



OPEN Development of an evaluation list for older adult community-based rehabilitation needs through a Delphi method

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Older adults' functional and intrinsic abilities may decline with increasing age. The positive effects of comprehensive community-based rehabilitation services to maintain physical, mental, and social function are essential. Nevertheless, few tools are available to assess the community-based rehabilitation needs of older adults. Therefore, we aimed to construct a list for the comprehensive evaluation of community-based rehabilitation needs of older adults. The International Classification of Functioning, Disability, and Health (ICF) was used to construct a first draft of the assessment list. From September to November 2023, 18 experts from five provinces and nine tertiary hospitals and institutions of higher education in China participated in this Delphi study. The older adult community-based rehabilitation needs evaluation list included six dimensions and 29 items. The weights of the six dimensions, from high to low, included mental function rehabilitation need (0.30), body function rehabilitation need (0.24), social participation need (0.18), individual activity rehabilitation need (0.14), environmental rehabilitation need (0.09) and rehabilitation information need (0.05). Using the Delphi method, an assessment list of older adult community-based rehabilitation needs based on ICF was developed. Future work should evaluate the list's reliability and validity and its application in managing community-based rehabilitation for older adults.

Keywords Aging, CBR, CBID, Rehabilitation, Needs assessment

Background

Since the 21st century and for the first time in human history, population aging has rapidly increased against the backdrop of longevity and decreasing fertility rates^{1,2}. Although a longer life is a precious resource, little evidence exists that older adult longevity is accompanied by an extended period of good health³. Instead, as people age, older adult functional and intrinsic abilities may decline¹, precipitating a swift upsurge in the prevalence of geriatric ailments, such as chronic diseases and geriatric syndromes. Among the 240 million older people in China, 69.13% have at least one chronic ailment, while 25.55% and 19.6% have depression and mobility disorders, respectively^{4–6}, resulting in significant healthcare service burdens and consequences⁷. In response to this daunting challenge, community-based rehabilitation (CBR) services, as a broader approach to support, have been recognized as an effective way to address this issue in older adults⁸.

CBR, also known as community-based inclusive development (CBID), is a strategy aimed at maximizing opportunities in health, education, livelihoods, and social participation for targeted groups and their families. The primary focus thereof is to promote the comprehensive development of people with disabilities, older adults, and other vulnerable groups within the community^{9,10}. Achieving this objective necessitates a precise assessment of the rehabilitation needs of older adults in the community, coupled with the delivery of tailored rehabilitation services aligned with these needs. In other words, public health administrators are responsible for ensuring that their CBR programs and services are inclusive and reflect the needs of persons with disabilities, their families, and their communities⁸. At the same time, CBR, as a multidimensional concept¹¹, suggests that the needs of

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older persons will be multilayered rather than single. This suggests that healthcare providers must systematically and comprehensively assess the needs of older people before providing them with individualized CBR services based on their needs. Regrettably, although there have been studies in recent years that have focused on the CBR needs of older adults^{12,13}, these studies have been limited to assessing only a single category of need (e.g., focusing solely on body or psychological needs) and there are few studies on the comprehensive needs of older people at multiple levels regarding physical, psychological, and social rehabilitation. Yanli et al.¹⁴ developed an evaluation of the need for nursing services as an index for older adults. However, this lacked that an assessment of older people's body function and environmental rehabilitation needs due to its primary focus on rehabilitation guidance and psychological and mental support service needs. Although Ćwirlej-Sozańska et al.¹⁵ paid attention to the environmental needs assessment of CBR for older adults, they lacked an understanding of other aspects. Due to limited comprehension of the needs for CBR among older individuals, the efficacy and contentment of CBR for this demographic have been suboptimal. This has impeded the advancement of CBR. There is a need to develop a systematic, comprehensive, and standardized needs assessment tool for CBR of older people to help us holistically understand the needs thereof.

The International Classification of Functioning, Disability, and Health (ICF), published by the World Health Organization (WHO), is based on a biopsychosocial model and consists of a global terminology system encompassing three main components: body structure and function, activity and participation, and the individual and the environment⁹. The WHO mandates that its member states use standards and tools developed from the ICF in fields related to rehabilitation and disability services¹⁶. The ICF framework suggests that functional independence is influenced not only by physical and mental abilities but also by social and environmental factors¹⁷; CBR for older adults should be viewed as a systematic process, emphasizing the need for comprehensive assessments to deliver precise and effective CBR services¹⁸. Over the past two decades, researchers have developed various evaluation lists based on the ICF to assess functional capabilities of older adults, long-term care needs, and environmental factors, thereby validating the framework's broad applicability^{15,19,20}. Therefore, developing a CBR needs assessment list for older adults based on the ICF will not only achieve a comprehensive understanding of their needs but also lay a solid foundation for the development of needs-oriented rehabilitation services and the promotion of their comprehensive development in the community.

