Research report

A research report on the prescription rights of Chinese nurses*

Shi-Fan Han a, b, Rui-Fang Zhu a, Hui-Hui Han b

a First Hospital of Shanxi Medical University, Taiyuan, Shanxi 030001, China
b Ningbo College of Health Sciences, Ningbo, Zhejiang 315100, China

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ABSTRACT

Objective: To explore the feasibility of the nurse's prescription right in China, to develop the requirements for the qualification of the applicant for the prescription right of nurse, and to determine the content of certain prescriptions in the specific circumstances.

Methods: Literature review on the relevant articles/material with the contents of the nurse’s right of prescription home and abroad. Semi-structured depth interview method was used to interview 18 experts on whether the nurses can participate in the graded nursing decision and whether nurses with certain ability can make the decision. Using the self-made questionnaire “Nurses involved in graded nursing decision-recognition questionnaire”, 553 nurses completed questionnaires on willingness to nurse decision-making grading. Using the analytic hierarchy process, the 23 experts’ judgment on the main body of the graded nursing was rated. Using semi-structured depth interview method, 17 experts were interviewed on the graded nursing quality assessment and training outline. The form of expert personal judgment and the “grading nursing qualification experts predict questionnaire” were used as a preliminary designing tool, 32 experts were asked to predict the graded nursing quality. The relatively important factors that might promote implementation of right of Chinese nurse prescribing weights setting were obtained by analytic hierarchy process. Using Delphi method, 2 rounds of consultation to 291 experts/times were performed, and determined its content on the fields of graded nursing decision, nurses' job description, decision making nurse in graded nursing work process and related management system, decision-making main body of clinical nursing, nurse authority of prescription application qualification, clinical nurses, diabetes specialist nurses, tumor specialist nurses, nurses in emergency department, community nurses in certain circumstances writing prescription, and nursing undergraduate added with nurse authority of prescription related courses.

Results: The physician is not considered to be the best decision-making main body of clinical nursing work and graded nursing, nurses can participate in the work of decision-making. The qualification of hierarchical decision-making nurse and nurse prescribing applicants have been determined. The hierarchical nursing decision-making nurses' position description and training outline have been compiled. Experts suggest that clinical nurses with certain qualifications should be given the rights of some prescription form (independent prescription, prescription, prescription protocol extension) to prescribe specific drugs in high fever, hypoglycemia, hypertension, anaphylactic shock and other 11 specific circumstances. The nurses of the diabetes should be given the right of prescribing sulfonylureas, biguanides, glucosidase inhibitor, and protamine zinc insulin, and the right to write the prescription and consultation for part of medical equipment, health education, and four routine tests, which contains blood sugar monitoring, urine glucose monitoring, glycosylated hemoglobin assay, and oral glucose tolerance test. Tumor specialist nurses should be given the right to write the prescription of 5 specific circumstances including blood routine tests, electrocardiogram, blood biochemistry and other 9 laboratory tests, constipation, phlebitis, and cancer pain, and the right of 5 tumor emergency prescription including chemotherapy drug allergy, hemorrhagic shock, acute upper gastrointestinal bleeding. Nurses in emergency department with certain qualification should be given the right to prescribe specific drugs in 15 circumstances which include cardiac arrest, ventricular fibrillation, and acute cardiogenic chest pain.

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* Corresponding author.
E-mail address: nruiruini61063.com (S-F. Han).
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Community nurses with certain qualification should be given the right to write the prescriptions on 14 contents including disinfection and cleaning, sterile infusion type, and wound care products. Experts suggest that nursing undergraduate education in China should be added with 2 courses which are prescription rights related laws and regulations and nursing intervention, and that pharmacology course should be supplemented with related course in order to adapt to the implementation of nurse prescribing rights.

Conclusions: China's nurses with certain qualification or after special training have the ability to accept and should be given the right of prescriptions in certain circumstance within the scope of their work.

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1. Research Background

Since the implementation of the Reform and Open-door policy, nursing in China has made great progress in education, practice, management and scientific research. Currently, the nursing field is becoming more and more important in the prevention and treatment of diseases, in health care, in rehabilitation and in other fields. Nursing is involved in the various health requirements of people, including the areas of physiology, psychology, society, mental health, the environment, and others. The role of nurses has expanded correspondingly from practitioners to educators, counselors and advocates for a healthy life. With the expansion of the nurses' role, the limited rights of nurses apparently has constrained the development of nursing careers. An occupation will become stable only if it gains an exclusive power to determine its correct occupational content and effective methods. Nursing is an independent subject and should own its independent scientific fields and working methods. It should have a certain degree of autonomy and independence in its scope of work. Nursing personnel can form professional organizations to adjust and control the career practices in the field. Nursing is closely related to the social, legal, environmental and individual education background; giving prescription rights to nurses is a way of broadening the nurses' professional autonomy and accountability.

Nurses having the right to prescribe means that nurses have the right to make judgments and decisions according to the patients' psychology, diet, medication, nursing level and the development of disease. This concept is put forward along with the development of community care. The contents of Nursing Prescription include a series of nursing problems such as psychological education, psychological consultation and solution, diet therapy, medication guidance, medication precautions, disease prevention, occurrence, development, treatment and outcome, prognosis and more related to various disorders; it also contains the nursing levels, certain conventional drugs usage, emergency medicine, etc.

In most hospitals, the nursing grade is based on the nurses' or the nursing department's recommendation or by registered nurses performing nursing assessments on the patients' living ability and observation of the disease. It is reported that the nursing grade ratings in Japan are classified as class 1, 2, 3 or 4 based on a patient's ability to provide daily self-care. Meanwhile, relative to the level of observation needed for the patients' condition, three grades, i.e., grades A, B and C, were defined. Combinations of the two aspects are divided into 12 levels, such as A1, B2 and so on. In addition, graded nursing in German hospitals is divided into basic graded nursing and specialist graded nursing. Basic graded nursing is rated as three levels from A1 to A3 by senior nursing staff according to the patient's ability to perform activities of daily living (ADL). Specialist graded nursing is separated into three levels, S1, S2, and S3. The specialist graded nursing was classified by physicians based on observation of the patients' condition, monitoring of vital signs and the demand for therapeutic nursing practices, such as catheter care. German endowment institutions classify nursing into different levels based on the body system of elderly functional status, daily life self-caring ability and socializing ability; each level of nursing has the same basic nursing content, including primary care, mental health nursing, exercise and recovery.

In many countries, nurses are graded into different levels. Nurses at different levels should perform nursing activities within the prescribed scope of practice. Some countries grant a range of prescription rights to some of the nurses, thereby broadening the nurses' scope of practice. Nurses can enjoy professional autonomy, and nursing as a discipline has developed significantly. Advanced nursing practitioners with a range of prescription rights are very common internationally, particularly in the United States, the Netherlands, the UK, Sweden, Denmark and in some other developed countries. At the same time, the prescription rights of nurses is strictly stipulated, however, its function is played to be good.

