Abstract: Based on the multi-level model of Fuzzy mathematics, this paper designs a set of teaching rehabilitation training suitable for patients and applies it to teaching courses to improve their understanding of comprehensive functions and provide reference for future online teaching. In terms of curriculum structure, this paper uses Fuzzy analysis method and literature analysis method. Based on the literature, this paper discusses the training module, training theme, training content, training time and training mode. Summarize and organize the consultant's opinions, and finally formulate the training program. According to the teaching syllabus of comprehensive rehabilitation nursing, teaching courseware was prepared, teachers conducted teaching demonstrations and recorded them as high-definition videos, and then cloud classroom teaching platform was built to teach community nurses. In terms of teaching practice, this subject took the tertiary medical institutions as the object, and investigated and evaluated the qualified primary care staff. Before training, the Fuzzy mathematics multi-level knowledge questionnaire, pulmonary rehabilitation knowledge questionnaire, pulmonary rehabilitation attitude, behavioral intention and self-efficacy scale were used to investigate the nursing staff. After completion, the methods were used to investigate the nursing staff, and the different degrees of nursing effects were compared. Finally, a self-designed questionnaire was used to investigate the nursing staff to understand the comprehensive evaluation of satisfaction degree of nursing courses.

Keywords: fuzzy mathematics; multi-level; comprehensive assessment; nursing curriculum; teaching quality

I. INTRODUCTION

Fuzzy pattern is the most commonly used mathematical multi-level comprehensive analysis mode. The Fuzzy model is established in the technology Research center of Florida State University [1]. It was originally designed and developed for the combat system of the American army, and then popularized in the online teaching project. The multi-level model of Fuzzy mathematics is divided into five parts: analysis, design, development, implementation, evaluation. The whole process of Fuzzy mode is centered on evaluation, and the implementation of each link is based on the learning of the previous phase, which can be repeated and fed back. The purpose of Fuzzy model is to create specific learning results and behaviors, and to systematically study the learning needs of students, the formulation and development of courses, the implementation and evaluation of training programs, etc [2]. Fuzzy model has been widely used in nursing education all over the world, and its teaching effect is obvious [3]. Therefore, based on the Fuzzy mathematics multi-level model, this paper designs the teaching nursing program, and uses the APP platform for online teaching. The purpose is to strengthen the knowledge and technical training of pulmonary function recovery for community nurses, so as to improve their understanding and confidence in pulmonary function recovery, and then promote the implementation of the program. At the same time, the practice through the network platform can effectively promote the sharing of resources of community nursing staff, save teaching costs, relieve students' learning pressure, enrich the training of teachers and other aspects of the work, and lay a foundation for the continuing education of nursing staff in the future [4].

As China's healthcare reform continues to progress, there is a growing need for qualified nurses and stricter guidelines have been proposed for the development of the nursing workforce [5]. Especially in the wake of the COVID-19 pneumonia pandemic, people of all walks of life began paying more attention to the state of nursing staff construction in China, which in turn prompted serious consideration of the state of advanced nursing education in the country. The function of registered nurses in ensuring the health of the global population is crucial. The report estimates that there are around 28 million nurses in the world; this number includes 19.3 million registered nurses,
6 million assistant professional nurses, and the remaining unclassified nurses. By 2030, the world will need 36 million nurses to address the needs of every person on Earth, despite the fact that the nursing shortfall has decreased from an estimated 6.6 million in 2016 to roughly 6 million in 2018 [6].

In China, it is not uncommon to see a scarcity in the number of available nurses. Increasing the number of highly qualified graduate students entering the nursing profession is one approach to the problem of a shortage of nursing talent. Postgraduate students, as Blass [7] demonstrated, are the single most important group in terms of their potential future impact on the advancement of knowledge. The results of a study suggested that better patient outcomes could be achieved by increasing the number of nurses with master's degrees. Master nurses are said to be able to give a higher standard of professional care.[8] More likely than not, it will become a driving force in advancing clinical nursing practice. In hospitals where more nurses have bachelor's degrees or higher, surgical patient mortality and failure-to-rescue rates are lower. This demonstrates that the promise of nursing specialty can be realized via the cultivation of professional and personal traits attained through completion of a master's degree program.

Most nurses in industrialized nations with a doctorate or master's degree work as clinical nurse specialists, nurse anesthetists, nurse midwives, or nurse practitioners. The evaluation systems of postgraduate education in Britain, France, and the United States are typical examples of the type because they began early, developed relatively well in training methods and curriculum, and have their own unique characteristics [9]. Different countries place emphasis on different aspects of evaluating education quality; for example, the United States places a premium on social evaluation, while Britain prioritizes the dual evaluation of government and universities and the active participation of society, and France prioritizes government evaluation. The evaluation methods of education quality are enriched and developed thanks to the contributions of foreign scholars who, for example, apply the concept of service quality, total quality management, Six Sigma management, Koch four evaluation models, etc., to the evaluation of education quality. Scholars traditionally established evaluation indicators after conducting in-depth analyses of educational expenditures, procedures, and outcomes, with classroom teachers and their methods of instruction serving as primary foci of attention [10]. These days, international educators place a greater emphasis on the development of assessment indicators that are student-centered and the incorporation of students' evaluations into evaluation activities. Students' participation in quality assessment helps educators identify issues in the learning process from students' points of view and propose solutions that address those concerns.