We, therefore, aimed to develop a standardized inventory to help community health workers evaluate the CBR needs of older adults. This systematic and structured assessment may allow community health workers to provide individualized rehabilitation services to older adults based on a comprehensive understanding of their needs. Meanwhile, given the multidimensional nature of rehabilitation needs, we also included the analytic hierarchy process (AHP), the core purpose of which is to determine the priorities of the evaluation objects using a systematic analysis method widely used in healthcare research²¹. We aimed to assess the importance of the entries in the CBR needs assessment lists by utilizing the theoretical and practical expertise of each of the experts in the Delphi Consultation to identify the priority of these entries. This will help community public health staff to make more effective decisions and targeted investments in resource allocation and policy development by understanding the weighting and prioritization of each rehabilitation need.

Methods

The development of the older adult CBR needs evaluation lists occurred in three phases: (1) constructing the first draft of the lists; (2) screening and identification of the list items through the Delphi method; and (3) analyzing the weights of the indicators.

Description of the study group

The study group included a geriatric nurse and doctor, a rehabilitation expert, a community health manager, an expert related to statistics, and three postgraduate nursing students. All team members were responsible for the main tasks of constructing the first draft of the indicator system, implementing expert consultation and data collation, and analysis, etc.

Evaluation list first draft

We systematically searched the PubMed, Embase, Web of Science, CENTRAL, CINAHL, Physiotherapy Evidence Database, CNKI, and other databases from inception to June 2023. The leading search terms used were as follows: "Analytic hierarchy process (AHP)," "Delphi method," "Aged/Elderly/Older adults/Older persons/Aged people/Older adult," "Community rehabilitation/CBR/Community-based rehabilitation/Home rehabilitation/community-based inclusive development/CBID, and "Need/Demand/Requirement." By combining the ICF framework with CBR guidelines, the research team constructed the first draft of the evaluation lists consisting of six dimensions, including six first-level and 31 second-level items. Team member experts initially verified the readability and feasibility of the preliminary draft.

Delphi process

Expert panel inclusion criteria

Experts in China were selected using the purposeful sampling method, with the following criteria: (1) Bachelor's degree or above; (2) deputy high or above title; (3) 5 years or more experience in the field of geriatric nursing or medicine, geriatric rehabilitation nursing or medicine, and/or community nursing; (4) publishing one or more article on geriatric rehabilitation or CBR in a core journal; and (5) voluntary participation in this study.

Expert consultation questionnaire

The expert consultation questionnaire consists of the following three parts. (1) Instructions for completing the questionnaire, including the purpose and significance of the study and how to fill out the questionnaire. (2)

Information about the expert, including general information, a rating of familiarity with the content (divided into five levels from “very familiar” to “completely unfamiliar”), and the basis for evaluation including clinical experience, theoretical analysis, domestic and international references, and intuition, with each evaluation corresponding to strong, moderate, or weak levels of judgmental dependence. (3) The body of the questionnaire, which included first- and second-level items for CBR needs assessment of the elderly, with a column for suggestions to add indicators and a column for modifications. The expert’s evaluation of the importance of the indicators was based on a five-point Likert scale (1, completely unimportant to 5, very important).

Implementation of expert consultation

Expert consultation was carried out from September to November 2023 using the consultation questionnaire and by e-mail, with a time limit of 2 weeks for each consultation and an interval of 1 month between each round. After each round, the researcher organized and entered the expert consultation questionnaires. The study team screened the entries of the indicator system according to the expert opinions. The screening results were used as the basis for the next round of consultation. The research team then decided whether to adopt the opinions put forward by the experts after discussion, and the results of the decision to adopt them were incorporated into the next round of consultation.

Statistical methods

Positive and authority coefficient

Microsoft Excel 2019 and SPSS 29.0 software were used for data entry and analysis. We used frequency or average to describe basic information about the experts and how each candidate was scored. $P < 0.05$ indicated a statistically significant difference.

