

# Effects of Health Education with Problem-Based Learning Approaches on the Knowledge, Attitude, Practice and Coping Skills of Women with High-Risk Pregnancies in Plateau Areas

Ying Wu<sup>1</sup>, Suolang Sezhen<sup>2</sup>, Renqing Yuzhen<sup>1</sup>, Hong Wei<sup>1</sup>, Zhijuan Zhan<sup>1</sup>,  
Baima Hongying<sup>1</sup>, Yuhong Zhang<sup>1</sup>, Lihong Liu<sup>1\*</sup>

<sup>1</sup>Department of Nursing, Linzhi People's Hospital, Linzhi, China

<sup>2</sup>Department of Obstetrics and Gynecology, Linzhi People's Hospital, Linzhi, China

Email: wuying20050511@126.com

**How to cite this paper:** Wu, Y., Sezhen, S.L., Yuzhen, R.Q., Wei, H., Zhan, Z.J., Hongying, B.M., Zhang, Y.H. and Liu, L.H. (2024) Effects of Health Education with Problem-Based Learning Approaches on the Knowledge, Attitude, Practice and Coping Skills of Women with High-Risk Pregnancies in Plateau Areas. *Open Journal of Nursing*, **14**, 192-199.

<https://doi.org/10.4236/ojn.2024.145014>

**Received:** April 20, 2024

**Accepted:** May 19, 2024

**Published:** May 22, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Objective:** Given the unique cultural background, way of life, and physical environment of the Tibetan Plateau, this study aims to investigate the effects of health education using problem-based learning (PBL) approaches on the knowledge, attitude, practice, and coping skills of women with high-risk pregnancies in this region. **Methods:** 76 high-risk pregnancy cases were enrolled at Tibet's Linzhi People's Hospital between September 2023 and April 2024. 30 patients admitted between September 2023 and December 2023 were selected as the control group and were performed with regular patient education. 46 patients admitted between January 2024 and April 2024 were selected as the observation group and were performed regular patient education with problem-based learning approaches. Two groups' performance on their health knowledge, attitude, practice and coping skills before and after interventions were evaluated, and patient satisfaction were measured at the end of the study. **Results:** There was no statistical significance ( $P < 0.05$ ) in the patients' health knowledge, attitude, practice, or coping skills between the two groups at the beginning. However, following PBL-based health education, patients in the observation group performed significantly better than those in the control group who received regular education, indicating a statistical significance ( $P < 0.05$ ). Patient satisfaction in the observation group (97.82%) was higher than that of the control group (86.66%) with  $P < 0.05$ . **Conclusions:** Health education with problem-based learning approaches is worth promoting as it can help high-risk pregnant women in plateau areas develop better health knowledge, attitude and practice and healthier coping skills. Also, it can improve patient sanctification.

---

## Keywords

Plateau Areas, Patients with High-Risk Pregnancies, Problem-Based Learning, Health Education, Health Knowledge, Attitude and Practice, Coping Skills

---

## 1. Introduction

People in the Tibetan Plateau suffer from long-term exposure to high-altitude hypoxia which can impact disease development. When a woman and her fetus face a higher-than-normal chance of experiencing complications, such as fetal death, spontaneous abortion, congenital disorders, ectopic pregnancy, preterm labor, or obstructed labor, is considered a high-risk pregnancy [1], e.g. history of abnormal pregnancy and delivery, bleeding during pregnancy, gestational hypertension, and gestational diabetes, etc. Women with high-risk pregnancies are subject to increased incidence of perinatal complications and deaths. Therefore, it is vital to strengthen clinical management for high-risk pregnancies to improve birth outcomes [2]. Research has shown that pregnant women's ignorance of high-risk pregnancy is the primary cause of their disregard for medical advice which could result in adverse pregnancy outcomes. Thus, it is crucial to provide effective health education for them [3]. Health education with PBL approaches is a new type of patient-centered education model where patients can decide on their learning materials and methods to improve learning efficiency [4]. There are few studies related to the effects of PBL in health education on the knowledge, attitude, practice and coping skills of women with high-risk pregnancies in plateau areas. This research is designed to evaluate that by studying 76 cases of high-risk pregnancies admitted between September 2023 and April 2024 in our hospital.

## 2. Data and Methods

### 2.1. Data

This study included 76 cases of high-risk pregnancies that were hospitalized at our hospital between September 2023 and April 2024. 30 patients admitted between September 2023 and December 2023 were selected as the control group, and they were performed with regular patient education. 46 patients admitted between January 2024 and April 2024 were selected as the observation group, and they were performed with regular patient education using PBL approaches. Two groups' basic information, including age, body mass index (BMI) and obstetric history indicated no significant significance ( $P > 0.05$ ). See **Table 1**.

