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A Study on the Construction of a Core Midwife-Led Total Maternal Care Program for High-Risk Pregnancies

Ying Zhou, Xiwei Zhang*, Xin Hong, Zimo Chen, Ying Yue

Department of Obstetrics and Gynaecology, Beijing Anzhen Hospital, Capital Medical University, Beijing 100029, China

Corresponding author: Xiwei Zhang, anna13601216142@163.com

Abstract: *Objective:* To analyze the care needs of high-risk pregnant women during pregnancy, delivery, and postpartum hospitalization. Additionally, to gather obstetrics staff's suggestions for improving a total care program with core midwives leading. *Methods:* The study conducted semi-structured interviews with 20 high-risk pregnant women and 10 obstetricians at a tertiary hospital from August 2021 to October 2022. A descriptive qualitative study assessed their care needs and current care models. An evidence-based approach was used to evaluate guidelines and develop a draft care plan. Finally, the Delphi method refined the core midwife-led total care program. *Results:* The study formulated a draft for a core midwife-led care program, integrating literature and expert feedback. This program defined midwife roles with 7 service standards and 6 qualification standards. The care practice included 3 level 1, 19 level 2, and 58 level 3 entries. Management of common risk factors had detailed entries for conditions like gestational diabetes, advanced maternal age, abnormal early pregnancy weight, hypertensive disorders, and scarred uterus. *Conclusion:* The study offers a qualitative exploration of high-risk pregnant women's care needs and suggests improvements based on healthcare professionals' experiences. It provides a foundation for a midwife-led care program and proposes new research directions. The methodology combines the Ottawa research application model, evidence-based approaches, and theoretical analysis to support this program's development.

Keywords: Core midwife; High-risk pregnancy; Total care; Program

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1. Introduction

In clinical medical research, the research on high-risk pregnancy (HRP) is mainly based on the special characteristics of HRP maternal care, in which the whole process of care should be carried out in the stages of pregnancy, delivery and postpartum hospitalization. In order to strengthen the scientific management of HRP pregnant women, the implementation of total care can strengthen the safe packaging of mothers and infants and reduce the mortality rate of mothers and infants. However, the development of a comprehensive HRP maternal total care program is still under continuous research. Based on the clinical characteristics of HRP pregnant women, there is a high demand for nursing services before and after delivery and during the puerperium, and maternal health can only be ensured

with high-quality nursing interventions, but in order to provide better nursing services, it is necessary to rationally use evidence-based clinical practice and non-medical interventions to strengthen the construction of medical infrastructure and to achieve the whole care of HRP pregnant women in a scientific management manner. In order to provide better quality care, it is necessary to strengthen the medical infrastructure by using evidence-based clinical practice and non-medical interventions and to achieve scientific management of HRP maternal care. In this regard, considering the characteristics of obstetric care, the construction of the HRP maternal care program should be led by core midwives and based on the construction of a professional midwife team to enhance the standardization, rationality and scientificity of HRP maternal care. Thus, the study explores the construction of the HRP maternal care program based on the core midwife-led approach and provides a basis for applying and promoting the core midwife-led concept in the construction of the HRP maternal care program.

2. Materials and methods

2.1. Basic materials of high-risk pregnant women

The study is based on an example analysis of 20 high-risk pregnant women admitted to the antenatal clinic of a tertiary hospital during the period of May 2021–June 2022 and high-risk mothers admitted to the obstetrics ward for delivery as the object of the study.

Inclusion criteria for high-risk pregnant women admitted to the antenatal clinic:

(1) Maternal risk assessment during pregnancy is red, purple and orange;

(2) The pregnant woman has no mental illness, and there is no language communication barrier;

(3) The pregnant woman and her family members are aware of the details of the study and have signed an informed consent form.

Exclusion criteria:

(1) Physical condition does not allow a long time interview;

(2) Mental, cardiovascular and cerebrovascular diseases, and the existence of language barriers.

