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ORIGINAL RESEARCH

Developing a Multi-Dimensional Health Index System for a General Occupational Population in the Light of Health Ecology Theory: A Delphi Study

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Background: The health status of the occupational population is critical to the development of countries and regions as it is the main force of social and economic development. However, there is a dearth of comprehensive and systematic indicators to evaluate the health of occupational groups. This study aimed to construct a multi-dimensional evaluation index system for the general population.

Methods: This study combined a literature review and initially established a multidimensional health system framework for the occupational population based on health ecology theory and then used two rounds of Delphi expert consultation to construct the final multidimensional health index system for the occupational population. Fifteen experts from related fields were selected for two rounds of Delphi expert consultation.

Results: The recovery rates of the two rounds of expert questionnaires were 100.00% and 93.33% respectively, the expert authority coefficient were 0.90, and the Kendall's coordination coefficients of the first and second level indexes were 0.32 and 0.42 ($P \geq 0.001$). The final index system includes four primary indicators (individual characteristics, health knowledge, health behavior, and health skills), 13 second-level indicators, and 41 third-level indicators; the weight coefficients of the four primary health dimensions are relatively close, and the "health knowledge" is slightly higher.

Conclusion: The multi-dimensional health index system of the occupational population established in this study is comprehensive and reasonable from the perspective of health ecology, which can provide a solid foundation for the further development of a comprehensive health status prediction model for the occupational population.

Keywords: health ecology, delphi method, multidimensional health, index system

Background

The occupational population, which makes up the majority of economic and social development in a nation, is essential for the rapid and high-quality growth of society, and its health is the labor force's insurance.[1] However, the physical and mental health of the current occupational population faces several risks and challenges.[2–6] According to reports, the morbidity and mortality of hypertension, diabetes, cardiovascular disease, and tumors among the current social and occupational groups are increasing annually,[3,7] becoming a high-risk group for chronic diseases. Additionally, they face unprecedented occupational stress and anxiety in the wake of the Corona Virus Disease 2019 epidemic. In contrast to children and the elderly, health risk factors faced by occupational groups show obvious multi-dimensional complexity, mainly in the occurrence of chronic diseases dominated by healthy lifestyle changes. In recent years, research on the health risk assessment and health management of occupational groups has stagnated. With the diversity of occupations and widespread rise and development of modern occupations, the original national health index system cannot accurately reflect and evaluate the health status of this group. Improving the health level of occupational people and promoting them to form a healthy lifestyle is an important measure to reduce the risk of future diseases and the economic burden on public health.

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Ecological theory was first incorporated into the field of health promotion by McLeroy in 1988[8] and was then widely used in the field of chronic disease management, becoming a new mode of public health practice. The theory of health ecology holds that health is the result of the interaction between individual and environmental factors, emphasizing the multilevel factors affecting individual health.[9,10] Individuals' biological characteristics, lifestyle and behavioral habits, interpersonal relationships, social culture, policy environment, and other factors.[11] Recently, it has become a significant theoretical basis for summarizing and guiding the practices of preventive medicine and public health.[12,13] Therefore, this theoretical model can be used to explain the occurrence and influencing factors of diseases in the occupational population to overcome the shortcomings of previous studies on single-level analysis of influencing factors. This is applicable to constructing a more systematic and comprehensive health index system, measuring and evaluating the health status of occupational populations in a timely manner, and optimizing the health management of occupational groups.

As a subjective and qualitative method, the Delphi method produces reliable results and draws unified Conclusions from sufficient data, which provides a strong foundation for identifying the key indicators used to construct a multi-dimensional health index system for occupational populations. At present, relatively little attention has been paid to the health index system for specific groups at home and abroad,[14–16] especially occupational groups. In this study, we constructed a comprehensive multi-dimensional health index system of the occupational population for the first time from the perspective of Health Ecology through a review of the literature and the Delphi method, combined with the physiological, psychological, and social characteristics of the general occupational population at the present stage. It provides an evaluation tool for comprehensively measuring the health status of the general occupational population as well as a scientific reference for relevant departments to formulate health policies and health strategies and measures.