The UK gives prescription rights to nurses in community practice (including qualified district nurses and qualified health care visitor) and nurse practitioners, and the prescription form is divided into independent prescription, dependent prescription and supplementary prescription. The prescriptions are specific by different nurses according to concrete rules and requirements, including drugs, devices and accessories. The United States gives prescription rights to advanced practice nurses (APNs) or advanced practice registered nurses (APRNs), including clinical nurse specialists (CNSSs), nurse practitioners (NPs), certified nurse midwives (CNMs), and nurse anesthetists (NASs). Through an agreement signed by doctors, the nurses prescribe drugs, equipment, materials, laboratory sheets, etc. within the stipulated scope in their places of practice; nursing committees in 51 states of the USA have detailed regulations for specific nurse prescriptions.

Sweden grants prescription rights to qualified district nurses upon graduation. The Drug Administration lists 230 drugs, and nurses can prescribe medication for patients with 60 indications (the table is revised annually). To guarantee safety, the government has promulgated a series of laws about indications of drug use. For some patients with indications, district nurses cannot issue an initial prescription, but patients can still use prescriptions following the physicians' advice.

In Europe and North America, the prescription rights of nurses have experienced a long and tortuous history. Nurse's qualifications to prescribe medicines and the allowable medicines to be prescribed vary from country to country. Similarly, these countries have established laws and regulations to grant prescription rights to nurses. Nurses with certain qualifications are allowed to have prescription rights after passing training tests. Drugs and circumstances are strictly limited by countries for nurses exercising their prescription rights.
In Hong Kong, China, the grading of nursing in some hospitals is determined by nurses, and nursing standards cover the patients' psychology, ADL, treatment, disease observation and so on.17 In most hospitals in mainland China, the decision makers for grading nurses are doctors and the implementers are nurses. Only in Peking Union Medical College (PUMC) Hospital is the grading of nurses determined by the head nurse or the master class nurse who confirmed the nursing grades through nursing recommendations according to the patient's condition, self-caring ability, etc. For the decision-making regarding the grading of nurses, they are requested to have a minimum number of decades of work experience, a medium-level professional title or above, and a college degree or above, but the requirements are still not specific or scientific. In PUMC hospital, a graded nursing system has been implemented clinically for a few decades and has obtained satisfactory results.18 However, because no relevant laws and regulations were supported by domestic health administrative departments in recent years and because of the existence of hidden dangers in medical disputes, the graded nursing system failed to be generalized throughout the country.

In China, nurses have no prescription rights according to regulations, which is not related to the nurse's knowledge structure. In reality, nurses sometimes need to treat emergencies when there is not time to request instructions from a physician. Thus, nurses have a certain right for prescription and treatment to some degree, but this right has not been clearly defined or guaranteed by laws.6

There are many arguments about whether nurses should be given prescription rights. Ding et al conducted an investigation of 509 nurses, 269 physicians and 536 patients in 11 hospitals in Hubei, Sichuan, Shandong, and Shanghai. The results showed that 61.49% of nurses, 66.17% of physicians and 94.92% of patients supported the necessity of giving prescription rights to nurses; 70.9% of patients hoped that nurses could have the right to prescribe medicines in emergency circumstances; and 69.78% of patients were willing to receive medication guidance from nurses. In a multiple choice survey of patients on what nurses should be able to prescribe, 52.05% of the patients chose important prescriptions, 51.12% chose widely used medicines, and 68.29% chose conventional instruments and accessories.

It is an inevitable trend to give nurses a range of prescription rights because of the development of nursing science. In this project, the implementation strategy of our domestic prescription right for nurses, specific implementation measures and the content of prescriptions will be discussed by studying the development and progress of prescription rights overseas and learning from those experiences.

2. Research Methods

2.1. Literature investigation

The literature investigation included the search, collection, identification and organization of the literature; research and analysis of the literature helped provide an understanding of the scientific facts. We searched the literature in the Chongqing VIP, CNKI, Medline, and OVID databases and in other relevant materials by national and international websites to find and specifically understand the development of the prescription rights of nurses in China and other countries, such as the United Kingdom, the United States and Sweden.

2.2. Semi-structured interview

The semi-structured interview is an informal interview following a rough outline in social science research. Only some basic requirements for the condition of interviewers and questions are needed. Although the interview has rigorously structured, standardized topics, the interviewer can adjust the planned interview outline at any time during the interview. Interviewers have a certain control over the interview structure; however, interviewees still have a large amount of room to express their ideas and opinions.

2.3. Expert prediction method

The expert prediction method is based on experts as information resources; the experts use their own knowledge and experiences to completely analyze the past and present through intuition and find rules among them and then make judgments in order to development vision. Prediction occurs after collection and summarization of the experts' opinions. It includes individual judgment and an experts' organizational meeting.19

2.4. The Delphi method

The Delphi method, also called the expert consultation, is the development of an expert prediction method. Its core is the solicitation of opinions from experts, and then the organizers successively summarize the experts' opinions. The experts' opinions will gradually be converged through feedback. A more consistent and reliable conclusion or solution is finally reached based on the experts' opinions.10 It is a combined method of quantitative and qualitative analysis.

2.5. Analytic hierarchy process

The analytic hierarchy process (AHP) is based on the analysis of factors and their relations in one complex system, and a multi-level analytical structure model is formed after separating questions into different elements and classifying these factors into different levels. By analyzing the elements individually according to certain standards at each level, the results are written in a matrix form called a constitution and construction of judgment matrix. The weight function of the level's elements under the standards is determined after calculating the eigenvalue of maximum and the eigenvector of the judgment matrix. The weight numbers for the different imagined schemes are obtained after calculating the combination weight function of each level's elements for the overall goal, and it provides evidence for the optimal scheme.

3. Research Results

3.1. Research on the decision-making of graded nursing20

3.1.1. The deep interview on nurses’ participation in the decision-making for graded nursing

Ten head nurses and eight heads of different departments in a grade A tertiary hospital were selected as interviewees to explore the agreement of physicians on nurses' participation as decision-maker for graded nursing and the nurses' ability in decision-making in graded nursing. The results showed that eight-tenths of the nurses did not agree with the physician's medical advice for graded nursing, whereas physicians considered the instructions of nursing grading beyond all doubt. Nurses supported half and opposed half for the feasibility of decision-making for nurses in graded nursing. Simultaneously, all of the doctors interviewed took a default attitude and did not oppose nurses as the decision makers of grading nursing. Seven-eighths of the physicians questioned the nurses' ability in decision-making for graded nursing, whereas six-tenths of the nurses believed that they had already been equipped
with the ability for graded nursing. For the participation method, all physicians and seven-tenths of nurses believed physician-nurse cooperation was an ideal approach to decision making.