The questionnaire response rate expressed the experts’ degree of positivity; a higher response rate can reflect the expert’s attention to and cooperation with the research, which is usually acceptable if the response rate exceeds 70%^{22,23}. The degree of expert authority was expressed using the authority coefficient (Cr): $(Ca + Cs)/2$, where Ca is the expert’s level of education and the basis of judgment, and Cs is the expert’s familiarity with the indicator^{22,24}, which is considered acceptable when $Cr > 0.7$ ²⁵. Experts who did not achieve $Cr > 0.7$ were excluded.

Concentration and coordination degree

The selection of specific items includes the degree of concentration and coordination of expert opinions²⁶. The degree of concentration of expert opinion is expressed using the arithmetic average of the importance assigned to each item. The coefficient of variation (CV) and Kendall’s W were used to represent the degree of coordination of expert opinions. CV was used to describe the degree of variation of evaluation results on a single index, calculated by dividing the standard deviation by the mean. The smaller the CV value, the lower the dispersion of expert opinion on the project, showing that the experts have the same view on this item²⁷. At the end of each round of surveys, we retained entries with a mean value of > 4.0 and $CV < 0.25$ ^{28,29}.

Index weight

The mean and standard deviation were used for item importance. Hierarchical analysis was used to calculate the weights of the indicators, with a consistency ratio < 0.1 indicating a reasonable weight distribution; the more critical the evaluation indicators are, the greater the weight value.

Quality control

The following strict quality control measures we put in place to safeguard the scientific validity and effectiveness of the study:

1. The selection of experts was carried out in strict accordance with the inclusion criteria. To avoid potential bias in the study results due to an excessive number of experts with the same background³⁰, we also selected as many experts as possible from different research fields.
2. For the quality of the questionnaires filled out by experts, we contacted the experts in time to revise the incomplete or logical questionnaires, and the questionnaires with an error rate of more than 10% were regarded as invalid and were deleted.
3. Two researchers, who were trained in the entry and management process, including data entry procedures using Excel 2019, data management principles, data security protocols, and quality control measures, entered and cross-checked the data.

Results

Basic information of the experts

The experts came from five provinces and nine tertiary hospitals and institutions of higher education in China. Table 1 summarizes the basic information of the participating experts, such as gender, age, and work experience.

Positivity and authority coefficient of the experts

Initially, 19 experts were selected as corresponding experts, and finally, 18 experts participated. The Ca of the two rounds of expert consultation was 0.93 ± 0.04 , Cs was 0.87 ± 0.09 , and Cr was 0.90 ± 0.05 , of which $Cr > 0.7$, which indicates that the authority of experts was reliable.

Items		N (%)
Gender	Male	3 (16.67)
	Female	15 (83.33)
Age (Year)	30~	5 (27.78)
	40~	11 (61.11)
	50~	2 (11.11)
Field of study	Geriatric nursing	4 (22.22)
	Geriatric medicine	4 (22.22)
	Rehabilitation nursing	4 (22.22)
	Rehabilitation medicine	5 (27.78)
	Community nursing	1 (5.56)
Academic degree	Master's degree	12 (66.67)
	Ph.D. degree	6 (33.33)
Professional title	Deputy senior	14 (77.78)
	senior	4 (22.22)
Work experience	10~	1 (5.56)
	20~	6 (33.33)
	30~	11 (61.11)

Table 1. Profile of expert's information.

	Indicators (n)	Kendall's W	χ^2	P value
First round				
First-level dimensions	6	0.205	18.437	0.002
Second-level item	31	0.181	97.805	<0.001
Total	37	0.184	119.253	<0.001
Second round				
First-level dimensions	6	0.209	18.827	0.002
Second-level item	29	0.108	54.243	0.002
Total	35	0.121	74.080	<0.001

Table 2. Coordination results of expert opinion.

Reliability of the expert panel

The coordination coefficient (Kendall's W) scores for the two rounds of consultation are shown in Table 2, and the results indicate a high degree of consistency between the two rounds of opinions.

Formation process of the needs evaluation index system

Two rounds of consultation were conducted. Based on the results thereof, and the criteria for the selection of indicators, the research team adjusted the **evaluation list items** through discussion, finally reached a consensus.