Inclusion criteria for high-risk women in obstetric wards were:

(1) Maternal risk assessment during pregnancy was red, purple and orange;

(2) Those who were about to be discharged from the hospital within 7 days after hospital delivery;

(3) No mental illness and no language communication barriers;

(4) The mothers and their family members were aware of the details of the study and had signed an informed consent form.

The exclusion criteria were:

(1) Those whose physical condition did not allow a long interview;

(2) Those with mental or cardiovascular diseases and language communication barriers.

The study was conducted to find out the nursing needs of HRP mothers during pregnancy, delivery and postpartum hospitalization. To summaries the views of obstetricians and nurses on the current situation of the HRP maternal care service model and suggestions for improvement. Combined with the concept of the core midwife, this study will explore the specific content of the construction of an HRP maternal care program with the concept of the core midwife.

2.2. Base material of healthcare workers

The study used purposive sampling during the period of May 2021–June 2022 to select 10 medical and nursing staff in the obstetrics department of a tertiary hospital as the study subjects.

Inclusion criteria:

(1) Have a certain degree of obstetrics medical and nursing work experience and work time of 5 years and above;
(2) Doctor title for the intermediate and above;
(3) Midwife title for the nurse practitioner and above, and has a certificate of maternal and child health care technology;
(4) Occupational physical examination, the indexes are normal;
(5) Know the details of the study and participate in the study voluntarily.

Exclusion criteria:

(1) Obstetric interns and healthcare personnel with less than 5 years of working time;
(2) Healthcare personnel on leave during the study period;
(3) Retired and rehired personnel and those who are expected to retire this month;
(4) Those who refused to take part in the study due to personal reasons [1].

2.3. Sample size

The sample size was based on information saturation, which means that the respondents' interview data were repeated and no new themes were presented when the data were analyzed.

2.4. Research methods

2.4.1. Data collection method

Combined with the main body of the study to draw up high-risk pregnant women, high-risk maternal, obstetrician and midwife interview outline, respectively, selected high-risk pregnant women, maternal, obstetrician and midwife each interview test. The results of the interviews were analyzed in the form of expert consultation, which should be conducted by experts working in Grade 3A hospitals with intermediate or higher titles. According to the experts' opinions, the interview outline should be adjusted and modified and a formal outline should be formed.

(1) Interview outline for high-risk pregnant women:
   (a) What are your feelings during the obstetric examination and treatment? Do you have any problems during pregnancy?
   (b) How do you feel about the nursing services provided by the hospital during your hospitalization?
   (c) What were your needs for nursing services during your hospitalization? What kind of services did you expect from the hospital?
   (d) Have you received any special maternal services during your pregnancy?
   (e) Do you think it is necessary for the hospital to provide core midwife one-to-one full nursing care service? Do you think the service is helpful to you?

(2) Interview outline for high-risk women:
   (a) What did you feel during the labour examination, delivery and postnatal hospitalization? Are there any problems that bother you?
   (b) What did you think of the nursing services provided by the hospital during your hospitalization?
   (c) What were your needs for nursing services during your hospitalization? What services do you expect the hospital to provide?
   (d) Did you receive any special maternal services during your maternity checkup, delivery and post-partum hospitalization?
   (e) Do you think it is necessary for the hospital to provide core midwife one-to-one full nursing care service? Do you think the service is helpful to you?

(3) Outline of the obstetrician's interview:

(a) What kind of nursing services do you think should be provided to high-risk pregnant women during hospitalization?
(b) What do you think should be done to provide high-risk maternal services? Are there any different needs for different diseases?
(c) Do you think it is necessary to understand the care needs of high-risk pregnant women, and which needs do you think are reasonable? How should it be implemented?
(d) What types of high-risk maternity services are you aware of? Which services do you think high-risk pregnant women need?
(e) Do you think hospitals need to provide core midwife care services for high-risk pregnant women? How is it implemented?