### 2.2. Inclusion and Exclusion Criteria

**Inclusion criteria:** a) Age > 25 years old and live in the plateau area; b) Meet the diagnostic criteria in "Obstetrics and Gynecology" for high-risk pregnancies

**Table 1.** Basic information.

Group	Age (year)	BMI (kg/m <sup>2</sup> )	Multipara (n)	Primipara (n)
Observation (n = 46)	29.38 ± 2.15	25.34 ± 1.97	16	30
Control (n = 30)	29.51 ± 2.24	25.43 ± 2.02	14	16
<i>t/x<sup>2</sup></i>	0.284	0.216		0.045
<i>P</i>	0.777	0.829		0.822

[5]. When a woman and her fetus face a higher-than-normal chance of experiencing complications, such as fetal death, spontaneous abortion, congenital disorders, ectopic pregnancy, preterm labor, or obstructed labor, is considered a high-risk pregnancy [1]; **c)** Singleton pregnancies; **d)** Good communication and comprehension.

**Exclusion criteria:** **a)** Experienced induced abortion or miscarriage during pregnancy; **b)** Patients with abnormalities of the birth canal; **c)** Patients with intellectual disability or disorders in psychology and personality; **d)** Withdrawal from the study for personal reasons.

### 2.3. Methods

Regular patient education was carried out in both groups for one month, including promoting prenatal care and nutrition knowledge, answering patients' questions on a regular basis, distributing health care brochures before delivery, and informing them of prenatal and postnatal precautions (labor inspection, postnatal recovery, etc.). Patients' vital signs and body indexes were closely monitored at the same time. PBL methods were applied additionally to the observation group. Details were as follows:

1) Set up a PBL education team. It was headed by a nursing director and team members included nurses and outpatient physicians, etc. Members were professionally trained by the nursing director to master the concepts and methods of PBL education beforehand.

2) Talk to the patients one-on-one to learn about their situations and concerns by raising questions. Then summarize the information and existing problems to develop a reasonable education plan.

3) Set up PBL health education classes and conducted multimedia lectures (2 hours per week, 1 hour for lectures and 1 hour for questions and answers). For patients in early pregnancy, we would discuss topics that they are most interested in, such as prenatal care, risk factors of high-risk pregnancies, and some precautions. For patients in mid-pregnancy, we would keep them up with the antenatal checkup notice, and they were asked to attend one course per week which mainly talked about prenatal diagnosis like amniocentesis. We would explain its purposes, steps, detection methods, precautions, etc., so as to help them overcome fear and be more cooperative during the puncture. Complications such as vaginal bleeding and spontaneous abortion were likely to occur after the puncture so nurses should strengthen the risk management of patients with high-risk

pregnancies and instruct them to rest for 2 hours after the operation to avoid triggering uterine contraction. Meanwhile, we would closely monitor fetal heart rate and other vital signs, and remind the patients to inform the medical staff immediately when necessary.

4) After class, we would assess how well the patients had learned about pregnancy knowledge and prenatal diagnosis, etc., and encourage them to ask more questions to stimulate their interest in learning. At the same time, we would remind them how negative emotions could have adverse impacts on birth outcomes, so it was important for them to remain calm and positive. In addition, we used narrative methods to soothe their emotions, creating a quiet and comfortable environment by playing soft and soothing music, and instructing them to relax and regulate their respiratory rhythms.

## 2.4. Evaluation Indicators

### 2.4.1. Knowledge, Attitude and Practice

Questionnaires developed by the department were distributed to the two groups before and after the education interventions to evaluate the outcomes from three dimensions: knowledge, attitude and practice, with each dimension scored from 0 to 5. The higher the scores, the more positive the impacts. The effective response rate of the questionnaire was 100.00%.

### 2.4.2. Coping Skills

The Medical Coping Modes Questionnaire (MCMQ) [6] was applied to measure the two groups' coping skills before and after interventions from 3 scales, including confrontation (8 items), avoidance (7 items), and resignation (5 items), scored from 0 ~ 3 points for each item. Higher scores suggested that the frequency of using this coping mode was higher. The questionnaires' test-retest reliability and validity were 0.895 and 0.893, respectively.

### 2.4.3. Patient Satisfaction

Satisfaction questionnaires were issued to the two groups before discharge. Patients could select from very satisfied, satisfied and dissatisfied. The questionnaires were collected immediately after completion to calculate the two groups' patient satisfaction.