In the first round of expert consultation, the experts did not comment on any changes or deletions to the first-level dimensions; therefore, these dimensions were retained. Among the secondary **list items**, four **items**, voice and speech functions, weight maintenance functions, movement functions, and carrying, moving, and handling objects, were deleted because their CVs exceeded 0.25. Two experts suggested adding an **item** for rehabilitation of proprioceptive functions to help older adults better maintain their sensory functions of sensing the relative positions of body parts; two experts suggested adding the need for rehabilitation of muscular endurance functions; and three experts suggested adding the indicator of the need for self-care. Two experts suggested combining joint mobility and stabilization indicators into one indicator—functions of the joints and bones. Finally, the experts also modified the expression of some specific entries, and based on these opinions, we formed the second round of expert consultation, and a total of six dimensions and 29 s-level items were included.

In the second round of expert consultation, the expert opinions were relatively uniform, and with no additional or deleted entries suggested; however, comments were made only on the order of the indicators and modifications to the expression of the **items**. The detailed content of the evaluation **lists** was enriched and improved through feedback from the two rounds of the Delphi study. The experts agreed on the indicator system and formed the demand evaluation indicator system, which included six first-level dimensions and 29 s-level **items**. The **list** revision process is shown in Table 3.

Index weight

AHP can analyze the subjective judgment of experts using mathematical forms and behaviors for multi-objective decision analysis of scientific processing to ensure the best results³¹. The AHP calculates the weights of the

Round	Total number of items (<i>n</i>)	Modified items (<i>n</i>)	Deleted items (<i>n</i>)	Added items (<i>n</i>)	Incorporation items (<i>n</i>)
First round					
First-level dimensions	6	0	0	0	0
Second-level item	31	6	4	3	1
Total					
Second round	6	0	0	0	0
First-level dimensions	29	2	0	0	0

Table 3. The process of items revision.

	Mean (SD)	CV	Weight	CR
1. Body function rehabilitation need			0.24	0.035
1.1 Vision and related functions	4.78 ± 0.43	0.09	0.13	0.038
1.2 Hearing and vestibular functions	4.72 ± 0.57	0.12	0.12	
1.3 Pain	4.22 ± 0.73	0.17	0.03	
1.4 Circulatory function	4.72 ± 0.46	0.10	0.12	
1.5 Functions of the respiratory system	4.67 ± 0.59	0.13	0.09	
1.6 Exercise tolerance function	4.56 ± 0.51	0.11	0.06	
1.7 Swallowing function	4.50 ± 0.62	0.14	0.06	
1.8 Defecation functions	4.67 ± 0.49	0.10	0.08	
1.9 Urination functions	4.67 ± 0.49	0.10	0.08	
1.10 Functions of the joints and bones	4.44 ± 0.62	0.12	0.04	
1.11 Muscle power functions	4.56 ± 0.51	0.14	0.07	
1.12 Muscle endurance functions	4.56 ± 0.51	0.11	0.07	
1.13 Proprioceptive function	4.50 ± 0.52	0.11	0.05	
2. Mental functions rehabilitation need			0.30	0.035
2.1 Cognitive function	4.83 ± 0.38	0.08	0.31	0.051
2.2 Sleep functions	4.56 ± 0.51	0.11	0.20	
2.3 Emotional functions	4.61 ± 0.50	0.11	0.49	
3. Individual activities rehabilitation need			0.14	0.035
3.1 Changing and maintaining body position functions	4.44 ± 0.51	0.12	0.30	0.009
3.2 Walking and moving functions	4.33 ± 0.49	0.11	0.54	
3.3 Self-care functions	4.61 ± 0.50	0.11	0.16	
4. Social participation need			0.18	0.035
4.1 Community life participation	4.66 ± 0.49	0.10	0.33	0
4.2 Recreation and leisure	4.56 ± 0.51	0.11	0.67	
5. Environment rehabilitation need			0.09	0.044
5.1 Use of assistive devices need	4.72 ± 0.46	0.10	0.45	0.027
5.2 Cultural and entertainment need	4.61 ± 0.50	0.11	0.26	
5.3 Community barrier-free environment transformation	4.39 ± 0.50	0.11	0.12	
5.4 Home barrier-free environment transformation	4.44 ± 0.62	0.14	0.17	
6. Rehabilitation information need			0.05	0.035
6.1 Social security and public service information	4.39 ± 0.61	0.14	0.27	0.027
6.2 Health-related information	4.50 ± 0.52	0.11	0.42	
6.3 Education and training information	4.28 ± 0.46	0.11	0.19	
6.4 Laws and policies protect relevant information	4.17 ± 0.62	0.15	0.12	

Table 4. Older adult CBR needs evaluation lists. SD, Standard deviation; CV, Coefficient of variation.

indicators based on expert opinion, and the consistency test of the indicators at each level yields a $CR < 0.10$, indicating that the judgment matrix is within an acceptable range. According to the AHP results, the weights of the six dimensions from the most to least common were as follows: mental function rehabilitation need (0.30), body function rehabilitation need (0.24), social participation need (0.18), individual activity rehabilitation need (0.14), environmental rehabilitation need (0.09), and rehabilitation information need (0.05) (Table 4).