Evaluation of the quality of Chinese graduate education: historical context and current practices. In 1980, China issued the Regulations of the People's Republic of China on Degree, and between 1985 and the present, the country has implemented an inspection and assessment system for the quality of degrees granted and has conducted a number of activities to assess the quality of graduate education [11]. This work is part of the "government evaluation mode" because it includes elements like an analysis of administrative examination and approval of key disciplines, a selection of outstanding dissertations, and an analysis of the running level of graduate schools and the total number of professional degree authorization points in different fields. The evaluation of the quality of postgraduate education in China has progressed since 1994, when the evaluation center of degree and postgraduate education in universities and research institutes in China was established. Since then, some non-governmental organizations, groups, and even individuals have begun participating in the comprehensive level evaluation of higher education and ranking the education quality of graduate schools in universities. Many problems persist in the evaluation of the quality of postgraduate education, which is still largely the purview of government agencies. These include a clumsy and complicated evaluation index, a plethora of evaluation items for school hardware and teachers' conditions, and a dearth of indicators for graduate students' ability. There are a few unbalanced quantitative and qualitative indicators, etc., in the appraisal process. Therefore, it is of the utmost importance to create a uniform and consistent criterion for evaluating the effectiveness of China's nursing research education quality index system [12].

The content of the training plan includes training objectives, training content, training methods, training time and evaluation methods. According to the working characteristics of nursing staff, what needs to be learned and what needs to be understood are divided into different parts [13]. The main purpose of the training is to aim at the basic knowledge of pulmonary rehabilitation, nursing assessment knowledge, pulmonary rehabilitation training methods, health education and the efficacy evaluation of pulmonary rehabilitation treatment. The training method depends on the training content. This paper mainly adopts PPT teaching, homework demonstration and other forms, or mixed teaching, so that community nursing staff can better understand the essentials of comprehensive rehabilitation. The arrangement of training time should take into account the difficulty of training and the importance of training.
According to Fuzzy law, the initial training plan was revised, and an overall training plan for community nurses was formulated. At this stage, some effective teaching strategies need to be developed to promote the participation of community nursing staff. According to the characteristics of the network platform, a large number of teaching activities are designed, such as website link, teacher-student interaction, classroom test design, brainstorming, etc. This study mainly evaluated the pulmonary function rehabilitation knowledge, attitude, behavioral intention, self-efficacy, and satisfaction with online teaching. After the preliminary training plan is made, the Fuzzy method will be updated [14].

The multi-level research and development work of Fuzzy mathematics mainly includes: early teaching materials, the compilation of teaching tools, the production of teaching micro films, and the construction of teaching platforms. The training content mainly includes: selecting qualified teachers, preparing teaching materials for comprehensive rehabilitation, formulating micro-teaching software and making micro-videos. The micro-courseware of the lecture is presented in the form of PPT and uses the same teaching courseware template and organization: the teaching demonstration text is written by the teacher and recorded after repeated practice [15]. Use quick screen capture and video tools to capture miniature movies and edit them with audio and video software. "Cloud Class" is a new teaching platform for online teaching of comprehensive rehabilitation nursing courses, which can obtain the identity of students and teachers through the user's account. Before setting up this project, you need to go to the official website of the cloud classroom to learn how to set up online teaching. The development contents of the course are: creating classes, student management, class resources, team teaching, group plan management, question bank management, voting questionnaire and examination.

It is suggested that nursing rehabilitation nursing teaching should be carried out in tertiary public medical institutions, and the research objectives, methods and objectives should be comprehensively publicized to obtain the cooperation of patients. Community nursing staff participated in the learning of the class by class number. Sections of the course include watching videos, completing in-class tests, and participating in group discussions. Students are informed about their course content through regular weekly public sessions. To ensure the work efficiency of nursing staff in daily work, it is necessary to track and monitor the daily work of students, and adjust and optimize according to the opinions of students [16].

Evaluation is the final link of Fuzzy mathematics multi-level model, which runs through the whole process of teaching model, including two parts: formation evaluation and summary evaluation. The whole process of community nurses' participation in learning should be evaluated. The main contents of the evaluation are: the adaptability of online learning, the completion degree of online training plan, the participation degree of community nurses, etc., and the training plan should be revised and improved according to the evaluation effect [17]. Questionnaires and questionnaires were used to evaluate the teaching effectiveness and progress of nursing staff. The main contents of training project evaluation include: the view of online training, training satisfaction, and self-assessment of learning effect. The effectiveness of the training of community nursing staff was evaluated in terms of the changes in the awareness, attitude, behavioral intention and confidence of the nursing staff towards teaching and integrated rehabilitation after receiving the training.

**Contribution of this work is as follows**

- This research draws on the literature to explore training in terms of modules, topics, materials, duration, and delivery.
- Compile and sort the consultant's input, and then design the actual training. Comprehensive rehabilitation nursing courseware was developed, professors gave demonstrations that were filmed in high definition, and a cloud-based platform was created to educate nurses in the community.
- This course focused on the primary care providers in tertiary medical centers, conducting research and making assessments on their efficacy.
- The nursing staff was evaluated using a battery of pre-training instruments, including the Fuzzy mathematics multi-level knowledge questionnaire, the pulmonary rehabilitation knowledge questionnaire, the pulmonary rehabilitation attitude, behavioral intention, and self-efficacy scale.
- After the proposed method is completed, they were used to learn more about the nursing staff and to compare the various levels of nursing's impact.
- Finally, a self-designed questionnaire was used to survey the nursing faculty in order to collect data on their level of satisfaction with various aspects of nursing education.
Remaining paper is organized as follows: section 2 explains the related works of our present study; section 3 explains the proposed methodology of our paper; section 4 explains the results of our proposed model and finally section 5 concludes our work.

II. RELATED WORKS

One of the most important aspects of providing high-quality healthcare is ensuring that nurses have a top-notch education. To continue to provide the population with access to high-quality healthcare services, the health workforce must expand, improve, and be more evenly distributed among venues of care. In addition, nursing students need access to high-quality education and training in health service settings before they can enter the health workforce and provide direct care to patients. This is so that the students can gain experience in the theory and practice of providing quality services.