Methods

Preliminary Establishment of a Multi-Dimensional Health Index System

The theory of health ecology emphasizes the interaction of behavior, society, environment, and psychology.[17,18] This explains the multiple elements that affect health, which can provide a theoretical basis for occupational populations to formulate targeted and multi-dimensional health intervention measures. The first, second, third, and fourth layers of the health ecology model (individual characteristics, behavioral characteristics, interpersonal networks, living, and working conditions) belong to near-end social factors, and the last layer (policy environment) is a distal social factor. Considering remote policy factors and other factors that are difficult to quantify, we classified the main factors affecting the health of the occupational population into four categories:

(I) Individual characteristics: age, sex, ethnicity, disease history, blood biochemical indicators, work ability, education level, and knowledge of medication.
(II) Psychological and behavioral Characteristics: Psychological conditions (depression, anxiety), lifestyle behavior (occupational health checkup cycle, diet, sleep and physical activity, smoking, alcohol consumption), and healthcare (nutritional supplements).
(III) Interpersonal network: Marital status, major life events, social adaptation, social and family support, and availability of medical services.
(IV) Living and working conditions: Income, working environment, occupational pressure, work intensity, and occupational health behaviors (daily first-aid skills, identification, and protection of occupational hazards).

We constructed a multi-dimensional health index system for occupational people based on the basic indicators screened by the health ecology theory through expert interviews and group discussions. It includes four dimensions (individual characteristics, health knowledge, health behavior, and health skills), 13 second-level indicators (occupational characteristics, mental health, nutrition and health care, lifestyle, etc), and 42 third-level indicators (occupational physical labor intensity, weekly working hours, health check-up cycle, etc), which were prepared for the next step of the Delphi expert consultation to establish and screen the final multi-dimensional health indicators.

Delphi Expert Consultation

Selection of Consultation Experts

In this qualitative study, the selection of experts played a pivotal role in constructing the index system using the Delphi method. We selected 15 experts from related fields for consultation, based on the principles of representation and authority.[14] The selected experts come from public health and preventive medicine, health management, social and health management, public health and other related fields. Experts were chosen based on the following criteria: (I) bachelor's degree or above; (II) intermediate-level certificate above; (III) specialists who have been engaged in health management, public health, and health services for five years and above; and (IV) voluntary participation.

Letter Questionnaire Design

The questionnaire consisted of four parts: (I) Letter to experts: a brief introduction to the current situation of multi-dimensional health research in the occupational population, the purpose of this study, and the description of filling in the form. (II) Basic information questionnaire: gender, occupational title, educational Background, occupational direction, work unit, and number of years. (III) Expert evaluation form: A scoring table was designed according to the importance, scientificalness, feasibility, and classification rationality of each index based on the conceptual framework of the preliminary occupational population multi-dimensional health index system. Each index was assigned according to Likert 5 component table method,[15,16] in addition, set up the "revision opinions" column to fill in the expert modification suggestions. (IV) questionnaire on familiarity (Ca) and judgement basis (CS): Ca is the expert's familiarity with the problem, which set five levels of "Very familiar", "Familiar", "General familiarity", "Not very familiar" and "Unfamiliar", with values of 0.9, 0.7, 0.5, 0.3 and 0.1, respectively.[17] Ca is an expert's familiarity with the problem and is divided into four dimensions,[18,19] which are divided into three levels according to their degree of influence: large, medium, and small (Table 1).

Expert Letter Inquiry

Our researchers conducted a total of two rounds of the Delphi survey by e-mail, WeChat, each of which continued for 1.5-month for a total of 3-month (July 15, 2022, to October 15, 2022). During the investigation process, no alternate experts were set up and no new experts were entered. The first round of expert consultation was mainly to consult and propose amendments to the overall design dimension and feasibility of the health index system, including scoring and proposing opinions on the importance, scientificalness, feasibility, and rationality of classification of each dimension index (Appendix 1).

After collating and summarizing the results in round 1, we sorted the content items in the index system one by one and formulated the score table of the second round of expert consultation according to the group discussion and proposals of the expert panel (Appendix 2). Finally, we built the final occupational population multi-dimensional health index system based on the second-round scores.

Data Analysis

We used SPSS software (version 26.0) for statistical analysis, and the reliability and representativeness of expert consultation results were analyzed and tested by degree of expert positive, authority degree, and coordination degree. Descriptive analysis was expressed as mean, standard deviation, and variable coefficient ($P < 0.05$).