Discussion

Accurate evaluation and intervention services in CBR for older adults can maximize the maintenance or restoration of their psychological, physical, and social functions. Therefore, understanding their needs and establishing a standardized evaluation tool is essential to manage CBR for older adults in a more personalized manner. We propose a unified assessment tool based on the ICF, encompassing physical and psychological functions, social participation, individual activities, environmental rehabilitation, and access to information. This tool enables health service providers to systematically, structurally, and normatively assess the needs of older adults in community-based rehabilitation and assists public health administrators in prioritizing areas for investment in CBR.

We utilized a two-round Delphi method to finalize the dimensions and indicators of the evaluation tool. Over 15 experts participated in the survey, meeting the recommended expert panel size for Delphi studies¹⁹. The CR of the experts was 0.90 ± 0.05 , meeting the ≥ 0.7 criterion suggested by Collier et al.³², indicating high authority and reliability of the expert survey results. Items with mean expert ratings above 4.0 and a CV below 0.25 were retained, aligning with Delphi method retention criteria³³. Although the expert agreement levels did not improve significantly after two rounds of consultation, the decision to discontinue further rounds was based on two factors: no suggestions from experts to add or delete items after the second round, and statistical analyses confirming that the expert agreements passed the consistency test. The absence of significant improvement in agreement may be attributed to introducing new items in the second round and a deeper understanding by the experts, who may have applied more stringent assessment criteria. However, these factors do not diminish the scientific validity of the study.

According to the expert preferences, mental function rehabilitation needs were weighted the most at 30% of the six evaluation dimensions used to evaluate older adult CBR needs. Within this dimension, emotional functions were weighted 0.49, accounting for the highest proportion, followed by the proportion of cognitive function (0.31) and sleep functions (0.20). With the rise of modern health concepts, concern for health is no longer limited to bodily functioning health but has expanded to the overall health of mental and social functions. In this study, our experts believed that the rehabilitation of mental functions is more important for older people than body functions. Compared to other groups, older people not only have to address aging but also the accompanying increase in psychological distress, social isolation, and loneliness^{1,34}. These factors contribute to the increasing incidence of depression, self-neglect, cognitive impairment, and mental disorders in the older population^{35,36}, in addition to the global burden of disease data, which shows that suicide rates are higher among older people than among younger people³⁷. Therefore, in CBR, we must place a high priority on mental health rehabilitation for older people to help them reduce the incidence of mental illness and maintain the highest possible quality of life by increasing social support and facilitating community integration. At the same time, social participation need, which is linked to mental health rehabilitation, was ranked third (0.18) out of the six indicators, indicating that the focus of our CBR is to improve the quality of rehabilitation and living standards of older people through effective interventions that provide equal opportunities and inclusive development for older people, and through effective community integration.

In the opinion of our experts, the body function rehabilitation need is second only to the mental functions rehabilitation need. Body function rehabilitation is also one of the most important aspects of existing rehabilitation for health administrators. However, as a developing country, China's health resources are relatively scarce, and there is often a lack of professional rehabilitation therapists and rehabilitation equipment in CBR, resulting in less than satisfactory functional rehabilitation results at the community level³⁸. The Chinese government has recognized the importance of training CBR personnel and has vowed to address this issue. However, for most developing countries, the lack of specialized rehabilitation personnel to provide physical functioning rehabilitation physiotherapy, occupational therapy, and other services for older persons at the community level is a challenge. Therefore, how to effectively utilize the available resources to better provide professional rehabilitation guidance to older adults in conjunction with their needs has become an issue for health managers to consider.