(4) Midwife interview outline:
(a) What kind of care services do you think high-risk pregnant women should receive? What services do you provide now?
(b) What do you think should be done to provide high-risk pregnant women with high-quality care services?
(c) Do you think it is necessary to understand the care needs of high-risk pregnant women, and which needs do you think are reasonable? How should it be implemented?
(d) What types of services for high-risk pregnant women are you aware of? Which services do you think high-risk pregnant women need?
(e) Do you think hospitals need to provide core midwife care services for high-risk pregnant women? How to implement it?
(f) Do you think you and your colleagues are competent to work as core midwives? If not, what measures should be taken?

Based on the above interview outline, different subjects were interviewed to collect data on the construction of a core midwife-led total maternal care program for high-risk pregnancies. The mode of the interview is one-on-one offline interviews, the time is controlled at 20–40 min, and the whole interview process is recorded to facilitate the subsequent conversion of the audio files into transcripts.

2.4.2. Data analysis method

By analyzing the interview transcripts, the frequently occurring statements are classified and integrated for similar phrases, emotions, beliefs, experiences and values, and authoritative experts are invited to review them in the process. IBM SPSS Statistics 20 software was used for statistical analysis, and the measurement data were expressed by mean ± standard deviation (SD), and the count data were described by %. The degree of expert authority (Cr) was calculated by combining the self-assessment results of the basis of judgment (Ca) and familiarity (Cs) made by the experts. The degree of influence of expert judgment basis on expert judgment is large, medium and small, and the specific assignment can be seen in **Table 1**.

Table 1 Expert judgment basis assignment

Project	Degree of influence assigns a value		
	Large	Medium	Small
Practical experience	0.6	0.5	0.4
Theoretical analysis	0.4	0.3	0.1
Intuitive experience	0.2	0.2	0.1
Peer-based understanding	0.1	0.1	0.1

The degree of coordination of expert opinions in the expert correspondence analysis is expressed by the Kendall coefficient W value. The closer the value is to 1, the closer the *P*-value is to 0, which represents a higher degree of confidence in the expert test results.

2.4.3. Program revision method

The study uses the Delphi method to carry out the expert prediction and the macro-prediction survey to enhance the substance of the dissertation research by means of the authority of experts to ensure that the core midwife-led total care program for high-risk pregnancies proposed by the study can provide a basis for innovation in obstetric care services. Based on the expert prediction method helps to solidify the quantitative basis. According to the draft nursing program formulated by the study, the evaluation is carried out in the form of expert correspondence, and the results of each round of scoring should be fed back to the participating experts before the next round of correspondence and at least two rounds of expert correspondence should be completed to unify the experts' opinions [2]. Twenty experts with professional knowledge in the field of obstetrics and midwifery were selected for the study. The inclusion criteria of the experts were: (1) 20 years or more working hours in a tertiary hospital; (2) more than 10 years of work experience in obstetrics clinical care, nursing and management; (3) title of intermediate or above; (4) know the details of the study and voluntarily participate in the study.

2.4.4. Preparation of the draft program

Under the combination of multiple research methods, a draft sub-program on the total care of high-risk pregnant women led by core midwives was formulated, including the contents of the total care practice and the definition of the role of core midwives, which covered 5 level 1, 15 level 2 and 50 level 3 items; and the definition of the role of core midwives covered 8 service norms and 3 qualification standard items. The draft sub-program on the management of common risk factors in pregnancy includes 40 entries on the management of high-risk pregnant women with gestational diabetes mellitus, 25 entries on the management of elderly pregnant women, 46 entries on the management of high-risk pregnant women with abnormal body weight in early pregnancy (BMI > 25 kg/m^2), 56 entries on the management of pregnant women with hypertensive disorders of pregnancy and 22 entries on the management of women with scarred uterus [3].