Table 1 Quantitative Self-Evaluation Scores Cs

Judgement Basis (Cs)	Degree of Influence on Expert Judgment		
	Large	Medium	Small
Theoretical analysis	0.3	0.2	0.1
Practical experience	0.5	0.4	0.3
Understanding of relevant progress at home and abroad	0.1	0.1	0.1
Subjectivity	0.1	0.1	0.1

(I) The positive degree of experts: expressed by the positive coefficient of experts,[20–22] that is, the return rate of the questionnaire, the higher the return rate, the higher the importance and enthusiasm of the corresponding experts on this research topic. It is generally considered good if the response rate to expert inquiries is > 70%.

(II) Degree of authority of the expert: This is represented by the authority coefficient (Cr), which reflects the authority of experts on research issues and is determined by Cs and Ca.[18,23] It is generally believed that Cr ≥0.7 is considered acceptable.

$$Cr = (Ca + Cs)/2 \tag{1}$$

(III) Expert coordination coefficient: This refers to the coordination degree of experts' opinions on all dimension items of the index system, expressed by the coordination coefficient W.[16,20] The value range of W is between 0 and 1, and the larger W is, the better the coordination degree of experts on all plans, which is; W has statistically significant after testing ($P<0.05$), indicating that the coordination of expert scoring opinions is good. Otherwise, it can be considered that the reliability of expert scoring is poor, and the result is unacceptable.

(IV) Index weight calculation: The Delphi method was used to calculate the weight distribution coefficient of each dimension index[24] based on the importance score of the second-round experts.

$$w_j = \frac{\bar{x}_j}{\sum_{j=1}^{n} \bar{x}_j} \tag{2}$$

where $\bar{X}_j$ represents the average value of the expert score for the importance of index j.

Results

Characteristics of Experts

The 15 experts who participated in our study came from 11 institutions, including the scientific research institutions of colleges and universities, comprehensive tertiary hospitals, and health administration systems (Table 2). These experts covered the occupational fields of public health and preventive medicine, nursing, health economy, social medicine and health management, rehabilitation medicine and so on. Their average age was 49.33 (SD 7.79) years old. Their average working years were 21.93 (SD 10.76) years.

Positive Degree of Experts

We conducted two rounds of expert consultation to assess the positive degree of the experts, based on the return rate of the questionnaires. In the two rounds of questionnaire consultation, one expert failed to give timely feedback. In the first round, 15 questionnaires were sent out and 15 were recovered, with an effective recovery rate of 100.00%; in the second round, 15 questionnaires were sent out and 14 were recovered, with an effective recovery rate of 93.33%. In the consultation process, the questionnaire opinion extraction rate reached 93.33%, and many pertinent opinions were proposed on the design and connotation of the index system.

Expert Authority Coefficient and the Degree of Opinion Coordination

The research Results show that 6 experts are "Very familiar", 7 experts are "Familiar", 2 experts are "General familiarity". In the expert consultation, the expert authority coefficient (Cr)) was 0.90, which met the criteria of expert consultation authority coefficient > 0.7, indicating that the experts selected in this study were representative and authoritative. Kendall's coordination coefficients for the score importance, scientificalness, feasibility, and rationality of classification were 0.42, 0.32, 0.30, and 0.28, respectively, in the second round of expert consultation (Table 3). The Kendall's test results were statistically significant (all $P<0.001$).

Table 2 Demographic Information of Experts

Categories	Project	Frequency (N)	Proportion (%)
Gender	Male	10	66.67
	Female	5	33.33
Age (years)	30~	1	6.67
	40~	9	60.00
	50~	3	20.00
	60~	2	13.33
Degree	Undergraduate	2	13.33
	Master	3	20.00
	Doctor	10	66.67
Title	Associate senior level	3	20.00
	Senior level	9	60.00
	other	3	20.00
Institution	hospital	2	13.33
	university	10	66.67
	Health Commission/Research Institute	3	20.00
Research field	Public health/Preventive healthcare	4	26.67
	Social Medicine and Health Management	4	26.67
	Health policies and services	3	20.00
	Occupational health	4	26.67
Work years (years)	Less than 10 years	2	13.33
	10~	6	40.00
	20~	3	20.00
	30~	4	26.67