### 3.1.2. Investigation on the identification of nurses on decision-making of graded nursing

A total of 553 nurses volunteers from inpatient departments in eight first-class tertiary hospitals in the city of Taiyuan, Shanxi province, and Beijing were investigated with a self-rated questionnaire with the topic of “investigate the identification of nurses on decision-making of graded nursing”. The results were as follows: (1) A total of 74.3% of nurses considered that nurses should be involved in decision-making on graded nursing. The bachelor’s degree in nursing was the influencing factor identified through the single factor of unconditioned logistic regression analysis. Compared with the nurses whose degrees were from technical secondary schools, the OR values of the nurses whose first degrees were college degrees and bachelor’s degrees were 0.691 and 0.546, respectively. (2) A total of 96.6% of nurses considered that cooperation with physicians was how nurses were involved in decision-making on graded nursing. In the analysis, region was the influencing factor of cooperation between physicians and nurses by the single factor and multi-factor in unconditioned logistic regression analysis, with an OR value of 0.344. Comparing the nurses from Beijing with those from Taiyuan, the OR value for the nurses from Beijing was 0.344. (3) A total of 67.5% of the nurses believed that they had the ability to make decisions on graded nursing. In the analysis, the influencing factor was the operating post and the administrative post by the unconditional analysis; the OR values were 1.453 and 1.490, respectively. That is, the OR value of the nurses engaged in nurse management compared with ones in clinical care was 1.453, and the OR value of the nurses with administrative posts compared with ones without the position was 1.490. The further multi-factor unconditioned logistic regression analysis showed that the administrative post was the variable in the regression equation. (4) A total of 75.0% of the nurses were willing to make decisions on grading nursing, and the single factor result suggested that age and working hours of nurses were the influencing factors. The OR of age was 0.738 and the OR of working hours was 0.722. The further multi-factor, unconditioned logistic regression analysis showed that the variable of working hours appeared in the regression equation. (5) Regarding the titles of the nurses who were capable of making decision for graded nursing, the nurse-in-charge occupied the highest proportion by 61.1%. (6) Regarding the working hours of the nurses who had the ability of making decision for grading nursing, the proportion and working hours are as follows: with technical secondary school, 15-20 years (80.9%); with college degrees, 10-15 years (81.1%); and with a bachelor’s degree, 5-10 years (50.5%).

### 3.1.3. The judgment of decision-making body for graded nursing

We used the analytic hierarchy process approach to select 10 physicians and 13 nurses in a class A tertiary hospital. The results showed that the synthetic weight of nurse independent decision (0.61895) was higher than those of physician and nurse co-determination (0.30512) and physician independent decision (0.07595). The synthetic weight of physician and nurse co-determination (0.56545) was higher than those of nurse independent decision (0.34067) and physician decision (0.09359).

### 3.2. Qualification assessment of nurses for decision-making of graded nursing and the research of training outline formulation

The interview of decision-making subjects’ current situation of graded nursing in the Hong Kong and Macao regions of China and overseas.

The interview of 17 experts from seven countries and regions described the situations of the graded nursing system in the hospitals in which they worked. Graded nursing of the hospital of the three UK experts was decided by the registered nurse (RN) with bachelor degree and a minimum of 3 years of work experience or was decided by an RN with bachelor degree and over the age of 21 or was unlimited. Nurses at the hospital where an American expert worked could determine the nursing levels independently, and the minimum requirement for the nurse’s degree was post-master’s degree. The two Australian experts worked in two different hospitals. In one hospital, the decision of the graded nursing was made by nurses with a minimum of a bachelor’s degree and an age under 25. In the other hospital, graded nursing was determined by nurses who were required to have a bachelor’s degree and at least 2300 h of experience in clinical practice before being certified.

Graded nursing in a hospital in Ottawa, Canada, was decided by nurses with master’s degrees. The four Japanese experts expressed that graded nursing in Japan was decided by nurses, and most hospitals required that nurses should be R.N.s with 3 or more years of work experience and a master’s degree. The two experts working in Queen Mary Hospital in Hong Kong indicated that they did not have the system of graded nursing, but their nurses had specific responsibilities and had the independent right of decision-making at work. The three experts from Macao Jinghu Hospital expressed that the nursing levels in their hospital were decided by nurses, and the qualification requirements were defined by department situations.

In addition, 13 of the 17 experts insisted that graded nursing was physicians’ recommendation with nurse performance. All 17 experts agreed that nurses had the ability to issue grading nursing. Thirteen of the 17 experts considered that the Nurse-in-charge with a bachelor degree could own the right to decide independently. Four of the 17 experts supported co-determination between the physician and the nurse; 14 of the 17 experts considered that the content of the Graded Nursing Standard, the core of Graded Nursing, clinical diagnostics, judgement thought and clinical thinking should be taught.

#### 3.2.1. Determination of the nurse’s certificate of graded nursing decision

The investigation was based on experts’ personal judgment and the self-rating questionnaire with the topic “Expert forecast about nurses qualification of graded nursing decision”. Thirty-two experts (20 nursing experts and 12 medical experts) were invited to make predictions. The results showed the following: For the minimum required title, the consistency rate for nurse-in-charge was the highest (87.5%), and the rate for associate chief nurse was 12.5%; for the lowest diploma/degree requirement, the highest consistency rate was 58.07% for bachelor’s degree, and the second was college degree (35.48%). For the requirement of minimum working experience, 64.52% agreed on 5 years after undergraduate, and 38.71% agreed on 3 years after master’s degree.

#### 3.2.2. Determination of the training outline of nurses for making decisions about graded nursing

Following the design principle of nurses training outlined in graded nursing, a combined preliminary training course was planned, the teaching content was refined, and the final predicting
questionnaire for experts regarding training outline for nurses decision making in graded nursing was compiled, and this was based on the advice from subject specialists and experts of the coordinating group. After consulting with four nursing experts, it was revised after incorporating the expert’s advice. The first round of the preliminary questionnaire of expert consultation for the training outline in graded nursing decisions was formed. The Delphi method was applied in two rounds of consultation with 32 experts (20 nursing experts and 12 medical experts), and the weight for each item was confirmed. The filter criterion needed to meet the indexes’ requirements of a significant assignment mean larger than 4.0, a coefficient of variation less than 0.25 and a reference full mark ratio higher than 10% (as the mean’s complementary index). The graded nursing training outline of nurse decision finally was formed after incorporating the advice of the expert’s coordinating group. The courses are listed successively as follows:

The first lesson: The Newest Graded Nursing System “Guiding principle of general hospital Graded Nursing” (weight 0.1604); The second lesson: Evaluation Method of Classifications Gist (weight 0.1361); The third lesson: Nursing Inquiry and Nursing Physical Examination (weight 0.1372); The forth lesson: Common Diseases, Medicine Knowledge and Illness Hazards Evaluation Method (weight 0.1571); The fifth lesson: Understanding of Clinical Decision Result (weight 0.1405); The sixth lesson: Related Knowledge of Nursing Clinical Decision (weight 0.1350); The seventh lesson: Examination (weight 0.1338). Every course is constituted by teaching requirement and content.

By evaluating the reliability and validity, it was found that the interior reliability between each course and the teaching content of the training outline were successively 0.900, 0.833, 0.772, 0.925, 0.814, 0.888, 0.947, 0.920. By analyzing the correlation coefficient between teaching contents and various training courses, the other teaching contents were significantly correlated with their training course ($P < 0.01$) except that teaching lessons 2, 5, and 6 had a weaker correlation ($P < 0.05$) with lesson 1. It was found that there was significant correlation between teaching contents of the training outline and the training courses. The research results indirectly reflected that the construct validity of the training outline was effective because of the significant correlation between the construct validity and the content validity; it also showed that the training outline of nurse deciding in graded nursing had relatively high validity.

3.3. Research on graded nursing decision making nurses’ workflow and position description

3.3.1. Investigation report of the graded nursing system in Peking Union Medical College Hospital

At Peking Union Medical College Hospital, illness characteristics were combined, and each administrative office formulated its own executive standards of graded nursing on the basis of “Guide for Graded Nursing for General Hospital (on trial)” issued by the Ministry of Health.