3. Results

3.1. Analysis of general information

A total of 20 high-risk pregnant women participated in this study, antenatal and postnatal 8 and 12 each, aged between 25 and 45 years old, with an average age of 33.22 ± 5.36 years old, of which 15 belonged to the risk of orange high-risk pregnancies, combined with one purple high-risk, and four red high-risk. The basic information can be seen in the following **Table 2**. 10 healthcare workers participated in the study, which consisted of 4 doctors, 6 midwives and 4 doctors, aged between 29 and 56 years old, with a mean age of 46.73 ± 11.64 years old, with a minimum of 5 years and a maximum of 34 years in obstetrics, with a mean working experience of 24.66 ± 11.35 years. There were 3 doctors with senior titles and 1 doctor with intermediate titles; 4 midwives with intermediate titles and 2 midwives with junior titles, which can be seen in **Table 3**.

Table 2 General information of high-risk pregnant women (n = 20)

No.	Age	High-risk level	Parity	Para	Risk factor
A1	25	Red	2	1	Pregnancy combined with arrhythmia, anemia
A2	27	Red	2	1	Combined arrhythmia of pregnancy, hyperthyroidism, anemia
A3	28	Orange	2	0	Early pregnancy BMI > 25, thyroid disease in pregnancy
A4	29	Red	1	1	Gestational diabetes mellitus, arrhythmia in pregnancy
A5	29	Orange	2	0	Early pregnancy BMI < 18, history of preeclampsia, history of preterm labor
A6	30	Orange	2	0	Early pregnancy BMI < 18, combined thyroid disease in pregnancy
A7	30	Orange	3	2	Thyroid disease in pregnancy
A8	31	Orange	2	1	Thyroid disease in pregnancy, combined with hypertension and liver insufficiency
A9	32	Red	1	0	Nephritis syndrome, hyperthyroidism, anemia, twin pregnancy
A10	35	Orange	4	2	Hypertension in pregnancy, cardiorespiratory insufficiency, advanced age
A11	35	Orange	3	2	Gestational diabetes mellitus, gestational thyroid disease, advanced age
A12	36	Orange	1	0	Assisted reproduction pregnancy, advanced age
A13	37	Orange，Violet	5	3	Early pregnancy BMI ≥ 28, scarred uterus, advanced age, syphilis
A14	39	Orange	1	0	Early pregnancy BMI > 25, hypertension in pregnancy, cardiorespiratory insufficiency, advanced age
A15	40	Orange	1	1	Gestational diabetes, advanced age
A16	40	Orange	2	2	Early pregnancy BMI > 25, combined thyroid disease in pregnancy, advanced age
A17	42	Orange	2	1	Nephritis syndrome, hyperthyroidism, anemia, advanced age
A18	42	Orange	2	2	Hypothyroidism in pregnancy, advanced age
A19	43	Orange	1	1	Advanced age
A20	45	Orange	3	2	Advanced age

Table 3 General information on healthcare workers (n = 10)

No.	Sex	Age	Years of working experience (years)	Cultural level	Job title
N1	Female	50	25	College	Nurse practitioner-in-charge
N2	Female	29	5	Undergraduate	Nurse practitioner
N3	Female	53	30	College	Nurse practitioner-in-charge
N4	Female	46	22	Undergraduate	Nurse practitioner-in-charge
N5	Female	32	8	Undergraduate	Nurse practitioner
N6	Female	37	14	Undergraduate	Nurse practitioner-in-charge
D1	Male	40	15	Undergraduate	Attending physician
D2	Female	44	20	Master’s degree student	Attending physician
D3	Female	56	32	Undergraduate	Attending physician
D4	Female	52	29	Master’s degree student	Chief physician

3.2. Results of expert correspondents

Twenty obstetrics experts were selected for the expert correspondence inquiry; the age of the experts ranged from 36 to 60 years old, with an average age of 46.75 ± 6.67 years old, and the clinical working experience in obstetrics ranged from 12 to 37 years, with an average working experience of 25.44 ± 8.23 years. The cultural level of the experts was 3 doctoral students, 5 master's students, 10 undergraduates, and 2 junior colleges (4.55%), of which 8 had intermediate titles and 12 had senior titles, as shown in **Table 4**.