Table 3 Coordination Coefficient (ω) of Expert Opinions and Test Results

Project	Rounds	Indicators	ω	χ^2	P
Importance	First round	59	0.32	275.52	<0.001
	Second round	58	0.42	334.99	<0.001
Feasibility	First round	59	0.20	165.84	<0.001
	Second round	58	0.32	255.75	<0.001
Scientificalness	First round	59	0.21	180.71	<0.001
	Second round	58	0.30	237.77	<0.001
Classification rationality	First round	59	0.22	189.78	<0.001
	Second round	58	0.28	220.57	<0.001

The Multi-Dimensional Health Evaluation Index System for Occupational Population

In the first round of expert consultation, the experts evaluated the importance, feasibility, science, and classification rationality of all levels of indicators (1–5 points) from which the mean, standard deviation, and coefficient of variation of all levels of indicators were obtained. In this round of expert consultation, most experts provided detailed opinions and suggestions for the index system. The members of the research group further screened and improved the index system based on their expert opinions and scores.

In the first round, the research team amended 16 indicators, removed 14, and added 13 indicators. The second round of expert consultations did not delete or modify indicators. Therefore, the final index system for occupational groups included 4 first-level indicators, 13 second-level indicators, and 41 third-level indicators. According to the results of the two rounds of expert consultation, we used the formula to calculate the weight distribution of the indicators in each dimension (Formula 2). First-level indicators included individual characteristics, health knowledge, health behavior, and health skills. In terms of weight, health knowledge had the highest weight (0.256), followed by individual characteristics (0.252), health behavior (0.248), and health skills (0.244) had the smallest weight (Table 4).

Table 4 Multi-Dimensional Health Index System of Occupational Population

Index Level	Mean ±Standard deviation	Variable Coefficient	Weighting Targets	Combination Weighting Targets
1. Individual characteristics	4.79±0.43	0.089	0.252	–
1.1 Occupational trait	4.79±0.43	0.089	0.263	0.079
1.1.1 Level of manual labor	3.93±0.62	0.157	0.311	0.022
1.1.2 Working hours per week	4.00±0.56	0.139	0.316	0.022
1.1.3 Working conditions and environment	4.71±0.61	0.130	0.373	0.026
1.2 History of chronic non-communicable diseases	3.71±0.61	0.165	0.204	0.061
1.2.1 Individuals with chronic diseases	4.64±0.63	0.136	0.546	0.025
1.2.2 Immediate family members suffering from chronic diseases	3.86±0.66	0.172	0.454	0.021
1.3 Routine physiological indexes	4.93±0.27	0.054	0.271	0.081
1.3.1 Body mass index (BMI)	4.21±0.58	0.138	0.229	0.023
1.3.2 Blood lipid and blood glucose level	4.79±0.43	0.089	0.260	0.026
1.3.3 Uric acid level	4.71±0.47	0.100	0.256	0.026
1.3.4 Imaging index of neck	4.71±0.47	0.100	0.256	0.026
1.4 Mental health status	4.79±0.43	0.089	0.263	0.079
1.4.1 Anxiety	4.71±0.47	0.100	0.545	0.026
1.4.2 Depression	3.93±0.62	0.157	0.455	0.022
2. Health knowledge	4.86±0.36	0.075	0.256	–
2.1 General medical knowledge	4.86±0.36	0.075	0.340	0.080
2.1.1 Normal body temperature range	4.79±0.43	0.089	0.368	0.026
2.1.2 Normal blood pressure	4.07±0.62	0.151	0.313	0.022
2.1.3 Normal heart rate	4.14±0.66	0.160	0.318	0.023
2.2 Basic knowledge of drug use	4.64±0.50	0.107	0.325	0.077
2.2.1 Principles and precautions of medication for hypertension	4.14±0.77	0.186	0.234	0.023
2.2.2 Principles and precautions of diabetes medication	4.79±0.43	0.089	0.270	0.026
2.2.3 Principles and precautions of antibiotic medication	4.79±0.43	0.089	0.270	0.026
2.2.4 Medication principles and precautions of antipyretic and analgesic drugs	4.00±0.68	0.170	0.226	0.022
2.3 Occupational health knowledge	4.79±0.43	0.089	0.335	0.079
2.3.1 Types of occupational hazards	3.86±0.54	0.139	0.291	0.021
2.3.2 Prevention and control measures of common occupational diseases	4.71±0.47	0.100	0.355	0.026
2.3.3 Handling of sudden injury incidents	4.71±0.47	0.100	0.355	0.026
3. Healthy behavior	4.71±0.47	0.100	0.248	–
3.1 Life style	4.71±0.47	0.100	0.345	0.078
3.1.1 Eating habits	4.07±0.62	0.151	0.223	0.022
3.1.2 Smoking and drinking	4.79±0.43	0.089	0.262	0.026
3.1.3 Physical activity	4.71±0.47	0.100	0.258	0.026
3.1.4 Sleep quality	4.71±0.47	0.100	0.258	0.026
3.2 Medical and health care	4.07±0.48	0.117	0.298	0.067
3.2.1 Regular occupational health check-up	4.93±0.27	0.054	0.361	0.027
3.2.2 Use of nutritional supplements	4.64±0.50	0.107	0.340	0.025
3.2.3 Accessibility of medical services	4.07±0.62	0.151	0.298	0.022
3.3 Social adaptation	4.86±0.36	0.075	0.356	0.080
3.3.1 Stress event	4.86±0.36	0.075	0.360	0.027
3.3.2 Occupational stress	3.93±0.48	0.121	0.291	0.022
3.3.3 Social and family support	4.71±0.47	0.100	0.349	0.026
4. Health skills	4.64±0.50	0.107	0.244	–
4.1 Daily first aid skills	4.86±0.36	0.075	0.337	0.080
4.1.1 Disposal of local burns and scalds	4.07±0.62	0.151	0.183	0.022
4.1.2 Disposal of airway foreign body obstruction	4.86±0.36	0.075	0.218	0.027
4.1.3 Disposal of food poisoning	4.71±0.47	0.100	0.211	0.026