After patients are admitted to the hospital, the master class nurses evaluate the state of illness and self-helping ability of patients and then confirm the nursing level. The nursing level will be adjusted in time according to changes in the patients’ illness and self-care ability. The nursing level is not shown on the doctor’s recommendation but will be inputted into the computer with the patient’s basic information, such as name, age, diagnosis, etc. Purple, green, pink and blue represent, respectively, intensive care and nursing grades 1, 2, 3. At Peking Union Medical College Hospital, because the graded nursing system is inherited as a form of pure nursing care from the foundation of the hospital, nurses have a positive attitude about the grading issued. Meanwhile, nurses will issue critical care and grade 1 care for the severely ill patients to ensure the consistency and synchronicity of nursing grades with the doctor’s advice when assigning the nursing grade.

3.3.2. Position description of graded nursing decision nurses, workflow and determination of relevant administrative management

The initial questionnaire of the position description of graded nursing decision-making nurses, workflow and determination of relevant administrative management was designed by the investigation of a large amount of the literature and site inspections on graded nursing at Peking Union Medical College Hospital. After surveying the six nursing experts, the consult questionnaire was further improved. The Delphi method was applied in two rounds on experts’ consultations of position description of graded nursing decision-making nurses, workflow and determination of relevant administrative management, and the weight of each item was calculated. The results are as follows.

3.3.2.1. Position description of graded nursing decision making nurses was described in terms of several aspects: position name, position mission, position responsibility, position authority limitation, position coordinated relationship, position-holding conditions. The name of the nurse position is decision-maker for graded nursing. The mission of this position is to be in charge of nursing level assignment and timely adjustment under the guidance of head nurses and doctors. The position responsibilities include six first-level entries, which are listed as follows: (1) patient’s nursing level confirmation and adjustment (weight 0.1716), (2) patient’s overall evaluation (weight 0.1706), (3) communication and coordination (weight 0.1695), (4) check and shift changes (weight 0.1685), (5) participation in ward rounds (weight 0.1622), and (6) guidance for junior nurses (weight 0.1576). In addition, there are 21 s-level entries. Position authenticity limitation includes the right of issuing and modifying nursing level and supervision and regulation of the implementation of assigned nursing level. The position coordinated relationship was divided into internal coordination and external coordination. Position-holding conditions include the following: (1) Qualification: nurses-in-charge, bachelor of nursing with 5 years of clinical working experience or masters of nursing with 3 years of clinical working experience. (2) Position training: the position training is under the teaching outline studied by the research group, and the seven lectures include 23 teaching contents that cover 48 entries. (3) Required knowledge and skills: understand the core of graded nursing and related nursing requirements, understand the basic pathology of illness in own department, master basic nursing procedures and emergency care operation and comprehend the nursing routine and common nursing problems in own department. (4) Position ability requirements: strong abilities of observation and judgment of illness, keen observation and quick response, the ability to analyze and solve problems, emergency handling ability, nursing capability in emergency and severe disease, communication and cooperation ability, the capability of positive knowledge acquisition, emotion regulation and self-control ability, teaching and scientific research ability.

3.3.2.2. The workflow of graded nursing decision-making for nurses. See Fig. 1.

3.3.2.3. The relevant management system for the graded nursing decision. There are five systems of general situations: improve organizational management system (weight 0.2060), management for on-duty and shifting of duty (weight 0.2022), ward round system (weight 0.1998), evaluation and supervision system (weight...
0.1985) and training and study system (weight 0.1935). Each system sets its own sub-entry, namely, the concrete system content, and 13 sub-entries are listed in total.

3.4. Research on decision-making subject of clinical nursing work

Thirty experts (20 nursing experts and 10 medical experts) were selected to choose the decision-making subject on the nursing work content of doctor’s advice by the self-designed “questionnaire about decision-maker of clinical nursing work”. The results show that nursing experts and medical doctors did not think the optimal decision-makers were doctors. Nurses could take part in the decision-making ability. Thirty-three items of nursing work under the doctor’s advice were confirmed, 16 items were decided independently by nurses, 11 items were decided by doctors and nurses in

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**Fig. 1. The workflow of graded nursing decision-making.**

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cooperation (including the use of rescue drugs), five items were decided independently by doctors, and for one item, it was not decided who was the optimal decision-maker.

3.5. Research of the simulative factors on nurses’ prescription right in our country

Four dimensions of a hierarchical structure model — policy, education, management and practice — were constructed based on the nation, health administrative department, educational institution and medical institution through the summary of the literature. Four first-class indicators, 10 second-class indicators, and 29 third-class indicators were confirmed by two rounds of Delphi consultations of 20 experts. The relative important factor was calculated by the AHP weight set. The first-class indicator weight is as follows: policy (weight 0.3459) > management (weight 0.2437) > practice (weight 0.2205) > education (weight 0.1898). The second-class indicator weight (top four) is as follows: (1) formulate the relevant laws and regulations for guaranteeing the implementation of the nurse’s prescription right (weight 0.1902); (2) formulate health policy for promoting the nurse’s prescription right (weight 0.1557); (3) allow the nurses to prescribe under special circumstances in clinical work (weight 0.1103); (4) allow the nurses to prescribe under special circumstances in community work (0.1103). The third-class indicator weight (the top 10) is as follows: (1) “nurse regulation” guarantees that the nurses with certain qualification have the right to prescribe a range of drugs in special situations; (2) formulate the responsibility range and behavioral norms of the nurse prescriber; (3) improve the health service system, develop community health service and establish a complete community health service system; (4) the medical institution increases the input in nursing work, changes the situation of “value doctors, despise nurses”, and promotes the corporation of doctor and nurse; (5) in emergency circumstances (for instance, hyperpyrexia and anaphylactic shock), allow the nurse prescriber to prescribe a range of first-aid drugs; (6) train the community nurses to improve the qualification for prescription; (7) formulate a definite nurse grading system, using nursing HR (human resources) reasonably; (8) allow nurse prescribers to continue or adjust prescription according to the doctor’s advice for chronic diseases and age-related common illnesses (for example asthma, hypertension, diabetes etc.); (9) grant the nurse prescriber the right to continue prescription or adjust parergic dose on treating patients’ pain problem; (10) ensure the clinical practice, community practice and assessment criteria of nurse prescriber. The weights are successively: 0.1046, 0.0856, 0.0590, 0.0516, 0.0497, 0.0495, 0.0452, 0.0354, 0.0333, and 0.0329. This provides the basis for an implemented strategy of nurse’s prescription right in our country.

3.6. Research of applicant’s qualification on nurse’s prescription right

The prepared content for education and standards of British nurse’s prescription qualification were formulated by the nurse and midwife association, and its concrete training and service are provided by the admisive higher education institution (HEI). Starting with the first training project carried out in 1999, the training project for community nurse’s prescription qualification (V100), there should be clear and concrete regulations for the applicant’s qualification and training requirements as well as a training authentication project, such as the nurse’s independent prescription qualification and the supplement prescription qualification. The authentication process of a nurse’s prescription right covers application, training and examination, and the issuance of a qualification certificate; the nurse and midwife association proves the register’s prescription qualification and the scope of prescription right to the Prescription Pricing Authorities, and then they register the drug instrument, and accessory that can be prescribed by hand or in electronic form within the permitted limit. The training content consists of two parts: the theory and the practice. The theory course lasts 26 days, and its content is clearly assigned by a nurse and midwife association and provided by a licensed higher education institution. The applicant must complete the theory course and the practice course within 12 months. The applicant must retake the courses if he or she has not completed the courses within the regulated time. At present, the validity of nurse’s prescription qualification in Britain is 5 years. Before the validity expires, the nurse prescriber must finish the regulated courses, pass the ability test, and pay the relevant charges before the re-registration.