Table 4 General information of experts (n = 20)

No.	Age	Years of working experience (years)	Cultural level	Job title
1	36	12	Undergraduate	Nurse Practitioner-in-Charge
2	36	13	Undergraduate	Nurse Practitioner-in-Charge
3	37	13	College	Attending physician
4	38	15	Master's degree student	Nurse Practitioner-in-Charge
5	40	16	Master's degree student	Attending physician
6	40	17	Undergraduate	Nurse Practitioner-in-Charge
7	41	17	PhD student	Attending physician
8	42	18	Undergraduate	Nurse Practitioner-in-Charge
9	44	20	Undergraduate	Associate Chief Nurse
10	46	22	Undergraduate	Associate Chief Nurse
11	46	23	College	Associate Physician
12	48	24	Master's degree student	Associate physician
13	49	25	Undergraduate	Associate physician
14	50	25	Undergraduate	Associate Chief Nurse
15	52	28	Undergraduate	Associate physician
16	55	30	PhD student	Chief physician
17	56	33	Undergraduate	Associate Chief Nurse
18	57	33	PhD student	Associate Chief Nurse
19	59	36	Master's degree student	Chief physician
20	60	36	Master's degree student	Chief physician

The questionnaire of expert correspondence was issued to 20 experts who participated in the study, 20 questionnaires were issued, 20 valid questionnaires were recovered and the recovery rate of the questionnaires was 100%, which reflects that the enthusiasm of the experts who participated in the study by correspondence was good. The coefficient of authority of experts' correspondence is within the range of 0.80–1.00, **Table 5** shows the authority of experts' correspondence, and the coefficient of authority of all experts (Cr') is the arithmetic average of the coefficient of authority of all experts, and Cr' = 0.90 > 0.70, which verifies that the results of experts' correspondence have good credibility.

Table 5 The degree of authority of experts' correspondence

No.	Practical experience	Theoretical analysis	Intuitive feeling	Peer-based understanding	Judgment	Familiarity	Degree of authority
1	0.5	0.2	0.1	0.1	0.80	0.60	0.80
2	0.6	0.3	0.1	0.1	0.90	0.60	0.95
3	0.5	0.2	0.1	0.1	0.90	0.80	0.90
4	0.4	0.2	0.1	0.1	1.00	0.70	0.80
5	0.5	0.3	0.1	0.1	0.80	0.90	0.90
6	0.6	0.2	0.1	0.1	1.00	1.00	0.85
7	0.6	0.3	0.1	0.1	0.90	0.60	0.85
8	0.5	0.3	0.1	0.1	0.90	0.80	0.80
9	0.4	0.2	0.1	0.1	0.80	0.80	1.00
10	0.5	0.2	0.1	0.1	1.00	1.00	0.70
11	0.3	0.3	0.1	0.1	1.00	1.00	0.80
12	0.6	0.2	0.1	0.1	0.90	0.80	0.90
13	0.5	0.2	0.1	0.1	1.00	1.00	0.95
14	0.5	0.3	0.1	0.1	0.90	0.60	1.00
15	0.5	0.3	0.1	0.1	0.90	1.00	0.95
16	0.4	0.3	0.1	0.1	1.00	0.80	0.90
17	0.4	0.3	0.1	0.1	1.00	1.00	1.00
18	0.5	0.4	0.1	0.1	1.00	0.80	0.95
19	0.5	0.4	0.1	0.1	1.00	1.00	1.00
20	0.5	0.3	0.1	0.1	1.00	1.00	1.00

The study combined the scores and revisions given by experts to revise the entries of the original draft program, adding and deleting relevant entries. In the revision of the core midwife-led total care for high-risk pregnant women, the service specification for the definition of the role of the core midwife was deleted from 8 to 1 and the list of qualifications was added from 3 to 6; in the revision of the entries for level 1, level 2, and level 3 of the practice of total care, the level 1 entries were not changed, while level 2 entries were increased by 4, and level 3 entries were increased by 8. In the management of common high-risk factors in pregnancy sub-program, the management of high-risk pregnant women with combined diabetes mellitus was revised from 40 entries to 41; the management of high-risk pregnant women of advanced age was deleted by 2 entries, and the final entry was 23; the management of high-risk pregnant women with abnormal body weight in early pregnancy (BMI > 25 kg/m^2) was deleted by 6 entries, and the final entry was 40; the management of high-risk pregnant women with hypertensive disorders of pregnancy was deleted by 3 entries, and the final entry was 53; and the management of high-risk pregnant women with hypertensive diseases of pregnancy was deleted by 3 entries, and the final entry was 53, with a final entry of 53, and the management of high-risk pregnant women with scarred uterus was added by 3, with a final entry of 25 [4].