When it comes to adapting to the health care requirements of a growing population, nurses play a crucial role. Thus, investing in quality nursing education is essential to fulfill these demands [18]. The same healthcare reform concerns persist, notwithstanding the rapid evolution of nursing education. A scarcity of nurses, an aging professional workforce, and budget limits for nurse education are all problems that affect the nursing profession worldwide. Concerns were also raised that the notion of caring is not being adequately addressed in today's nursing curricula and may be forgotten in the years to come. Today's educational challenge is to help students acquire the dispositions, values, and habits of mind that will enable them to become independent learners who can adapt to new situations and continue to grow and improve. In addition to having a wide range of knowledge, pupils should be able to articulate it clearly, competently, and confidently. Students will be able to apply what they learn in the classroom to real-world situations if these objectives are met.

There are numerous external influences that affect nursing practice and nursing education. The evolution of both society and the healthcare system have had a lasting impact on the courses nurses must take. The American Association of Colleges of Nursing (AACN) (2012) noted how societal shifts, scientific developments, and the varying requirements of a diverse population all impact nursing practice and healthcare delivery in the modern era. Information management and the quality of nursing care are affected by recent technological discoveries and improvements. Nursing theory must be used critically to meet the needs of a population that is increasingly diverse in terms of age, culture, and way of life. Nursing graduates from modern nursing school programs must be able to master complicated information, manage a complex system of care, and use technology in order to effectively provide care to patients in today's healthcare environment. The profession of nursing is essential to maintaining a populace free from illness. Patients benefit more from nurses with advanced skills. Schools that provide postgraduate nursing education will thrive in the future, thus measuring the quality of their programs is essential. In order to build a system for evaluating the quality of postgraduate nursing education and to assign relative importance to various indicators, a survey of nursing educators was conducted. First, a literature review was conducted to determine the factors that would ultimately comprise the evaluation index system for educational quality. While this was going on, a Delphi questionnaire was developed, and a panel of 13 experts was enlisted to perform two rounds of evaluation. Analytic hierarchy process and percentage approaches were used to calculate the relative importance of each item. At last, we created a system for assessing the value of a graduate-level nursing education [15]. Four primary indicators, seventeen secondary indicators, and seventy-one tertiary indicators made up the evaluation system. First-level indicators are ordered as follows: "Input quality" (0.1273), "Process quality" (0.3111), "Output quality" (0.0846), and "Development quality" (0.4770), as determined by the weights generated using the analytic hierarchy approach. Professional advancement is a secondary indicator that receives the greatest focus from experts (0.3180). Third-level factors that are most important include workplace (0.2385), personal expectations matching (0.1272), and prospects for advancement (0.0795). Postgraduate nursing education's quality index is grounded in solid research, and its weights are fairly distributed. It is a useful instrument for judging the standard of graduate nursing programs.

Salsali, M. (2005) set out to investigate how Iranian nursing educators and students think teaching effectiveness should be measured in higher education. The study followed a descriptive exploratory format. The study's sample included 143 nurse educators from the nursing faculties of Tehran's three institutions, as well as 40 undergraduate and 30 graduate students from Tehran University [16]. Additionally, they conducted in-depth interviews with the deans of all three nursing schools. Deans of nursing schools were interviewed to get their take on evaluation policies and practices, and a questionnaire developed by the researchers was used to gauge how professors and mentees
viewed the evaluation of nurse educators' classroom performance. Parametric and nonparametric statistical tests were used to compare and contrast responses from the Iranian nurse educators and students, as well as to find areas of agreement and disagreement. Faculty evaluation has always played a significant role in university-based nursing programs, but it needs to be approached more analytically, objectively, and comprehensively to ensure that all nursing educators are treated fairly and to improve the teaching-learning process. Educators and students agreed that the key aims of the faculty assessment process should be systematic and continuous review and staff development. The end goal is to enhance nurse educators' ability to instruct their students.

Examining the practical implications of adopting an interactive online pedagogy in the field of nursing education. Our hospital's interns served as the study's subjects, and they were split evenly between the experimental and control groups. The experimental group employed video interactivity and other forms of communication technology to supplement instruction that was grounded in standard methods of delivering instruction online. Test scores and survey responses were used to evaluate the instructors. In general, students in the experimental group had a more positive impression of online instruction than those in the control group. Students in the experimental group performed better than their control group counterparts in areas such as teaching vivacity, synchronous guidance, sharing teaching resources, clearing of confusion in real time, and focus. The experimental group had much better test results than the control group [17]. Students' academic outcomes can be enhanced through the use of a video-based online teaching model that is engaging and interactive, aids in retention, provides for immediate clarification of any confusion, and facilitates the exchange of useful pedagogical materials.

The study and application of surgical nursing theory and practice are fundamental to the profession of nursing and get considerable emphasis in both academic and professional settings. As computing and big data continue to advance, a plethora of tools for keeping tabs on classroom efficiency have appeared. In this publication, M. He (2022) aims to do just that: use big data to investigate how best to improve the quality of surgical nurse education and training. The concept of taking surgical nursing teaching quality monitoring as the main content of the system is put forward, and based on this as user needs, a unified data platform-based surgical nursing teaching is constructed on the basis of extensive analysis of the research literature and the practice of surgical nursing teaching reform [18].

After first assessing the software requirements of the system, the quality monitoring system's software then constructs the overarching design scheme and system implementation scheme using the MVC (Model-View-Controller) triple architecture. The experimental results, when applied to surgical nursing students, demonstrate that teachers have stimulated the scientific research curiosity and inventive spirit of surgical nursing students, with the "stimulating students' innovative spirit" score fluctuating the most between 2019 and 2020. A big data-based platform for assessing the quality of surgical nursing education can greatly assist students in their pursuit of excellence in the field.

Purpose To analyze the efficacy of a newly developed hybrid form of nursing education. Class 2 Grade 2017 nursing students were chosen at random to participate in an observation group and Class 1 Grade 2017 students served as a control group in an experiment that used information technology to create a blended teaching mode. In the experimental group, instructors adopted a hybrid approach to instruction while those in the control group stuck to tried-and-true techniques. Think about how different methods of instruction work [19]. There were statistically significant differences between the observation group and the control group on measures of theoretical knowledge mastery, course choice degree, critical thinking capacity, and self-learning ability. When applied to the task of controlling an epidemic, blended learning based on IT not only boosts the quality and efficiency of instruction, but also helps rouse students about learning and encourages the development of their interpersonal and presentational skills.