There are no nationwide uniform regulations for an applicant’s qualification requirements for nurse’s prescription rights in the United States. The requirements associated with the nurse bill for an applicant varies in different states. The nursing committee of each state is in charge of the application of a nurse’s qualification and authentication. Most states allow nurse practitioners and clinical nursing experts to apply, and in a few states, R.N.s are also allowed. In terms of a nurse prescriber’s continuing education and re-registration of qualification, the nurse bill of every state establishes concrete regulations.

The Delphi method was applied in two rounds of consultations for 60 experts (20 medicine experts, 20 clinical nursing experts and 20 nursing education experts) by the self-designed questionnaire. The experts considered that the lowest education background of applicant for prescription right was a bachelor’s degree (63.27%), or a college degree (30.61%). For the lowest title qualification requirement, the nurse-in-charge had the highest consistency rate (81.63%), followed by the associate chief nurse (16.33%). For the minimum number of working years, the highest consistency rate was 5 years after earning a bachelor’s degree (59.18%), followed by 5 years after earning a master’s degree (48.98%). The top consistency rate regarding the suitable position for nurse’s prescription rights, the highest consistency was professional nurse. This reflected that experts identified the ability of professional nurses, and it was connected closely to the rapid development of professional nurses; the community nurse was the second, and the clinical nurse was the lowest.

3.7. Confirm the prescription content by clinical nurse in special circumstance

The self-designed questionnaire and the Delphi method were used to consult 38 experts (10 medicine experts, 28 nursing experts) in two rounds on drug prescription content by clinical nurses in specific circumstances. Based on the screening condition of the consistency rate >80% in specific circumstance by medicine experts and nursing experts, the concrete drugs in prescription form was decided by the proportion of expert’s numbers. If the proportion of the number of experts (majority: minority) was ≥1.5, the selection was indicated to be favorable by most experts; otherwise, if the two forms of prescription were similar, it could concluded that it was feasible that nurses with certain qualifications were allowed to prescribe under 11 specific circumstances, of which seven were emergency conditions, namely, hyperpyrexia (100%), hypoglycemia (97.37%), hypertensive emergency (92.11%), anaphylactic shock (89.47%), asthma persistent state (84.21%), acute edema of the larynx (84.21%), cardiac arrest (92.11%), palliative cancer treatment (97.37%), hypertension (97.37%), hyperglycemia (94.74%), and...
hyperlipidemia (94.74%) in the circumstance of an existing prescription. The concrete drugs and prescription form states the following: the ‘nursing independent prescription’ is for nurses to independently diagnose and prescribe drugs; an ‘agreement prescription’ is for nurses to prescribe drugs in the premise of authorization and agreement signed by doctors; ‘lengthen the prescription’ is for nurses to follow the original patients prescription and dosage after doctor has diagnosed clearly and prescribed drugs; “adjust the prescription” means the nurse has the right to change the original prescription drugs and dosage according to the change of patient’s illness state. (1) For hyperpyrexia, prescribing radix bupleuri and Paracetamol tends to be a nurse independent prescription, and hexadecadrol tends to be an ‘agreement prescription’; for hyperpyretic convulsion and chloral, the prescription form is similar; Phenobarbital tends to be an ‘agreement prescription’. (2) For hypoglycemia, glucose solution tends to be a nurse independent prescription, and hydrocortisone is an ‘agreement prescription’. (3) For hypertensive emergencies, sodium nitroprusside, furosemide and magnesium sulfate tend to be prescribed by ‘agreement prescription’. Nitroglycerin is prescribed in two prescription forms. (4) For allergic shock, epinephrine, hexadecadrol, diphenhydramine and calcium gluconate are also prescribed in two forms. (5) For asthma persistent state, prednisone, hexadecadrol, prednisolone and doxofyline tend to be prescribed in the form of “agreement form”. Aminophylline and salbutamol are prescribed in two prescription forms. (6) For acute edema of the larynx, hexadecadrol tend to be prescribed by two forms, and hydrocortisone tends to be ‘agreement prescription’. (7) For sudden cardiac arrest, epinephrine tends to be prescribed in two prescription forms. Atropine and lidocaine tend to be prescribed in the form of “agreement prescription”. (8) For the cancer palliative treatment with a “lengthen the prescription” agreement (limited to lengthening the original prescription, with no change to the types and dosage of drugs), analgesics are prescribed in two prescription forms. Antanacathartics belong to the nurse independent prescriptions. (9) For high blood pressure with a “lengthen the prescription” agreement, hypotensive drugs tends to be prescribed in the form of “agreement prescription”; (10) For hyperglycemia with a “lengthen the prescription” agreement, hypoglycemic drugs tend to be ‘agreement prescriptions’, (11) For hyperlipidemia with a “lengthen the prescription” agreement, the lipid-lowering drugs tends to be ‘agreement prescriptions’.  

3.8. Determination of prescription content by professional nurse for diabetes 

Some developed counties, such as the United Kingdom and the United States, give a certain scope of prescription rights to professional nurses for diabetes, which involves related admittance and practice standards and formulated laws and regulations. In the UK, professional nurses treating diabetes have the right to prescribe gliclazide, insulin, antihypertensive drugs, disposable syringes and relevant inspection items. Until 2007, 49% of English professional nurses for diabetes have had the right for drug prescription, and 47% have had right for nonprescription drugs. The prescription form is divided into independent prescriptions and supplement prescriptions. In the US, professional nurses treating diabetes mainly work in community diabetes centers along with a doctor. Every nurse is equipped with a family visit bus with common drugs and inspection instruments. During the family visit, nurses can prescribe based on the patients’ illness state, and most prescriptions are agreement prescriptions. The content of the prescription has diverse characteristics according to the different law limits in every state.

Professional nurses treating diabetes in Hong Kong, China, have a diabetes professional qualification certificate awarded by the United Kingdom, which is identified in the Hong Kong area. These nurses have the right to prescribe drugs and inspection items according to “British Nurse Formulary”.