3.3. Determination of program content

After being revised by experts, this study finalized the content of the core midwife-led total care program for

high-risk pregnant mothers. In the sub-program of the core midwife-led total care for high-risk pregnant women, the role of the core midwife is defined to cover seven service specifications and six qualification standards; in the content of the total care practice, there are three Level 1 entries, 19 Level 2 entries and 58 Level 3 entries, respectively. The management of common risk factors in pregnancy sub-program covers 41 entries for the management of high-risk pregnant women with gestational diabetes mellitus, 23 entries for the management of high-risk pregnant women of advanced age, 40 entries for the management of high-risk pregnant women with abnormal body weight in early pregnancy (BMI > 25 kg/m^2), 53 entries for the management of high-risk pregnant women with hypertensive disorders of pregnancy and 25 entries for the management of high-risk pregnant women with scarred uterus [5].

4. Discussion

4.1. Analysis of the needs of high-risk pregnant women

Through semi-structured interviews with high-risk pregnant women, it is found that most HRP pregnant women have negative emotions such as panic, depression, anxiety, etc., which seriously jeopardize the mental health, fetal safety and disease prognosis of HRP pregnant women. Through studying domestic and international literature, the study found that most scholars have pointed out in their case studies that negative emotions of HRP pregnant women have hindered the development of treatment to a certain extent. Worrying about the health and safety of mother and child is the primary source of pregnancy stress for pregnant women, while family economic level and family relationship are important factors affecting the level of stress, and pregnancy stress is positively correlated with prenatal depression. The greater the pregnancy stress, the higher the level of prenatal depression [6]. Therefore, based on the prevalence of negative emotions in HRP pregnant women, strengthening psychological interventions and linking the adverse negative emotions of HRP pregnant women is a major need for HRP pregnant women in clinical practice and healthcare professionals should pay high attention to the character of maternal mental health in high-risk pregnancies [7].

Secondly, taking into account the individual differences of HRP pregnant women, each HRP pregnant woman has a different degree of disease, so there are big differences in the needs. At present, most hospitals mainly focus on treatment and nursing care in HRP maternity services and do not pay enough attention to the psychological state, living condition and family and social support of HRP pregnant women, which leads to poor results in actual care. Based on this study, in order to carry out core midwife-led total care for high-risk pregnant women, it is necessary to carry out total care based on the psychological and spiritual status of society, family, and HRP mothers themselves, which is the care service that HRP mothers are eager to experience during their hospitalization.

Finally, most of the negative emotions of HRP pregnant women, mainly from their own lack of understanding of the disease, do not have professional knowledge, and then produce panic, anxiety and other negative emotions. In the diagnosis and treatment, HRP pregnant women tend to book their own familiar health care personnel, which can facilitate the communication between the HRP pregnant women and health care personnel, in order to ease their nervousness and anxiety [8]. This reflects the need for continuity of care for HRP pregnant women, and HRP pregnant women look forward to strengthening communication with healthcare professionals. Therefore, attaching importance to the construction of a perfect doctor-patient relationship with HRP pregnant women can help the development of clinical medical and nursing care and provide a guarantee for the implementation of the whole care program [9]. Only by continuously strengthening doctor-patient communication can we enhance the confidence of HRP pregnant women, improve their trust in healthcare personnel and rely on a good doctor-patient relationship to strengthen the psychological intervention and

treatment adherence of HRP pregnant women so as to provide a safe guarantee for the health of mothers and infants [10].