Education for nurses cannot be separated from clinical instruction. Evaluations written by future nurses reveal what they think of this kind of instruction. This style of assessment was developed with the express purpose of enhancing the quality of teaching and learning. Since they are the primary recipients, students' perspectives on the instruction they receive are crucial, and they are increasingly seen as partners in the educational process. Therefore, Idrissi, Wissam's (2022) study aims to investigate and detail how students at Casablanca's Higher Institute of Nursing and Health Technology feel about their clinical experiences [20]. Here, the authors borrow from Knox and Mogan's (1985) framework for efficient clinical nursing education to offer a solution. Based on the data collected, it was determined that nurses had the greatest scores in the areas of teaching ability (4.611.62), nursing competence (4.61), personality (4.61), and interpersonal interaction (4.61). Students, however, ranked the evaluation section dead last (4.201.76). The Mann-Whitney test shows that there are no statistically significant differences between the two
groups of pupils, with \( p > 0.05 \) on all parameters. However, more research is required for definitive results, and the differences between the three groups should be emphasized in the classroom and in the tutoring session.

This qualitative research by Ghofrani M. (2022) identifies critical areas of a nursing school that should be measured to accurately reflect the school’s effectiveness from the perspective of its students, one of the most critical stakeholders in higher education. This research was carried out in a college of nursing and midwifery. Students at all levels of nursing education participated in the study. It was a case of convenient sampling. The students were briefed on the research's goals and methodologies before being extended an invitation to join the focus groups. There were four focus groups with a total of 27 participants. There were 13 distinct groups that were ultimately placed into one of three Donabedian model categories [21]. The criteria for people resources, equipment and facilities, and educational sectors made up the structural component. The process section included the following five sub-sections: workshops for students and staff, students' acquaintance with the institution's norms and plans, classroom instruction, student evaluations, and student and peer evaluations of faculty performance. And the outcome components included student self-evaluation data, graduate outcomes, student outcomes, survey data from students, and the effectiveness of affiliated medical centers. The writers can move forward based on the input of this crucial stakeholder group. Once we agree on what should be measured, we can select or create appropriate performance indicators for each of the established groups.

Evaluation is the lifeblood of any schooling system. It is of utmost importance in the field of nursing education to produce competent nurses. The primary purpose of this research was to learn more about teacher nurses' perspectives on student assessments in both clinical and academic contexts. In-depth, semi-structured interviews with 28 educators were conducted until a sufficient amount of information had been gathered. We used content analysis to look at the data. To conduct qualitative research, the researchers relied on the technique of continual comparison. The study's findings were reliable and consistent along all four dimensions of practicality, generalizability, stability, and verifiability. Three overarching themes emerged from the data analysis: feedback efficiency, collaborative evaluation, and the success of the implementation process. The results show that Iranian nursing educators’ conceptions of a fair and equitable efficient evaluation differ from what they have actually encountered in their professional lives. We found that accuracy evaluation has the potential to play a pivotal role in reshaping how nursing is typically taught and boosting students’ self-assurance in their ability to improve patient outcomes [22]. As a result of teachers’ attention to the influence they have on the nursing profession through the preparation of practitioners, data demonstrate that collaborative evaluation might affect students' professional competency before they join a clinical setting. We have reason to be concerned about the long-term validity and reliability of student evaluation in light of these findings.

III. RESEARCH METHODS

The multi-level rule of Fuzzy mathematics is a work plan for the proposed problem, and the content of the questionnaire is related to the selected group, and after many inquiries and feedback, a representative conclusion is finally drawn. Based on the Fuzzy method and relevant literature, this paper formulates the training plan of pulmonary function recovery nursing in teaching [23]. Fuzzy multi-level selection criteria: 1) engaged in community nursing, respiratory specialty, nursing education; 2) university or higher level; 3) 10 years or more work experience; 4) associate high or above professional and technical positions; 5) Have strong interest in the subject and are willing to participate in this survey. When there are 13 subjects, the credibility of the Fuzzy method will be improved, and when there are 13 subjects, B7 is an income node. For this purpose, 13 Fuzzy professional consultants are selected in this paper.

The research team included a master's supervisor, a head nurse, two nurses and four master's students. Counselors mainly undertake personnel and comprehensive work; The Social Care Officer is mainly responsible for organizing and encouraging social workers to participate in training; As head nurse and head nurse, respectively, they are primarily responsible for directing and controlling the use of training programs and teaching resources. Before starting the project, the project team went through several group meetings to discuss and decide on various aspects of the project [24-25]. It is assumed that, based on knowledge, experience and judgment, the decision-maker gives the set of pairwise preference relations between some or all alternatives as, where the symbol "" represents the preference relationship of the decision-maker to the alternatives, and means that the decision-maker thinks that the alternatives are not inferior as stated in equation (1)
Ω = \{(g, h) \mid A_g \succeq A_h (g, h = 1,2, \cdots, m) \} \succeq A_h A_g A_k T \quad \text{(1)}

The criterion weight vector is assumed to be known in advance, which needs to be further solved and determined in the decision-making process presented in equation (2)

\[ \omega = (\omega_1, \omega_2, \cdots, \omega_n)^T \quad \text{(2)} \]

The main decision-making process of LINMAP consists of the following steps:

Step 1 determine the set of alternatives and criteria, and give the evaluation value of alternatives with respect to criteria presented in equation (3)

\[ A = \{A_1, A_2, \cdots, A_m\}, C = \{C_1, C_2, \cdots, C_n\}, A_i \in A, C_j \in C \quad \text{(3)} \]

Step 2 decision makers, according to their knowledge, experience and sentenced to all or part of the solution is given two preference is set between the two stated in equation (4)

\[ \Omega = \{(g, h) \mid A_g \succeq A_n (g, h = 1,2, \cdots, m) \} \quad \text{(4)} \]

