengthening the training of professionals related to trauma. Therefore, emergency trauma nurses, as indispensable members of emergency trauma centres, must be standardised, systematic and professionally trained to adapt to the development of trauma care. Although the training of trauma nurses was carried out for the first time in 2009 in China, there is a lack of an evaluation index system for the core competencies of emergency trauma nursing, and the curriculum of emergency trauma nursing has not been unified or targeted.³⁷ Thus, developing a core competency training curriculum system for emergency trauma nurses in China is necessary and urgent.

At present, the construction of trauma centres and the training of trauma nurses are not complete in China. The establishment of the core competency training curriculum system has important reference value to further standardise the training of emergency trauma nurses, which provides a theoretical framework for the training of emergency trauma nurses. Training based on standardised and systematic competency courses will ensure that emergency trauma nurses practise, demonstrate, and maintain the knowledge and skills required for effective response to trauma care. A professional emergency trauma nurse will cooperate with physicians effectively to treat and care emergency trauma patients and reduce the mortality and disability rate.

The purpose of this study was to develop a core competency training curriculum system for emergency trauma nurses, including training objectives, training contents, training methods, evaluation indicators and evaluation methodologies. This study had high levels of rigour and robustness. The rigour of the findings was ensured by the study methodology and design, which consisted of the following components: credibility, transferability, confirmability and reliability.³⁸ In this study, credibility was assured through the number and expertise of participants who represented different research fields and levels within emergency trauma care. Transferability was proven through the aim of the study, which was to develop a core competency training curriculum system with systematic and standardised courses for emergency trauma nurses. The resulting competency training curriculum system could be extended to emergency trauma centres throughout China. Confirmability was confirmed



through an iterative study design, as all data came from identifiable sources. Throughout the study, we provided summary results to participants, solicited feedback and maintained regular communication with participants. The reliability of the findings is indicated by whether the results can be repeated in other studies.³⁸ Undoubtedly, some studies of the same design will be conducted as trauma care evolves. In this study, three associate professors from the China Trauma Nursing Alliance were invited to review the final competency training curriculum system to ensure the reliability of the findings. The core competency training curriculum system had been highly recognised by experts from trauma centres or emergency departments of major medical institutions in China, who were able to ensure that the competency training curriculum system established was comprehensive and specific to emergency trauma care practices. The Kendall's W of the two rounds in this study ranged from 0.208 to 0.467. Therefore, the results of this study are rigorous and robust, and the competency curriculum system with systematic and standardised courses can be used to evaluate, train and certify emergency trauma nurses to improve trauma care practice.

The final curriculum system of core competency training for emergency trauma nurses includes training objectives (8 theoretical knowledge and 9 practical skills), training contents (6 first-level indicators, 13 second-level indicators and 70 third-level indicators), training methods (9), evaluation indicators (4) and evaluation methodologies (4). All topics achieved a high degree of consensus (70%; mean ≥ 3.5 ; CV ≤ 0.25) based on the predetermined consensus criteria. The final first-level indicators based on the integrated course design model represented the six dimensions of the core competencies of emergency trauma nurses, including basic knowledge, professional practice, leadership, communication and cooperation, education and care, and study and research. The nursing versions of the ATLS, ATCN and TNCC promote systematic, organised assessment and intervention for trauma nursing and have been promulgated worldwide.^{14 39} However, these three courses are not comprehensive for the training of emergency trauma nurses in China. To compensate for the lack of trauma-trained physicians, emergency trauma nurses often need to lead teams, communicate with other partner departments, train junior nurses and conduct research. In this study, four dimensions of core competency—leadership, communication and cooperation, education and care, and study and research—achieved high consensus (100%; mean ≥ 4.5 ; CV ≤ 0.11). The trauma resuscitation setting is characterised by complex clinical care provided by dynamic interprofessional teams with little time for deliberate planning.⁴⁰ Therefore, there must be a leader to lead the trauma team members quickly and efficiently in trauma resuscitation, and leadership can improve the process of trauma care.⁴¹ The literature suggests that team cooperation and effective communication among team members are important factors in assuring patient

safety.⁴² Education can train more qualified emergency trauma clinical practitioners, and study and research can improve the self-competency of emergency trauma nurses.

This study has a variety of practical clinical significance. On one hand, it forms a specialty emergency trauma nurse team with perfect ability, which potentially improves patients' ability to obtain healthcare and services; on the other hand, it also promotes the development of emergency trauma nursing discipline and nurtures talent for emergency trauma nursing.

CONCLUSION

This study proposed a core competency training curriculum system for emergency trauma nurses in China using the modified Delphi process. As a guideline, the training curriculum system can be applied to assess emergency trauma care performance and highlight areas for improvement for emergency trauma nurses, thus ensuring adequate education and training. This training curriculum system could also contribute to the accreditation of emergency trauma specialist nurses.

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Contributors LX conceptualised the study and drafted the manuscript. MF analysed the data and drafted the results. JC reviewed the manuscript and provided important contributions throughout. SH made substantial contributions to the design of the study. All authors contributed to reviewing and editing the manuscript. All authors have read and agreed to the published version of the manuscript. LX is responsible for the overall content as guarantor. LX accepts full responsibility for the finished work and/or the conduct of the study, and had access to the data, and controlled the decision to publish.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study was approved by the Research Ethics Committee of Tongji Hospital of Tongji Medical College of Huazhong University of Science and Technology (TJ-IRB20210920). Participation was voluntary, and participants were made aware of their right to withdraw from the study at any point without explanation. All participants were given information about the nature of the study and what they needed to do. The act of completing each questionnaire was interpreted as consent to participate in the study.

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