4.2. Recommendations on program implementation

In order to realize the effective implementation of the core midwife-led high-risk pregnancy maternity care program, hospitals should pay attention to the training of midwives' professional knowledge, regularly carry out professional training on HRP maternal care, enhance midwives' knowledge of HRP maternity care, understand HRP professional knowledge, and promote the enhancement of midwives' professionalism. Besides, the hospital can also combine professional training with the human resources performance appraisal system and strengthen the supervision of midwives' HRP professional knowledge training by means of a scientific, reasonable and standardized appraisal method. Combine professional training with human resources performance appraisal system, strengthen the supervision of HRP professional knowledge training for midwives in a scientific, reasonable and standardized appraisal way, guide midwives to comprehensively and deeply master relevant knowledge and skills about HRP maternal care and help to build a more complete HRP maternal care team for midwives by improving the professional level and ability of midwives in HRP maternal care, so that midwives are familiar with the use of the core midwife-led high-risk pregnancy Maternity Care Program for the whole process of maternal care [11]. At the same time, in the midwifery care work, organizational leadership should be strengthened to provide support for the implementation of the core midwife-led high-risk pregnancy maternal care program, whether in terms of human, material, or financial resources should be based on the midwife HRP maternal care work to give maximum support [12]. Therefore, in order to avoid the midwives in the work to produce greater professional pressure, hospitals must combine the use of incentives in human resource management, material and spiritual incentives to stimulate the enthusiasm of the midwives to work in parallel, to drive their work initiative and enthusiasm, in order to enable midwives to maintain a healthy working condition for a long period of time, preventing burnouts. Besides, this can also carry out a reasonable distribution and continuously strengthen the introduction and training of professional midwives to solve the problem of human resources shortage [13].

In addition, it is necessary to emphasize the construction and leadership of the professional team of midwives and hospital executives and obstetric managers need to give more care to the midwife team [14]. According to the work of midwives to appropriately adjust the amount of work, reasonable adjustment of shift work time, the implementation of salary and welfare policies, in the strong support of the leadership to help improve the confidence of midwives. The leadership should play the lubricant of the midwife team, coordinating the relationship between all parties to build a good working atmosphere and leading to enhance the sense of unity and cooperation of midwives through the construction of the team centripetal force and cohesion [15]. This is to provide more help for the effective implementation of the core midwife-led maternal care program for high-risk pregnancies so that the program can rely on the unity of the professional team to play its own performance and role [16]. In this regard, in the management of the midwife team, it is necessary to build a corresponding working mechanism for the characteristics of the HRP maternal care work, to constrain the work behavior of midwives with a reasonable and standardized system, and to organize the midwives to jointly establish a team with mutual respect and trust, so that the midwives can maintain an upward working mentality and enthusiasm for work [17].

4.3. Reliability analysis of the program

When constructing the core midwife-led total maternal care program for high-risk pregnancies, the study invited 20 experts with sufficient working experience in the field of obstetrics and more than 10 years of working

experience to participate in the study out of consideration for professionalism and in order for the program to be effectively implemented in clinical treatment and to have a certain degree of practicality. Based on the analysis of expert evaluation and opinion, the study examined the authority of the expert team and concluded that the authority coefficient of the correspondence experts is 0.80, which meets the basic standards, and the credibility of the expert correspondence results is good, and it also represents that the construction of this nursing program has a good degree of reliability [18].

4.4. Scientific analysis of the program

Based on the domestic and international literature and guidelines, the study introduced the midwife-led maternity care model, which has been developed in Australia and New Zealand [19].In 2021, nearly 85% of HRP pregnant women in New Zealand were able to receive midwife-led maternity care, and the outcomes of labor and delivery under this model were significantly improved [20]. The study combined the current situation of the development of the domestic healthcare industry, based on the reality of China's healthcare resources, and considering that the foreign care model could not be fully applied to the domestic clinical environment. The study conducted semi-structured interviews with high-risk HRP pregnant women and obstetric healthcare personnel, from which to understand the care needs of HRP pregnant women and the views of healthcare personnel on HRP maternal care and to localize and modify the foreign care model so that its content can be more closely related to the actual situation and needs of domestic HRP pregnant women [21].