(*Continued*)

Table 4 (Continued).

Index Level	Mean ±Standard deviation	Variable Coefficient	Weighting Targets	Combination Weighting Targets
4.1.4 Disposal of outdoor heatstroke	3.86±0.66	0.172	0.173	0.021
4.1.5 Disposal of indoor fire	4.79±0.43	0.089	0.215	0.026
4.2 Identification and protection of occupational hazards	4.71±0.47	0.100	0.326	0.078
4.2.1 Ability to recognize hazards in the work environment	4.14±0.77	0.186	0.310	0.023
4.2.2 Ability to avoid or mitigate occupational hazards	4.57±0.51	0.112	0.342	0.025
4.2.3 Correct use of occupational protective equipment	4.64±0.50	0.107	0.348	0.025
4.3 Self-management	4.86±0.36	0.075	0.337	0.080
4.3.1 Disease surveillance	4.57±0.51	0.112	0.492	0.025
4.3.2 Daily diet collocation	4.71±0.61	0.130	0.508	0.026

Discussion

Health refers to physical, mental, and social adaptability.[25] A single health index cannot comprehensively reflect and measure the health status of the occupational population, and a series of indicators covering all dimensions of the health of the occupational population are needed. The theory of health ecology highlights its rationality and applicability. Therefore, we constructed a multi-dimensional health index system covering the health of general occupational people from the perspective of health ecology for the first time, combined with a literature review to overcome the previous single national index system, which is difficult to measure.

The Delphi method has been widely used in the construction of index systems, and the academic community has reached consensus on its effectiveness and rationality.[26–28] This study applied the Delphi method to explore the multi-dimensional health index system of the occupational population, which is a useful attempt and exploration for the comprehensive evaluation of health education and health promotion in the general occupational population. We invited 15 experts in relevant health fields who were deputy seniors or older to conduct two rounds of Delphi expert consultation, and the number of experts was relatively reasonable.[28] The positive coefficients of the two rounds of expert consultation were 100% and 90%, respectively, which shows that the experts were interested in this research and generally had a high participation enthusiasm. It is generally believed that the authority coefficient of experts is greater than 70% and this study is reliable.[29] The authority coefficient of the experts consulted in this study was 0.90, which can be considered relatively authoritative and representative. After two rounds of Delphi consultation, the coordination coefficients of the importance, scientificalness, feasibility, and classification rationality of the indicators at all levels increased, and the differences were statistically significant, indicating that the degree of coordination of expert opinions was relatively high and the opinions were gradually unified.