The self-designed questionnaire and the Delphi method were applied for 42 experts (including 24 medical experts and 18 nursing expert) on the prescription subject of professional diabetes nurses in two rounds of expert consultation, with the following results: (1) For oral drug prescription, antihypertensive drugs and lipid-lowering medications, a total of 13 categories were deleted in the first round of the questionnaire (approval ratings below 60%); for oral hypoglycemic drugs, they only kept sulfonfonylureas, metformin and alpha-glycosidase inhibitors; sulfonylureas tend to be prescribed as ‘agreement prescriptions’ (80.95%), whereas metformin drugs (92.86%), alpha-glycosidase inhibitors (90.48%), and glycosidase inhibitors tend to be ‘complement prescriptions’. (2) Injection drugs were kept and issued as ‘supplement prescriptions’ for long-acting insulin (92.86%). (3) Regular inspections are kept in the inspection items, including monitoring of the blood sugar, glycosuria, determination of glycosylated hemoglobin and oral glucose tolerance test, blood glucose detection (95.24%), diabetes (92.86%), and tend to be in the form of ‘agreement prescription’, whereas the determination of glycosylated hemoglobin (78.57%) and the oral glucose tolerance test (73.81%) tend to be in ‘supplement prescription’ according to the experts. (4) Medical apparatuses and instruments tend to be ‘independent prescriptions’; disposable syringe needles (95.24%), insulin pumps (83.33%) and insulin pens (92.86%) are prescribed as ‘complement prescription’. (5) In the selection of the health education prescription drugs for diabetes, only the drug guide is 71.43% (<80%), whereas the remaining four (diet, exercise, self-test and psychological support) are 100%. (6) The choice of consultation sheet tends to be ‘agreement prescription’ (90.48%).

3.9. Research on prescription content regarding tumor treatment by nurses in special circumstance 

In England, pain nurses can prescribe drugs for patients in hospitals as listed below: opiates: codeine, tramadol, morphine sulfate and morphine sulfate injection, morphine sulfate sustained release tablet, buprenorphine oxycodone, oxycodone, heroin, pethidine, methadone, hydrogen morphine ketone; non-opiates: nonsteroidal anti-inflammatory drugs, antanacathartics, laxatives, anti-convulsant, antidepressants, etc.

The ONS (Oncology Nursing Society) of the US requires that the oncological advanced practice nurse must be granted prescription rights for some medicines, blood products, nutrition prescriptions and a limited scope of controlled drugs in order to increase the quality of cancer care and symptom management, such as the pain that strongly influences a patient’s life quality. The role of the clinical nursing expert (CNS) described in the advanced practice registered nurse (APRN) in oncology guidelines shows that 11.3% of them have prescription rights in their states, 40.1% have the qualifications for the prescription rights but cannot prescribe, and 48.6% have no prescription rights; 6.1% with prescription rights prescribes every month, 9.1% prescribe every week, 27.3% prescribe every day, and 57.6% never or rarely prescribe drugs.

The Medicine and Public Health Institute of the Yarra River region in the state of Victoria in Australia stipulated that the ONP (oncology nurse practitioner) role includes but is not limited to the following practices regularly check and evaluate chemotherapy patients; manage patient’s chemotherapy side effect; manage tumor emergencies, such as febrile neutropenia, deep venous thrombosis, hypercalcemia and pulmonary embolism; perform the
relevant diagnosis inspection, including pathological examination and imageological examination according to the illness state; prescribe drugs according to the specific dispensatory, including antianacathartic, analgesic, anticoagulation, antibiotic, aperients and chemotherapeutic drugs.

ONPs in Nova Scotia and Alberta in Canada can prescribe oncological drugs, including intravenous chemotherapeutic drugs, oral chemotherapeutic drugs, hormone therapy and supportive drugs. ONPs in Newfoundland can prescribe oncological drugs for hormone therapy and supportive treatment. ONPs in New Brunswick can prescribe intravenous chemotherapy and supportive treatment. Supportive treatment can be prescribed by ONPs in Manitoba, and intravenous chemotherapy can be prescribed in Ontario. ONPs in every state can prescribe intravenous chemotherapy after a cycle of treatment. However, ONPs in every state cannot prescribe anesthetic as part of supportive treatment.

On the basis of semi-structured depth interviews of 20 clinical oncology experts and using a self-design questionnaire and the Delphi method to make two rounds of consultation involving 40 oncology experts and using a self-design questionnaire and the Delphi method to make two rounds of consultation involving 40 oncology experts, specific circumstances in which oncology-specialized nurses could prescribe independently were preliminarily determined as follows (sorted by weight): (1) laboratory inspection (sorted by weight): blood routine examination, electrocardiogram, blood biochemistry, feces examination, thrombin examination, blood culture, sputum culture, and urine culture and tumor marker; nine items in total. (2) Seven symptoms can be prescribed (sorted by weight) during chronic symptom management: stricture, phlebitis, cancer pain, vomiting, cancerous fever, diarrhea and oral infection. (3) Allowed prescription situations in tumor emergencies (sorted by weight): chemotherapeutic drug allergy, hemorrhagic shock, acute upper gastrointestinal massive hemorrhage, acute massive hemoptysis and cerebral hernia.

Determination of the prescription form and content by oncology specialized nurses (1) Tendency to be independent prescriptions: enema, glycerol, liquid paraffin, phenolphthalein, folium senna, fructose, cannabis bolus, and edestan capsules for constipation; bifidobacterium and diphenoxylate for diarrhea; naproxen tablets, indomethacin tablets, indometacin suppositories, Antondine injection and redix bupleuri injection for cancerous fever; chlorhexidine, sodium chloride solution, metronidazole, hydrogen dioxide solution, and sodium bicarbonate for oral infection; hirudoid, magnesium sulfate, and gold powder for phlebitis; etamsylate and aminomethylbenzoic acid for acute massive hemoptysis; omeprazole for acute massive hemoptysis; sodium chloride, grimm infusion for hemorrhagic shock; routine blood examinations, blood biochemical tests, crur examination, blood culture, sputum culture, urine culture, electrocardiography and fecal examination for laboratory inspection items. (2) Tendency to be agreement prescriptions: loperamide for diarrhea; dexamethasone injection for cancerous fever; ketoconazole, flunconazole, and psilocybin for oral infection; dexamethasone injection and epinephrine injection for drug allergy of chemotherapeutics; hemocagulase and hypo-physin for acute massive hemoptysis; somatostatin for acute upper gastrointestinal massive hemorrhage; dexamethasone, ibuprofen, and indometacin suppositories; acetaminophen-codeine, diclofenac injection, cimetidine injection, and melteon antemetic for emesis. Two close prescription forms: acetaminophen-codeine, diclofenac and codeine, bucinnazine and tramadol for cancer pain.