## 2.5. Statistical Methods

Data were analyzed by SPSS22.0. The results were compared with an independent samples t-test indicating with  $(\bar{x} \pm s)$ , and a chi-square test indicating with %.  $P < 0.05$  was considered statistically significant.

## 3. Results

### 3.1. Comparisons of Two Groups' Health Knowledge, Attitude and Practice

As shown in **Table 2**, the scores of the two groups' performance on health

**Table 2.** Comparisons of two groups' health knowledge, attitude and practice ( $\bar{x} \pm s$ , points).

Group	Knowledge		Attitude		Practice	
	before	after	before	after	before	after
Observation (n = 46)	2.12 ± 0.42	4.02 ± 0.70*	1.96 ± 0.37	3.97 ± 0.66*	1.87 ± 0.32	3.91 ± 0.65*
Control (n = 30)	2.16 ± 0.45	2.98 ± 0.53*	1.91 ± 0.35	2.86 ± 0.41*	1.84 ± 0.29	2.81 ± 0.38*
<i>t</i>	0.440	7.963	0.665	9.418	0.470	9.731
<i>P</i>	0.662	0.000	0.506	0.000	0.638	0.000

Note: \*indicated it was compared to the data before interventions, with  $P < 0.05$ .

knowledge, attitude and practice before interventions indicated no statistical significance ( $P > 0.05$ ), and the scores of the observation group after taking PBL health education were significantly higher than that of the control group with ( $P < 0.05$ ).

### 3.2. Comparisons of Two Groups' Coping Skills

As shown in **Table 3**, two groups' coping skills (evaluated by scores) indicated no statistical significance before intervention ( $P > 0.05$ ), and that changed significantly and showed statistical significance after the intervention with  $P < 0.05$ .

### 3.3. Comparisons of Two Groups' Patient Satisfaction

As shown in **Table 4**, the satisfaction rate in the observation group was higher than that in the control group ( $P < 0.05$ ).

## 4. Discussion

1) Many risk factors could lead to high-risk pregnancy, including gestational complications, advanced maternal age, placenta praevia, and certain adverse environmental and social factors. High-risk pregnancy may cause fetal death, intrauterine growth restriction and other adverse outcomes and also increase the risk of obstructed labor which could endanger the health of both mothers and fetuses. Therefore, applying reasonable and effective interventions for women with high-risk pregnancies is of great significance to help improve pregnancy outcomes and reduce complications of pregnancy.

2) At present, high-risk pregnancies caused by various factors are addressed by interventions, such as symptomatic treatment, nutrition support and bed rest according to high-risk factors and medical conditions in clinical practice. It also focuses on pregnancy management in order to ensure a healthy pregnancy. Regular prenatal care for women with high-risk pregnancies includes health education, prenatal checkups, etc. However, it is mostly teacher-centered, which undermines patients' motivation and initiative and learning outcomes [7]. PBL health education is a problem-oriented and patient-centered teaching model that encourages patients to analyze and solve problems in simulation scenarios to acquire related knowledge. It can also create a relaxing and interesting learning

**Table 3.** Comparisons of two groups' coping skills ( $\bar{x} \pm s$ , points).

Group	Confrontation		Avoidance		Resignation	
	before	after	before	after	before	after
Observation (n = 46)	10.12 ± 1.25	20.34 ± 2.74*	16.37 ± 1.93	8.12 ± 0.75*	12.39 ± 1.74	5.37 ± 0.61*
Control (n = 30)	10.19 ± 1.32	14.78 ± 1.55*	16.45 ± 1.99	13.12 ± 1.44*	12.32 ± 1.69	9.35 ± 1.25*
<i>t</i>	33.310	11.921	0.195	20.712	0.195	19.470
<i>P</i>	0.000	0.000	0.844	0.000	0.845	0.000

Note: \*indicated it was compared to the data before interventions, with  $P < 0.05$ .

**Table 4.** Comparisons of two groups' patient satisfaction [n, (%)].

Group	Very Satisfied	Satisfied	Dissatisfied	Satisfaction Rate
Observation (n = 46)	26 (56.52)	19 (41.30)	1 (2.17)	45 (97.82)
Observation (n = 46)	10 (33.33)	16 (53.33)	4 (13.33)	26 (86.66)
$\chi^2$	-	-	-	4.812
<i>P</i>	-	-	-	0.022

atmosphere and environment for pregnant women, which can keep them motivated and help them deal with negative emotions [8]. The ultimate goal of adopting PBL health education is to help students develop good problem-solving skills. It emphasizes the combination of patients' common problems, theories and practice. Patients are encouraged to engage in knowledge transfer, discussions on the issues that they are interested in and question-and-answer sessions so as to significantly enhance their sense of efficacy and subjective initiative [9]. PBL health education advocates nurse-patient interaction. Patients are encouraged to express their views and opinions in discussions, and the educators will give them careful instructions to resolve some existing misunderstandings so as to improve patients' problem-solving abilities.