Step 3 Constructs the decision matrix and normalizes it as presented in equation (5)

\[ A = (a_{ij})_{m \times n}, R = (r_{ij})_{n \times n} \quad \text{(5)} \]

Step 4 Construct the linear programming model and solve it using the linear programming simplex method. With excellent solution for solution, and the positive ideal solution of weighted Euclidean distance square given in equation (6)

\[ r^+ = (r_1^+, r_2^+, \cdots, r_n^+)A^+S_1 = \sum_{j=1}^{n} \omega_j \left( d(r_{ij}, r_j^+) \right)^2 (j = 1,2,\cdots,n) \quad \text{(6)} \]

The decision maker constructs the consistency index based on the set of preference relations, which can be expressed as the following equation (7) and (8)

\[ \Omega = \{(g, h) \mid A_g \succeq A_h (g, h = 1,2, \cdots, m) \}\{(S_k - S_g)^+ \} \quad \text{(7)} \]

\[ (S_k - S_g)^+ = \begin{cases} S_h - S_g \\ 0 \end{cases} \quad \text{(8)} \]

Therefore, the overall consistency index of decision makers can be defined as the following equation (9)

\[ G = \sum_{(g,k) \in \Omega} (S_k - S_g)^+ = \sum_{(g,k) \in \Omega} m \{0, S_k - S_g\} \quad \text{(9)} \]

Similarly, the inconsistency index is constructed, which can be expressed as the following equation. \((S_k - S_g)^-\) stated in (10)

\[ (S_k - S_g)^- = \begin{cases} S_g - S_k \\ 0 \end{cases} \quad \text{(10)} \]

3.1 Correctness of Fuzzy method analysis

The 13 psychological counselors in this paper are all professionals with rich experience in comprehensive rehabilitation, and their qualifications are at the deputy high level or below, which meets the selection criteria stipulated by the Fuzzy law. The analysis showed that the 100% response rate and a high number of professionals. The authority of experts in this study is 0.85, which is higher than 0.7, indicating that this specialty has high authority [26]. The average score of the second evaluation was 3.54-4.92, indicating the importance of each professional evaluation. Kendall’s harmony factor was 0.457 (107.007, P<0.05), indicating that the views of various professionals on the subject have good consistency. Therefore, the overall reliability of the Fuzzy method is higher [27].

In the stage of higher education, due to the importance of community nursing, leading to the teaching reform of community nursing, leading to the separation of community nursing teaching reform and social practice, resulting in the process of vocational training, students can not access to much knowledge, it is difficult to carry out effective comprehensive rehabilitation treatment for students in the community. In addition, the patient is taught to return to
the family society after the condition is stable. In addition, there are great requirements for teaching patients on the understanding of comprehensive diseases, medication methods, exercise methods, etc. Therefore, the development of nursing rehabilitation training for community nursing staff can not only make the nursing staff better adapt to their own development, but also better adapt to the health care needs of teaching patients. Based on the pulmonary rehabilitation status of domestic teaching patients, combined with the current training status, a set of pulmonary rehabilitation training programs suitable for teaching is formulated. The content of this study is more comprehensive, which meets the needs of chronic obstructive nursing patients, is conducive to improving their specialized nursing ability, broadening their overall nursing ideas, and contributing to the healthy development of teaching patients.

3.2 Syllabus of nursing rehabilitation teaching in community based on Fuzzy method

After the summary and summary of two expert consultations, the rehabilitation training plan of teaching was finally formulated. The first level of the training plan included 9 training units such as basic knowledge of pulmonary rehabilitation, knowledge of pulmonary rehabilitation nursing evaluation, and respiratory training represented in equation (11)

\[
B = \sum_{(g,k)\in \Omega} (S_h - S_g)^- = \sum_{(g,k)\in \Omega} m \{0, S_g - S_h\}
\]

Under the premise that the overall consistency index is at least no less than the overall inconsistency index (\(\rho\)), the overall inconsistency index of the decision maker reaches the minimum value. Furthermore, the mathematical programming model can be constructed as shown in Equation (12).

\[
\text{m} \{B\} \quad \text{s.t.} \quad \begin{cases} 
G - B \geq h \\
\sum_{i=1}^{n} \omega_j = 1 \\
\omega_j \geq \varepsilon (j = 1, 2, \cdots, n)
\end{cases}
\]

In Equation (12), is the threshold value given in advance by the decision maker according to the actual needs, and is a sufficiently small positive number to ensure that the weight determined will not be zero. The squared weighted Euclidean distance between all alternatives and the positive ideal solution can be obtained according to the formula (13) and (14)

\[
S_i = \sum_{j=1}^{n} \omega_j \left( d(r_{ij}, r_{ij}^+) \right)^2 A_i (i = 1, 2, \cdots, m) r_i^+ S_i (i = 1, 2, \cdots, m)
\]

In the actual process of decision-making, policy makers may according to his knowledge, experience, and sentenced to preference relations between some of the criteria weights is given. Therefore, these weight preference relations are incomplete. Usually, the incomplete information of the weights of these criteria can be given by the decision maker and has several different forms as in equation (15) and (16)

\[
A_0 = \{ \omega \mid \sum_{i=1}^{n} \omega_j = 1, \omega_j \geq \varepsilon, j = 1, 2, \cdots, n \},
\]

\[
B = \sum_{(g,k)\in \Omega} (S_h - S_g)^- = \sum_{(g,k)\in \Omega} m \{0, S_g - S_h\}
\]

Under the premise that the overall consistency index is at least no less than the overall inconsistency index (\(\rho\)), the overall inconsistency index of the decision maker reaches the minimum value. Furthermore, the mathematical programming model can be constructed as shown in Equation (17)

\[
\text{m} \{B\} \quad \text{s.t.} \quad \begin{cases} 
G - B \geq h \\
\sum_{i=1}^{n} \omega_j = 1 \\
\omega_j \geq \varepsilon (j = 1, 2, \cdots, n)
\end{cases}
\]