The emergence of digital health technology offers the possibility of solving this problem, through which we can not only continuously and dynamically detect the rehabilitation-related indicators of older adults but also provide professional services to older adults through remote video guidance and other forms to make up for the lack of professionals in the community, which could be a promising direction of service provision in the future³⁹. In addition, body function rehabilitation also correlates with the rehabilitation needs of individual activities, which was ranked fourth by importance. Effective body functioning can safeguard individual activities, which suggests that we need to pay attention to individual activities and to body function rehabilitation. These two indicators are interrelated and affect each other, which is an essential reflection of the quality of life of older people.

Rehabilitation is not a single process but an interaction between the human body and the environment; a favorable environment allows older people to maintain their physical vitality better and reduce the incidence of disease and disability¹. The indicators of environmental rehabilitation need (0.09) and rehabilitation information need (0.05) ranked fifth and sixth among all six indicators. Among the environmental rehabilitation needs, the need for the use of assistive devices has the highest weighting (0.45), followed by cultural and recreational needs (0.26), home accessibility modification (0.17) and community accessibility modification (0.12). This shows that, in CBR, we need to provide a suitable rehabilitation environment for older people in several dimensions; first, by providing them with suitable assistive devices, including personal medical aids, orthotics, and prosthetics, to maintain their abilities and comfort related to their daily activities⁴⁰; second, community health managers need to adapt the public spaces in their neighborhoods according to the actual situation of the older adults in the neighborhoods⁴¹. Finally, public health managers need to suggest modifications to the home environments of older adults based on their actual situation to improve the accessibility and practicality of their rehabilitation in

the home environment and to maintain their mobility and safety in the home. In the rehabilitation information need, experts stated that the most important was to understand the need of older people for health-related information in CBR. Correct and effective rehabilitation information can improve older people's understanding of their illnesses, rehabilitation measures, and policies and help them recognize how they can get the right help when they need it.

In addition, we must recognize a critical phenomenon: older people are no longer lacking information, but have access to too much information compared to those 10 years ago. The significant development of internet technology and the infodemic phenomenon during the COVID-19 pandemic reminded public health managers of false or misleading information, which poses a severe threat to effective public health⁴². Moreover, effective interventions can reduce the likelihood of individuals being persuaded by or sharing false information with others^{43,44}. Therefore, we need to understand what knowledge older adults need in CBR and provide them with accurate knowledge that, by increasing their knowledge base and cognitive change, will, in turn, facilitate their full rehabilitation and integration at the community level.

Limitations

This study has several limitations. First, only 18 experts participated in the Delphi survey due to time and interpersonal constraints. Although this number of experts and the authority of the chosen experts are acceptable, they are still not representative of the entire population of experts in geriatric CBR-related research. However, we have tried to be as representative and professional as possible regarding geography and research areas. In addition, at this stage of this study, experts in related fields were selected to construct the assessment list; however, the validity and applicability of the list for older adults were not included in the test. Therefore, we will invite older adults to examine our results further and refine the assessment list in future studies.

Conclusions

The needs assessment list for CBR for older persons is an assistive tool designed to facilitate needs assessment for CBR for older persons. This tool covers six aspects, including physical, mental, environmental, and information dimensions, and can help community workers and medical personnel assess the state of needs of older people from a comprehensive perspective. This assessment list may help to investigate the needs and characteristics of older persons, develop individualized rehabilitation strategies, and improve the effectiveness and satisfaction of CBR for older persons.

Data availability

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

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Author contributions

Lei Xu, Ke Yang participated in writing the protocol, editing the manuscript, setting up the experiments, and obtaining the data. Caixiu Xue, Tingting Xiong, Xiaohui Xie and Jia Wang participated in test design, data analysis, and interpretation. Lianhong Wang conceived, designed, and approved the forthcoming edition of the manuscript, and agreed to be responsible for all aspects of the work to ensure that any issues with the accuracy or integrity of any part of the work were properly investigated and resolved. Lei Xu and Ke Yang contributed equally to this study, should be regarded as first joint authors.

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Declarations

Consent for publication

All participants will receive both oral and written information regarding how the findings will be reported. The study will be published after obtaining written informed consent from all participants.

Competing interests

The authors declare no competing interests.

Ethics statement

This study was performed in accordance with the 1964 Declaration of Helsinki and received the approval of the Medical Ethics Committee of the Affiliated Hospital of the Zunyi Medical University(KLL-2023-228). All participants were informed of the purpose of the study, voluntary participation, the right to withdraw from the study. The members of the expert panel gave written and verbal informed consent and their identity was kept anonymous.

Additional information

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