3) During PBL health education for women with high-risk pregnancies in this study, educators will collect patients' information and concerns through one-on-one meetings and then develop a reasonable education program. Meanwhile, health education lectures are delivered to disseminate knowledge related to high-risk pregnancies and prenatal diagnosis, etc. The outcomes will be evaluated and patients are encouraged to ask more questions to reorganize their knowledge framework towards high-risk pregnancies and change from passive learning to active learning. Patients are expected to ultimately acquire strong problem-solving abilities, self-management abilities and a great sense of efficacy [10].

4) The results of this study show that patients with PBL-based interventions demonstrate better knowledge, attitude and practice than those who only take regular patient education. The reason for this may be that traditional pregnancy care focuses on monitoring vital signs and simply telling patients what to do yet

pays less attention to the teaching process and guidance. PBL methods have proved to be effective in promoting learners' subjective initiative, enthusiasm for learning and problem-solving abilities. Learners are able to take the advice wisely and put them into practice. In terms of coping skills, patients in the observation group tend to choose to confront the problems rather than just accept or run away from them compared to that in the control group according to the results. The reason for this may be that PBL health education enables patients to have a comprehensive understanding of their own situations, allowing them to better deal with the fear of the unknown and avoid having unnecessary speculation and negative feelings. More importantly, it helps them create a stronger sense of well-being so that they can positively handle complications and diseases and obtain satisfactory treatment and patient experience.

## 5. Conclusion

In conclusion, health education with problem-based learning approaches is worth promoting as it can help high-risk pregnant women in plateau areas develop better health knowledge, attitude and practice as well as healthier coping mechanisms. It can also enhance patient sanctification and experience.

## Acknowledgements

Leading Specialist Construction Project-Department of the First Affiliated Hospital, Jinan University (2022225).

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Wang, F.Y. (2021) Effect of Problem-Oriented Health Education during Pregnancy Intervention on Quality of Life in Pregnant Women. *Chinese General Practice*, **24**, 3-4.
- [2] Ma, S. (2020) Effect of Problem-Oriented Health Education on Pain Level and Subjective Well-Being of Women Undergoing Cesarean Delivery. *Modern Diagnosis and Treatment*, **31**, 2170-2171.
- [3] Shen, H.Y. and Sun, Q.Y. (2019) A Study on the Effects of Problem-Oriented Health Education on Perioperative Psychological Status and Quality of Life of Primiparas Undergoing Cesarean Delivery. *Nursing Practice and Research*, **16**, 90-92.
- [4] Zhou, S.S. and Zhang, W.N. (2019) Effects of a Problem-Oriented Health Education Model on the Psychological State and Quality of Life of Cesarean Delivery Mothers. *The Journal of Medical Theory and Practice*, **32**, 2848-2850.
- [5] Tong, F. and Li, J. (2020) Effects of Internet-Based Health Education on the Psychological Status of Women with High-Risk Pregnancies. *Zhongguo Xiangcun Yiyao*, **27**, 66-67.
- [6] Liu, Y.L. (2019) Effects of Problem-Oriented Health Education and Early Care In-

- 
- tervention on Treatment Adherence and Pregnancy Outcomes in Patients with Gestational Diabetes Mellitus. *Women's Health Research*, No. 13, 186-187.
- [7] Zhang, X.X., Zhao, F., Chang, Y., et al. (2019) Effects of Problem-Oriented Health Education on Postpartum Depression and Hormone Levels in Primiparas. *Chinese Journal of Practical Nursing*, **35**, 784-789.
- [8] Tao, Y. (2019) Effects of Problem-Oriented Health Education on Negative Emotions and Quality of Life of Cesarean Section Mothers. *Electronic Journal of Practical Clinical Nursing Science*, **4**, 188-189.
- [9] Qiu, G.F. and Su, L.J. (2018) Application of Problem-Oriented Health Education in Cesarean Section Care. *Journal of Bengbu Medical College*, **43**, 269-271.
- [10] Xu, Y.J. (2021) Effects of Problem-Oriented Health Education Model on Treatment Adherence and Glycemic Control Level in Patients with Gestational Diabetes Mellitus. *Journal of Practical Medical Techniques*, **28**, 650-651.