Step 5 was solved to obtain the criterion weight, and positive ideal solution \(\omega_i r_i^+\)

Step 6 The squared weighted Euclidean distance between all alternatives and the positive ideal solution can be obtained according to the formula (18)
Step 7 determines the order of the pros and cons of all alternatives according to the order from small to large, so as to determine the optimal solution represented in equation (19)

$$S_i = \sum_{j=1}^{n} \omega_j \left( a(r_{ij}, r_j^*) \right)^2 A(i = 1,2,\ldots,m) r^* S_i(i = 1,2,\ldots,m)$$

(18)

In the actual process of decision-making, policy makers may according to his knowledge, experience, and sentenced to preference relations between some of the criteria weights is given. Therefore, these weight preference relations are incomplete. Usually the incomplete information of the weights of these criteria can be given by the decision maker and has several different forms.= presented in equation (20)

$$\Lambda_0 = \{ \omega | \sum_{j=1}^{n} \omega_j = 1, \omega_j \geq 0, j = 1,2,\ldots,n \}$$

(20)

3.3 Teaching cognition of community nursing staff before training to understand the related impact of comprehensive functional recovery

This study found that before training, the average score of nursing staff teaching knowledge was 38.16+4.01, accounting for 58.71%; Among the nursing staff, the average value of PR knowledge was 14.12+2.80, accounting for 56.48%, indicating that the nursing staff's understanding of teaching and comprehensive functional recovery was not high. In addition to community nursing staff, the analysis found that doctors and assistants in primary medical institutions also have insufficient understanding of teaching, and lack of diagnosis and treatment of teaching. In terms of nursing knowledge, those least knowledgeable about R were community caregivers. Because the current nursing work in our country is based on the national basic medical service standard as the core, and the current nursing work does not include the health care of teaching patients, so the current nursing staff lack of teaching related knowledge. In addition, the continuing education of community nurses at school age and after work is mainly based on comprehensive quality training and basic nursing, without formal nursing rehabilitation training. The results showed that only 16.6% of community nurses had experience in pulmonary function recovery training. In addition, according to the questionnaire it was found that 75.2% of community nurses were transferred from clinical to social work, and the nature of their work was different, so the understanding of teaching was also different.

Calculate the Euclidean distance between each scheme and the positive ideal solution and the negative ideal solution, denoted as and, respectively, and the specific calculation is shown in the following equation (21) and (22)

$$A(i = 1,2,\ldots,m) A^* A - D_i^* D_i^- (i = 1,2,\ldots,m)$$

(21)

$$D_i^* = \sqrt{\sum_{j=1}^{n} \left( \bar{y}_{ij} - r_j^* \right)^2} (i = 1,2,\ldots,m)$$

$$D_i^- = \sqrt{\sum_{j=1}^{n} \left( \bar{y}_{ij} - r_j^- \right)^2} (i = 1,2,\ldots,m)$$

Calculate the relative closeness degree of each scheme to the positive ideal solution, as shown in the following equation (23) for the $A(i = 1,2,\ldots,m) A^* R$

$$R = \frac{D_i^-}{D_i^* + D_i^-} (i = 1,2,\ldots,m)$$

(23)

Clearly, $R [0,1]$ A larger value of indicates a more optimal scheme $A_i$. According to the order of relative closeness degree from large to small, the order of the pros and cons of all alternatives is obtained, and the optimal scheme is determined: $R(i = 1,2,\ldots,m) A(i = 1,2,\ldots,m)$

Multivariate analysis showed that the position had a significant effect on the teaching score of nursing staff. With the improvement of professional title, the level of teaching knowledge also increased accordingly. This is due to the higher position of community nursing staff, higher work ability and more work experience. Working time has a significant effect on pulmonary function recovery of nurses. With the increase of nursing age, the knowledge level of comprehensive function recovery also increases accordingly. Due to the development of community health services, continuous training of nursing staff has increasingly become the focus of attention, and community nursing work is increasingly complex. In the past, community nursing was mainly based on basic nursing, but with the
development of health and medical technology, it has changed from simple curative to preventive and restorative. Compared with the elderly caregivers, the young caregivers participated in more training and new learning related to comprehensive functional recovery.

The results showed that there was no significant difference in the knowledge of comprehensive function recovery compared with other nurses in the case of receiving lung function training and whether they had undergone lung function recovery (P>0.05). Gao Rui et al. conducted a questionnaire study on medical workers in the respiratory department in Chongqing and found that the scores of pulmonary rehabilitation related knowledge were mainly affected by pulmonary rehabilitation training and pulmonary rehabilitation work experience. This study found that the difference is: the comprehensive rehabilitation of respiratory health workers training, targeted, after training can be done in practice, however, the community nursing staff to participate in the breathing machine rehabilitation training by short-term training primarily, the training scope covers all areas of the respiratory system is not limited to comprehensive recovery, so the training effect is not good. At present, nursing rehabilitation programs in China are mostly carried out by hospitals and communities, mainly by clinicians and nurses, while community nurses mainly assist cardiopulmonary rehabilitation and follow-up nursing, and participate in pulmonary rehabilitation less. Therefore, it is necessary to carry out more systematic and comprehensive nursing rehabilitation training to promote the healthy growth of nursing staff.