In the construction of the core midwifery-led high-risk pregnancy maternal care program, not only should it be combined with the opinions of experts in the field of obstetrics to revise the program, but also be based on the actual working conditions of obstetric HRP maternal care, and should not just learn from foreign care programs [22]. In terms of midwife education and autonomous authority should be adjusted in accordance with the actual situation of clinical work to enable midwives to be competent in core midwifery. Combined with the results of the interviews and the research team discussion, this study on the foreign core midwife qualification standards and service specifications can enhance the professionalism of the midwife team so that the applicability of the midwife nursing program has been strengthened in terms of the selection of midwives, the basic requirements. In the selection of midwives, the basic requirement is that the medical and nursing personnel with the title of intermediate or above should be subject to, and at the same time, they should have rich clinical experience in obstetrics, and the working hours should meet the requirement of 10 years or above [23]. In addition, in the selection of midwives, it is necessary to assess whether they have good care, patience and keen observation, and select midwives with strong professional ability and a high level of practical ability to help strengthen the applicability of the program [24].

In the management of high-risk factors in pregnancy, midwives abroad are required to collaborate with general practitioners or obstetricians from other healthcare facilities in order to refer high-risk pregnant women at the necessary moment. This study builds a program for hospital midwives, and the application base of the program is a tertiary general hospital whose obstetrics department has established links with all levels of maternal and child healthcare institutions. There are multidisciplinary specialty teams in the hospital, which not only ensures that there are obstetricians and midwives to participate in the diagnosis, treatment and care of high-risk pregnancy and childbirth, but also can be easily assisted by other specialists [25]. In case of emergency, midwives are able to contact specialists for maternal consultation or emergency care immediately, making up for the limitation that midwives in China do not have independent prescribing power. In the whole maternal care model implemented abroad, high-risk pregnant women generally need to select an obstetric medical institution in advance to deliver under the supervision of doctors [26]. The implementation of this program in hospitals can ensure that high-risk pregnant women are provided with adequate medical equipment and specialized personnel

to respond to emergency emergencies at any time [27].

4.5. The program has clinical significance

HRP pregnant women are difficult to treat, and in nursing care, in order to provide more high-quality nursing services, the application of the core midwife-led high-risk pregnancy pregnant women's total care program can enhance the continuity of nursing care by way of total care, and based on the HRP pregnant women's mental health and quality of life, and other aspects of factors to be considered [28]. The one-on-one total care program can help reduce the risk of adverse outcomes for mothers and infants caused by HRP, and with the help of professional midwife teams, it can enhance doctor-patient communication, help HRP mothers build up their confidence and strengthen mutual trust [29]. It is of practical significance to improve the efficiency and technical level of obstetric clinical care, and it can be based on the implementation of the new HRP maternal care program and strengthen the standardization of obstetric clinical care services and practice guidance with the goal of realizing the whole process of care [30].

5. Conclusion

(1) The nursing needs of HRP pregnant women during pregnancy, labor and delivery, and the postpartum stage were clarified. The paper also integrates and analyzes the perceptions of obstetricians and nurses on HRP pregnant women's nursing services and suggests improvements.

(2) The survey and interview data combined to extract the themes of issues that should be of concern in HRP pregnant maternity services are the practice of HRP pregnant maternity services, the content of HRP pregnant maternity services, the deficiencies of the existing services, and the influencing factors of the implementation of the HRP pregnant maternity total care program.

(3) Combining domestic and international literature, based on the theoretical learning and experience between the results of previous research, hospitals are encouraged to build two sub-programs of core midwife-led total maternal care and the management of common high-risk factors in pregnancy.

(4) Combined with the expert argumentation method, improve the content of the core midwife-led total maternal care program for high-risk pregnancies based on the assessment opinions of experts.

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