In the first round of consultation, many experts put forward suggestions on the modification of indicators, including the specialization of terms and ways to more accurately determine the scope of conditions, which resulted in deleted, added, and adjusted indicators. In the first round, we added secondary indicators “Occupational Health knowledge” and “Occupational Hazard Identification and Protection”, deleted “health belief”, and “demographic characteristics”, and adjusted the description and evaluation Methods of some indicators. In the process of revising and adjusting the index system, the occupational health index system was constantly improved to comprehensively and systematically reflect and measure the multi-dimensional health status of the professional population. This system covers the important links of population health management in the three-level prevention of diseases, such as individual physiology, psychology, occupational health knowledge, lifestyle habits, the social environment, and health skills. It also reflects the multi-level and complexity of the influence of environment on individuals in the theory of health ecology. The weight coefficients of “individual characteristics”, “health knowledge”, “health behavior” and “health skill” are 0.252, 0.256, 0.248 and 0.244 respectively. Under the four dimensions, the weight coefficients were relatively close, and the “health knowledge” was slightly higher. However, health knowledge cannot be ignored in this context. Whether it is the physical health level of

the individual, mastery of health knowledge, cultivation of behavioral habits, and cultivation of occupational skills are all indispensable parts of the health system of the occupational population.

Health evaluation indicator tools are often used to predict disease risks, assess comprehensive national development, health systems, medical care and other comprehensive conditions.[30–32] Domestic and foreign research on health indicators widely focuses on children, women, children, the elderly, etc.[10,12,33,34] This study constructs a health indicator system from the perspective of occupational population health, filling the gap in this research field. Compared with previous studies, this study starts from the health characteristics of occupational individuals and adds occupational-related health knowledge based on ecological theory, such as occupational health knowledge, basic occupational health skills, work stress and other indicators, which to a certain extent innovates previous studies. From the perspective of physical health as the main health criterion, this study shows that both mental health and physical health are extremely important, followed by social adaptation, medical security level, interpersonal communication and other external environments that cannot be ignored.

We constructed a multi-dimensional health index system of the general occupational population, which included four first-level indicators, 13 second-level indicators, and 41 third-level indicators, and calculated the weight values of all levels of indicators. The index system has good reliability and can be used to comprehensively measure and reflect the multi-dimensional health status of occupational groups to a certain extent and guide individuals of occupational groups to form a healthy lifestyle. At the same time, it helps decision makers notice the changes in the health needs of the population, formulate scientific and effective health management and intervention measures, evaluate their effects, and help my country formulate multi-dimensional health evaluation index models for general occupational groups, health intervention measures, and medical and health institutions. Rationally allocating public health resources and providing scientific references.

However, this study has some limitations. The multi-dimensional index system of the occupational population constructed in this study is still in the exploratory stage only for the general occupational population and does not include special types of work. In addition, the selection and setting of system indicators cannot completely exclude the influence of subjective factors. To make the evaluation index more objective and scientific, it is also necessary to verify, screen, and apply the determined health index in further measurements to objectively, truly, and accurately reflect and evaluate the health status of the general occupational population in practical applications. This will be the focus of future research.

Conclusions

The multi-dimensional health index system of the general occupational population established in this study is comprehensive, reliable, and reasonable and can provide a theoretical basis for the further establishment of a comprehensive health evaluation prediction model for occupational populations. At the same time, we will add this part to future research, put the index system into practice and application, and continue to modify and improve it.

Data Sharing Statement

The datasets generated and analyzed during the current study are not publicly available because of privacy concerns but are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Zhoup Research Project of the Clinical Research Center of Shanghai Health Medical University Hospital of Shanghai Pudong New Area (No.2022-C-068-E01). Informed consent was obtained from all participants included in the study. They were assured that their data would remain confidential.

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The manuscript is also available on Research Square as a preprint which has not been peer reviewed by a journal. (https://www.researchsquare.com/article/rs-3110032/v1).

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; Xiaoling Zhou, Jing Wu, Ying Liu, Yuzhong Yan, Geyao Zhou and Ming Li part in drafting, revising or critically reviewing the article; Yuzhong Yan, Ming Li, Geyao Zhou, Xiaoling Zhou, Jing Wu and Ying Liu gave final approval of the version to be published; Xiaoling Zhou and Yuzhong Yan, Jing Wu, Ying Liu, Geyao Zhou and Ming Li have agreed on the journal to which the article has been submitted; Ming Li, Geyao Zhou, Xiaoling Zhou, Jing Wu, Ying Liu and Yuzhong Yan agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no competing interests in this work.

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