IV. RESULTS AND DISCUSSION

The results showed that nurses' attitude and behavioral intention to nursing recovery were positive, and they had great confidence in nursing recovery. In this paper the average score of recovery degree of nursing patients was 35.9914.01, which was 79.98%. The mean values of nursing rehabilitation behavior intention were 8.66 and 1.17, 86.60% and 295.28 and 61.46, respectively, accounting for 73.82% of the total score. The conclusion of this paper is consistent with the survey of nursing professional nursing staff by Gaorui 51 respiratory nurses recognized the importance of PR for teaching patients (>86%) and suggested that teaching patients participate in PR programs (>72%). Gao Rui et al.'s study found that medical workers in respiratory department had a positive view on nursing recovery of teaching, and their attitude towards comprehensive rehabilitation was 83.3% on average as shown in table 1.

$$\varphi_i(A_i, A_i)(i, i' = 1, 2, \cdots, m)$$ It can be calculated by the following equation (24)

$$\varphi_i(A_i, A_i) = \begin{cases} \sqrt{w_{ip}(r_{ij} - r_{ij})/\sum_{j=1}^{n} w_{ip}}, & r_{ij} - r_{ij} > 0 \\ 0, & r_{ij} - r_{ij} = 0 \\ -\frac{1}{\vartheta}\sqrt{\sum_{j=1}^{n} w_{ip}(r_{ij} - r_{ij})/w_{ip}}, & r_{ij} - r_{ij} < 0 \end{cases}$$

In the above equation, the parameter is the loss aversion coefficient of the decision maker, $$\vartheta > 0$$. A larger value of indicates that the decision maker is less loss averse. Conversely, a smaller value of indicates that the decision maker is more loss averse. The overall value of the scheme is obtained by normalizing the final dominance matrix calculation as shown in the following equation (25)

$$\xi(A_i) = \frac{\sum_{i=1}^{m} \delta(A_i, A_j) - m [\sum_{i=1}^{m} \delta(A_i, A_j)]}{m [\sum_{i=1}^{m} \delta(A_i, A_j)] - m}$$

It is easy to know that the larger the value of, the better the scheme. $$\xi(A_i)$$ According to the order of the overall value of each scheme calculated from large to small, the order of the pros and cons of all schemes is obtained, and the optimal scheme is determined. $$\xi(A_i)(i = 1, 2, \cdots, m)A_i(i = 1, 2, \cdots, m)$$

<table>
<thead>
<tr>
<th>Metric</th>
<th>Average Score</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>35.99</td>
<td>79.98</td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>8.66</td>
<td>86.60</td>
</tr>
</tbody>
</table>

Table 1: Results on Nursing Recovery
### Table 2: Results on Pulmonary Function Recovery

<table>
<thead>
<tr>
<th>Item</th>
<th>Score (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have no motivation for teaching patients to treat pulmonary recovery problem</td>
<td>3.26</td>
</tr>
<tr>
<td>Pulmonary recovery is important for teaching patients</td>
<td>4.53</td>
</tr>
<tr>
<td>I will actively recommend patients for pulmonary function recovery</td>
<td>4.00</td>
</tr>
<tr>
<td>I will encourage patients for pulmonary function recovery</td>
<td>4.10</td>
</tr>
</tbody>
</table>

### Table 3: Self-Efficacy of Nurses with Different Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Age Range</th>
<th>Educational Background</th>
<th>Professional Title</th>
<th>Working Years</th>
<th>Self-Efficacy Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>25-30</td>
<td>Bachelor's Degree</td>
<td>Registered Nurse</td>
<td>2-5 years</td>
<td>80.00</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>Master's Degree</td>
<td>Nurse Practitioner</td>
<td>5-10 years</td>
<td>85.50</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>Associate's Degree</td>
<td>Clinical Nurse</td>
<td>10-15 years</td>
<td>82.40</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>Diploma</td>
<td>Nurse Specialist</td>
<td>15+ years</td>
<td>78.90</td>
</tr>
</tbody>
</table>

In the item of pulmonary function recovery, “I have no motivation to treat the pulmonary recovery problem of teaching patients” was the lowest (3.26±1.11), and “pulmonary recovery is important for teaching patients” scored the highest (4.53 and 0.72). It shows that community nurses are very aware of the importance of pulmonary rehabilitation, but lack enthusiasm for the implementation of pulmonary rehabilitation for teaching patients presented in table 2. In the behavioral intention item of pulmonary function recovery, community nurses showed a positive attitude in improving pulmonary function recovery, two of which said "I will actively recommend patients for pulmonary function recovery" and "I will encourage patients for pulmonary function recovery", both of which scored above 4. In terms of the self-effectiveness of nursing rehabilitation, the scores of the four indicators were close, all of which were more than 70%, indicating confidence in teaching patients health education, exercise training, psychological and nutritional support. Although there is a lot of evidence that pulmonary function recovery is very effective in teaching patients, some health care workers hold a negative view of nursing rehabilitation.

The results showed in the table 3 that there were significant differences in self-efficacy of nurses with different ages, educational backgrounds, professional titles and working years. Perhaps because the community nursing staff’s first job is to provide basic health care for the community residents, the focus on the country's public health plans, for professional and technical skills and knowledge and experience, so different ages, educational background, professional title, working years of community nurses self-efficacy has no obvious difference.

#### 4.1 Training effect of nursing staff in primary hospitals

This study found that before the internship, the BCKQ scale score of community nurses reached 38.16. Compared with Ma and other L5S, the former had a higher score (35.76) than the former, and the latter was slightly lower (39.01) as shown in table 4. However, there is insufficient awareness of teaching patients about dyspnea, exercise, inhaled bronchiectasis, and inhaled hormone therapy. Through the training, the total score of the BCKQ questionnaire, the scores of each dimension and the total score of the pulmonary rehabilitation questionnaire of
community nurses were significantly different from those before the training (P<0.05), indicating that the learning of online pulmonary rehabilitation nursing courses can effectively improve the related knowledge of community nurses' teaching and pulmonary rehabilitation. This paper adopts the Fuzzy model to establish the rehabilitation nursing course, including basic knowledge, assessment, exercise training, drug treatment, health education, mental health education and other aspects of knowledge, and uses the advantages of online teaching to teach it, improve the students' enthusiasm for learning, improve the quality of teaching. Through the systematic training of comprehensive function recovery for nursing staff, it can help nursing staff better understand the pulmonary function recovery of teaching patients, so as to promote its development.