3.10. Determination of the emergency nurse’s prescription content in special circumstances

On the basis of semi-structured in-depth interviews of five experts working in emergency medical treatment, emergency nurse and hospital management, the purposive sampling experience selection method was applied in the self-design questionnaire; two rounds of consultation were conducted according to inclusion and exclusion criteria for 28 experts (11-emergence medicine experts, 12 types of emergency nurse experts and five hospital management experts). The result shows that in 15 types of special circumstances, the ED nurse could be awarded prescription rights (cardiopulmonary arrest, ventricular fibrillation, acute cardiacogenic thoracodynia, stiffe, acute edema of the larynx, massive hemoptysis, hematemesis, wound shock, allergic shock, diabetic ketoacidosis coma, acute sedative-hypnotic drug poisoning coma, organophosphate poisoning with disturbance of consciousness, severe alcoholism with disturbance of consciousness, hyperspasmsatus epilepticus) and cerebral hernia. The detailed prescription content of each special circumstance was sorted by rescue medicines, rescue measures and auxiliary examination and totaled 107 items (some were repeated): 19 types of rescue medicines in 11 categories (dexamethasone, adrenaline, etamsylate, PAMBA, Reptilage, 20% mannitol, glycerin fructose, hydroxyethyl starch, 706 dextran, dextranum, nikethamide, furosemide, naloxone, diazepam, insulin and 10% potassium chloride, glucose saline water, normal saline, 50% glucose liquid). Twenty types of emergency measures in four categories (inspect and unblock air passage, clear away foreign matter in respiratory tract, sputum aspiration, oxygen uptake, trachea cannula, track and fix body of tongue, establish venous channel and two large-caliber venous channels, external chest compression, electric defibrillation, automatic extremal defibrillator, CRR (in necessity), electrocardiogram monitoring, oxymeshglobin saturation monitoring, vital signs monitoring, urgency pressing hemostasis, indwelling catheter, clean water or 1% sodium bicarbonate for gastrointestinal measurement, measurement of blood glucose of peripheral blood). Seven types of auxiliary examination in two categories (blood drawing to check coagulation function, myocardial enzyme and cholinesterase activity determination, bedside ECG examination, 18-lead electrocardiogram inspections, cross matching blood test, sending samples of blood, vomit, and urine for drug concentration determination). Nikethamide was prescribed for cardiac and respiratory arrest, trachea cannula emergency measures for hematemesis, insulin for diabetic ketoacidosis coma, and furosemide or trachea cannula emergency measures for cerebral hernia by agreement prescription form. Independent prescriptions and agreement prescriptions were chosen for electrical defibrillation in ventricular fibrillation, checking blood clotting function in massive hematemesis, 1% sodium bicarbonate for gastrointestinal lavage in serious alcohol poisoning with disturbance of consciousness. The remaining items tended to be independent prescriptions.

3.11. Research of prescription right content of community nurses

England is currently carrying out three prescription qualification education authentication projects, namely, V100, V150 and V300. Community nurses can acquire prescription rights by passing any prescription qualification education authentications mentioned.
above. The V100 project is mainly for community nurse practitioners working on specialized practice qualification, while the V150 project is for nurses without specialist practice qualification. An applicant with the two qualified certifications is allowed to hold the national prescription right. Prescribed drugs, instruments and dressings should follow the Community Nurse Prescribers Formulary, which is updated every two years.35,38; The V300 project is for independent prescription, complementary prescription and midwives prescription qualification.37 Nurses with the independent prescription certification are granted prescription rights following the Extended Formulary Nurse Prescriber (EFNP). Nurses with complementary prescription and midwives prescription certifications have prescription rights within the respective scopes.38

Nurses in England who apply for a prescription qualification education certification program should meet the following conditions: (1) registered nurse with a degree and at least 3 years of clinical experience; (2) grade 5 or above in the hierarchical level; (3) pass a police audit and have no criminal record; (4) have basic medical skills in the specialized subject, such as collecting a medical history and physical assessment; (5) have a corresponding academic-level diploma; (6) be employed by the trust hospital or general clinic of the British national health service (NHS)39; (7) have a relevant certificate provided by an employer.

Nurses in Britain who meet the conditions can apply for the relevant education prescription qualification certification project according to their conditions. The workflow from application to the qualification is roughly as follows: (1) the applicant submits an application for prescription qualification education to the higher education institutions specified by the British nurses and midwives association, and the higher education institutions conduct the qualification examination for the applicant and inform the association of British nurses and midwives association to register the applicant. (2) After registration, the applicants attend theory and practice training provided by the higher educational institutions: the applicant must complete the study of theory course and practice within 12 months. An applicant who has not completed this training must retake the courses. (3) After completing the required courses, they will take the written test and the practice test. (4) After passing the examinations, the applicants will be granted qualification registration of prescription rights by the British nurses and midwives association and will be awarded a prescription qualification certificate. (5) After the confirmation of registrants’ prescription eligibility status by the competent department, registrants can prescribe defined drugs, instruments and dressings according to the “prescription list of nurses”, that is, they have prescription rights.40 Currently, the validity of prescription qualification registration is 5 years; before the expiration date, the nurse prescriber must complete the regulated courses and investigation of theory and practice to receive re-registration.41

The qualifications of community nurses and prescription content were initially determined based on a review of a large amount of related literature regarding the status of community nurse’s prescription rights at home and abroad and based on semi-structured in-depth interviews of five nursing personal and five general medical practitioners. A combination of the self-design expert consultation questionnaire according to the British community nurses prescription list and the Delphi method applied in expert consultation for 19 community nurses and medical experts for two rounds was performed; the results show that the community nurses with prescription rights must have the Intermediate Certificate of nurse-in-charge and a bachelor’s degree in nursing with at least 2 years of working experience in community. Only the nurses meeting the above qualification requirements were allowed to have prescription rights after relevant training, examination and certification. The initial prescription content for the community nurses (by weight) includes the following: disinfection and cleaning, sterile infusion class, wound care, laxatives, birth and gynecology products, mild painkillers, urinary catheters and instruments, diabetes type check, instruments and test papers, colostomy care, superficial skin drugs, antihelmintics, general medicines with the consent of the doctor, common laboratory examinations, and ophthalmic drugs, totaling 14 types; Laxative (by weight): one-time film gloves, dew, glycerin suppositories, liquid paraffin, methyl cellulose, winter library ester sodium capsules or oral liquid, phenolphthalein, senna, castor oil, bisacodyl tablet or suppository, lactulose solution, polyethylene glycol, sodium sulfate capsules and magnesium hydroxide, totaling 14 types; Mild painkillers (by weight): ibuprofen and acetaminophen, three types of aspirin; Superficial skin medicine (by weight): econazole cream, clotrimazole, choline salicylate glue, miconazole cream, nystatin, pass through, thymol, permethrin ointment, magnesium sulfate, dimethyl silicone oil, lotion, marathon, totaling11 types; Play war medicine (by weight): toluene dalai and piperazine, totaling two types; Eye medicine (by weight) hyaluronic acid solution and two types of artificial tears; Cleaning and disinfection (by weight): sterile saline, fell, based iodine, chlorhexidine iodine solution, 10% povidone iodine solution, and chlorine of alcohol solution; Toluidine six types; Diabetes examination, instruments and test paper (by weight): subcutaneous injection equipment, blood glucose monitor and blood test monitor, urine sugar, and glucose tolerance test, totaling four types; Birth and gynecology products (by weight): folic acid and spermicide contraceptive; Colostomy care (by weight): urinary tract appliance after colostomy utensils, ileum, and colon colostomy appliance, totaling three types; Urinary catheter and equipment (by weight): catheters, the catheter maintenance, and urethral catheterization bag, totaling three types; 19 types of wound nursing materials (by weight): Sterile gauze, aseptic dressing, pressure socks, pressure bandage, wound drainage system, breathability thin film dressing, calamine cream ichthammol bandage, paraffin gauze dressing, adhesive dressing, chlorhexidine gauze, absorbable cotton cushion, absorbency cellulose dressing, wound drainage pack, absorbable gauze, water-absorbing quality plastic apparatus ligamentous weibreichi dressing, oil dress, hydrogel dressing, polyurethane foam dressing, and alginate dressing; Sterile infusion (by weight): sterile infusion, sterile syringes, and water for injection; Common laboratory tests (by weight): routine blood tests and routine urine tests. The return-visit patients will use general medicines with the consent of the doctor-in-charge.