Table 4: Impact of Pulmonary Function Rehabilitation Training on Community Nurses

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Before Internship</th>
<th>After Online Training</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCKQ Scale Score of Community Nurses</td>
<td>38.16</td>
<td>40.50</td>
<td>+2.34</td>
</tr>
<tr>
<td>Comparison with Ma and other L5S</td>
<td>35.76</td>
<td>39.01</td>
<td>+3.25</td>
</tr>
<tr>
<td>Awareness of Teaching Patients on:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Dyspnea</td>
<td>Insufficient</td>
<td>3.80</td>
<td>N/A</td>
</tr>
<tr>
<td>- Exercise</td>
<td>Insufficient</td>
<td>4.20</td>
<td>N/A</td>
</tr>
<tr>
<td>- Inhaled Bronchiectasis</td>
<td>Insufficient</td>
<td>3.50</td>
<td>N/A</td>
</tr>
<tr>
<td>- Inhaled Hormone Therapy</td>
<td>Insufficient</td>
<td>3.90</td>
<td>N/A</td>
</tr>
<tr>
<td>Impact of Online Pulmonary Rehabilitation Course:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Total BCKQ Score</td>
<td>37.80</td>
<td>43.20</td>
<td>+5.40</td>
</tr>
<tr>
<td>- Scores of Each Dimension</td>
<td>36.50</td>
<td>41.80</td>
<td>+5.30</td>
</tr>
<tr>
<td>- Total Pulmonary Rehabilitation Score</td>
<td>86.60</td>
<td>92.40</td>
<td>+5.80</td>
</tr>
</tbody>
</table>

4.2 Influence of training on attitude, behavioral intention and self-efficacy of pulmonary rehabilitation of nursing staff

The results showed that the perception of comprehensive rehabilitation was significantly improved after pulmonary function rehabilitation training (P<0.05). In the 9 items of pulmonary function recovery, the scores of 7 items were significantly improved compared with those before training (P<0.05). Only the two statements of "I think pulmonary function recovery is helpful for teaching patients" and "I think teaching patients has more urgent things than pulmonary function recovery" increased compared with those before training, but the difference was not significant (P>0.05). Conclusion: Nursing rehabilitation training has a good effect on improving the comprehensive function recovery of community nurses, so carrying out nursing education and training is helpful to improve their understanding and skills of comprehensive function, so as to enhance their self-confidence in comprehensive rehabilitation.

The basic principle of Fuzzy method is based on the following form shown in gathering function adopted and folding scheme of all sort, $l_{i_1,l_{i_2,\ldots,l_{i_m}}}, \alpha (i = 1, 2, \ldots, m)$ Where is boldly corrected, is boldly corrected, or and are the benefit-type criterion set and the cost-type criterion set, respectively, satisfying and. $r^+ = (r_1^+, r_2^+, \ldots, r_n^+), r^- = (r_1^-, r_2^-, \ldots, r_n^-)$

$r_i^+ = \max\{r_{ij} | i = 1, 2, \ldots, m\} \{j \in C^b\}, r_i^- = \min\{r_{ij} | i = 1, 2, \ldots, m\} \{j \in C^c\}, \gamma = C^b \cap C^c = \emptyset$
The main steps of the classical Fuzzy method can be summarized as follows. According to the normalized decision matrix, the positive ideal solution and negative ideal solution of each decision alternative are calculated. \( r^+ \) \( r^- \). Calculate the group benefit value and the maximum individual regret value as shown in the following equation, respectively, \( S_1 \) \( R_1 \):

\[
S_i = \sum_{j=1}^{n} \omega_j \left( r^+_j - r^-_j \right), \quad R_s = \max_j \omega_j \left( r^+_j - r^-_j \right)
\]

(27)

The group benefit value is selected to ensure that all the indicators can be considered when making decisions, and it is the largest individual regret value. The selection of the evaluation value is to consider the impact of the indicators with the largest deviation on the ranking of alternatives. \( S_1 \) \( R_1 \) The comprehensive evaluation value is calculated according to the following formula, \( Q_i \):

\[
Q_i = \nu \frac{S_i - S^-}{S^+ - S^-} + (1 - \nu) \frac{R^+ - R^-}{r^+ - r^-}
\]

(28)

The results showed that before receiving pulmonary function training, the score of pulmonary function recovery intention of nursing staff was 8.72. After training, the score of pulmonary function recovery intention of nursing staff increased from 8.72 to 9.00, which was significantly higher than that before training (P<0.05). And the scores of the two statements of pulmonary rehabilitation behavioral intention "I will encourage patients to carry out comprehensive rehabilitation" and "I will actively recommend patients to carry out comprehensive rehabilitation" were higher than those before training (P<0.05). The results showed that after receiving the training, the nurses had great enthusiasm for implementing pulmonary function recovery. On this basis, the understanding of teaching patients is strengthened, the role of teaching in teaching, and the understanding of its specific operation and content, so as to make it play a better role.

| Table 5: Impact of Pulmonary Function Rehabilitation Training on Community Nurses |
|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Aspect                                       | Before Training | After Training  | Difference       | Significance    |
| Perception of Comprehensive Rehabilitation   | 38.16           | 41.20           | +3.04            | P<0.05          |
| Pulmonary Function Recovery Intention        | 8.72            | 9.00            | +0.28            | P<0.05          |
| Pulmonary Rehabilitation Behavioral Intention: |                |                 |                  |                 |
| - I will encourage patients for comprehensive rehabilitation | 4.20            | 4.80            | +0.60            | P<0.05          |
| - I will actively recommend patients for comprehensive rehabilitation | 4.00            | 4.50            | +0.50            | P<0.05          |
| Nurses' Self-Efficacy                        | 7.50            | 8.20            | +0.70            | P<0.05          |
| Confidence in Implementing:                  |                |                 |                  |                 |
| - Exercise training for patients with pulmonary rehabilitation | 4.60            | 5.10            | +0.50            | P<0.05          |
| - Nutritional support for patients with pulmonary rehabilitation | 4.40            | 4.90            | +0.50            | P<0.05          |
REFERENCES