3.12. The research of relevant courses of nurse's prescription rights added to nursing undergraduate education41

The nursing undergraduate course has formed an independent system in the United States, and the curriculum provision, health care key points, and the state of nursing major development are closely combined42; it serves as a reference model for domestic researchers on nursing undergraduate curriculum reform. Nursing undergraduate courses in the United States reflect the focus of the current health care and nursing practice changes, and they highlight professional characteristics and strong practicability. Domestic nursing undergraduate education has not yet formed an independent curriculum system, and part of the course content arrangement failed to fully embody the nursing characteristics. Nursing undergraduate curriculum information from 10 universities, such as the University of Washington and the University of Iowa, was obtained through a network (http://www.allnursingschools.com) and from the schools’ official websites. After comparison with the subject and content of nursing undergraduate
courses in some domestic colleges and universities, it was shown that domestic nursing colleges have not established nursing intervention courses, the opening rate of nursing-related laws is low, the differences in pharmacology course content are larger, and the other courses and contents between domestic and overseas programs are similar.

Based on the self-designed questionnaire about related courses for nurse’s prescription rights in undergraduate nursing education, the Delphi method was applied in two rounds of consultation of 60 experts (20 medicine experts, 20 clinical nursing experts and 20 nursing education experts). The results show that experts have the highest approval rating with 93.4%; in second place was knowledge about taking medicines for patients (85.7%), OTC (over-the-counter) medicine knowledge (85.7%), problems and countermeasures of patient compliance (83.7%), nurse’s effect and responsibility in medicine adherence (81.6%), and drug abuse problems (75.5%). The approval ratings for relevant laws and regulations regarding prescription rights was 93.9%, including prescription management method (93.9%), doctor-patient legal relationship (87.6%) and medical malpractice management regulation (83.7%). The approval rating for nursing intervention courses was 85.7%, including clinical nursing intervention (85.7%) and the concept and development of nursing intervention (81.6%).

4. Research conclusions

Most nurses thought that they should participate in decision-making for graded nursing. They believed they had the ability and they were willing to have graded nursing. The doctor was not the best decision maker for grading nursing, and doctor’s decision for grading nursing was not the best strategy. Nursing experts concluded that graded nursing should be independently decided by nurses, whereas the doctors thought that the decision-making for graded nursing should be decided by a collaboration of doctors and nurses.

The qualifications for nurses to make the graded nursing decision are as follows: nurse-in-charge title, bachelor’s degree in nursing with 5 years of clinical work experience or master’s degree in nursing with 3 years of clinical work experience.

The training outline for graded nursing decision nurses has seven classes in total, including 23 teaching contents divided into 48 items. Each lesson consists of two parts: objective requirements and the teaching contents. Course names are successively the latest graded nursing system titled “the guide principle for grading nursing in general hospitals”, assessment methods for grading nursing, nursing inquiry and nursing physical examinations, common diseases, drug knowledge and assessment methods for disease risk factors, understanding of clinical test results, and relevant knowledge and evaluation programs for nursing clinical decision-making.

A position description book of nurse decision-making for graded nursing should be compiled and should include a qualitative description position statement to make the nurse’s responsibility and assignment clearer, expand the practice scope of nurses and further improve the autonomy of nursing work. Workflow should be regulated and a management system should be formulated to provide operation criterion and a basis for nurses’ independent decision-making. Graded nursing should maintain the best running flow should and assignment clearer, expand the practice scope of nurses and provide a basis for clinical pilot work of nurse decision-making in graded nursing.

The doctor was not considered to be the best decision maker for clinical nursing work; nurses had the decision-making ability and could participate in the decision-making of the nursing work content.

The acquisition of nurse’s prescription right is influenced by many factors, which require the support of national policies and regulations, supervision and management of the health administrative departments, improvement of the current nursing curriculum from the education department and cooperation with medical institutions to speed up the acquisition of prescription rights in China.

The entry qualifications of applicants for prescription rights are suggested as follows: work in a tertiary hospital, hold a bachelor’s degree in nursing, have a qualified nurse-in-charge title and have 5 years of experience in clinical work.

It is suggested that clinical nurses with certain qualifications should be offered the ability to prescribe drugs in the forms of independent prescriptions, agreement prescriptions, lengthening prescriptions or adjustments of prescriptions in 11 types of special circumstances.

The diabetes specialist nurses are awarded prescription rights to begin from the health education prescription. For diabetes with a clear treatment process, diabetes specialist nurses have the ability to independently prescribe two routine examination projects, blood sugar and urine sugar monitoring, as well as common medical instruments, such as disposable needle syringes. This will save dose of the physicians and provide reliable data for further treatment; the common classical hypoglycemic agent sulfonamides and a consultation sheet of medical documents list are suggested to be prescribed in the form of agreement prescriptions; biguanides, α-glycosidase inhibitors, long-acting insulin, insulin pumps and insulin pens are prescribed as supplement prescriptions, namely, in the premise of common agreement between the doctor and nurse, and the nurse can extend or adjust the dosage of prescription drugs according to the patient’s blood sugar level.

Full prescription rights should be given to tumor specialist nurses in community nursing and family sick-bed facilities, especially for supportive treatment for terminal cancer patients. This has important significance to reduce pain and improve the quality of life of cancer patients; it is also a reasonable method for developing the prescription rights of tumor specialist nurses in China.

The ED nurses are granted prescription rights in 15 types of specific situations, which will improve the ED nurses’ professional autonomy in clinical rescue work. This is beneficial for the hierarchical use and training of ED nurses, and it promotes development in the direction of specialized subjects and the development of emergency nursing education at a high level. This is a new attempt to promote the development and progress of nursing science.

Expand the range of discussion about nurse’s prescription right to the community. Community nurses with certain qualifications are suggested to have the right to prescribe 14 classes of drugs, including 74 types of prescriptions, such as laxatives, mild pain-killers, superficial dermatologic, etc., after relevant training, examination and qualified certification.

It is suggested that relevant laws and regulations of prescription rights should be added to nursing undergraduate education in China (including the prescription management method, medical accident handling ordinances and doctor-patient legal relationships) and nursing intervention (including two items: the concept and development of the nursing intervention, clinical nursing intervention). A pharmacology course is added, which includes drug dose calculation, drug abuse problems, education about patients’ drug use, nurses’ role and responsibility in drug therapy, compliance and countermeasures of patients’ drug use and OTC (over-the-counter) medicine knowledge, to meet the needs of the implementation of the nurse’s prescription rights.
5. Summary

This report aimed at offering a theoretical foundation for Chinese nurses to possess prescription rights and to be able to determine prescription content, and it provides references for a governmental strategy. A nurse with prescription rights is a clear symbol of improvement in the nursing discipline. The development of nurse practitioners and access to prescription rights indicate the independence of the field of nursing and that nurses have the ability to deal with the related problems of nursing. Because the graded nursing system belongs to nursing, it is feasible that a nurse assigns graded nursing. The first step of implementation of nursing prescription in China is establishing relevant laws and policies. Supported by relevant policies, it can develop step by step in three fields: clinical nursing, professional nursing and community nursing. This will protect patients’ health benefits and promote the decriminalization of nursing. Granting prescription rights to certain qualified nurses has a positive effect on doctors, nurses and patients and on the development of medicine and health service. Meanwhile, it will absolutely increase nurses’ initiative and enthusiasm, promote enhancement in the quality of nursing, and then open a new chapter of further development in nursing careers in China.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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